

## I. Module B: 60KW DC to DC Power Module

The Deltrix DT60DD01MB is a DC to DC Power module which has an input range of 600-820Vdc and a rated output power of 200-1000Vdc/60kw.

The module has the following key features:

- Input over/under voltage protection
- Lost phase alarm
- Output over current protection
- Output over voltage protection
- Output short circuit protection
- N+1 redundancy and current sharing



### I. General

This DC/DC module, input range is 600-820Vdc, rated output power is 1000Vdc/60kw. It features input over/under voltage protection, lost phase alarm, output over current protection, output over voltage protection, output short circuit protection, N+1 redundancy and current sharing functions.

### II. Main Specifications

Rated power	Input Voltage range	Output Voltage range	Output Current range	Ripple (p-p) (Rated Load, Width Limited 20MHz)
60KW	600—820Vdc	200—1000Vdc	0—200A	≤±0.5%Vo

### III. Environmental Conditions

No.	Items	Technical Specifications	Unit	Remarks
1	Operating Temperature	-40 — +60	°C	+50~ +60°C derating 20% in linearity.
2	Storage Temperature	-40 — +70	°C	
3	Relative Humidity	Operation	%	
		Storage		
4	Altitude	≤3000	m	It should be derated used according to the rules of GB/T 3859.2 when it exceeds 3000m.
5	Cooling	Forced cooling, drawing air from the front and exhausts heat from the behind and this module has temperature-sensing timing function.		
Remarks: when it is 50°C—60°C, the module power will de-rate, the derating mode is module auto linear derating.				

## IV. Electrical Characteristics

1. Input Characteristics					
No.	Item	Technical Requirement	Unit	Remark	
1.1	Rated input voltage	820	Vdc		
	DC Input voltage range	600—820			
1.2	Power De-rate Point	600	Vdc		
1.3	Max Input current	< 102	A		
1.4	Input inrush current	Not exceeding the Max. stable 150% of input peak current	—		
2. Output Characteristics					
2.1	Output voltage range adjustable	200—1000	Vdc	Can be adjustable by monitor (testing condition: half load)	
2.2	Constant power range	300—1000	Vdc		
2.3	Output current range	0—200	A		
2.4	Overall efficiency	≥97	%	Rated input, output half load	
2.5	Output noise and ripple	≤±0.5%Vo	mVp-p	Width 20MHz. Parallel with 10u+104 Capacitor	
2.6	Soft-start time	3-10	S	Rated input voltage starting up till output voltage rise to 380V	
2.7	Modulation factor	≤±5	%		
2.8	Dynamic response	Overshoot range	ΔV : ≤±5	%	25%—50%—25% or 50%—75%—50% load change, change rate 0.1A/us, variable period 4ms
		Recovery time	Δt: ≤200	μS	
2.9	voltage stabilization	≤±0.5	%		
2.10	Line regulation	≤±0.1	%		
2.11	Load regulation	≤±0.5	%		
2.12	Current sharing imbalance	≤±5	%	50—100% Load	
2.13	Input current harmonic	≤5	%	Rated input and load.	
2.14	Temperature coefficient	≤±0.02	%/°C		
3. Protection Characteristics					
3.1	Input under voltage protection point	570±5	Vdc	Can be auto recoverable, test with 5A load.	
3.2	Input under voltage recovery point	585±5	Vdc		
3.3	Input over voltage protection	830±5	Vdc		
3.4	Input over voltage recovery point	820±5	Vdc		
3.5	Input over current protection	200±5	A		
3.6	Output over voltage protection point	1030±5	Vdc		
3.7	Output over current protection point	210±5	A		

3.8	Short circuit protection	Endure long time short circuit without damage and auto recover.		
3.9	Over temperature protection	> 60	°C	Auto-recoverable when temperature is less than 60°C

## V. Other Requirement

No.	Item	Requirement	Remark
1	Acoustics Noise	≤55dB	A-weighted, test distance is 1 meter
2	Odour Noise	Can't generate peculiar smell and unhealthy smell	
3	Failure isolation	The rectifier module can be separated from the system after it's failure.	
4	Environmental requirement	Meet 2002/95/EC ;	
5	Three-Proofing requirement	The power supply should be three proofs to prevent the module vulcanization failure	

## VI. Safety & EMC

No.	Item	Criteria	Remark
1	Dialectical strength	Input-output	3535Vdc/30mA/ 1min
		Input-ground	3535Vdc/30mA/ 1min
		Output-ground	2121Vdc/30mA/ 1min
2	Isolation resistance	Input-output	≥10MΩ@500Vdc
		Input-ground	≥10MΩ@500Vdc
		Output-ground	≥10MΩ@500Vdc

Performance criterion :

Criterion A: Performance is normal when meet the technical requirements;

Criterion B (DIP test criterion): The performance that can recover automatically when function degrade or lost temporarily

Criterion B (other test criterion except DIP): The performance that can recover automatically when function degrade or lost temporarily ; But in the test, the output voltage must be kept in normal range.

Criterion C: auto-recover for short time function interruption allowable, long time of function interruption and recovery by hand script unallowable

Criterion R: Any components damage except protection components unallowable; the testing pieces' performance can recover when replaces the damaged protection components.

## VII. Logical function and signal

No.	Item	Description
1	Operate (Green)	The indicator light is green if the module works normally
2	Alarm (Yellow)	If input over/under voltage, input derating, temperature derating, output short circuit and internal PS abnormal, the yellow light will be on.
3	Fault (Red)	Output over current, over voltage, OVT, fan fault and internal PS fault, the red light will be on.

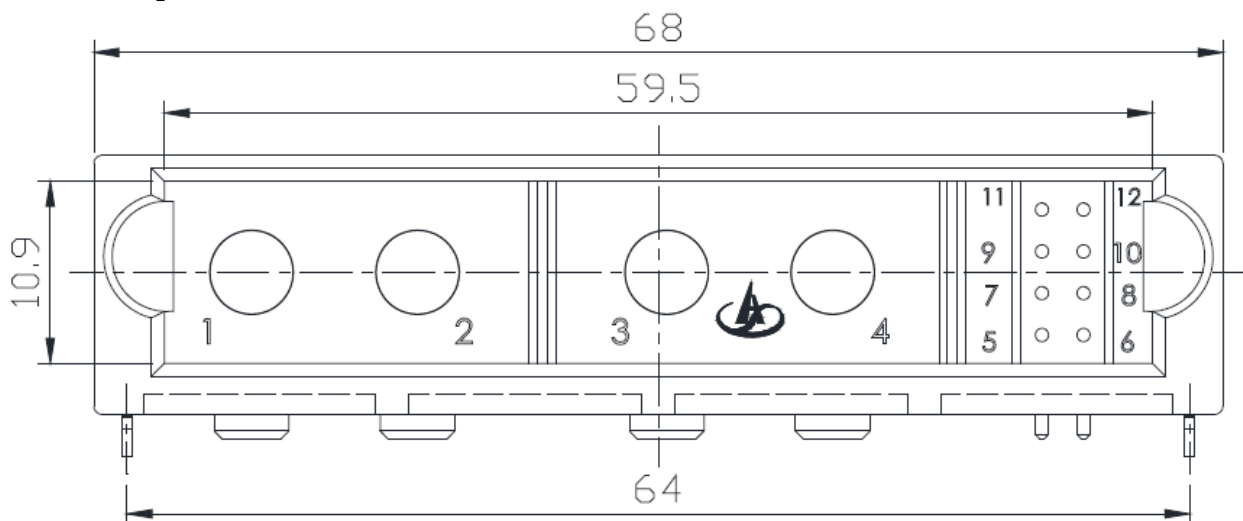
## VIII. Mechanical Characteristics and Connector Definition

### 1. Outline dimension (unit : mm)

L\*W\*H=490mm×360mm×125 mm



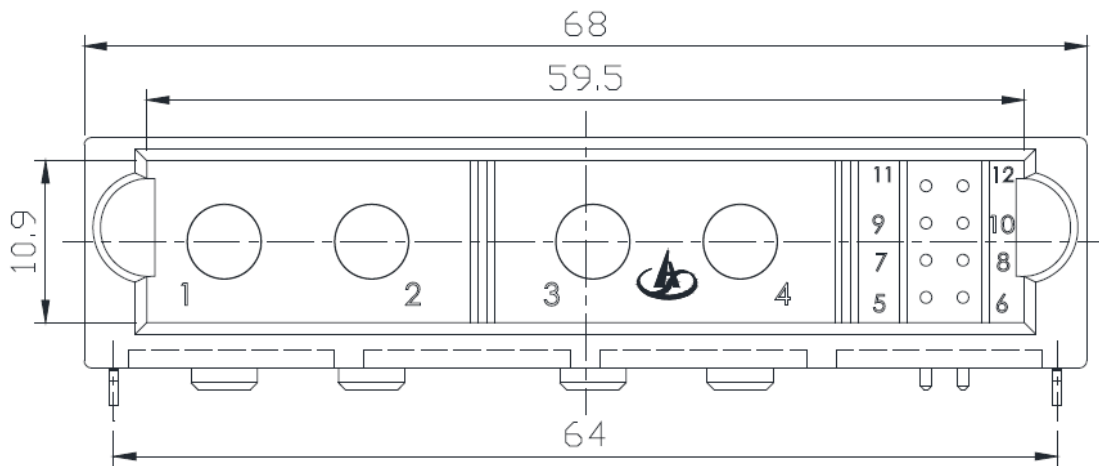
### 2. Input connector PIN definition



### Connector 4

	Pin	Name	Function
<b>connector 4</b>	1	OUT+	PSU input positive
	2		
	3	OUT-	PSU input negative
	4		
	5	CAN-L	PSU communication wire
	6		
	7	CAN-H	PSU communication wire
	8		
	9/10	NC	
	11	NC	
	12	NC	

### 3. Output connector PIN definition



### Connector 5

	Pin	Name	Function
<b>Connector 5</b>	1	OUT+	PSU output positive
	2		
	3	OUT-	PSU output negative
	4		
	5	24V—	Auxiliary power supply (The auxiliary power supply with output voltage of 24 V $\pm$ 2% and output current greater than 5 A is required.)
	6		
	7	24V+	
	8		
	9/10	NC	
	11	NC	
	12	NC	

#### 4. Others

No.	Item	Criteria	Remark
1	Placement	horizontal	
2	Connection to ground	Through case, front plane, consolidate screw and rack.	
3	Weight	<25Kg	

### IX. Reliability requirement

MTBF≥50Khour ; test condition: 25°C, rated input, full load output.MTBF≥50Khour ;

### X. Package, Transportation & Storage

#### Package

There are product name, model, logo of manufacturer, safety approval, manufacturing date on the package box, and manual of specifications and packing list in the package box as following:

#### Transportation

Suitable for transportation by truck, ship, and plane. The products should be shielded by tent from sunshine, and loaded and unloaded carefully.

#### Storage

Products should be stored in package box when it is not used. And warehouse temperature should be - 40°C—85°C with relative humidity 10%—90%. In the warehouse, there should not be harmful gas, inflammable, explosive products, corrosive chemical products, or strong mechanical vibration. Shock and strong magnetic field affection not allowed. The package box should at least 20cm height above the ground, and 50cm away from wall, thermal source or vent. Under this requirement, product has 2 years of storage period, and should be rechecked when over 2 years.

### XI. Attention

Dangerous power output, keep safe space when in operation !



High Temperature Alarm Label