

FERROPAC

Ferro Resonant Power Supplies

FP / SP - series, MS / MSE / MSWC - series



 **OLTRONIX**

Industrial Power Supplies b.v.

Ferro resonant regulators

The Ferro resonant regulators, which are also known as Constant Voltage Regulators, are based on an old technique in which the secondary winding (which is located at a certain distance from the primary) is in resonance with a capacitor. The result of this is that the magnetic circuit is saturated every half period.

Now energy is stored in the capacitor and in the magnetic circuit.

As the stored energy is more than is delivered to the load, a hold up performance is achieved in case of a disruption of the line voltage. This makes the Ferro resonant regulators capable to suppress transients on the primary to a very high degree. Transients caused by the starting of powerful machines or equipment will be suppressed and will not be affect the output current.

It is not unusual to find voltage peaks up to 3000V at the primary under such circumstances.

The output wave form is rectangular which is excellent for a subsequent rectification. Standard square wave output requires less filtering than linear transformers for DC applications.

Ferro resonant regulators are able to provide a nearly constant average output voltage even when there is a widely varying input voltage. It can operate with an input voltage range as low as $\pm 40\%$ or more of the nominal voltage. The output power factor remains in the range of 0.96 or higher from half to full load.

The Ferro systems are good surge suppressors, and provide an inherent short-circuit protection and are not sensible to input overloads.

Ferro resonant systems provide exceptional reliability under extreme operating conditions and drop-outs are very rare. The systems are completely non-affected by other surrounding electrical systems. The efficiency will easily reach 90%.

Minimal maintenance is required apart from annual replacement of failed capacitors. Redundant capacitors built into the units allow several capacitors to fail between inspections without any noticeable effect to the device's performance. Devices are suited for use in battery chargers, inverter and UPS systems, line voltage stabilizers, industrial automation and machine tools, and other applications that require stable output with a high degree of isolation from line disturbances.



Wall/foot mounted power supplies

The FP/SF series is a range of stabilised power supplies according to the ferro resonant principle with an excellent price/quality ratio.

The units can be foot mounted (SF series) and wall mounted (FP series). This series are build into a robust aluminium case.

Due to the special design of the casing, forced fan cooling is not necessary. The transformer will transfer its heat directly to the aluminium side panels. Air will flow along the aluminium panels by means of natural heat convection, supplying a sufficient cooling of the unit.

The absence of cooling fans and other sensitive components makes the FP/SF series extremely reliable.

The FP/SF series is divided into three subcategories, based on output voltage and output current:

FP/SF AC
Output voltage AC

FP/SF DC
Output voltage DC

FP/SF AD
Dual output voltage DC, in combination with 230 VAC.

General features:

- ▶ Stabilized output.
- ▶ Short circuit proof.
- ▶ Protected against continuous overload.
- ▶ High efficiency.
- ▶ Strong suppression of transients.
- ▶ High reliability.
- ▶ According to IEC 742/EN 60742.
- ▶ Cooling by natural heat convection, no forced fan cooling necessary.
- ▶ Rugged aluminium casing.
- ▶ CE approved.
- ▶ Suitable for customer made adaptations.
- ▶ Wide range of input and output voltages.
- ▶ Wall or feet mounted.
- ▶ Multiple or redundant operation



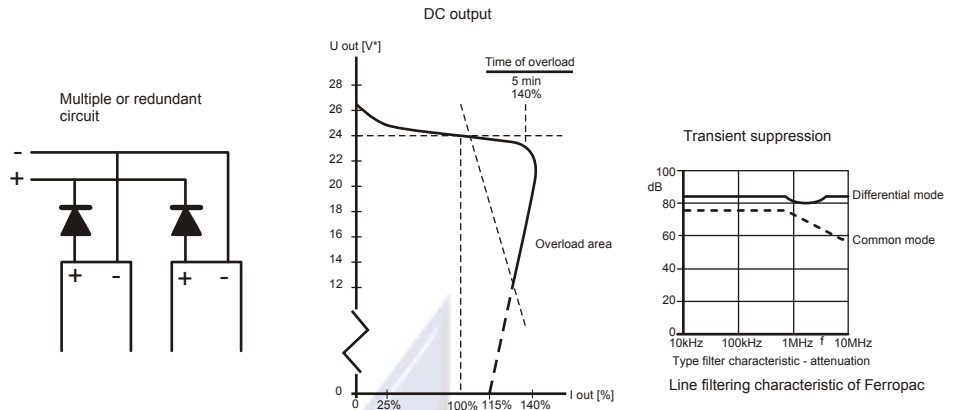
FP



SF

Options:

- ▶ Other line frequencies
- ▶ Input-voltages 24 V AC to 600 VAC
- ▶ Output voltages 12 V DC to 300 VDC
- ▶ Lower ripple <100 mV pp
- ▶ Multiple or Redundant operation



Technical data:		FP/SF-070 ..	FP/SF-150 ..	FP/SF-300 ..	FP/SF-500 ..	FP/SF-800 ..
Input:						
Voltage +10/-20% VAC *)	Us:	230/400	230/400	230/400	230/400	230/400
Frequency 50Hz +/-0,1%	Fs:	50 Hz	50 Hz	50 Hz	50 Hz	50 Hz
Current	Ism:	0,6 A	1,2 A	2,0 A	3,0 A	5,0 A
Fuse (recommended)		0,8 AT	1,6 AT	3,15 AT	5,0 AT	8,0 AT
Max. Output Power		70 VA	150 VA	300 VA	500 VA	800 VA
Transient Reduction		> 80 dB	> 80 dB	> 80 dB	> 80 dB	> 80 dB
Ambient Temp. Operating		-25/ +50 °C	-25/ +50 °C	-25/ +50 °C	-25/ +50 °C	-25/ +50 °C
Derating 50 - 70 °C		3% per °C	3% per °C	3% per °C	3% per °C	3% per °C
Output DC model						
Voltage	Uex:	24 VDC	24 VDC	24 VDC	24 VDC	24 VDC
Current	Iex:	3A	6A	12A	20A	32A
Ripple		0,5 Vpp	1,2 Vpp	1,2 Vpp	1,2 Vpp	1,5 Vpp
Line regulation	Uers:	2%	2%	2%	2%	2%
Load regulation (25%-100%)		3%	3%	3%	3%	3%
Efficiency	Approx.	74%	76%	76%	78%	80%
Output AC model						
Voltage	Uex:	230 VAC	230 VAC	230 VAC	230 VAC	230 VAC
Current	Iex:	70 VA	150 VA	300 VA	500 VA	800 VA
Efficiency	Approx.	80%	82%	82%	84%	86%
Output AD model						
Output 1	Uex:	24 VDC	24 VDC	24 VDC	24 VDC	24 VDC
Max. Current	Iex:	3A	6A	12A	20A	32A
Ripple		0,5 Vpp	1,2 Vpp	1,2 Vpp	1,5 Vpp	1,5 Vpp
Efficiency	Approx.	73%	76%	78%	80%	84%
Output 2	Uex:	230 VAC	230 VAC	230 VAC	230 VAC	230 VAC
Power		70 VA	80 VA	150 VA	300 VA	400 VA
Max. Power (AC + DC)		70 VA	150 VA	300 VA	500 VA	800 VA
Dimensions:						
Width		130/118	141/132	164/156	166-150	197/179
Depth		190	214	252	305	357
Height		126	126	126	171	173
Weight		3 kg	5 kg	9 kg	13 kg	23 kg

*) for the SF series: +6/-10%.

Rack mounted power supplies

The MS series is a range of stabilised power supplies according to the ferro resonant principle.

The MS-series is suitable for mounting in a 19" industrial rack. The series comprises two sizes, a 19" or ½ 19" case. This series are built into a robust aluminium casing.

Due to the special design of the casing, forced fan cooling is not necessary. The transformer will transfer its heat directly to the aluminium side panels. Air will flow along the aluminium panels by means of natural heat convection, supplying a sufficient cooling of the unit.

The absence of cooling fans and other sensitive components makes the MS series extremely reliable.

General features:

- ▶ Stabilized output.
- ▶ Short circuit proof.
- ▶ Protected against continuous overload.
- ▶ High efficiency.
- ▶ Strong suppression of transients.
- ▶ High reliability.
- ▶ According to IEC 742/EN 60742
- ▶ Cooling by natural heat convection, no forced fan cooling necessary.
- ▶ Rugged aluminium casing.
- ▶ CE approved.
- ▶ Suitable for customer made adaptations.
- ▶ Wide range of input and output voltages.
- ▶ Wall or feet mounted.
- ▶ Multiple or redundant operation



Options:

- ▶ Output power up to 1500 VA
- ▶ Other line frequencies
- ▶ Input-voltages 24 V AC to 600 VAC
- ▶ Output voltages 12 V DC to 5000 VDC
- ▶ Lower ripple <100 mV pp
- ▶ Blind panel for full 19" mounting
- ▶ Multiple or Redundancy operation

MODEL		MS 070	MS 150	MS 300	MS 500	MS 800
Input :						
Voltage (+10/-20%)	Us :	230/400 VAC	230/400 VAC	230/400 VAC	230/400 VAC	230/400 VAC
Frequency (+/- 0,1%)	Fs :	50 Hz	50 Hz	50 Hz	50 Hz	50 Hz
Current (230 VAC)	Ism :	0,6 A	1,2 A	2 A	3 A	5 A
Fuse (not included for MS 070)		0,8 AT	1,6 AT	3,15 AT	5 AT	8 AT
Max. Output Power		70 VA	150 VA	300 VA	500 VA	800 VA
Transient suppr. (10kHz-10MHz)		=80dB	=80dB	=80dB	=80dB	=80dB
Ambient Operating Temperature		-25/+50 °C	-25/+50 °C	-25/+50 °C	-25/+50 °C	-25/+50 °C
Derating 50 -70 °C		3 % per °C	3 % per °C	3 % per °C	3 % per °C	3 % per °C
Isolation (Output - Ground)		> 1000 VDC	> 1000 VDC	> 1000 VDC	> 1000 VDC	> 1000 VDC
HV-Test (Mains - Output)		5600 VDC	5600 VDC	5600 VDC	5600 VDC	5600 VDC
Output :						
Voltage (100% Load)	Uex :	24 VDC	24V DC	24V DC	24V DC	24V DC
Current	Iex :	3 A	6 A	12 A	20 A	32 A
Ripple		0,5 Vpp	1,2 Vpp	1,2 Vpp	1,5 Vpp	1,5 Vpp
Line regulation (+10/-20%)		± 2 %	± 2 %	± 2 %	± 2 %	± 2 %
oad regulation (25%-100%)		3 %	3 %	3 %	3 %	3 %
Efficiency approx.		74%	76%	76%	78%	80%
Dimensions :						
Width		74 mm(14,5TE)	216 mm (9,5")	216 mm (9,5")	216 mm (9,5")	432 mm (19")
Height		132 mm (3HE)	88 mm (2HE)	132 mm (3HE)	176 mm (4HE)	176 mm (4HE)
Depth		175 mm	324 mm	324 mm	326 mm	326 mm
Connection :						
		H11 DIN 41612	Screw Terminals	Screw Terminals	Screw Terminals	Screw Terminals
Weight :						
		4 kg	8 kg	13 kg	18 kg	23 kg

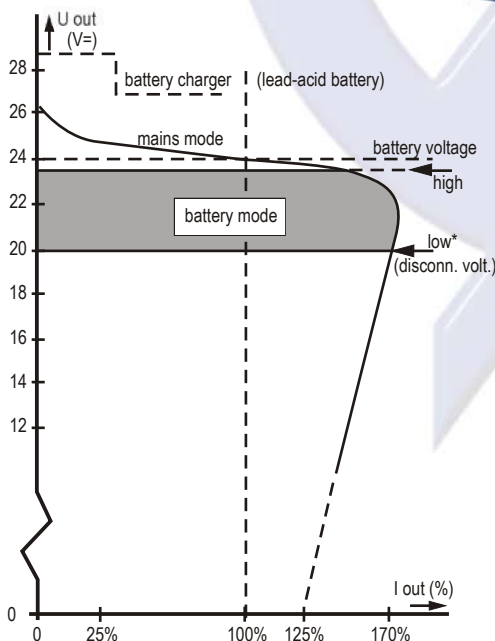
Uninterruptible stabilised power supplies

The MSE series is a range of stabilised power supplies according to the ferro resonant principle in combination with a battery and an integrated charger. The MS-series is suitable for mounting in a 19" industrial rack. These series are built into a robust aluminium casing.

Due to the special design of the casing, forced fan cooling is not necessary. The transformer will transfer its heat directly to the aluminium side panels. Air will flow along the aluminium panels by means of natural heat convection, supplying a sufficient cooling of the unit.

The absence of cooling fans and other sensitive components makes the MS series extremely reliable.

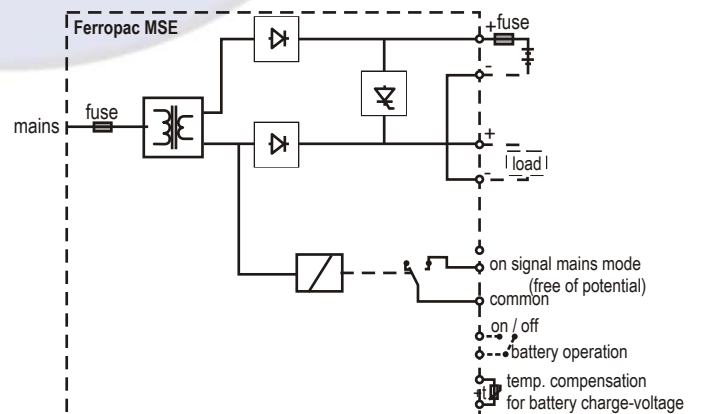
A MSE unit is excellently suitable to cope with black outs, brown-outs, line dips and surges and guarantees an uninterruptible supply of output voltage



Output chart

General features:

- ▶ Stabilized output and UPS in one unit.
- ▶ Fast switchover between mains and battery mode
- ▶ Battery with Under Voltage Protection
- ▶ Battery can be disconnected for maintenance
- ▶ Potential free contact for mains failure indication
- ▶ Short circuit proof.
- ▶ Protected against continuously overload.
- ▶ High efficiency.
- ▶ Strong suppression of transients.
- ▶ High reliability.
- ▶ According to IEC 742/EN 60742
- ▶ Cooling by natural heat convection, no forced fan cooling necessary.
- ▶ Rugged aluminium casing. IP20
- ▶ CE approved.
- ▶ Suitable for customer made adaptations.
- ▶ Wide range of input and output voltages.
- ▶ Wall or feet mounted.
- ▶ Multiple or redundant operation



Batteries:

Battery : Depending on the type of battery, the back-up time may be minutes or hours, Small lead-acid batteries can be build in, bigger ones have to be mounted separately.

A suitable lead-acid battery type is specified by :

- ▶ Back-up time
- ▶ Current
- ▶ Minimum battery voltage

Options:

- ▶ Other line frequencies
- ▶ Input-voltages 24 VAC to 600 VAC
- ▶ Output voltages 12 VDC to 300 VDC
- ▶ Lower ripple <100 mV pp
- ▶ Blind panel for full 19" mounting
- ▶ Multiple or Redundancy operation
- ▶ Faster battery charger for larger batteries

MODEL		MSE 070	MSE 150	MSE 300	MSE 500	MSE 800
Input :						
Voltage (+10/-20%)	Us :	230 VAC	230/400 VAC	230/400 VAC	230/400 VAC	230/400 VAC
Frequency (+/- 0,1%)	Fs :	50 Hz	50 Hz	50 Hz	50 Hz	50 Hz
Current (230 VAC)	Ism :	0,6 A	1,2 A	2A	3A	5A
Fuse (not included for MSE 070)		0,8 AT	1,6 AT	3,15 AT	5 AT	8 AT
Max. Output Power		70 VA	150 VA	300 VA	500 VA	800 VA
Transient - Suppression (10kHz-10MHz)		=80dB	=80dB	=80dB	=80dB	=80dB
Ambient operating temperature		-25/+50 °C	-25/+50 °C	-25/+50 °C	-25/+50 °C	-25/+50 °C
Derating 50 - 70 °C		3 % per °C	3 % per °C	3 % per °C	3 % per °C	3 % per °C
Isolation (Output - Case)		> 1000 VDC	> 1000 VDC	> 1000 VDC	> 1000 VDC	> 1000 VDC
HV-Test (Mains - Output)		5600 VDC	5600 VDC	5600 VDC	5600 VDC	5600 VDC
Mains operation :						
Output						
Voltage (100% Load)	Uex :	24VDC (±0,5V)	24VDC (±0,5V)	24VDC (±0,5V)	24VDC (±0,5V)	24VDC (±0,5V)
Output current	Iex :	3A	6A	12A	20 A	32 A
Ripple		0,5 Vpp	1,2 Vpp	1,2Vpp	1,5 Vpp	1,5 Vpp
Line regulation (+10 / -20%)		± 2 %	± 2 %	± 2 %	± 2 %	± 2 %
Load regulation (25%-100%)		4%	4%	4%	4%	4%
Efficiency approx.		74%	76%	76%	78%	80%
Battery operation :						
Output voltage		24-20 VDC	24-20 VDC	24-20 VDC	24-20 VDC	24-20 VDC
Min. voltage (adjustable)		20 VDC	20 VDC	20 VDC	20 VDC	20 VDC
Minimal load		0,3 A	0,6 A	1,2 A	2A	3,2 A
Charge voltage		28,6/27,4 VDC	28,6/27,4 VDC	28,6/27,4 VDC	28,6/27,4 VDC	28,6/27,4 VDC
Charge current		0,6 A	0,6 A	1,2 A	2A	3A
Max. battery capacity		7,5 Ah	7,5 Ah	15 Ah	24 Ah	24 Ah
Operation :						
Mains / battery indication		LED	LED	LED	LED	LED
Potential free contact		N.O.	N.O.	N.O.	N.O.	N.O.
Battery on/off switch		yes	yes	yes	yes	yes
Low battery protection		yes	yes	yes	yes	yes
Temperature compensation		option	option	option	option	option
Battery activ indicator		LED	-	-	-	-
Battery low indicator		LED	-	-	-	-
Dimensions:						
Width [mm]		178	216	216	432	432
Height [mm]		132	132	176	176	176
Depth [mm]		175	320	320	320	320
Weight		4kg	8kg	13kg	18kg	23kg

Stabilized power supplies for cable television

The MSWC range is specifically designed for applications within the cable television industry and distinguishes itself from the other series by its variety of output voltages and wide power range. The MSWC is mainly customer built.

The MSWC series comes standard in a low noise execution. The transformer is installed within the case on flexible supports that guarantees a low vibration level.

Just as the other MS series the MSWC is a series of stabilised power supplies according to the ferro resonant principle.



General features:

- ▶ Stabilized output.
- ▶ Short circuit proof.
- ▶ Protected against continuous overload.
- ▶ High efficiency.
- ▶ Strong suppression of transients.
- ▶ High reliability.
- ▶ According to IEC 742/EN 60742.
- ▶ Rugged aluminium casing IP20.
- ▶ CE approved.
- ▶ Suitable for customer made adaptations.
- ▶ Wide range of input and output voltages.

CE-standards applied:

EN50091-2
EN61000-3-2
EN61000-3-3
EN60950

High transient suppression: >80dB
All outputs short circuit proof.
Sound reduction by the use of internally mounted absorbers.
Total output power is maximally 2100VA

Input voltage:

230 VAC

Output voltage:

42 VAC up to 60 VAC.
12 VDC up to 50 VDC.

Output Power range:

up to 2100 VA

Other line frequencies,
input/output voltages on request.

AC Input voltage

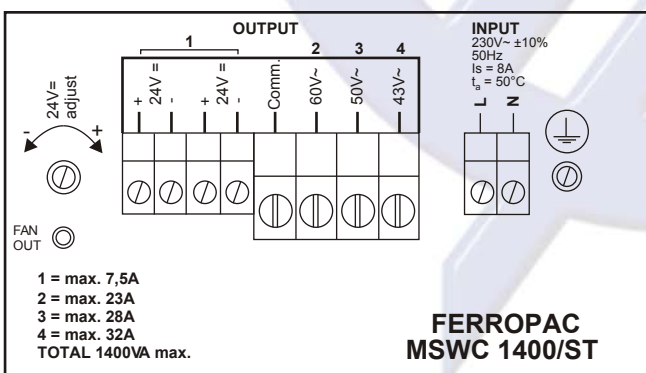
Input voltage: 230V~ ±10%
 Input frequency 50Hz ±0,1%
 Input current 8,0A
 Recommended line fuse: 12A
 Efficiency: 89 - 92%
 Transient suppression: = 80dB (10kHz-1MHz)
 Isolation test voltage:
 Input-Case and Input-Output: 5600VDC

AC Outputs

Output power: max.1400VA, AC plus DC
 Output voltage 2: 60V~
 Output voltage 3: 50V~
 Output voltage 4: 43V~
 Output current 2: 23A
 Output current 3: 28A
 Output current 4: 32A
 Line regulation ($U_s=±10\%$): = 2V
 Load regulation ($I_{ex}=25-100\%$): = 3V
 Max. short-circuit current: = 36A
 Isolation test voltage (output-case): 1000VDC

DC Output

Output voltage: 24VDC
 Output power: 180VA
 Output current: 7,5A
 Line regulation ($U_s=+/-10\%$): < 0,1%
 Load regulation ($I_{ex}=0-100\%$): < 2%
 Ripple (20Hz-30MHz) < 5mV





OLTRONIX

Industrial Power Supplies b.v.

Oltronix Industrial Power Supplies b.v.

Euroweg 15

NL-9351 EM LEEK

the Netherlands

Tel.: +31 (0)594 512 700

Fax: +31 (0)594 518 864

info@oltronix.nl

www.oltronix.nl