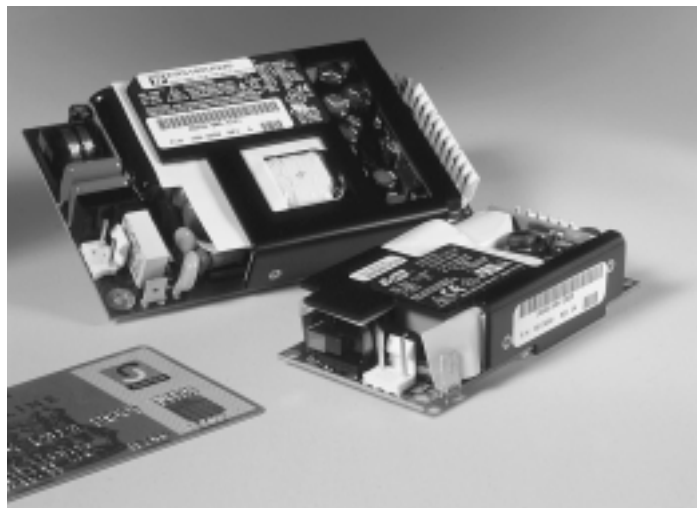


Miniature Medical Switchers

ERS Medical SERIES

25-110 Watts



CE Marked - LVD
•
IEC 601, EN60601
•
High Power Density
•
High Efficiency
•
Convection Cooled
•
Single & Multi Outputs
•
International Safety Approvals

Specification

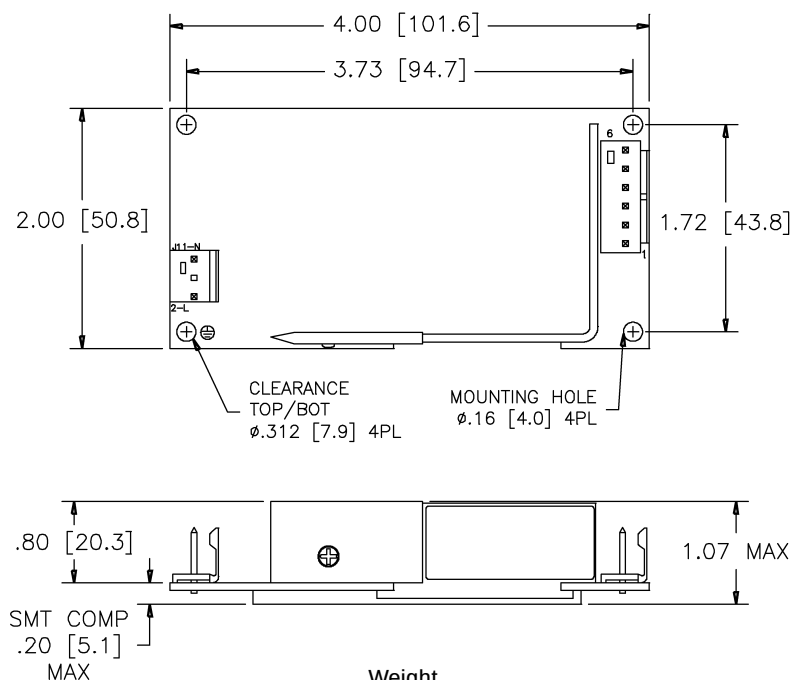
Input Voltage	90-132/180-264 V AC - autoranging ERS25-60 90-264 V AC - ERS80 & ERS110
Input Frequency	47-63 Hz
Inrush Current	75 A max. @ 240 V AC
Efficiency	See Tables
Output Voltage	See Tables (initial set point accuracy $\pm 5\%$ max)
Hold-Up Time	6 ms (25-60 W), 10 ms (80 W), 15 MS (110 W) @ 115 V AC
Line Regulation	$\pm 0.3\%$ max. over full operating range
Load Regulation	$\pm 0.5\%$ max. measured from min. to max. load
Overvoltage Protection	V_i multi output units only set @ 6.2 V ± 0.4 V DC for 5 V & 3.95 V ± 0.25 V for 3.3 V,
Overload Protection	Typically 110-150% of max. output current on single output units. Overall power limit @ 125% of max. for multi output models. O/P shuts down & hiccups. The PSU will recover when overload condition is removed.
Ripple & Noise	1.0% for ERS110, for all other models - See Tables
Power Fail	Optional 80 W models, standard on ERS110PQXX-M
Turn-on Delay	4 secs max. (25-60 W), 5 secs max. (80 W) @ 115 V AC
Temperature Coefficient	2.4 mV/°C
Operating Temperature	0-50 °C @ 100% load (derate linearly from 50 °C to 70 °C @ 2.5%/°C)
Storage Temperature	-40 °C to +70 °C
Altitude	Operating 10,000 ft max., non-operating 40,000 ft max.
Humidity	5 to 95% non-condensing
EMI/RFI	- CISPR 55024, CISPR 55014 Level B (@ 230 V AC & 115 V AC) - FCC 47 CFR Part 15, Level B (115 V AC)
Isolation (Input/Output)	5700 V DC/minute min.
Insulation Resistance	7 MΩ
Leakage Current	250 μA max. to IEC601
Safety Standards	- IEC601, EN60601, EN60950, UL2601 (recognised component), C-UL - Not suitable for patient connect applications
MTBF @ 25 °C	>100,000 hrs (25-60 W single output models), >200,000 hrs all other models calculated to MIL-H 217F

Output Voltage & Current Ratings - 25 Watt Models

Output Voltage	Output Current		Ripple & Noise ⁽²⁾	Regulation		Efficiency ⁽³⁾	Model Number
	Minimum ⁽⁴⁾	Maximum ⁽¹⁾		Load	Line		
5.1 V	0.20 A	5.0 A	50 mV	±0.5%	±0.3%	80%	ERS25US05-M
12.0 V	0.10 A	2.1 A	120 mV	±0.5%	±0.3%	83%	ERS25US12-M
15.0 V	0.10 A	1.7 A	150 mV	±0.5%	±0.3%	83%	ERS25US15-M
24.0 V	0.05 A	1.1 A	240 mV	±0.5%	±0.3%	83%	ERS25US24-M
+5.2 V ₁	0.50 A	4.0 A	50 mV	±0.5%	±0.3%	81%	ERS25UT30-M
+12.5 V ₂	0.10 A	2.0 A	120 mV	±5.0%			
-12.8 V ₃	0.00 A	0.5 A	120 mV	±5.0%			
+5.2 V ₁	0.50 A	4.0 A	50 mV	±0.5%	±0.3%	81%	ERS25UT31-M
+23.8 V ₂	0.10 A	1.0 A	240 mV	±5.0%			
-12.8 V ₃	0.00 A	0.5 A	120 mV	±5.0%			
+5.2 V ₁	0.50 A	4.0 A	50 mV	±0.5%	±0.3%	81%	ERS25UT32-M
+14.6 V ₂	0.10 A	1.5 A	150 mV	±5.0%			
-14.8 V ₃	0.00 A	0.5 A	150 mV	±5.0%			
+3.3 V ₁	1.00 A	4.0 A	50 mV	±0.5%	±0.3%	75%	ERS25UT33-M
+5.1 V ₂	0.10 A	2.0 A	50 mV	±5.0%			
-12.8 V ₃	0.00 A	0.5 A	120 mV	±5.0%			

NOTES:

- Total output power not to exceed 25 W free air convection.
- Measured after 5 min warm up with 47 μ F bypass (single output) 0.1 μ F C-cap and 10 μ F E-cap (multi output) @ measurement point and 25 MHz bandwidth.
- Measured @ full load and 230 V AC input @ 25 °C with 5 min warm up (for multi output models V₁ @ 12.5 W, V₂ @12.5 W, V₃ @ 0 W)
- Minimum load required for operation.

Mechanical Details - 25 Watt Models

Weight
Single Output Units 6 oz
Multi Output Units 10 oz

Pin No	J1	J2	
		Single	Multi
1	N	V Out	+V ₁
2	L	V Out	+V ₁
3	N/A	- V Out	GND
4	N/A	-V Out	GND
5	N/A	N/A	-V ₃
6	N/A	N/A	+V ₂

Molex Connectors

AC Molex 09-50-3031
Pins 08-52-0072

DC Molex 09-50-8061
Pins 08-50-0106

Output Voltage & Current Ratings - 40 Watt Models

Output Voltage	Output Current		Ripple & Noise ⁽⁴⁾	Regulation		Efficiency ⁽¹⁾	Model Number
	Minimum ⁽³⁾	Maximum ⁽²⁾		Load	Line		
5.1 V	0.20 A	8.0 A	65 mV	±0.5%	±0.3%	80%	ERS40US05-M
12.0 V	0.10 A	3.5 A	120 mV	±0.5%	±0.3%	84%	ERS40US12-M
15.0 V	0.10 A	2.7 A	150 mV	±0.5%	±0.3%	84%	ERS40US15-M
24.0 V	0.05 A	1.7 A	240 mV	±0.5%	±0.3%	84%	ERS40US24-M
+5.2 V ₁	0.50 A	6.0 A	65 mV	±0.5%	±0.3%	82%	ERS40UT30-M
+12.5 V ₂	0.10 A	2.0 A	120 mV	±5.0%			
-12.8 V ₃	0.00 A	0.5 A	120 mV	±5.0%			
+5.2 V ₁	0.50 A	6.0 A	65 mV	±0.5%	±0.3%	82%	ERS40UT31-M
+23.8 V ₂	0.10 A	1.0 A	240 mV	±5.0%			
-12.8 V ₃	0.00 A	0.5 A	120 mV	±5.0%			
+5.2 V ₁	0.50 A	6.0 A	65 mV	±0.5%	±0.3%	82%	ERS40UT32-M
+14.6 V ₂	0.10 A	1.5 A	150 mV	±5.0%			
-14.8 V ₃	0.00 A	0.5 A	150 mV	±5.0%			
+3.3 V ₁	1.00 A	6.0 A	65 mV	±0.5%	±0.3%	75%	ERS40UT33-M
+5.1 V ₂	0.10 A	3.0 A	50 mV	±5.0%			
-12.8 V ₃	0.00 A	0.5 A	120 mV	±5.0%			

NOTES:

1. Measured on multi output models at V₁ @ 20 W, V₂ @ 20 W and V₃ @ 0 W, 230 V AC input. Single output models @ 100% load and 230 V AC.
2. Maximum total continuous output power is 40 W with free air convection.
3. Minimum load required for operation.
4. Measured after 5 mins warm up with 47 µF bypass at measurement point (single o/p), 0.1 µF C-Cap & 10 µF E-Cap (multi o/p) @ 25 MHz bandwidth.

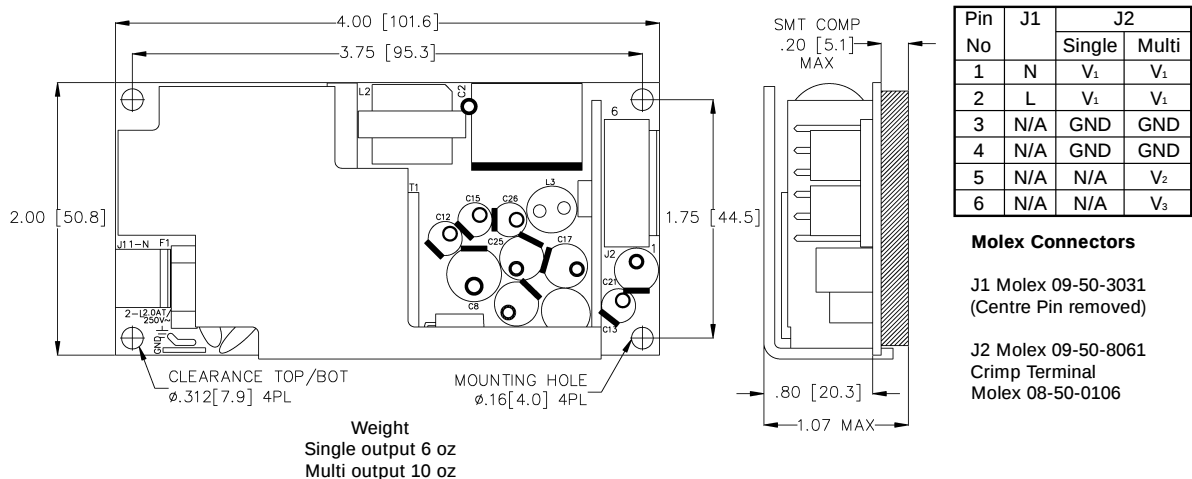
Output Voltage & Current Ratings - 60 Watt Models

Output Voltage	Output Current		Ripple & Noise ⁽³⁾	Regulation		Efficiency ⁽²⁾	Model Number
	Minimum ⁽⁵⁾	Maximum ⁽⁴⁾		Load	Line		
5.1 V	0.20 A	10.0 A ⁽¹⁾	65 mV	±0.5%	±0.3%	80%	ERS60US05-M
12.0 V	0.10 A	5.0 A	120 mV	±0.5%	±0.3%	87%	ERS60US12-M
15.0 V	0.10 A	4.0 A	150 mV	±0.5%	±0.3%	87%	ERS60US15-M
24.0 V	0.05 A	2.5 A	240 mV	±0.5%	±0.3%	87%	ERS60US24-M
+5.2 V ₁	0.50 A	8.0 A	65 mV	±0.5%	±0.3%	85%	ERS60UT30-M
+12.5 V ₂	0.10 A	3.0 A	120 mV	±5.0%			
-12.8 V ₃	0.00 A	0.5 A	120 mV	±5.0%			
+5.2 V ₁	0.50 A	8.0 A	65 mV	±0.5%	±0.3%	85%	ERS60UT31-M
+24.0 V ₂	0.10 A	1.5 A	300 mV	±5.0%			
-12.8 V ₃	0.00 A	0.5 A	120 mV	±5.0%			
+5.2 V ₁	0.50 A	8.0 A	65 mV	±0.5%	±0.3%	85%	ERS60UT32-M
+14.6 V ₂	0.10 A	2.5 A	200 mV	±5.0%			
-14.8 V ₃	0.00 A	0.5 A	150 mV	±5.0%			
+3.3 V ₁	1.00 A	8.0 A	50 mV	±0.5%	±0.3%	85%	ERS60UT33-M
+5.1 V ₂	0.10 A	3.0 A	50 mV	±5.0%			
-12.8 V ₃	0.00 A	0.5 A	120 mV	±5.0%			

NOTES:

1. Convection cooled; 12 A maximum with forced air (10 CFM).
2. Measured at full load @ 230 V AC @ 25 °C (V₁ @ 30 W, V₂ @ 30 W and V₃ @ 0 W multi output units).
3. Measured after 5 mins warm up with 47 µF bypass at measurement point (single output).
4. Total output power not to exceed 60 W.
5. Minimum load required for operation.

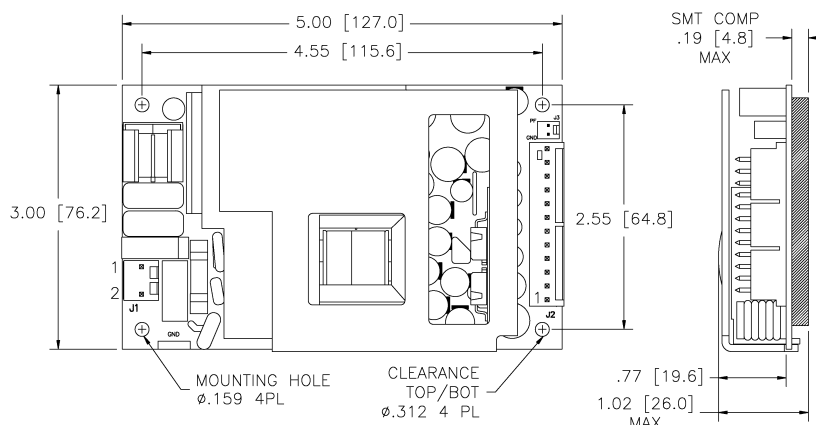
Mechanical Details - 40 & 60 Watt Models



Output Voltage & Current Ratings - 80 Watt Models							
Output Voltage	Output Current		Ripple & Noise ⁽²⁾	Regulation		Efficiency	Model Number
	Minimum ⁽²⁾	Maximum ⁽¹⁾		Load	Line		
5.00 V	1.0 A	12.0 A	50 mV	±1.0%	±0.3%	88%	ERS80US05-M
12.00 V	0.4 A	6.0 A	120 mV	±1.0%	±0.3%	89%	ERS80US12-M
15.00 V	0.4 A	5.5 A	150 mV	±1.0%	±0.3%	90%	ERS80US15-M
24.00 V	0.2 A	3.4 A	240 mV	±1.0%	±0.3%	90%	ERS80US24-M
48.00 V	0.2 A	1.7 A	480 mV	±1.0%	±0.3%	90%	ERS80US48-M
+5.10 V ₁	3.0 A	10.0 A	50 mV	±0.1%	±0.3%	85%	ERS80UQ40-M
+12.25 V ₂	0.1 A	3.0 A	120 mV	±5.0%			
-5.10 V ₃	0.0 A	0.8 A	50 mV	±5.0%			
-12.50 V ₄	0.0 A	0.8 A	120 mV	±5.0%			
+5.10 V ₁	3.0 A	10.0 A	50 mV	±1.0%	±0.3%	85%	ERS80UQ41-M
+24.00 V ₂	0.1 A	2.0 A	240 mV	±5.0%			
-12.50 V ₃	0.0 A	0.8 A	50 mV	±5.0%			
-12.50 V ₄	0.0 A	0.8 A	120 mV	±5.0%			
+5.10 V ₁	3.0 A	10.0 A	50 mV	±1.0%	±0.3%	85%	ERS80UQ42-M
+15.90 V ₂	0.1 A	3.0 A	150 mV	±5.0%			
-5.10 V ₃	0.0 A	0.8 A	100 mV	±5.0%			
-15.90 V ₄	0.0 A	0.8 A	150 mV	±5.0%			
+5.10 V ₁	3.0 A	10.0 A	50 mV	±1.0%	±0.3%	85%	ERS80UQ43-M
+12.25 V ₂	0.1 A	3.0 A	120 mV	±5.0%			
+23.60 V ₃	0.0 A	0.8 A	240 mV	±5.0%			
-12.50 V ₄	0.0 A	0.8 A	120 mV	±5.0%			
+3.30 V ₁	5.0 A	10.0 A	50 mV	±1.0%	±0.3%	85%	ERS80UQ44-M
+5.10 V ₂	0.1 A	3.0 A	50 mV	±5.0%			
+12.50 V ₃	0.0 A	0.8 A	120 mV	±5.0%			
-12.50 V ₄	0.0 A	0.8 A	120 mV	±5.0%			

NOTES:

- Maximum total continuous output power is 80 W with free air convection (62 W max for ERS80US05-M, 70 W for ERS80UQ44-M)
- Minimum load required for operation.
- Measured after 5 mins warm up with 47 µF bypass at measurement point (single o/p). 0.1 µF C-Cap & 10 µF E-Cap (multi o/p) @ 20 MHz bandwidth.

Mechanical Details - 80 Watt Models

PIN CONNECTIONS				
Pin No	J1	J2		J3
		Single	Quad	
1	N	V ₁	V ₁	Common
2	L	V ₁	V ₁	Power Fail
3		V ₁	V ₁	
4		V ₁	V ₁	
5		DC Return	DC Return	
6		DC Return	DC Return	
7		DC Return	DC Return	
8		DC Return	DC Return	
9		N/C	V ₂	
10		N/C	V ₂	
11		N/C	V ₃	
12		N/C	V ₄	

Weight 9 oz

Mating Connectors

J2 Molex 09-50-3031
 (Centre Pin removed)
 J2 Molex 09-50-8121
 J3 Molex 22-01-2021

Crimp Terminal

J1 & J2 Molex 08-50-0106
 J3 Molex 08-50-0114

Powerfail

80 W 2.0 ms typical warning before voltage drops to 4.8 V.

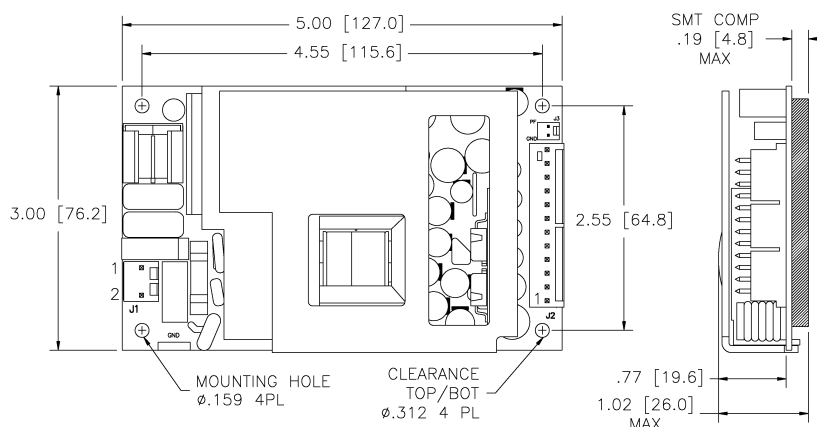
Output Voltage & Current Ratings - 110 Watt Models

Output Voltage	Output Current			Regulation		Model Number
	Minimum	Maximum ⁽¹⁾	Maximum ⁽²⁾	Load	Line	
5.0 V	1.0 A	12.0 A	18.00 A	±1.0%	0.3%	ERS110PS05-M
12.0 V	0.2 A	6.6 A	9.20 A	±1.0%	0.3%	ERS110PS12-M
15.0 V	0.2 A	5.5 A	7.30 A	±1.0%	0.3%	ERS110PS15-M
24.0 V	0.1 A	3.4 A	4.60 A	±1.0%	0.3%	ERS110PS24-M
48.0 V	0.1 A	1.7 A	2.30 A	±1.0%	0.3%	ERS110PS48-M
+5.0 V	1.0 A	10.0 A	15.00 A	±1.0%	0.3%	ERS110PQ40-M
+12.0 V	0.1 A	3.0 A	4.10 A	±5.0%		
-5.0 V	-	0.8 A	1.10 A	+7.0%/-5.0%		
-12.0 V	-	0.8 A	1.10 A	±5.0%		
+5.0 V	1.0 A	10.0 A	15.00 A	±1.0%	0.3%	ERS110PQ41-M
+24.0 V	0.1 A	2.0 A	2.75 A	±5.0%		
+12.0 V	-	0.8 A	1.10 A	+7.0%/-5.0%		
-12.0 V	-	0.8 A	1.10 A	±5.0%		
+5.0 V	1.0 A	10.0 A	15.00 A	±1.0%	0.3%	ERS110PQ42-M
+15.0 V	0.1 A	3.0 A	4.10 A	±5.0%		
-5.0 V	-	0.8 A	1.10 A	+7.0%/-5.0%		
-15.0 V	-	0.8 A	1.10 A	±5.0%		
+5.0 V	1.0 A	10.0 A	15.00 A	±1.0%	0.3%	ERS110PQ43-M
+12.0 V	0.1 A	3.0 A	4.10 A	±5.0%		
+24.0 V	-	0.8 A	1.10 A	+7.0%/-5.0%		
-24.0 V	-	0.8 A	1.10 A	±5.0%		
+3.3 V	1.0 A	10.0 A	15.00 A	±1.0%	0.3%	ERS110PQ44-M
+5.0 V	0.1 A	3.0 A	4.10 A	±5.0%		
+12.0 V	-	0.8 A	1.10 A	+7.0%/-5.0%		
-12.0 V	-	0.8 A	1.10 A	±5.0%		

NOTES:

- Maximum current per output - do not exceed total power rating.
- Maximum current per output with 150 LFM of force cooling - do not exceed total power rating.

Mechanical Details - 110 Watt Models



PIN CONNECTIONS				
Pin No	J1	J2		J3
		Single	Quad	
1	N	V ₁	V ₁	Common
2	L	V ₁	V ₁	Power Fail
3		V ₁	V ₁	
4		V ₁	V ₁	
5		DC Return	DC Return	
6		DC Return	DC Return	
7		DC Return	DC Return	
8		DC Return	DC Return	
9		N/C	V ₂	
10		N/C	V ₂	
11		N/C	V ₃	
12		N/C	V ₄	

Weight 12 oz (250 g)

TOTAL OUTPUT POWER RATING			
Cooling	Convection	Fan	Fan
Model	Cooled	Vin ≥100 V	Vin <100 V
Single Output	80 W	110 W	100 W
Quad	75 W	110 W	100 W
ERS110PQ44-M	70 W	98 W	98 W

AC Input Connector J1

Molex 3 position, 0.156 centre header 26-60-4030 or equivalent

Ground Connector

Spade connector 0.25"

DC Output Connector J2

Molex 12 position, 0.156 centre header 26-60-4120 or equivalent

Output Connector J3

Molex 2 position, 0.100 centre header 22-23-2021 or equivalent

Powerfail

110 W 1.5 ms typical warning at all line conditions and 90% load.