Product Catalogue

UPSET®
POWER EXPERT

UPSET®
POWER EXPERT

INDEX

COMPANY PROFILE

UPSet is one of the leading uninterruptible power supply manufacturer in Turkey. UPSet has been founded in 2002 as an engineering company in UPS & electronics industry. With the advantage of being engineering team and with R&D and technology investments, UPSet has reached to highest level in the last years. Thanks to this experience, UPSet has become one of the followed companies in the market now. UPSet is moving towards becoming a global brand with the win & win perception and with range of manufactured products with the latest technology.

UPSet always combines its experience with its innovative identity. Right business and market needs understanding of UPSet makes the company one of the most wanted brands with its exceptional growth ratio . UPSet has 8000 m² closed production area, for manufacturing of electrical products and electronic equipment. UPSet product range varies from Uninterruptible Power Supply (UPS) Systems, Voltage Regulators, Frequency Converters to DC Power Supply, Battery Chargers , Inverters, Batteries and other electrical products and electronic equipments. UPSet is an official ISO certified company. UPSet has also CE certifications. All the UPSet products are designed and produced with the worldwide quality understanding and ISO rules.

MA SERIES

Line Interactive Technology
600VA to 2000VA

- *Line interactive design.*
- *Microprocessor control guarantees high reliability.*
- *Equipped with 3-Step Boost and 2-Step Buck AVR to stabilize input voltage.*
- *Built-in DC start function enables UPS to be started up without AC power supplied.*
- *Auto restart while AC recovery.*
- *Replaceable Battery Design.*
- *Provides Modem/Phone line surge protection.*
- *Energy saving function (UPS green mode).*
- *50/60Hz frequency auto sensing.*
- *Provides lightning, surge, overload, and short-circuit and overload protection.*
- *Built-in CCCV battery charger and battery auto test.*

MA SERIES TECHNICAL SPECIFICATIONS

MODEL	MA-600	MA-650	MA-850	MA-1100	MA-1200	MA-1500	MA-2000
CAPACITY	600VA/360W	650VA/390W	850VA/510W	1000VA/600W	1200VA/720W	1500VA/900W	2000VA/1200W
INPUT							
Voltage	220VAC/230VAC/240VAC						
Voltage Range	-30% +25%						
Frequency	50Hz/60Hz Auto-sensing						
OUTPUT							
Voltage Regulation	±10% (Battery Mode)						
Frequency	50Hz/60Hz ±1Hz						
Waveform	Simulated Sinewave						
Transfer Time	<6ms (Typical)						
BATTERY							
DC Voltage	12VDC			24VDC			
Recharge Time	5 Hours to 90% after complete discharge						
Battery Protection	Over Discharge Protection						
Advanced Battery Management	Yes						
FUNCTIONS							
Display	LED status indicators for AC normal (Green), Back-up (Yellow), UPS cut off (Red)						
Alarms	Buzzer on for back-up mode, battery low, overload						
Short Circuit Protection	AC fuse and electronic circuit (line mode); electronic circuit (back-up mode)						
Voltage Regulation	2 steps boost and 1 step buck AVR						
DC Start Function	Yes (Cold Start)						
ENVIRONMENT							
Operating Temp.	0°C - 40°C						
Relative Humidity	90% Non-condensing						
Audible Noise	<40dB at 1 meter						
Dimensions (D*W*H) mm	308*98*170			385*98*170		370*150*170	

MM PORTABLE SERIES

Line Interactive Pure Sine Wave Technology
500VA to 1000VA

- *Line Interactive Design.*
- *Wide Input Voltage Range*
- *AVR Automatic Voltage Regulation*
- *High Reliability With CPU Control*
- *Cold Start*
- *Overload And Short Circuit Potection*
- *LCD Front Panel*
- *Pure Sine Wave Output Voltage*
- *Longer Back-up Time With the Additional Battery Pack*

MM Portable Series Technical Specifications

MODEL	MM-500	MM-1000
CAPACITY	500VA/300W	1000VA/600W
INPUT		
Nominal Voltage	220VAC/230VAC/240VAC	
Voltage Range	145-275VAC	
Frequency	50/60 Hz (Auto sensing)	
OUTPUT		
Voltage	220VAC/230VAC/240VAC	
Voltage Range	±5%	
Frequency Range (Battery Mode)	50 Hz or 60 Hz ±1 Hz	
Transfer Time	5ms	
Waveform	Pure Sinewave	
BATTERY		
DC Voltage	12VDC	24VDC
Charging Time	8 hours to 90% capacity after full discharge	
Back Up Time	External Battery Design	
INDICATORS		
LCD Panel	Input, Output, Load, Battery, Frequency	
PROTECTIONS		
Full Protection	Over and low voltage protection, overload, discharge, and overcharge protection	
ALARMS		
Battery Mode	Sounding every 10 seconds	
Low Battery	Sounding every second	
Overload	Sounding every 0.5 second	
PHYSICAL		
Dimensions	305*121*207	
Packing Dimensions	440*407* 282(two pieces)	
Weight kg	7	9

UPSET® POWER EXPERT

POWERACTIVE RACK / TOWER SERIES

MODEL	PA – 1000R	PA – 2000R	PA – 3000R	PA – 6000R	PA – 10000R
Power (VA)	1000 VA	2000 VA	3000 VA	6000 VA	10000
Power (W)	900 W	1800 W	2700 W	5400 W	9000 W
INPUT					
Voltage	208 VAC / 220 VAC / 230 VAC / 240 VAC				
Voltage Range	50% Load (115 – 295) ± 5Vac. 100 Load (145 – 295) ± 5Vac.			50% Load (115 – 295) ± 5Vac. 100% Load (165 – 295) ± 5Vac.	
Frequency	45-55 Hz.± 0,5% / 55-65 Hz. ± 0,5% (Auto Sense)			40-70 Hz. ± 0,5% (Auto Sense)	
Power Factor	≥ 0,98			≥0,99	
Bypass Voltage Range	Rated Output Voltage ± 32 VAC			160 VAC - Rated Output Voltage+ 32 VAC	
OUTPUT					
Voltage	208 VAC / 220 VAC / 230 VAC / 240 VAC – Settable via LCD				
Voltage Regulation	± 1%				
Frequency	Synchronized with utility in mains mode; 50 / 60 Hz. ± 0,2 Hz in battery mode				
Wave Form	Pure Sine Wave				
Crest Factor	3:1				
Harmonic Distortion	Linear Load ≤ 3% ; Non Linear Load ≤ 5%			Linear Load ≤ 2% ; Non Linear Load ≤ 5%	
Transfer Time	Mains mode to battery mode; 0 ms Inverter mode to bypass mode : 4 ms			Mains mode to battery mode ; 0 ms Inverter mode to bypass mode : 0 ms	
Over Load	105% - 150% transfer to bypass in 30 sec.; >150% transfer to bypass in 300 msec.			105% - 125% transfer to bypass in 3 mins. 125%-150% transfer to bypass in 30 sec. >150% transfer to bypass in 100 msec.	
EFFICIENCY					
Mains Mode	≥ 90%			≥ 92%	
Battery Mode	≥ 87%			≥ 91%	
ECO Mode	≥ 98%			≥ 98%	
BATTERY					
Battery Voltage	24 VDC	48 VDC	72 VDC	192 VDC	
Qty / Model	2*12V 9 Ah	4*12V 9 Ah	6*12V 9 Ah	16*12V 7 Ah	16*12V 9 Ah
Charging Current (Standard Model)	1 Amp.				
Charging Current (Long Model)	6 Amp.			8 Amp.	
Recharging Time	8 hours				
ALARMS					
Battery Low	1 sec. per beep				
Over Load	1 sec. twice beep				
UPS Fault	Long beep				
ENVIROMENTAL / COMMUNICATIONS					
Operating Temp. / Humidity	0 - 40°C, 20%-90% (non condensing)				
Noise	≤ 50 Db (from 1 meter)		≤ 55 Db (from 1 meter)		
Standard RS 232 / Optinoal USB	Windows98/2000/2003/xp/vista/2008/7/8				
Optional SNMP	Power management from SNMP Manager and web browser				
DIMENSIONS					
Dimensions (WxDxH)	440*468*88	440*718*88		440*555*132 (UPS) 440*555*132 (BAT)	
Net Weight (Kg)	15	24	30	21 (UPS) / 48 (BAT)	22 (UPS) / 54 (BAT)

- Rack / Tower design
- High frequency and true double-conversion
- DSP digital control technology
- Input power factor correction (PFC)
- Wide input voltage range (110 V ~300 V)
- Output power factor 0.9
- Cold start
- Auto sensing frequency
- ECO mode operation for energy saving
- Selectable output voltage via LCD
- Output bypass settable for 1,2,3 KVA via LCD
- 50 Hz / 60 Hz frequency conversion mode available on 6 ~10 KVA
- Selectable battery low voltage via LCD
- Power-on self test
- Advanced battery management (ABM)
- Short circuit and overload protection
- Automatic charging in OFF mode
- Standard RS232 communication port and RJ45 protection
- Optional USB / SNMP communication port
- Optional emergency power off (EPO)

UPSET®
POWER EXPERT

POWERACTIVE SERIES

Online Double Conversion Technology
1kVA to 10kVA

- *DSP Digital Control Technology*
- *Output Power Factor 0.9*
- *Input PFC*
- *Green Environment-Friendly Model*
- *Wide Input Voltage Range*
- *Perfect Protection*
- *Cold Start and Mains Power Start Function.*
- *Generator Compatibility*
- *Zero Switching*
- *Intelligent Battery Management*
- *Friendly Interface*

POWERACTIVE SERIES 1-10 KVA TECHNICAL SPECIFICATIONS

MODEL	PA-1000	PA-2000	PA-3000	PA-6000	PA-10000
CAPACİTY	1KVA/0.9KW	2KVA/1.8KW	3KVA/2.7KW	6KVA/5.4KW	10KVA/9KW
INPUT					
Rated Voltage	208V/220V/230V/240VAC				
Voltage Range	Half load (115-295)±5VAC Full load (145-295)±5VAC			Half load (115-295)±5VAC Full load (165-295)±5VAC	
Frequency	45-55Hz±0.5% or 55-65Hz±0.5% (Auto Sensing)			40-70Hz±0.5% (Auto Sensing)	
Power Factor	≥0.98			≥0.99	
Bypass Voltage Range	Rated output voltage-34V ~ Rated output voltage+32V			160V ~ Rated output voltage+32V	
OUTPUT					
Voltage	208V/220V/230V/240VAC Setting available via LCD				
Voltage Regulation	±1%				
Frequency	Synchronized with utility on AC mode;50/60±0.2Hz on battery mode				
Waveform	Pure sinewave				
Crest Factor	3:1				
Harmonic Distortion	≤3%(Linear load);≤5%(Non-linear load)			≤2%(Linear load); ≤5%(Non-linear load)	
Transfer Time	AC mode to battery mode :0ms Inverter mode to bypass mode:4ms(Typical)			AC mode to battery mode :0ms Inverter mode to bypass mode:0ms	
Overload Capability	105%-150%:Transfer to bypass after 30s; >150%: Transfer to bypass after 300ms			105%-125%:Transfer to bypass after 3mins; 125%-150%: Transfer to bypass after 30s; >150%: Transfer to bypass after 100ms	
EFFICIENCY					
AC Mode	≥90%			≥92%	
Battery Mode	≥87%			≥91%	
ECO Mode	≥98%			≥98%	
BATTERY					
DC Voltage	24V	48V	72V	192V	
Inbuilt Battery of Std Model	2*9Ah	4*9Ah	6*9Ah	16*7Ah	16*9Ah
Charge Current Standard Model	1Amp				
Charge Current Long Model	6 Amp			1/3/5/8Amp Selectable	
Typical Recharge Time	8 hours recover to 90% capacity				
ALARM					
Utility Failure	Beep/4s				
Battery Low	Beep/1s				
Overload	Beep Twice/1s				
UPS Fault	Long Beep				
ENVIRONMENT					
Humidity	20~90% RH @ 0~40°C (non-condensing)				
Noise Level	≤50dB (1m)			≤55dB (1m)	
MANAGEMENT					
Standard RS-232 ,Optional USB	Supports Windows 98/2000/2003/XP/Vista/2008/7/8				
Optional SNMP	Power management from SNMP manager and web browser				
PHYSICAL					
Dimension(mm) W*D*H	144*410*215	190*470*341		262*514*735	
Packing Dimension(mm) W*D*H	230*492*315	320*550*462		360*650*795	
Net Weight(kg)	13	25	29	67	75
Gross Weight(kg)	15	27	31	78	85

ISO 9001:2008

DEFENDER SERIES

Online Double Conversion Technology 10kVA to 20kVA

- *High Frequency and True Double-Conversion*
- *DSP Digital Control Technology*
- *Wide Input Voltage Range (110V-300V)*
- *Output Power Factor 0.9*
- *Optimized Battery Configuration: 192V/240V*
- *Cold Start*
- *50/60 Hz Frequency Adaptive*
- *ECO Mode Operation For Energy Saving*
- *50/60 Hz Frequency Converter Mode*
- *Selectable Output Voltage via LCD*
- *Selectable Battery Shutdown Voltage(EOD) via LCD*
- *Selectable Input Mode via LCD: 3/1 or 1/1*
- *Advanced Battery Management (ABM)*
- *Short Circuit and Overload Protection*
- *Automatically Charging Battery at UPS Off Mode*
- *Auto Control Fan Speed*
- *Standard RS232 Communication Port*
- *Optional Emergency Power Off (EPO)*
- *Optional RS485/SNMP/AS400/USB Communication Port*
- *Optional External Battery Bank*
- *Optional Manual Bypass*
- *Optional N+1 Redundancy Parallel*

Defender Series 10-20 kVA Technical Specifications

MODEL	Defender 3110	Defender 3110L	Defender 3115L	Defender 3120L
CAPACITY	10KVA/9KW	10KVA/9KW	15KVA/13.5KW	20KVA/18KW
INPUT				
Rated Voltage	3/1: 360V/380V/400V/415VAC; 1/1: 208V/220V/230V/240VAC Setting available via LCD			
Voltage Range	3/1: Half load (190-520)±5VAC, Full load (277-520)±5VAC; 1/1: Half load (110-300)±5VAC, Full load (160-300)±5VAC.			
Frequency	40-70Hz±0.5% (Auto sensing)			
Power Factor	3/1:≥0.95; 1/1:≥0.99			
BYPASS				
Voltage Range	160V-Rated output voltage+32V			
Frequency	50/60Hz±5Hz			
OUTPUT				
Voltage	208V/220V/230V/240VAC Setting available via LCD			
Voltage Regulation	±1%			
Frequency	Synchronized with utility on AC mode;50/60±0.1Hz on battery mode			
Waveform	Pure sinewave			
Crest Factor	3:1			
Harmonic Distortion	≤2%(Linear load);≤5%(Non-linear load)			
Transfer Time	AC mode to battery mode :0ms Inverter mode to bypass mode:0ms			
Overload Capability	105%-125%:Transfer to bypass after 3mins; 125%-150%: Transfer to bypass after 30s; >150%: Transfer to bypass after 100ms			
EFFICIENCY				
AC Mode	≥93%			
Battery Mode	≥92%			
ECO Mode	≥98%			
BATTERY				
DC Voltage	192V/240VDC(Set up by jumper)			
Inbuilt Battery of Std Model	16*9Ah	Without Batteries		
Charge Current Standard Model	1Amp	Without Batteries		
Charge Current Long Model	No	7 Amp		
Typical Recharge Time	8 hours recover to 90% capacity			
ALARM				
Utility Failure	Beep/4s			
Battery Low	Beep/1s			
Overload	Beep Twice/1s			
UPS Fault	Long Beep			
ENVIRONMENT				
Humidity	20~90% RH @ 0~40 (non-condensing)			
Noise Level	≤58dB (1m)			≤60dB (1m)
MANAGEMENT				
Standard RS-232 ,Optional USB	Supports Windows 98/2000/2003/XP/Vista/2008/7/8			
Optional SNMP	Power management from SNMP manager and web browser			
PHYSICAL				
Dimension(mm) W*D*H	262×580×732		262×580×628	
Packing Dimension(mm) W*D*H	359×687×822		359×687×717	
Net Weight(kg)	74	30	39	40
Gross Weight(kg)	84	36	47	48

DEFENDER DSP SERIES

Online "Double Conversion" Technology, DSP Controlled IGBT Rectifier UPS
3 Phase Input & 3 Phase Output 10kVA to 250kVA

- *IGBT Rectifier*
- *Real Digital Signal Processor (DSP) controlled transformerless design*
- *Input Power Factor Correction PFC(>0,99)*
- *Low Total Harmonic Distortion Level*
- *High Efficiency (up to 95%)*
- *Wide Input Voltage Range*
- *Generator Compatible Operation*
- *ECO Mode Feature*
- *Intelligent battery management system extends the lifetime of batteries*
- *Static and Manual Bypass*
- *Communication with computers and network systems with SNMP availability*
- *Expandable battery blocks*
- *Low installation and operating costs*
- *Special voltage applications other than stated values*

Defender DSP Series Technical Specifications

MODEL	Defender DSP 3310	Defender DSP 3315	Defender DSP 3320	Defender DSP 3330	Defender DSP 3340	Defender DSP 3345	Defender DSP 3360	Defender DSP 3380	Defender DSP 33100	Defender DSP 33120	Defender DSP 33160	Defender DSP 33200	Defender DSP 33250
Output Power (kVA)	10	15	20	30	40	45	60	80	100	120	160	200	250
Nominal Active Power (kW)	8	12	16	24	32	36	48	64	80	96	128	160	200
INPUT													
Number Of Phases	3Phase+N+E												
Nominal Voltage (Ph-Ph)	380/400/415VAC												
Voltage Range (100% Load)	176-280 VAC												
Nominal Frequency (Hz)	50/60 Hz												
Frequency Range	44-66 HZ												
Input Current THD	<4%						<5%						
Input Power Factor	0.99												
OUTPUT													
Power Factor	0,8												
Number Of Phases	3												
Voltage	380/400/415												
Static Voltage Regulation	1%												
THD-V	<3%												
Crest Factor	3:1												
Frequency (Hz)	50 / 60 Hz												
Free Running Frequency (Hz)	0,01 Hz												
Overload	125% for 10 minutes, 150% for 30 secs												
Efficiency	>94%												
BATTERY													
Type	Maintenance Free Dry Type												
Quantity	2x31								2x30				
Battery Protection	Deep Discharge Protection with Auto Cut Off												
Battery Test	Standard (Auto&Manual)												
DISPLAY													
LED Display	Line, Bypass, Battery, Inverter, Load, Fault Indications												
LCD Display	Load%, Input&Output Frequency, Voltage & Current, Bypass Voltage, Battery Voltage & Current, Temperature, Alarms, History												
STATIC BYPASS													
Number Of Phases	3Phase+N+E												
Voltage Range For Bypass	175-253 VAC												
Frequency Range For Bypass	47-53 Hz or 57-63 Hz												
COMMUNICATION													
Interface (Communication Ports)	RS 232												
Dry Contact Signals	Optional												
Others	SNMP Optional												
ENVIRONMENT													
Storage Temperature Range (°C)	Without Batteries -25 +55 C (15 to 40 recommended for longer battery life time)												
Operating Temperature Range (°C)	0-40 C (20 to 25 recommended for longer battery life time)												
Relative Humidity	0-95 % (non-condensing)												
Max. Altitude	1000 m												
Protection Level	IP 20												
PHYSICAL SPECIFICATIONS													
Dimensions W*D*H (cm)	46x83x86	46x83x86	46x83x86	46x83x86	46x94x116	46x94x116	56x96x110	56x96x110	56x105x130	56x105x130	108x96x148	108x96x148	108x96x148
Weight (kg)	80	85	85	95	120	125	175	185	220	240	360	440	480
STANDARDS													
Standards	CE												

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DEFENDER DSP-T SERIES

Online "Double Conversion" Technology, IGBT Rectifier UPS with Built in Isolation Transformer
3 Phase Input & 3 Phase Output 10kVA to 250kVA

- *IGBT Rectifier*
- *Real Digital Signal Processor (DSP) controlled*
- *Built in Output Isolation Transformer*
- *Input Power Factor Correction PFC(>0,99)*
- *Low Total Harmonic Distortion Level*
- *High Efficiency (up to 95%)*
- *Wide Input Voltage Range*
- *Generator Compatible Operation*
- *ECO Mode Feature*
- *Intelligent battery management system extends the lifetime of batteries*
- *Static and Manual Bypass*
- *Communication with computers and network systems with SNMP availability*
- *Expandable battery blocks*
- *Low installation and operating costs*
- *Special voltage applications other than stated values*

Defender DSP-T Series Technical Specifications

MODEL	Defender DSP-T 3310	Defender DSP-T 3315	Defender DSP -T 3320	Defender DSP-T 3330	Defender DSP-T 3340	Defender DSP-T 3345	Defender DSP-T 3360	Defender DSP-T 3380	Defender DSP-T 33100	Defender DSP-T 33120	Defender DSP-T 33160	Defender DSP-T 33200	Defender DSP-T 33250
Output Power (kVA)	10	15	20	30	40	45	60	80	100	120	160	200	250
Nominal Active Power (kW)	8	12	16	24	32	36	48	64	80	96	128	160	200
INPUT													
Number Of Phases	3Phase+N+E												
Nominal Voltage (Ph-Ph)	380/400/415VAC												
Voltage Range (100% Load)	176-280 VAC												
Nominal Frequency (Hz)	50/60 Hz												
Frequency Range	44-66 HZ												
Input Current THD	<4%						<5%						
Input Power Factor	0.99												
OUTPUT													
Power Factor	0,8												
Number Of Phases	3												
Voltage	380/400/415												
Static Voltage Regulation	1%												
THD-V	<3%												
Crest Factor	3:1												
Frequency (Hz)	50 / 60 Hz												
Free Running Frequency (Hz)	0,01 Hz												
Overload	125% for 10 minutes, 150% for 30 secs												
Efficiency	>94%												
BATTERY													
Type	Maintenance Free Dry Type												
Quantity	2x31								2x30				
Battery Protection	Deep Discharge Protection with Auto Cut Off												
Battery Test	Standard (Auto&Manual)												
DISPLAY													
LED Display	Line, Bypass, Battery, Inverter, Load, Fault Indications												
LCD Display	Load%, Input&Output Frequency, Voltage & Current, Bypass Voltage, Battery Voltage & Current, Temperatur												
STATIC BYPASS													
Number Of Phases	3Phase+N+E												
Voltage Range For Bypass	175-253 VAC												
Frequency Range For Bypass	47-53 Hz or 57-63 Hz												
COMMUNICATION													
Interface (Communication Ports)	RS 232												
Dry Contact Signals	Optional												
Others	SNMP Optional												
ENVIRONMENT													
Storage Temperature Range (°C)	Without Batteries -25 +55 C (15 to 40 recommended for longer battery life time)												
Operating Temperature Range (°C)	0-40 C (20 to 25 recommended for longer battery life time)												
Relative Humidity	0-95 % (non-condensing)												
Max. Altitude	1000 m												
Protection Level	IP 20												
PHYSICAL SPECIFICATIONS													
Weight (kg)	250	260	260	290	410	420	465	540	615	640	1015	1100	1360
STANDARDS													
Standards	CE												

DEFENDER PRO SERIES

Online "Double Conversion" Technology 3 Phase Input & 3 Phase Output

10kVA to 600kVA

- *Online Double Conversion Technology*
- *Eco Mode Feature*
- *Microprocessor Control*
- *Automatic Battery Test*
- *IGBT & PWM Technology*
- *Built-in Static & Manual Bypass*
- *Isolated Output Transformer*
- *Modification For Special Voltage*
- *Parallel System Option*
- *Internal Port for SNMP Option*
- *Expandable and Variable Battery Blocks*
- *12 Pulse Rectifier Option*

Defender Pro Series (10-150 kVA) Technical Specifications

POWER (KVA)	10	15	20	30	45	60	80	100	120	150
INPUT										
Voltage	220 / 380, 230 / 400, 240 /415 VAC ± %15 (Adjustable) 3 Phase + Neutral									
Frequency	50 or 60 Hz ± %5									
Protection	Current restriction for each phase on rectifier input (In x 1.5) + Fuse									
Input Power Factor	> 0,8 (6 Pulse/standart), > 0.85 (12 Pulse), > 0,99 (PFC Technology)									
Total Hormonic Distortion (THD-I)	< %25 (6 pulse/standart), < % 10 (12 pulse), < % 5 (PFC Technology)									
OUTPUT										
Voltage	220 / 380, 230 / 400, 240 /415 VAC ± %1 (Adjustable) 3 Phase + Neutral									
Frequency	50 or 60 Hz ± % 0.1 (independent from utility), 50 or 60 Hz ± %1 (synchronized working)									
Efficiency	Inverter > % 90, Eco-Mode >%97						Inverter > %91, EcoMode>%97			Inverter > %92, EcoMode>%98
Total Harmonic Distortion (THD-V)	< %3									
Power Factor	0,8									
Overload	Load ⩽ %150 1 minutes, Load>%150 Static Bypass									
Voltage Protection	200VAC-240VAC (Inverter operation limits - Adjustable) 200VAC-240VAC (Eco-mode operation limits - Adjustable) 185VAC-255VAC (Static by-pass operation limits - Adjustable)									
Temperature Protection	IGBT Heatsink and Output Transformer temperature protection									
Crest factor	3:1									
BATTERY										
Voltage	405 VDC									
Quantity	30 units (standart)									
Time	Optional									
PHYSICAL PROPERTIES										
Temperature	0 - 40 °C									
Relative Humidity	%0-95 (Non-condensing)									
Audible Noise	<55 dB (A)			<60dB (A)				<65dB (A)		<70dB (A)
Operation altitude	2000 m.									
Type of Protection	IP20 (IP31 and IP54 is optional)									
Weight (without battery) (kg)	205	250	305	360	420	485	520	920	1070	1410
GENERAL PROPERTIES										
Display	4 lines, 20 characters LCD monitor, Line, charge, discharge, Eco mode, Inverter, Bypass, Manual By-Pass, LED mimic diagram									
Warnings	32 memories for previous alerts (name, date, time), 4 fault report									
Working Type	Online double conversion - microprocessor controlled									
RFI Level	EN50091-2									
ECO Mode	Enhanced Intelligent ECO MODE feature,									
Technology	High frequency PWM technique, IGBT technology									
Communication	UPSet UPS server, terminal programs & RS232 cable is standard, Remote control over Internet or Ethernet by SNMP card and static TCP/IP number (optional).									
STATIC BYPASS										
Input Limit	185VAC-255VAC (adjustable)									
Transfer Time	0 ms									
Overload	%200 (adjustable), 10ms %2000, Fuse									

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Defender Pro Series (200-600 kVA) Technical Specifications

POWER (KVA)	200KVA	300KVA	400KVA	500KVA	600KVA
INPUT					
Voltage	220 / 380, 230 / 400, 240 /415 VAC ± %15 (Adjustable) 3 Phase + Neutral				
Frequency	50 or 60 Hz± %5				
Protection	Current restriction for each phase on rectifier input (In x 1.5) + Fuse				
Input Power Factor	> 0,8 (6 Pulse/standart), > 0.85 (12 Pulse), > 0,99 (PFC Technology)				
Total Hormonic Distortion (THD-I)	< %25 (6 pulse/standart), < % 10 (12 pulse), < % 5 (PFC Technology)				
OUTPUT					
Voltage	220 / 380, 230 / 400, 240 /415 VAC ± %1 (Adjustable) 3 Phase + Neutral				
Frequency	50 or 60 Hz ± % 0.1 (independent from utility), 50 or 60 Hz ±%1 (synchronized working)				
Efficiency	Inverter > % 93, Eco-Mode > % 97		Inverter > % 94, Eco-Mode > % 98		
Total Harmonic Distortion (THD-V)	<%3				
Power Factor	0,8				
Overload	load %100-110 1 hour ,for %110-125 3 minutes, for %125-150 1 minute,				
	when load > %150 STATIC BY-PASS				
Voltage Protection	200VAC-240VAC (Inverter operation limits - Adjustable)				
	200VAC-240VAC (Eco-mode operation limits - Adjustable)				
	185VAC-255VAC (Static by-pass operation limits - Adjustable)				
Temperature Protection	IGBT Heatsink and Output Transformer temperature protection				
Crest Factor	3:1				
BATTERY					
Voltage	405 VDC	729 VDC			
Quantity	30 units (standard)	54 units (standard)			
Time	Optional				
PHYSICAL PROPERTIES					
Temperature	0 - 40 °C				
Relative Humidity	%0-95 (Non-condensing)				
Audible Noise	<70 dB (A) 1 meter		<75dB (A) 1 meter		
Operation Altitude	2000 m.				
Type of Protection	IP20 (IP31 and IP54 is optional)				
Weight (without battery) (kg)	1350	1425	1650	1800	2200
GENERAL PROPERTIES					
Display	4 lines, 20 characters LCD monitor, Line, charge, discharge, Eco mode, Inverter, Bypass, Manual By-Pass, LED mimic diagram				
Warnings	32 memories for previous alerts (name, date, time), 4 fault report				
Working Type	Online double conversion - microprocessor controlled				
RFI Level	**EN50091-2**				
ECO Mode	Enhanced Intelligent ECO MODE feature,				
Technology	High frequency PWM technique, IGBT technology				
Communication	UPSET UPS server, terminal programs & RS232 cable is standard,				
	Remote control over Internet or Ethernet by SNMP card and static TCP/IP number (optional).				
STATIC BYPASS					
Input Limit	185VAC-255VAC (adjustable)				
Transfer Time	0 ms				
Overload	Current restriction for each phase on rectifier input (In x 1.5) + Fuse				

AVR 11 Series

Full Automatic AC Servo Voltage Stabilizers
1 kVA to 50 kVA

- *UPSet AVR 11 series 1 phase in / 1 phase out (1-50 kVA)*
- *UPSet AVR 11 series are single phase voltage stabilizers regulate mains voltage and bring many advantages.*
- *Non-linear charges drive*
- *1 phase input & 1 phase output*
- *Wide power and voltage range*
- *Fast Regulation*
- *High reliability thanks to Microprocessor and Smart Driver*
- *High efficiency*
- *Load transfer to Bypass via pole charge switch*
- *Safe and economic usage*
- *Overcurrent and overload protection (Optional)*
- *Digitally displayed status, input & output measurements*

AVR 11 SERIES LINE INTERACTIVE TECHNICAL SPECIFICATIONS

MODEL	1101	1102	1103	1105	1107	1110	1115	1120	1125	1130	1140	1150
CAPACITY	1kVA	2kVA	3.5kVA	5kVA	7.5kVA	10kVA	15kVA	20kVA	25kVA	30kVA	40kVA	50kVA
INPUT												
Voltage Correction Range	160-260VAC											
Voltage Operating Range	90-285VAC											
Operating Frequency	47-65Hz											
Protection	Overcurrent, Low and High Voltage Protection											
OUTPUT												
Voltage	220/230/240VAC±2%											
Overload	10 sec at 200% load											
Correction Speed	90 volt/second											
Uptorn Period	90 volt/second (160-260VAC)											
Protection	Overload, Overcurrent, Low and High Voltage Protection											
Working Type	Servo Motor, Microprocessor Controlled, Full Automatic											
GENERAL												
Cooling	Smart Fan System											
Display	RMS panel voltmeter, output voltage and line voltage											
Efficiency	>96%											
Mechanical By-Pass	Manually Controlled - PAKO Switch selects Voltage Regulator / Switch Turn On/Off											
Protection Level	IP20											
ENVIRONMENTAL												
Operating Temperature	0°C / 40°C											
Storage Temperature	-25°C / +60°C											
Relative Humidity	0 - 90% (non-condensing)											
Altitude	<2000m											
Acoustic Noise	<50dB at 1 meter											
DIMENSIONS												
H*W*D cm	23*42*23		27*45*35		27*55*35		32*60*40	85*50*50			85*50*70	
Weight kg	15	16	29	40	47	55	75	125	136	163	180	210

AVR 33 Series

AVR 33 Series Full Automatic AC Servo Voltage Stabilizers 3 kVA to 150

- *UPSet AVR 33 Series 3 phase in / 3 phase out (3-150 kVA)*
- *UPSet AVR 33 series are three phase voltage stabilizers regulates mains voltage and brings many advantages.*
- *Non-linear charges drive*
- *3 phase input 3 phase output*
- *Wide power and voltage range*
- *Fast Regulation*
- *High reliability thanks to Microprocessor and Smart Driver*
- *High efficiency*
- *Load transfer to Bypass via pole charge switch*
- *Safe and economic usage*
- *Overcurrent and overload protection (Optional)*
- *Digitally displayed status, input & output measurements*

AVR 33 Series Technical Specifications

MODEL	3303	3306	3310	3315	3320	3330	3345	3360	3375	33100	33120	33150
CAPACITY	3kVA	6kVA	10.5kVA	15kVA	22.5kVA	30kVA	45kVA	60kVA	75kVA	100kVA	120kVA	150kVA
INPUT												
Voltage Correction Range	275-450VAC											
Voltage Operating Range	155-490VAC											
Operating Frequency	47-65Hz											
Protection	Overcurrent, Low and High Voltage Protection											
OUTPUT												
Voltage	380/400/415VAC±2%											
Overload	10 sec at 200% load											
Correction Speed	90 volt/second											
Uptorn Period	90 volt/second (160-250VAC)											
Protection	Overload, Overcurrent, Low and High Voltage Protection											
Working Type	Servo Motor, Microprocessor Controlled, Full Automatic											
GENERAL												
Cooling	Smart Fan System											
Display	RMS panel voltmeter, output voltage and line voltage											
Efficiency	>96%											
Mechanical By-Pass	Manually Controlled - PAKO Switch selects Voltage Regulator / Switch Turn On/Off											
Protection Level	IP20											
ENVIRONMENTAL												
Operating Temperature	0°C / 40°C											
Storage Temperature	-25°C / +60°C											
Relative Humidity	0 - 90% (non-condensing)											
Altitude	<2000m											
Acoustic Noise	<50dB at 1 meter											
DIMENSIONS												
H*W*D cm	110*50*45					120*60*45		140*85*65			165*90*70	
Weight kg	55	65	120	135	154	183	237	330	356	456	545	565

AVR 33 HI Series

AVR 33 Hi Series Full Automatic AC Servo Voltage Stabilizers 200kVA to 3000kVA

- *UPSet AVR 33 Hi Series 3 phase in / 3 phase out (200-3000 kVA)*
- *UPSet AVR 33 Hi series are three phase voltage stabilizers regulates mains voltage and brings many advantages.*
- *Non-linear charges drive*
- *3 phase input 3 phase output*
- *Wide power and voltage range*
- *Fast Regulation*
- *High reliability thanks to Microprocessor and Smart Driver*
- *High efficiency*
- *Load transfer to Bypass via pole charge switch*
- *Safe and economic usage*
- *Overcurrent and overload protection (Optional)*
- *Digitally displayed status, input & output measurements*

AVR 33 HI SERIES TECHNICAL SPECIFICATIONS

MODEL	33200	33250	33300	33400	33500	33600	33800	331000	331250	331600	332000	332500	333000
CAPACITY	200kVA	250kVA	300kVA	400kVA	500kVA	600kVA	800kVA	1000kVA	1250kVA	1600kVA	2000kVA	2500kVA	3000kVA
INPUT													
Voltage Correction Range	275-450VAC (Standard) or 210-415VAC (Optional)												
Voltage Operating Range	155-490VAC												
Operating Frequency	47-65Hz												
Protection	Overcurrent, Low and High Voltage Protection												
OUTPUT													
Voltage	380/400/415VAC±1%												
Overload	10 sec at 200% load												
Correction Speed	90 volt/second												
Uptorn Period	90 volt/second (160-250VAC)												
Protection	Overload, Overcurrent, Low and High Voltage Protection												
WORKING TYPE													
GENERAL													
Cooling	Smart Fan System												
Display	RMS panel voltmeter, output voltage and line voltage												
Efficiency	>97%												
Mechanical By-Pass	Manually Controlled - PAKO Switch selects Voltage Regulator / Switch Turn On/Off												
Protection Level	IP20												
ENVIRONMENTAL													
Operating Temperature	0°C / 40°C												
Storage Temperature	-25°C / +60°C												
Relative Humidity	0 - 90% (non-condensing)												
Altitude	<2000m												
Acoustic Noise	<50dB at 1 meter												
DIMENSIONS													
H*W*D cm	172*60*70 (3pcs)			170*60*120 (3pcs)			185*70*80 (6pcs)			195*80*100 (6pcs)		175*140*100	205*140*100
Weight kg	1050	1150	1250	1500	2000	2500	2750	3500	3750	4500	5500	7000	8500

DEFENDER SFC-L SERIES

Defender SFC-L Series Static Frequency Converters
3 Phase Input & 3 Phase Output 10kVA to 300 KVA

- *Micro Processor Controlled*
- *Static IGBT-PWM inverter*
- *Efficiency > %90*
- *Clear Sinusoidal Waveform*
- *Galvanic Isolated Transformer*
- *Emergency Stop Button*
- *Isolated RS485 Communication Contact*
- *Warning Memory with last 50 events*
- *LCD panel, 4 rows by 20 characters*
- *Output Power Factor: 0.8 Ind.- 0.8 Cap.*
- *Input Power Factor: > 0,90 (>0,98 optional)*
- *Input Current THD: < %8 (<%5 optional)*
- *By Soft Start compliant with generator*

OPTIONS

- *Operating with the batteries*
- *External By-Pass*
- *Various IP protection classes for cabinet*
- *Anti Condensation Unit*
- *90 Degrees Door Stopper*
- *Remote Panel for remote monitoring and control*
- *SNMP Card (for Internet Management)*
- *Dry-Contacts*
- *Extra Analog-Digital multi-meters*
- *Earth leakage measuring*
- *28.5VDC Starter Rectifier*
- *Redundant Inverter features*

STANDARDS

Operation	S1 according to VDE 0530 (Continous Operation)
EMC	MIL-STD-461-E / EN 62040-2 / EN 61000-4-2 / EN 61000-4-4 / EN 61000-4-6
Safety	EN 62040-1-1
Grounding	MIL-STD-1310-G
Short Circuit and Transient	VDE0610
Parallel Operation and Load Sharing	MIL-F-24638
Acoustic Noise	STANAG 4293
Electronic Printed Boards	MIL-P-55110E
Vibration	MIL-STD-167-1 (For Naval Applications)
Input Values	STANAG 1008 (Ed.9) (For Naval Applications)
Output Values	MIL-STD-1399 (300A) (For Naval Applications)
Circuit Breakers Connection Points	TS EN 60947
Protection Class	IES 60529

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DEFENDER SFC-L SERIES

Defender SFC-L Series Technical Specifications

MODEL	SFC-L 3310	SFC-L 3320	SFC-L 3330	SFC-L 3340	SFC-L 3360	SFC-L 3380	SFC-L 33100	SFC-L 33120	SFC-L 33160	SFC-L 33200	SFC-L 33250	SFC-L 33300
Output Power (kVA)	10	20	30	40	60	80	100	120	160	200	250	300
Nominal Active Power (kW)	8	16	24	32	48	64	80	96	128	160	200	240
INPUT												
Voltage	380/400/415VAC±15%,3Phase+Neutral											
Frequency	50 or 60 Hz ±5%											
Protection	Adjustable rectifier operation limits+Fuse											
Current THD	<5% (at full load)											
OUTPUT												
Voltage	115/200VAC±1%,3Phase+Neutral											
Frequency	50 & 60 & 400Hz±0.5%											
Efficiency	>90%					>91%						
Voltage THD	<3%											
Power Factor	0,8											
Over Load	100-110% 1hour, 110-125% 10 mins, 125-150% 1 min											
Voltage Protection	Adjustable inverter operation limits. If inverter is out of limits, inverter off											
Temp. Protection	Temperature protection of IGBT heat sink and transformer											
Crest Factor	3:1											
DC												
Voltage	620VDC											
Ripple	<1%											
GENERAL												
Display	4 rows, 20 characters LCD display, warnings LEDS, mimic diagram											
Warnings	32 warning message memory (warning name, date, time) + 4 detailed warning report											
Operating System	Static Microprocessor Controlled											
Operating Technique	IGBT and High Frequency PWM Technique											
Operating Class	S-1 Continous Operation (according to VDE 0530 standard)											
Communication	Isolated RS485, Remote Control Panel (optional), SNMP (optional), Dry Contacts (Optional)											
RFI Level	EN 62040-2 and EN 61000-4:2, 4:4, 4:6 compliance											
Output Isolation	Galvanic isolation with isolated output transformer											
Short Circuit Protection	Electronic protection + fuse											
Start Rectifier	Additional starter rectifier (optional)											
PHYSICAL												
Ambient Temp.	0 - 40 °C											
Humidity	0-90% (non-condensing)											
Acoustic Noise	<60dB 1 meter					<65dB 1 meter			<70dB 1 meter			
Operation Altitude	2000m											
Protection Class	IP20											
Dimensions	Can be change according to the customer requirements											
Weight	Can be change according to the customer requirements											

DEFENDER SFC-H SERIES

Defender SFC-H Series Static Frequency Converters
3 Phase Input & 3 Phase Output 10kVA to 200 kVA

- *IGBT Rectifier*
- *Double conversion Technology*
- *Real Digital Signal Processor (DSP) Controlled*
- *Galvanic Isolation*
- *High Efficiency*
- *Wide Input Voltage Range*
- *User Friendly Front Panel (LED & LCD)*
- *History Log Events, Calendar and Time Indicators,*
- *High Performance at Non-linear Loads,*
- *Remote Monitoring via Network,*
- *SNMP Compatibility,*
- *Different Voltage and Frequency Applications*
- *Low Installation and Operating Cost,*

Defender SFC-H Series Frequency Converters Technical Specificatons

MODEL	SFC-H 3310	SFC-H 3315	SFC-H 3320	SFC-H 3330	SFC-H 3340	SFC-H 3360	SFC-H 3380	SFC-H 33100	SFC-H 33120	SFC-H 33160	SFC-H 33200
Output Power (kVA)	10	15	20	30	40	60	80	100	120	160	200
Nominal Active Power (kW)	8	12	16	24	32	48	64	80	96	128	160
INPUT											
Number Of Phases	3Phase										
Nominal Voltage (Ph-Ph)	380/400VAC										
Voltage Range (100% Load)	±10%										
Nominal Frequency (Hz)	50/60 Hz										
Frequency Range	±5%										
OUTPUT											
Power Factor	0,8										
Number Of Phases	3										
Voltage	Acoording to the customer requirements										
Static Voltage Regulation	1%										
THD-V	<3% at linear load										
Crest Factor	3:1										
Frequency (Hz)	50 / 60 / 400 Hz										
Free Running Frequency (Hz)	±0.2%										
Overload	125% for 10 minutes, 150% for 30 secs										
BATTERY											
Type	Maintenance Free Dry Type										
Quantity	2x31								2x30		
Battery Protection	Deep Discharge Protection with Auto Cut Off										
Battery Test	Standard (Auto&Manual)										
DISPLAY											
LED Display	Line, Bypass, Battery, Inverter, Load, Fault Indications										
LCD Display	Load%, Input&Output Frequency, Voltage & Current, Bypass Voltage, Battery Voltage & Current, Temperature, Alarms, Histo										
STATIC BYPASS											
Number Of Phases	3Phase+N+E										
Voltage Range For Bypass	175-253 VAC										
Frequency Range For Bypass	47-53 Hz or 57-63 Hz										
COMMUNICATION											
Interface (Communication Ports)	RS 232										
Dry Contact Signals	Optional										
Others	SNMP Optional										
ENVIRONMENT											
Storage Temperature Range (°C)	Without Batteries -25 +55 C (15 to 40 recommended for longer battery life time)										
Operating Temperature Range (°C)	0-40 C (20 to 25 recommended for longer battery life time)										
Relative Humidity	0-95 % (non-condensing)										
Max. Altitude	1000 m										
Protection Level	IP 20										
PHYSICAL SPECIFICATIONS											
Dimensions W*D*H (cm)	Can be change according to the customer requirements										
Weight (kg)	Can be change according to the customer requirements										

LEGEND BATTERIES

LEGEND BATTERY

- *Applications:*
- *Telecommunications*
- *Uninterruptible Power Supplies*
- *Electronic Devices*
- *Alarms and Security Systems*
- *Emergency Lighting*
- *Cable TV Infrastructure*
- *Computers*
- *ATM Machines*
- *Marine Sector*
- *Medical Devices*
- *Power Tools*
- *Toys*
- *Solar Systems*
- *Wind Energy Systems*
- *TV and Video Recorder*

Legend VRLA Battery General Features:

- *Totally Sealed*
- *Maintenance Free*
- *Have High Quality and Safety*
- *Suitable for Deep Discharge*
- *Low Self-discharge Loss*
- *Long Service life*
- *Complies With International Quality Standards (UL, CE, Vds, JIS, IEC, ISO 14001:2004,ISO 9001:2000)*

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BATTERY CABINETS

Cabinets		Capacity (Ah)													Dimensions			
		7	9	12	18	24	40	55	65	80	100	120	150	200	W (mm)	D (mm)	H (mm)	kg
BC00	Covered	32	32	22	14	6	6								655	230	530	15
BC00	Shelf	32	32	22	14	6	6								655	230	530	15
BC10	Covered	64	64	42	24	12	12								835	246	700	25
BC10	Shelf	64	64	42	24	12	12								835	246	700	25
BC20	Covered	76	76	48	32	15	15		6	6					957	246	760	30
BC20	Shelf	76	76	48	32	15	15		6	6					957	246	760	30
BC30	Covered	144	144	96	40	38	32		16	16					926	386	1073	50
BC30	Shelf	144	144	96	40	38	32		16	16					926	386	1073	50
BC40	Covered	120	120	72		32									828	386	846	35
BC40	Shelf	120	120	72		32									828	386	846	35
BC50	Covered	240	240	144		64	48	48	32	32	32	8			1566	386	1166	80
BC50	Shelf	240	240	144		64	48	48	32	32	32	8			1566	386	1166	80
BC60	Covered				90	100	80	120	62	62	62	45	45	32	1774	565	1785	230
BC60	Shelf				90	100	80	120	62	62	62	45	45	32	1774	565	1785	230

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NOTES

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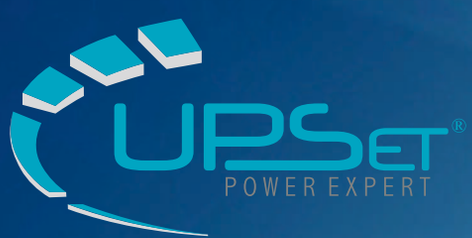
NOTES



Ferhatpaşa Mah. G17 Sok. No:127 Ataşehir / İstanbul TURKEY
Phone : +90 216 489 20 66 Fax : +90 216 489 20 73
www.upset.com.tr sales@upset.com.tr info@upset.com.tr