

## Crowbar/Chopper Resistor



### Grid Structure-Natural Cooling

M: Mass of resistance material in kg  
 Q: Energy absorbed by resistor mass in kj  
 C: Specific Heat Capacity of resistor material in kj/kg.K  
 $\Delta t$ : Temperature Rise of resistor in K  
 Take 1.5MW Windturbine as an Example:  
 $Q_{max}=1360kj$   $C=0.5kj/kg.K$   $\Delta t=400K$   
 $M=1360/(0.5*400)=6.8kg$   
 Resistor Mass: about 6.8kg  
 Other Material Mass: about 20kg



### Sandwich Structure - Natural Cooling

M: Mass of resistance material in kg  
 Q: Energy absorbed by resistor mass in kj  
 C: Specific Heat Capacity of resistor material in kj/kg.K  
 $\Delta t$ : Temperature Rise of resistor in K  
 Take 1.5MW Windturbine as an Example:  
 $Q_{max}=1360kj$   $C=0.5kj/kg.K$   $\Delta t=400K$   
 $M=1360/(0.5*400)=6.8kg$   
 Resistor Mass: about 6.8kg  
 Other Material Mass: about 20kg  
 Size: 500x450x150(mm)



### Tubular Structure - Natural Cooling

M: Mass of resistance material in kg  
 Q: Energy absorbed by resistor mass in kj  
 C: Specific Heat Capacity of resistor material in kj/kg.K  
 $\Delta t$ : Temperature Rise of resistor in K  
 Take 1.5MW Windturbine as an Example:  
 $Q_{max}=1360kj$   $C=0.5kj/kg.K$   $\Delta t=400K$   
 $M=1360/(0.5*400)=6.8kg$   
 Resistor Mass: about 6.8kg  
 Other Material Mass: about 12kg

## 制动单元 DBU DC Braking Module

### 产品概述 (Product Introduction)

采用在变频器直流侧设置制动单元组件，将再生电能消耗在功率电阻上来实现制动。通过专门的能耗制动控制电路将再生能量消耗在电阻上，转化为热能。

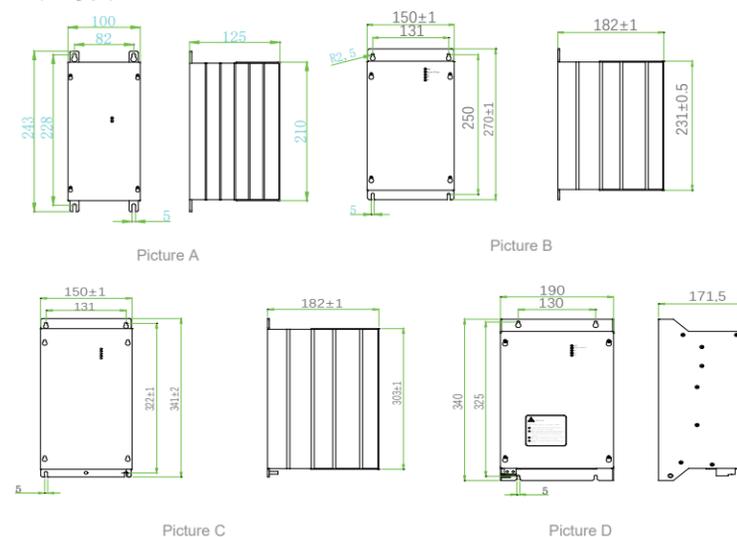
The function of the braking unit is to divert into a brake resistor the regenerative energy produced in the process of decelerating the motor, converting that energy into heat. Regenerative energy flows from the motor into the inverter DC bus, manifested as increased bus voltage.

### 产品应用 (Product Application)

主要用在变频器拖动系统需要急剧减速，刹车，定位等场合。变频器在减速时，由于拖动系统的惯性较大，此时电动机处于发电状态，机械能快速回馈到直流母线上，使直流母线电压迅速上升，从而危及变频器的安全，因此必须将该回馈能量迅速消耗掉，保持直流母线电压在某一安全范围以下，否则变频器将会过压保护或故障。一般惯性较大，或需急剧减速，刹车的场合可使用本制动单元。列如：离心机，电梯，起重机，拉丝机，港口机械等均可使用。

The equipments make EMI or equipments sensitive to EMI. The equipments impulse circuit or micro processor .SCR Silicon Controlled Rectifier equipments. Variable equipments, Variable speed ,variable frequency equipments, motor equipments

### 产品尺寸图 (Product Size)



电压等级 Voltage	规格型号 TYPE	图号 Product Picture	峰值电流(A) Peak current	额定电流(A) Rated Current	最小阻值 Ω Minimum resistance
AC200V-AC300V	DBU-2015D	Picture A	50	15	10
	DBU-2030D		90	30	6.5
	DBU-4030D		50	15	20
	DBU-4045D		75	25	13.6
AC380V-AC460V	DBU-4055	Picture B	90	30	12
	DBU-4075		110	35	10
	DBU-4090	130	45	7.5	
	DBU-4110	150	50	6.5	
	DBU-4160	200	70	4.5	
AC690	DBU-4220	Picture C	300	85	3
	DBU-4300		500	120	2.5
	DBU-6110	Picture D	150	50	8.5
	DBU-6220		180	75	7.5
	DBU-6300		200	85	6.5

### 成品识别码 (Product Identification Code)

DBU - 4030  
 制动单元  
 DC Braking Module  
 4: Rated Voltage 2:220V 4:380V 6:690V  
 11:1140V 030: Power 030=30KW