



SIKES CATALOGUE

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西凯士·制动单元选型手册

Dynamic Braking Unit Selection Brochure

Dynamic Braking Unit 制动单元	CE FC	
Filter 滤波器	Transformer 变压器	Regenerative drive 回馈装置
Choke 电抗器	RESISTOR 电阻	Load bank 负载

SIKES ELECTRIC (HK) CO., LTD.
西凯士电气(香港)有限公司

CONTENTS 目录

Dynamic Braking Unit 制动单元

03 Selection Formula

选型公式

04 Braking Unit

制动单元(LN)

06 How to select?

如何选配

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Dynamic Braking Resistor Calculation 选型公式

Braking Resistor's Resistance Value: R

Braking Resistor's Resistance Value: $R = \frac{U_{dc}^2}{K \times P}$

U_{dc}^2 : Voltage value of chopper wave of inverter's braking circuit

K: Folds of braking torque 1.2-2.0

P: Frequency of the selected converter

Braking Resistor's power: P_r

Braking Resistor's power: $P_r = \frac{P_o}{\Delta K} = \frac{P_1 \times (1 - 0.2) \times \eta}{\Delta K}$

P_o : the power of electric motor

ΔK : folds of allowable transient operating overload.

The exact value shall be determined by referring to the chart according to operating conditions.

P_1 : the average braking power that the system requires.

η : transmission efficiency, The mechanical system of transmission provides braking damp corresponding to the efficiency when it is functioning.

0.2: the internal resistance consumes 20% braking energy.

制动电阻器的阻值 : R

制动电阻的阻值 : $R = \frac{U_{dc}^2}{K \times P}$

U_{dc}^2 : 所选变频器制动回路的斩波电压值

K : 所需的制动转矩倍数1.2-2.0

P : 所选变频器的功率

制动电阻器的功率 : P_r

制动电阻器的功率 : $P_r = \frac{P_o}{\Delta K} = \frac{P_1 \times (1 - 0.2) \times \eta}{\Delta K}$

P_o : 电机的功率

ΔK : 制动电阻器短时工作允许过负荷倍数, 具体数据根据工况查图取值

P_1 : 系统所需的平均制动功率

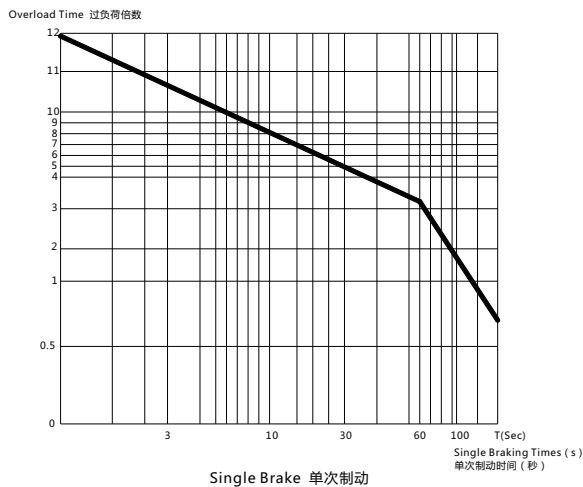
η : 传动效率, 传动的机械系统在制动时, 提供与效率相应的制动阻尼

0.2 : 电动机的内阻消耗了20%的制动能量

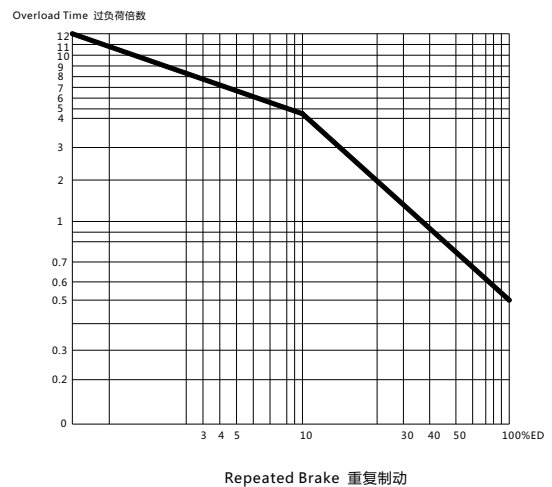
ED brake ratio is the percentage of braking time based on a 100-second operating cycle. The selection of brake unit shall be carried out in accordance with brake current U_{dc}/R and brake ration ED.

ED制动率以100S运行为一个周期, 制动时间所占比率根据制动电流 U_{dc}/R 与制动率ED选择制动单元

Overload Capability 电阻器允许过负荷倍数



Overload Capability 电阻器允许过负荷倍数



Dynamic Braking Unit 制动单元

Product Profile 产品简述

The function of the DBU braking unit is to divert in to a braking 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. The advantage gained using the DBU is improved braking performance and shorter deceleration time of the load.

Ln系列制动单元的作用是将马达在减速的过程中产生的再生能量，以热能的形式消耗在制动电阻上，从而改善变频器的制动性能及缩短变频器的制动时间。



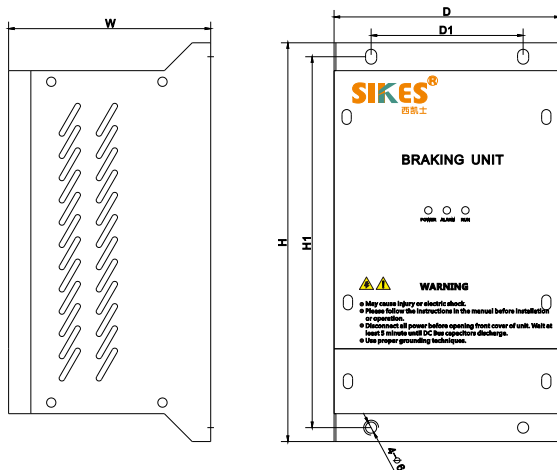
Product Parameters

- **SAFETY:** The tripping function against IGBT short circuit breakdown can avoid the fire caused by IGBT short circuit Breakdown of resistor after overload run.
- **WIDE COMPATIBILITY:** It's special design makes it compatible with general resistance rather than non-inductive resistance. It's adjustable chopper voltage DC 630V-DC 760V is applicable to various low-voltage inverters.
- **ECONOMICAL FEATURE:** It has a very high ratio of performance to price and its quality is parallel to similar type of imported product. yet has a lower price. It is considered the most cost-effective and practical auxiliary product for braking circuits of inverter's.
- **ADAPATABLE TO CONNECTIONS IN PARALLEL:** It adopts a book-shape design and can be installed in parallel connection with zero clearance. it is recommended that up to 3 units can be connected in parallel.

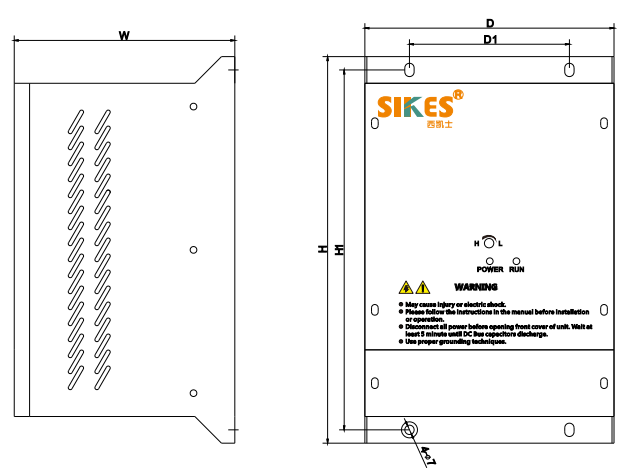
产品参数

- **安全性：**具有IGBT短路击穿脱扣功能，可能有效地防止因IGBT击穿，电阻器长时间过负荷运行而引起的火险隐患。
- **广泛性：**特殊设计可以使用普通电阻，不必选择无感电阻。斩波电压 DC 630V-DC 760V可调，适用于各种中低变频器（特殊设计可达1200V）。
- **经济性：**性价比高，品质可与同类进口产品相媲美，价格较低，是变频器刹车、制动回路中经济、实用的配套产品。
- **可并联使用：**采用书本型设计，可无间隙并联安装推荐最多3台并联使用。

Product Size 产品尺寸图

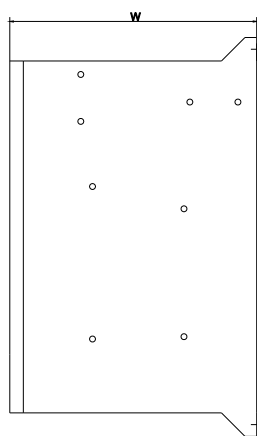


Picture A

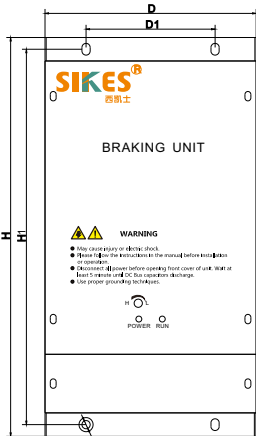


Picture B

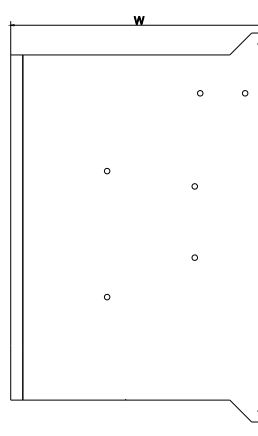
Dynamic Braking Unit 制动单元



Picture C

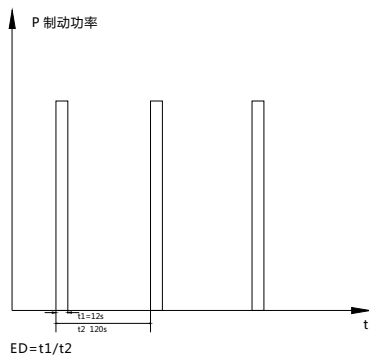


Picture D

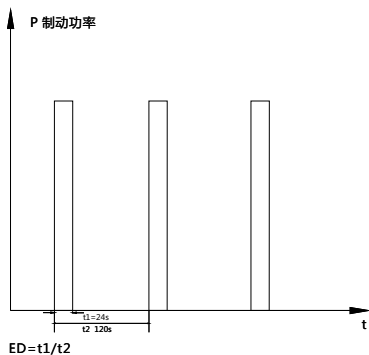


Selection Table 选型表

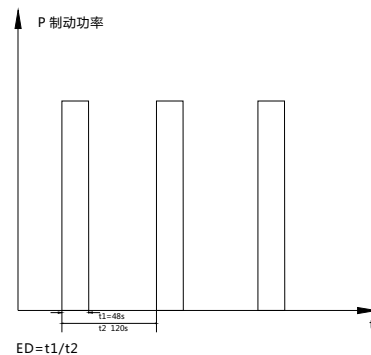
Category 类别	Type 规格	Picture NO. 图号	Max. Power 功率 (KW)	Rated Braking Current 最大制动电流	Min Resistance Value 最小电阻值	Chopper Voltage 斩波电压	Voltage Grade 电压等级	Dimensions 外形尺寸 (±5mm)					Terminal 端子	Weight 重量 (kg)	Cable 配线 (m ²)
								H	D	W	H1	W1			
Ordinary Light load Type 普通轻载型	SKS-LN-4022	A	7.5-22kw	40A	20Ω	DC660V±5V (Jump Line/可跳线)	400V	205	105	75	188	65	M4	1.5	4-6 m ²
	SKS-LN-4030		30kw	50A	17Ω	DC660V±5V (Jump Line/可跳线)		205	105	75	188	65	M4	1.5	6-8 m ²
	SKS-LN-4055		45-55kw	75A	12Ω	DC660V±5V (Jump Line/可跳线)		215	122	110	200	82	M4	2.5	6-8 m ²
	SKS-LN-4075	B	75kw	100A	7.5Ω	DC660V±5V (Jump Line/可跳线)		215	122	110	200	82	M4	2.5	10-16 m ²
	SKS-LN-4110		90kw-110kw	150A	6.0Ω	DC660V±5V (Jump Line/可跳线)		290	187	165	270	120	M5	5.1	10-16 m ²
	SKS-LN-4132		132kw	200A	3.8Ω	DC660V±5V (Jump Line/可跳线)		290	187	165	270	120	M8	5.1	25-35 m ²
Ordinary Heavy load Type 普通重载型	SKS-HN-4110	C	55-110kw	150A	5.0Ω	DC660V±5V (Jump Line/可跳线)	400V	340	180	209	320	110	M8	7.5	10-16 m ²
	SKS-HN-4200		132-200kw	200A	4.0Ω	DC660V±5V (Jump Line/可跳线)		340	180	209	320	110	M8	7.5	25-35 m ²
	SKS-HN-4280		220-280kw	300A	2.5Ω	DC660V±5V (Jump Line/可跳线)		340	180	209	320	110	M8	7.5	25-35 m ²
	SKS-HN-4400		315-400kw	400A	1.9Ω	DC660V±5V (Jump Line/可跳线)		340	180	209	320	110	M8	7.5	50-70 m ²
High-end Heavy load Type 高端重载型	SKS-GN-4110	D	55-110kw	150A	5.0Ω	DC660V±5V (With a keyboard 带可操作面板)	400V	355	220	230	335	150	M10	8.25	10-16 m ²
	SKS-GN-4200		132-200kw	200A	4.0Ω	DC660V±5V (With a keyboard 带可操作面板)		355	220	230	335	150	M10	8.25	25-35 m ²
	SKS-GN-4280		220-280kw	300A	2.5Ω	DC660V±5V (With a keyboard 带可操作面板)		355	220	230	335	150	M10	8.25	25-35 m ²
	SKS-GN-4400		315-400kw	400A	1.9Ω	DC660V±5V (With a keyboard 带可操作面板)		355	220	230	335	150	M10	8.25	50-70 m ²
	SKS-GN-4450		420-450kw	450A	1.6Ω	DC660V±5V (With a keyboard 带可操作面板)		355	220	230	335	150	M10	8.25	95-120 m ²
Medium voltage High-end Heavy load Type 中压高端重载型	SKS-GN-6110	D	55-110kw	150A	8.5Ω	DC1150V±5V (With a keyboard 带可操作面板)	660V	355	220	230	335	150	M10	8.35	10-16 m ²
	SKS-GN-6200		132-200kw	200A	6.5Ω	DC1150V±5V (With a keyboard 带可操作面板)		355	220	230	335	150	M10	8.35	10-16 m ²
	SKS-GN-6280		220-280kw	300A	4.5Ω	DC1150V±5V (With a keyboard 带可操作面板)		355	220	230	335	150	M10	8.35	25-35 m ²
	SKS-GN-6400		315-400kw	400A	3.2Ω	DC1150V±5V (With a keyboard 带可操作面板)		355	220	230	335	150	M10	8.35	50-70 m ²
	SKS-GN-6450		420-450kw	450A	2.8Ω	DC1150V±5V (With a keyboard 带可操作面板)		355	220	230	335	150	M10	8.35	50-70 m ²



Picture A



Picture B



Picture C

■ ED=20%,braking activation voltage=670VDC,Apply to common machine and the elevator (less than 10 layers,),crane trolley.

ED=20%，起始斩波电压VDC=670V，适用普通机械、10层以下电梯，起重机大小车选用。

Inverter Power 变频器功率 (KW)	Type 制动单元型号	Quantity of Braking Unit 制动单元数量	Resistor 电阻配置	Quantity of Resistor 电阻数量	Braking torque 制动力矩	Usage 使用率	Resistance form 电阻形式
0.4	Built-in braking unit 内置制动单元	/	80W/1000Ω	1	150%	20%	Single resistor 单支电阻
0.75		/	150W/600Ω	1	150%	20%	Single resistor 单支电阻
1.5		/	300W/350Ω	1	120%	20%	Single resistor 单支电阻
2.2		/	450W/250Ω	1	120%	20%	Single resistor 单支电阻
3.7		/	750W/150Ω	1	120%	20%	Single resistor 单支电阻
5.5		/	1000W/100Ω	1	120%	20%	Single resistor 单支电阻
7.5	SKS-LN-4022	1	1500W/89Ω	1	100%	20%	Single resistor 单支电阻
11	SKS-LN-4022	1	2000W/60Ω	1	100%	20%	Single resistor 单支电阻
15	SKS-LN-4022	1	3000W/45Ω	1	100%	20%	Single resistor 单支电阻
18.5	SKS-LN-4022	1	3500W/36Ω	1	100%	20%	Single resistor 单支电阻
22	SKS-LN-4022	1	4500W/30Ω	1	100%	20%	Single resistor 单支电阻
30	SKS-LN-4030	1	6000W/22Ω	1	100%	20%	Braking resistor box 电阻箱
37	SKS-LN-4055	1	7500W/18Ω	1	100%	20%	Braking resistor box 电阻箱
45	SKS-LN-4055	1	9000W/15Ω	1	100%	20%	Braking resistor box 电阻箱
55	SKS-LN-4055	1	10KW/12Ω	1	100%	20%	Braking resistor box 电阻箱
75	SKS-LN-4075	1	15KW/9Ω	1	100%	20%	Braking resistor box 电阻箱
90	SKS-LN-4110	1	18KW/7.5Ω	1	100%	20%	Braking resistor box 电阻箱
110	SKS-LN-4110	1	20KW/6Ω	1	100%	20%	Braking resistor box 电阻箱
132	SKS-LN-4132	1	26KW/5Ω	1	100%	20%	Braking resistor box 电阻箱
160	SKS-HN-4200	1	30KW/4.2Ω	1	100%	20%	Braking resistor box 电阻箱
187	SKS-HN-4200	1	35KW/3.6Ω	1	100%	20%	Braking resistor box 电阻箱
200	SKS-HN-4280	1	40KW/3.35Ω	1	100%	20%	Braking resistor cabinet 电阻柜
220	SKS-HN-4280	1	45KW/3Ω	1	100%	20%	Braking resistor cabinet 电阻柜
250	SKS-HN-4280	1	50KW/2.68Ω	1	100%	20%	Braking resistor cabinet 电阻柜
280	SKS-HN-4280	1	55KW/2.4Ω	1	100%	20%	Braking resistor cabinet 电阻柜
315	SKS-HN-4450	1	60KW/2.12Ω	1	100%	20%	Braking resistor cabinet 电阻柜
350	SKS-HN-4450	1	70KW/2Ω	1	100%	20%	Braking resistor cabinet 电阻柜
400	SKS-HN-4450	1	80KW/1.68Ω	1	100%	20%	Braking resistor cabinet 电阻柜
500	SKS-HN-4280	2	100KW/1.35Ω	1	100%	20%	Braking resistor cabinet 电阻柜
630	SKS-HN-4450	2	130KW/1Ω	1	100%	20%	Braking resistor cabinet 电阻柜

Showed in the Picture A. 如 Picture A 所示。

Dynamic Braking Unit 制动单元

ED=30%,braking activation voltage=670VDC,Apply to medium mechanical equipment and elevator(less than 20 layers)
ED=30%，起始斩波电压VDC=670V，适用中等机械设备、20层以下电梯选用。

Inverter Power 变频器功率 (KW)	Braking Unit Type 制动单元型号	Quantity of Braking Unit 制动单元数量	Resistor 电阻配置	Quantity of Resistor 电阻数量	Braking torque 制动转矩	Usage 使用率	Resistance form 电阻形式
0.4	Built-in braking unit 内置制动单元	/	120W/1000Ω	1	150%	30%	Single resistor 单支电阻
0.75		/	250W/600Ω	1	150%	30%	Single resistor 单支电阻
1.5		/	450W/300Ω	1	150%	30%	Single resistor 单支电阻
2.2		/	600W/205Ω	1	150%	30%	Single resistor 单支电阻
3.7		/	1000W/120Ω	1	150%	30%	Single resistor 单支电阻
5.5		/	1500W/80Ω	1	150%	30%	Single resistor 单支电阻
7.5	SKS-LN-4022	1	2000W/75Ω	1	120%	30%	Single resistor 单支电阻
11	SKS-LN-4022	1	3500W/50Ω	1	120%	30%	Single resistor 单支电阻
15	SKS-LN-4022	1	4500W/38Ω	1	120%	30%	Single resistor 单支电阻
18.5	SKS-LN-4030	1	5500W/30Ω	1	120%	30%	Single resistor 单支电阻
22	SKS-LN-4030	1	6.5KW/25Ω	1	120%	30%	Braking resistor box 电阻箱
30	SKS-LN-4055	1	9000Q/18Ω	1	120%	30%	Braking resistor box 电阻箱
37	SKS-LN-4055	1	11KW/15Ω	1	120%	30%	Braking resistor box 电阻箱
45	SKS-LN-4055	1	13.5KW/12Ω	1	120%	30%	Braking resistor box 电阻箱
55	SKS-LN-4055	1	16KW/10Ω	1	120%	30%	Braking resistor box 电阻箱
75	SKS-LN-4075	1	22KW/7.5Ω	1	120%	30%	Braking resistor box 电阻箱
90	SKS-HN-4110	1	27KW/6.2Ω	1	120%	30%	Braking resistor box 电阻箱
110	SKS-HN-4110	1	33KW/5Ω	1	120%	30%	Braking resistor box 电阻箱
132	SKS-HN-4200	1	40KW/4.2Ω	1	120%	30%	Braking resistor cabinet 电阻柜
160	SKS-HN-4280	1	48KW/3.5Ω	1	120%	30%	Braking resistor cabinet 电阻柜
187	SKS-HN-4280	1	55KW/3Ω	1	120%	30%	Braking resistor cabinet 电阻柜
200	SKS-HN-4280	1	60KW/2.8Ω	1	120%	30%	Braking resistor cabinet 电阻柜
220	SKS-HN-4280	1	65KW/2.5Ω	1	120%	30%	Braking resistor cabinet 电阻柜
250	SKS-HN-4450	1	75KW/2.3Ω	1	120%	30%	Braking resistor cabinet 电阻柜
280	SKS-HN-4450	1	85KW/2Ω	1	120%	30%	Braking resistor cabinet 电阻柜
315	SKS-HN-4450	1	95KW/1.8Ω	1	120%	30%	Braking resistor cabinet 电阻柜
350	SKS-HN-4450	1	105KW/1.6Ω	1	120%	30%	Braking resistor cabinet 电阻柜
400	SKS-HN-4280	2	120KW/1.4Ω	1	120%	30%	Braking resistor cabinet 电阻柜
500	SKS-HN-4450	2	150KW/1.2Ω	1	120%	30%	Braking resistor cabinet 电阻柜
630	SKS-HN-4450	2	190KW/0.9Ω	1	120%	30%	Braking resistor cabinet 电阻柜

Shown in the Picture B. 如 Picture B 所示。

ED=40%,braking activation voltage=670VDC,Apply to to more than 30 layers elevators,main hook choice of the light crane.
ED=40%，起始斩波电压VDC=670V，适用30以上电梯，轻型起重机主构选用。

Inverter Power 变频器功率 (KW)	Braking Unit Type 制动单元型号	Quantity of Braking Unit 制动单元数量	Resistor 电阻配置	Quantity of Resistor 电阻数量	Braking torque 制动力矩	Usage 使用率	Resistance form 电阻形式
0.4	Built-in braking unit 内置制动单元	/	150W/100Ω	1	150%	40%	Single resistor 单支电阻
0.75		/	300W/600Ω	1	150%	40%	Single resistor 单支电阻
1.5		/	600W/300Ω	1	150%	40%	Single resistor 单支电阻
2.2		/	900W/205Ω	1	150%	40%	Single resistor 单支电阻
3.7		/	1500W/120Ω	1	150%	40%	Single resistor 单支电阻
5.5		/	2200W/80Ω	1	150%	40%	Single resistor 单支电阻
7.5		SKS-LN-4030	1	3000W/60Ω	1	150%	40%
11	SKS-LN-4030	1	4500W/40Ω	1	150%	40%	Single resistor 单支电阻
15	SKS-LN-4030	1	6000W/30Ω	1	150%	40%	Braking resistor box 电阻箱
18.5	SKS-LN-4055	1	7500W/24Ω	1	150%	40%	Braking resistor box 电阻箱
22	SKS-LN-4055	1	9000W/20Ω	1	150%	40%	Braking resistor box 电阻箱
30	SKS-LN-4075	1	12KW/15Ω	1	150%	40%	Braking resistor box 电阻箱
37	SKS-LN-4075	1	15KW/12Ω	1	150%	40%	Braking resistor box 电阻箱
45	SKS-LN-4110	1	18KW/9.9Ω	1	150%	40%	Braking resistor box 电阻箱
55	SKS-HN-4110	1	22KW/8.1Ω	1	150%	40%	Braking resistor box 电阻箱
75	SKS-HN-4110	1	30KW/6Ω	1	150%	40%	Braking resistor box 电阻箱
90	SKS-HN-4110	1	36KW/5Ω	1	150%	40%	Braking resistor box 电阻箱
110	SKS-HN-4200	1	45KW/4.1Ω	1	150%	40%	Braking resistor cabinet 电阻柜
132	SKS-HN-4280	1	55KW/3.4Ω	1	150%	40%	Braking resistor cabinet 电阻柜
160	SKS-HN-4280	1	65KW/2.8Ω	1	150%	40%	Braking resistor cabinet 电阻柜
187	SKS-HN-4280	1	75KW/2.4Ω	1	150%	40%	Braking resistor cabinet 电阻柜
200	SKS-HN-4450	1	80KW/2.3Ω	1	150%	40%	Braking resistor cabinet 电阻柜
220	SKS-HN-4450	1	90KW/2.1Ω	1	150%	40%	Braking resistor cabinet 电阻柜
250	SKS-HN-4450	1	100KW/1.8Ω	1	150%	40%	Braking resistor cabinet 电阻柜
280	SKS-HN-4450	1	110KW/1.6Ω	1	150%	40%	Braking resistor cabinet 电阻柜
315	SKS-HN-4280	2	130KW/1.4Ω	1	150%	40%	Braking resistor cabinet 电阻柜
350	SKS-HN-4280	2	140KW/1.28Ω	1	150%	40%	Braking resistor cabinet 电阻柜
400	SKS-HN-4450	2	160KW/1.15Ω	1	150%	40%	Braking resistor cabinet 电阻柜
500	SKS-HN-4450	2	200KW/0.9Ω	1	150%	40%	Braking resistor cabinet 电阻柜
630	SKS-HN-4450	3	260KW/0.72Ω	1	150%	40%	Braking resistor cabinet 电阻柜

Shown in the Picture C. 如 Picture C 所示。

Note:The yard lifting equipment of port and wharf is in a state of high frequency use,its configuration is matched according to ED=60%~80%,specific configuration contact to our company please.

备注：港口、码头货场起重设备处于高频率使用状态，其配置要按ED=60%~80%选配，具体配置情况请与我公司联系。