NIETZ

OPTIMIZE MOTOR CONTROL

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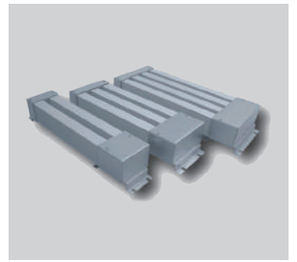
NIETZ

Braking unit | Rearctor | Resistor | Filter | Load banker resistor



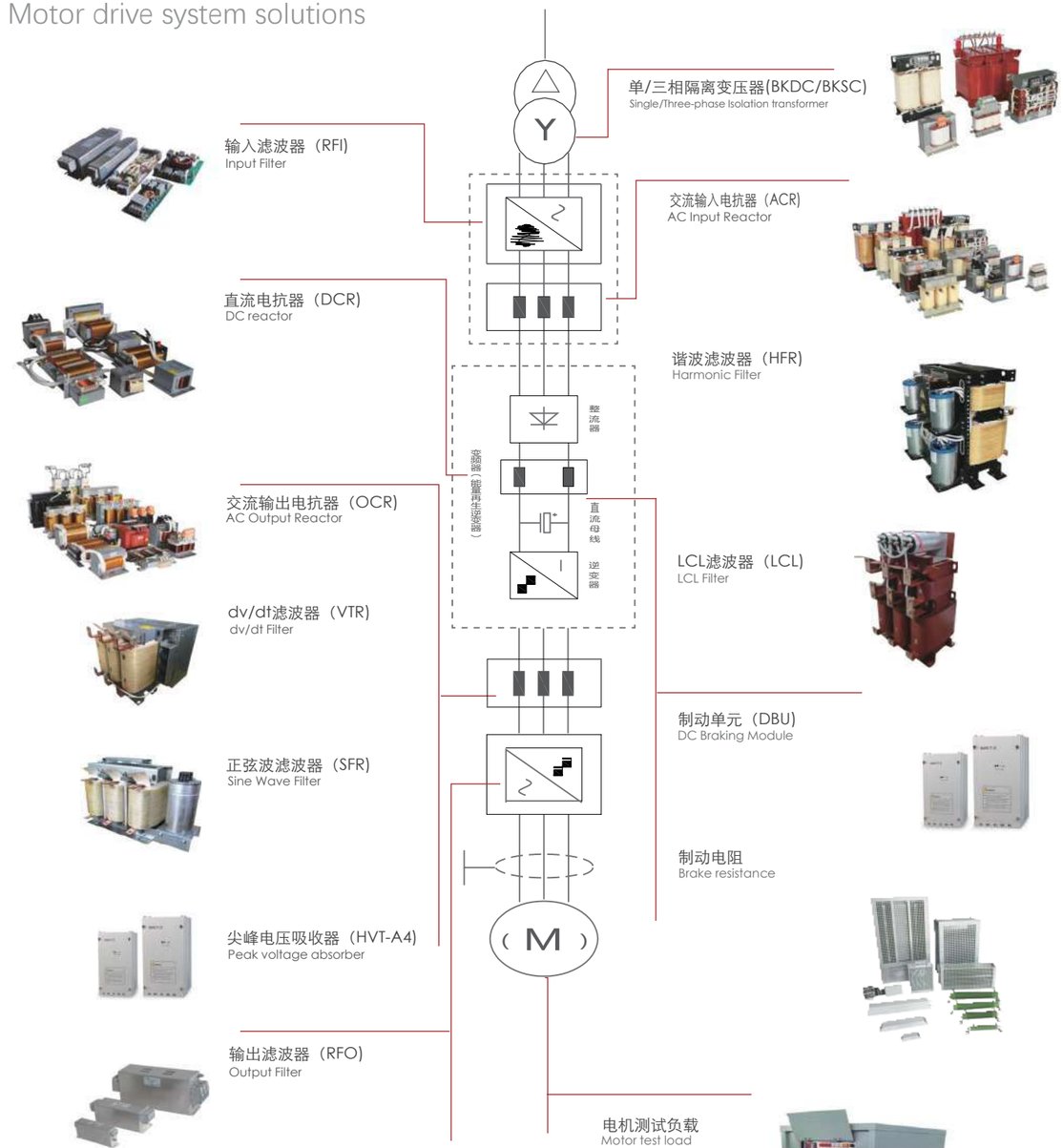



NIETZ ELECTRIC CO.,LTD

SINCE 2005

Contents

电机驱动系统解决方案
Motor drive system solutions



输入滤波器（RFI）
Input Filter

单/三相隔离变压器(BKDC/BKSC)
Single/Three-phase Isolation transformer

交流输入电抗器（ACR）
AC Input Reactor

直流电抗器（DCR）
DC reactor

谐波滤波器（HFR）
Harmonic Filter

交流输出电抗器（OCR）
AC Output Reactor

LCL滤波器（LCL）
LCL Filter

dv/dt滤波器（VTR）
dv/dt Filter

制动单元（DBU）
DC Braking Module

正弦波滤波器（SFR）
Sine Wave Filter

制动电阻
Brake resistance

尖峰电压吸收器（HVT-A4）
Peak voltage absorber

输出滤波器（RFO）
Output Filter

电机测试负载
Motor test load

交流输入电抗器（ACR） AC Input Reactor

■ 产品概述（Product Introduction）

进线电抗器可被用于给线路电源提供改进的过载保护，并能减小变频器产生的电流谐波失真。提高输入电源的功率因素，减少高次谐波，抑制变频器在电源设备上的浪涌。

Input reactors orrer overload to line power supply and reduce harmonic distortion arising from frequency inverters,also improve the input supply,reduce ultraharmonic and suppress the surge caused by frequency inverters to the power supply units.

■ 产品应用（Product Application）

特别在下列环境下推荐使用进线电抗器：

1.几个变频器并联紧密连接
2.线路电源有来自其他设备的明显 扰动（干扰，过电压）
3.线路电源各相之间存在电压不平衡，超过额定电压的1.8%
4.在同一线路上安装有大量的变频器
5.减小COS∮校正电容器上的过载，如果装置中含有一个功率系数校正设备

Particularly apply to the following cases:

1. Multiple frequency inverters in close parallel connection
2.Other devices produce interference to line power supply.(disturbance,, over voltage
3.Nonbalance among phases of line power supply.(1.8% over than of the rated voltage
4.Massive frequency inverters installed on the same line
5.Reduce cos ∮ and correct the overload of capacitor,in case the power factor correction devices are installed in system

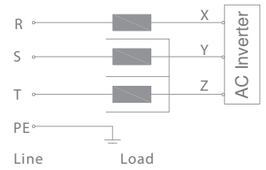
■ 技术规格（Technical Specifications）

工作电压 Work Voltage：	220VAC-3300VAC
工作频率 Work Frequency：	50/60Hz.
工作电流 Work Current：	3A-1600A
绝缘等级.Insulation Class：	class F,H
防护等级.Protection class：	IP00-IP22
压降 Voltage drop：	< 4% 大于此范围会引起转矩损失
最大电流 Max Current：	1.5× rated current, Constant 60S
噪音 Noise：	≤65dB
温升 Temperature Rise：	≤85K
抗电强度 Dielectric strength：	铁芯-绕组 3000VAC/50Hz/5mA/10s无飞弧击穿(工厂测试)
绝缘电阻 Insulation Resistor：	1000VDC绝缘阻值≥100MΩ

使用环境：-10~+45 ℃,额定值不会降低。最高可达+55℃， 在45℃以上，
每升高1℃，额定电流降低2%, 海拔高度不超过2000米。
运行环境温度-25℃～+45℃，相对湿度不超过90%。
周围无有害气体，无易燃易爆物品。
周围环境应有良好的通风条件，如装在柜内，应加装通风设备。

Operation Environment:-10~+45 ℃,rated value wont′ t lower,when higer than 55℃,
and every 1℃,thecurrent will step down 2%, Under seal level 2000m
Running ambient temperature -25 ℃ ~ +45 ℃, comparative moisture not over 90%.
No hazardous gas,no inflammables and explosives
With well-ventilated condition,ventilation devices shall be mounted if installatioh in panels

典型电路图
Typical Circuit Diagram

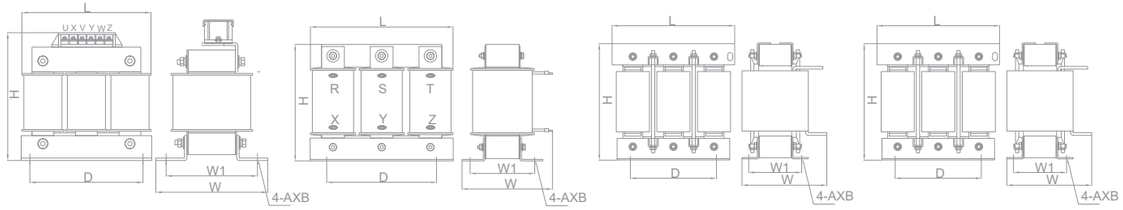


AC Input Reactor

■ 执行标准（Applicable Standards）

IEC289: 1987 Reactor
GB10229-88 Reactor (eqvIEC289: 1987)
JB9644-1999 Reactors used for semiconductor electrical driving

■ 产品尺寸图（Product Size）



Picture A　Picture B　Picture C　Picture D

380V输入电抗器 380V AC Input Reactor

电抗器型号 Reactor Type	图号 Picture NO.	适配功率 Power (kw)	额定电流 Rated Current(A)	电感量 Inductance Value(mH)	压降 Voltage Drop	绝缘等级 Insulation rank	尺寸 Dimension(±5mm) L	D	W	W1	H	A×B
ACR-0005-2M80-0.4SC	图 A Picture A	1.5	5	2.8	2%	F、H	115	90	95	70	135	6X11
ACR-0007-2M00-0.4SC		2.2	7	2	2%	F、H	115	90	95	70	135	6X11
ACR-0010-1M40-0.4SC		3.7	10	1.4	2%	F、H	115	90	95	70	135	6X11
ACR-0015-0M94-0.4SC		5.5	15	0.94	2%	F、H	115	90	95	70	135	6X11
ACR-0020-0M70-0.4SC		7.5	20	0.7	2%	F、H	115	90	95	70	135	6×15
ACR-0030-0M47-0.4SC	图 B Picture B	11	30	0.47	2%	F、H	155	95	130	63	135	6×15
ACR-0040-0M36-0.4SC		15	40	0.36	2%	F、H	155	95	135	76	135	6×15
ACR-0050-0M28-0.4SC		18.5	50	0.28	2%	F、H	155	95	135	76	135	6×15
ACR-0060-0M24-0.4SC		22	60	0.24	2%	F、H	195	120	135	72	165	8.5×20
ACR-0080-0M18-0.4SC		30	80	0.18	2%	F、H	195	120	155	92	165	8.5×20
ACR-0090-0M16-0.4SC		37	90	0.156	2%	F、H	195	120	155	92	165	8.5×20
ACR-0120-0M12-0.4SA	图 C Picture C	45	120	0.117	2%	F、H	230	150	170	83	220	11×18
ACR-0150-094U-0.4SA		55	150	0.094	2%	F、H	230	150	170	88	220	11×18
ACR-0200-070U-0.4SA		75	200	0.07	2%	F、H	250	182	175	98	230	11×18
ACR-0250-056U-0.4SA		110	250	0.056	2%	F、H	250	182	175	98	230	11×18
ACR-0290-048U-0.4SA		132	290	0.048	2%	F、H	290	214	200	102	250	11×18
ACR-0330-042U-0.4SA		160	330	0.042	2%	F、H	290	214	200	102	250	11×18
ACR-0390-036U-0.4SA		185	390	0.036	2%	F、H	290	214	205	107	250	11×18
ACR-0490-028U-0.4SA		220	490	0.028	2%	F、H	320	243	230	124	320	12×20
ACR-0600-024U-0.4SA		280	600	0.024	2%	F、H	320	243	250	140	320	12×20
ACR-0660-022U-0.4SA		300	660	0.022	2%	F、H	320	243	250	140	320	12×20
ACR-0800-17U5-0.4SA	图 D Picture D	380	800	0.0175	2%	F、H	365	260	280	135	390	15×25
ACR-1000-014U-0.4SA		450	1000	0.014	2%	F、H	365	260	280	139	410	15×25
ACR-1200-11U7-0.4SA		550	1200	0.0117	2%	F、H	395	260	340	160	390	15×25
ACR-1600-08U6-0.4SA		630	1600	0.0086	2%	F、H	395	260	340	160	435	15×25

备注：其他规格尺寸，可根据用户要求制造。Remark：Dimension can be customization

690V输入电抗器 690V AC Input Reactor

电抗器型号 Reactor Type	图号 Picture NO.	适配功率 Power (kw)	额定电流 Rated Current(A)	电感量 Inductance Value(mH)	压降 Voltage Drop	绝缘等级 Insulation rank	尺寸 Dimension(±5mm) L	W	H	D	W1	A×B
ACR-0005–5M60-0.7SC	图 A Picture A	3.7	5	5.6	2%	F、H	155	80	180	95	61	6X15
ACR-0007-4M00-0.7SC		5.5	7	4	2%	F、H	155	80	180	95	61	6X15
ACR-0010-2M80-0.7SC		7.5	10	2.8	2%	F、H	155	80	180	95	61	6X15
ACR-0015-1M87-0.7SC		11	15	1.87	2%	F、H	155	91	180	95	76	6X15
ACR-0020-1M40-0.7SC	图 B Picture B	15/18.5	20	1.4	2%	F、H	155	91	180	95	76	6X15
ACR-0030-0M93-0.7SC		22	30	0.93	2%	F、H	195	140	165	120	92	8.5X20
ACR-0040-0M70-0.7SC		30	40	0.7	2%	F、H	195	145	165	120	92	8.5X20
ACR-0050-0M56-0.7SA		37/45	50	0.56	2%	F、H	195	150	165	120	92	8.5X20
ACR-0060-0M47-0.7SA		55	60	0.47	2%	F、H	200	180	165	120	110	8.5X20
ACR-0080-0M35-0.7SA	图 C Picture C	75	80	0.35	2%	F、H	250	200	230	182	94	11X18
ACR-0090-0M31-0.7SA		90	90	0.31	2%	F、H	250	200	230	182	94	11X18
ACR-0120-0M23-0.7SA		110	120	0.23	2%	F、H	250	190	230	182	113	11X18
ACR-0150-0M19-0.7SA		132	150	0.19	2%	F、H	290	210	250	214	112	11X18
ACR-0200-0M14-0.7SA		160/185	200	0.14	2%	F、H	290	220	250	214	122	11X18
ACR-0250-0M11-0.7SA		220	250	0.11	2%	F、H	290	220	250	214	122	11X18
ACR-0290-096U-0.7SA		240	290	0.096	2%	F、H	320	250	285	243	134	11X18
ACR-0330-085U-0.7SA		280/300	330	0.085	2%	F、H	320	250	285	243	150	11X18
ACR-0390-072U-0.7SA		380	390	0.072	2%	F、H	320	260	320	243	150	11X18
ACR-0490-057U-0.7SA		450	490	0.057	2%	F、H	380	300	340	260	160	15X25
ACR-0600-047U-0.7SA	图 D Picture D	550	600	0.047	2%	F、H	380	320	340	260	184	15X25
ACR-0660-042U-0.7SA		630	660	0.042	2%	F、H	380	320	340	260	186	15X25

备注：其他规格尺寸，可根据用户要求制造。Remark：Dimension can be customization

■ 成品识别码 (Product Identification Code)

ACR	–	0060	–	0M24	–	0.4SC
输入电抗器 AC Input Reactor		额定电流 Rated Current 3A-1600A		电感量 Resistance Value M:mH U:uH		0.4:Working Voltage 0.2=220V,0.4=380V,0.7=690V,1.1=1140V S: D=Single Phase Reactor S=Three Phase Reactor C: C=Copper A:Aluminium

交流输出电抗器（OCR） AC Output Reactor

■ 产品概述 (Product Introduction)

安装在变频器输出端，用于限制变频器 与电机连接电缆的容性充电电流，钝化变频 器输出的PWM波的电压上升率。 电机电缆长度超过一定值时，建议在变频器与 电机之间插入一个电机电抗器。用于补偿在长 导线时的电容再充电电流。此最大长度决定于 变频器的额定值以及电机电缆的类型。

Installed at the output end of the frequency converter, it is used to limit the capacitive charging current of the cable connecting the frequency converter and the motor, and to passivate the voltage rise rate of the PWM wave output by the frequency converter. When the length of the motor cable exceeds a certain value, it is recommended to insert a motor reactor between the

■ 产品应用 (Product Application)

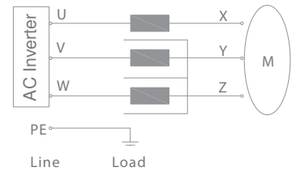
1.将dv/dt限制到500V/us
2.将电机端子上的过电压限制到：1000V至400V~（rms值）1150V至460V~（rms值）
3.打开滤波器与电机之间的接触器所引起的滤波器干扰
4.减小电机接地泄漏电流

1.Limit dv / dt to 500V/us
2.Limit the overvoltage of motor terminal to: 1000V to 400V ~ (rms) 1150V to 460V ~ (rms)
3.Filter interference caused by opening the contactor between the filter and the motor
4.Reduce the earth leakage current of motor

■ 技术规格 (Technical Specifications)

1. 工作电压：220VAC-3300VAC
2. 工作频率：50/60Hz.
3. 额定电流：3A-1600A
4. 载波频率：2-8KHz.
5. 绝缘等级：class F,H
6. 使用环境：-10~+45 ℃,额定值不会降低。最高可达+55℃，在45℃以上，每升高1℃，额定电流降低2%
7. 防护等级：IP00-IP22
8. 压　　降：＜4% 大于此范围会引起转矩损失
9. 最大电流：1.5×额定电流，持续60S
10.噪　　音：≤65dB
11.温　　升：≤85K
12.抗电强度：铁芯-绕组 3000VAC/50Hz/5mA/10s无飞弧击穿(工厂测试)
13.绝缘电阻：1000VDC绝缘阻值≥100MΩ
14.海拔高度不超过2000米。
15.运行环境温度-25℃～+45℃，相对湿度不超过90%。
16.周围无有害气体，无易燃易爆物品。
17.周围环境应有良好的通风条件，如装在柜内，应加装通风设备。

典型电路图
Typical Circuit Diagram

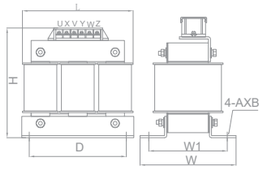


1.Work voltage: 220VAC-3300VAC
2.Work frequency: 50/60Hz.
3.Work current: 3A-1600A
4.Carrier frequency :2-8KHz
5.Insulation class: class F, H
6.Operation Environment:-10 ℃+45 ℃,rated value wont′ t lower,when higer than 45 ℃,and every 1 ℃,the current will step down 2%
7.Protection class: IP00-IP22
8.Voltage drop: <4% higher than the range will cause the loss of torque
9.Max Current: 1.5 × Rated current,continuous 60S
10:Noise: ≤ 65dB
11.Temperature Rise: ≤ 85K
12 Dielectric strength: Core Coil 3000VAC/50Hz/5mA/10s no electric arcing puncture (factory test)
13.Insulation Resistor: 1000VDC insulation resistance value ≥ 100MΩ
14.Under seal level 2000m
15.Running ambient temperature -25 ℃ ~ +45 ℃, comparative moisture not over 90%.
16.No hazardous gas,no inflammables and explosives
17.With well-ventilated condition,ventilation devices shall be mounted if installatioh in panels

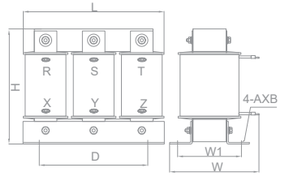
执行标准 （Applicable Standards）

IEC289: 1987 Reactor
GB10229-88 Reactor (eqvIEC289: 1987)
JB9644-1999 Reactors used for semiconductor electrical driving

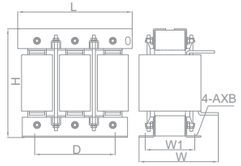
产品尺寸图 （Product Size）



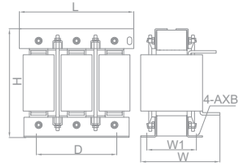
Picture A



Picture B



Picture C



Picture D

380V输出电抗器 380V AC Output Reactor

电抗器型号 Reactor Type	图号 Picture NO.	适配功率 Power (kw)	额定电流 Rated Current(A)	电感量 Inductance Value(mH)	压降 Voltage Drop	绝缘等级 Insulation rank	尺寸 Dimension(±5mm) L	D	W	W1	H	A×B
OCR-0005-1M40-0.4SC	图 A Picture A	1.5	5	1.4	1%	F、H	110	90	95	70	130	6X11
OCR-0007-1M00-0.4SC		2.2	7	1	1%	F、H	110	90	95	70	130	6X11
OCR-0010-0M70-0.4SC		3.7	10	0.7	1%	F、H	110	90	95	70	130	6X11
OCR-0015-0M47-0.4SC		5.5	15	0.47	1%	F、H	110	90	95	70	130	6X11
OCR-0020-0M35-0.4SC		7.5	20	0.35	1%	F、H	110	90	95	70	130	6X11
OCR-0030-0M23-0.4SC	图 B Picture B	11	30	0.23	1%	F、H	155	95	130	61	150	6×15
OCR-0040-0M18-0.4SC		15	40	0.18	1%	F、H	155	95	130	63	135	6×15
OCR-0050-0M14-0.4SC		18.5	50	0.14	1%	F、H	155	95	140	76	135	6×15
OCR-0060-0M12-0.4SC		22	60	0.12	1%	F、H	195	120	135	72	165	8.5×20
OCR-0080-087U-0.4SC		30	80	0.087	1%	F、H	195	120	135	72	165	8.5×20
OCR-0090-078U-0.4SC		37	90	0.078	1%	F、H	195	120	135	72	165	8.5×20
OCR-0120-058U-0.4SA	图 C Picture C	45	120	0.058	1%	F、H	230	150	165	83	220	11×18
OCR-0150-047U-0.4SA		55	150	0.047	1%	F、H	230	150	170	88	220	11×18
OCR-0200-035U-0.4SA		75	200	0.035	1%	F、H	230	150	180	98	220	11×18
OCR-0250-028U-0.4SA		110	250	0.028	1%	F、H	250	182	175	98	230	11×18
OCR-0290-024U-0.4SA		132	290	0.024	1%	F、H	290	214	200	107	250	11×18
OCR-0330-021U-0.4SA		160	330	0.021	1%	F、H	290	214	200	107	250	11×18
OCR-0390-018U-0.4SA		185	390	0.018	1%	F、H	290	214	200	107	250	11×18
OCR-0490-014U-0.4SA		220	490	0.014	1%	F、H	320	243	230	125	320	11×18
OCR-0600-012U-0.4SA		280	600	0.012	1%	F、H	320	243	250	140	320	11×18
OCR-0660-011U-0.4SA		300	660	0.011	1%	F、H	320	243	250	140	320	11×18
OCR-0800-08U7-0.4SA	图 D Picture D	380	800	0.0087	1%	F、H	365	260	280	135	390	15×25
OCR-1000-07U0-0.4SA		450	1000	0.007	1%	F、H	365	260	280	135	390	15×25
OCR-1200-05U8-0.4SA		550	1200	0.0058	1%	F、H	395	260	325	150	390	15×25
OCR-1600-04U3-0.4SA		630	1600	0.0043	1%	F、H	395	260	325	150	435	15×25

备注：其他规格尺寸，可根据用户要求制造。Remark: Dimension can be customization

AC Output Reactor

690V输出电抗器 690V AC Output Reactor

电抗器型号 Reactor Type	图号 Picture NO.	适配功率 Power (kw)	额定电流 Rated Current(A)	电感量 Inductance Value(mH)	压降 Voltage Drop	绝缘等级 Insulation rank	尺寸 Dimension(±5mm) L	D	W	W1	H	A×B
OCR-0005–2M80-0.7SC	图 A Picture A	3.7	5	2.8	1%	F、H	155	80	180	95	61	6X15
OCR-0007-2M00-0.7SC		5.5	7	2	1%	F、H	155	80	180	95	61	6X15
OCR-0010-1M40-0.7SC		7.5	10	1.4	1%	F、H	155	80	180	95	61	6X15
OCR-0015-0M93-0.7SC		11	15	0.93	1%	F、H	155	80	180	95	63	6X15
OCR-0020-0M70-0.7SC	图 B Picture B	15/18.5	20	0.7	1%	F、H	155	80	180	95	63	6X15
OCR-0030-0M47-0.7SC		22	30	0.47	1%	F、H	195	130	165	120	72	8.5X20
OCR-0040-0M35-0.7SC		30	40	0.35	1%	F、H	195	130	165	120	72	8.5X20
OCR-0050-0M28-0.7SA		37/45	50	0.28	1%	F、H	195	150	165	120	92	8.5X20
OCR-0060-0M23-0.7SA		55	60	0.23	1%	F、H	195	150	165	120	92	8.5X20
OCR-0080-0M18-0.7SA		75	80	0.18	1%	F、H	195	190	165	120	110	8.5X20
OCR-0090-0M16-0.7SA		90	90	0.16	1%	F、H	230	200	230	150	94	11X18
OCR-0120-0M12-0.7SA	图 C Picture C	110	150	0.12	1%	F、H	250	175	230	182	103	11X18
OCR-0150-094U-0.7SA		132	200	0.094	1%	F、H	250	200	230	182	113	11X18
OCR-0200-070U-0.7SA		160/185	250	0.07	1%	F、H	290	200	250	214	112	11X18
OCR-0250-055U-0.7SA		220	290	0.055	1%	F、H	290	210	250	214	122	11X18
OCR-0290-048U-0.7SA		240	330	0.048	1%	F、H	320	250	285	243	134	11X18
OCR-0330-042U-0.7SA		280/300	390	0.042	1%	F、H	320	250	285	243	134	11X18
OCR-0390-036U-0.7SA		380	490	0.036	1%	F、H	320	250	285	243	134	11X18
OCR-0490-028U-0.7SA		450	600	0.028	1%	F、H	320	270	320	243	154	11X18
OCR-0600-023U-0.7SA	图 D Picture D	550	660	0.023	1%	F、H	365	285	350	260	164	15X25
OCR-0660-021U-0.7SA		630		0.021	1%	F、H	365	285	350	260	164	15X25

备注：其他规格尺寸，可根据用户要求制造。Remark: Dimension can be customization

成品识别码 (Product Identification Code)

OCR	–	0060	–	0M24	–	0.4SC
输出电抗器 AC Output Reactor		额定电流 Rated Current 3A-1600A		电感量 Resistance Value M:mH U:uH		0.4:Working Voltage 0.2=220V,0.4=380V,0.7=690V,1.1=1140V S: D=Single Phase Reactor S=Three Phase Reactor C: C=Copper A:Aluminium

直流电抗器（DCR） DC reactor

■ 产品概述 （Product Introduction）

直流平波电抗器用于整流回路之中，抑制整流后的波纹脉动分量，并使整流后的电流连续不断，改善输出的支流波形，保证直流设备的正常运行。

DC smoothing reactor rectifier circuit being used to suppress ripple rectified pulsating component and make rectified current continuously Improve the output waveform tributaries, to ensure the normal operation of the DC devices.

■ 产品应用 （Product Application）

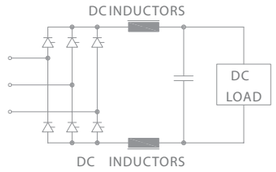
1. 改善电容滤波造成的输入电流波形畦变。
2. 减少和防止因冲击电流造成整流桥损坏和电容过热。
3. 提高功率因素，降低直流母线交流脉冲。
4. 限制电网电压的瞬变。
5.与并联连接的电容一起共同抑制或滤掉直流中的纹波，以排除对负载的不利影响。

1.Suppress the waveform distortion of input current caused by capacitive filtering
2.Reduce and avoid overheat of capacity and rectifier bridge damage both of which arise form surge current
3.Improve power factor and reduce the DC busbar AC pulse.
4.Limit the instant change of the grid voltage
5.Suppress or filter out ripple in DC together with capacitors connected in parallel to eliminate adverse effects on the load.

■ 技术规格 （Technical Specifications）

1. 工作电压：220VAC-1140VAC
2. 工作频率：50/60Hz.
3. 工作电流：3A-1600A
4. 绝缘等级：class F,H
5. 使用环境：-10…+45 ℃,额定值不会降低。最高可达+55℃，在45℃以上，每升高1℃，额定电流降低2%
6. 防护等级：IP00-IP22
7. 最大电流：1.5×额定电流，持续60S
8. 噪　　音：≤65dB
9. 温　　升：≤85K
10. 抗电强度：铁芯-绕组 3000VAC/50Hz/5mA/10s无飞弧击穿(工厂测试)
11. 绝缘电阻：1000VDC绝缘阻值≥100MΩ
12. 海拔高度不超过2000米。
13. 运行环境温度-25℃～+45℃，相对湿度不超过90%。
14. 周围无有害气体，无易燃易爆物品。
15. 周围环境应有良好的通风条件，如装在柜内，应加装通风设备。

典型电路图
Typical Circuit Diagram



1.Work voltage: 220VAC-1140VAC
2.Work frequency: 50/60Hz.
3.Work current: 3A-1600A
4.Insulation class: class F, H
5.Operation Environment:-10~…+45 ℃,rated value wont’ t lower,when higer than 45℃,and every 1℃,the current will step down 2%
6.Protection class: IP00-IP22
7.Max Current: 1.5 × Rated current,continuous 60S
8:Noise: ≤ 65dB
9.Temperature Rise: ≤ 85K
10.Dielectric strength: Core Coil 3000VAC/50Hz/5mA/10s no electric arcing puncture (factory test)
11.Insulation Resistor: 1000VDC insulation resistance value ≥ 100MΩ
12.Under seal level 2000m
15.Running ambient temperature -25 ℃ ~ +45 ℃, comparative moisture not over 90%.
16.No hazardous gas,no inflammables and explosives
17.With well-ventilated condition,ventilation devices shall be mounted if installatioh in panels

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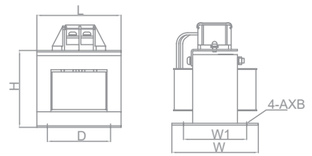
DC Reactor

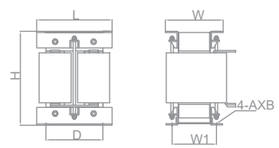
■ 执行标准 （Applicable Standards）

IEC289: 1987 Reactor
GB10229-88 Reactor (eqvIEC289: 1987)
JB9644-1999 Reactors used for semiconductor electrical driving

■ 产品尺寸图 （Product Size）



Picture A



Picture B

电抗器型号 Reactor Type	图号 Picture NO.	适配功率 Power (kw)	额定电流 Rated Current(A)	电感量 Inductance Value(mH)	绝缘等级 Insulation rank	尺寸 Dimension(±5mm)					
						L	D	W	W1	H	A×B
DCR-0010-6M30-0.4DC	图 A Picture A	4	10	6.3	F、H	110	87	120	70	135	6X12
DCR-0015-3M60-0.4DC		5.5	15	3.6	F、H	110	87	120	70	135	6X12
DCR-0020-3M60-0.4DC		7.5	20	3.6	F、H	110	87	120	70	135	6X12
DCR-0030-2M00-0.4DC		11	30	2	F、H	110	87	120	70	135	6X12
DCR-0040-2M00-0.4DC		15	40	2	F、H	110	87	120	70	135	6X12
DCR-0040-1M30-0.4DC		18.5	40	1.3	F、H	110	87	120	70	135	6X12
DCR-0050-1M08-0.4DC		22	50	1.08	F、H	120	95	135	85	145	8.5×14
DCR-0065-0M80-0.4DC		30	65	0.8	F、H	138	111	150	85	170	8.5×14
DCR-0080-0M70-0.4DC		37	80	0.7	F、H	138	111	150	85	170	8.5×14
DCR-0100-0M54-0.4DA		45	100	0.54	F、H	155	125	180	105	195	10×20
DCR-0120-0M45-0.4DA		55	120	0.45	F、H	155	125	160	90	195	10×20
DCR-0160-0M36-0.4DA	图 B Picture B	75	160	0.36	F、H	155	125	180	105	200	10×20
DCR-0200-0M33-0.4DA		90	200	0.33	F、H	155	100	180	98	215	10×20
DCR-0250-0M26-0.4DA		110	250	0.26	F、H	210	176	200	115	255	11×18
DCR-0300-0M26-0.4DA		132	300	0.26	F、H	210	176	150	115	255	11×18
DCR-0350-0M17-0.4DA		160	350	0.17	F、H	210	176	150	115	255	11×18
DCR-0450-090U-0.4DA		185	450	0.09	F、H	220	191	220	117	280	11×18
DCR-0500-060U-0.4DA		220	500	0.06	F、H	220	191	220	117	280	11×18
DCR-0650-050U-0.4DA		300	650	0.05	F、H	220	191	220	127	280	11×18
DCR-0800-050U-0.4DA		380/400	800	0.05	F、H	250	200	245	144	320	11×18
DCR-1000-050U-0.4DA		450	1000	0.05	F、H	250	200	280	146	360	11×18
DCR-1200-050U-0.4DA		500	1200	0.04	F、H	250	200	280	164	390	11×18

■ 成品识别码 (Product Identification Code)

DCR	–	0060	–	0M24	–	0.4SC
直流电抗器 DC Reactor		额定电流 Rated Current 3A-1600A		电感量 Resistance Value M:mH U:uH		0.4:Working Voltage 0.2=220V,0.4=380V,0.7=690V,1.1=1140V S: D=Single Phase Reactor S=Three Phase Reactor C: C=Copper A:Aluminium

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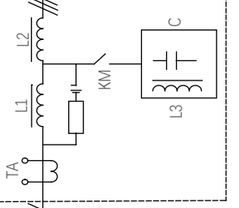
谐波滤波器（HFR） Harmonic Filter

■ 产品概述 （Product Introduction）

谐波滤波器（HFR）包括主电感器L1和L2和电感器L3以及电容器C组合的二级吸收电路,单元可配装互感器TA以及支路接触器KM,吸收电路需要特别调整，可改善以第5次和第5次以上的谐波电流。基波频率50HZ和基波频率60HZ的电路是不同的基波频率。滤波器性能随负载功能的变化而变化。额定负载下，HFR滤波器的性能THiD≤5%或≤10%

The harmonic filter (HFR) includes a secondary absorption circuit consisting of main inductor L1 and L2, inductor L3, and capacitor C combination. The unit can be equipped with transformer TA and branch contactor KM, and the absorption circuit needs special adjustment to improve the harmonic current of the 5th and above. The circuits with a fundamental frequency of 50Hz and 60Hz have different fundamental frequencies. The filter performance varies with the load function. Under rated load, the performance of HFR filter THiD ≤5% or ≤10%



■ 产品应用 （Product Application）

适用于各种前端是六脉冲整流的电力设备将谐波电流减小到规定限值以下。

日常用电负载，非线性负载占很大一部分。

Applicable to a variety of front-end is six-pulse rectifier power equipment harmonic current to reduce the specified limit below. DailyElectrical Load, nonlinear load accounts for a large part.

HFR谐波滤波器可以快速方便地将标准电机驱动升级为低谐波驱动。

The HFR harmonic filter can quickly and conveniently upgrade the standard motor drive to the low harmonic drive.

HFR谐波滤波器有助于缓解由于负载谐波电流引起的过载和电力基础设施过热，从而使电力系统得到充分利用。谐波电流较小降低了系统共振以及敏感电子设备潜在停运风险。

The HFR harmonic filter helps to reduce the overload caused by the load harmonic current and the overheating of the power infrastructure, thus making full use of the power system. The low harmonic current reduces the risk of system resonance and the potential outage of sensitive electronic equipment.

其典型应用有：Typical applications include:

- 配备前端六脉冲整流器的设备
  Equipment equipped with a front-end six-pulse rectifier
- AC和DC电动机驱动器
  AC and DC motor drivers
- 工厂自动化设备
  Factory automation equipment
- UPS及三相电源
  UPS and three-phase power supply
- 水/废水处理设施
  Water/wastewater treatment facilities
- 石油及天然气勘探
  Oil and gas exploration
- 重工业及机械
  Heavy industry and machinery
- 自给式系统（如船舶）
  A self-contained system (as of a ship)
- 风机及泵应用
  Fan and pump applications
- 电池充电器
  Battery Charger
- 供热通风与空调工程装置
  Heating, ventilation and air conditioning engineering equipment
- 关键工程
  Key projects

■ 技术规格 （Technical Specifications）

额定工作电压 Rated working voltage	3×370 to 500VAC
电压容差范围 Voltage tolerance range	3×342 to 550VAC
工作频率 Operating frequency	50Hz/60Hz
电机驱动输入电流* Motor drives input current	10 to 500A@50° C
电机驱动输入功率 The motor drives the input power	4 to 250KW
总谐波电流畸变THID**	在额定功率下At rated power: THDI≤5%/≤10%
效率 Efficiency	>98.5%
绝缘等级 Insulation grade	class F,H
抗电强度 Electrical strength	P=>E 2500VAC(1分钟)
防护等级 Protection level	IP00-IP20
冷却 Cooling	风冷 Air-cooled
过载容量 Overload capacity	1.5 * In / 60S
环境温度范围 Ambient temperature range	全操作状态 Full operational status: -25° C to +50° C 降容操作状态 Volume Reduction Operation Status: +50° C to +70° C*** 运输和存放Transport and storage：-25℃ to +85℃

* 谐波滤波器可以通过降低谐波电流和提高功率因数来降低有效输入和峰值电流。

The harmonic filter can reduce the effective input and peak current by reducing the harmonic current and increasing the power factor.

** 系统要求System requirements：THDI<2%,线电压不平衡度Line voltage unbalance<1%。

*** Iderated=Inominal*√（85° C-Tamb）/35° C

典型电路图

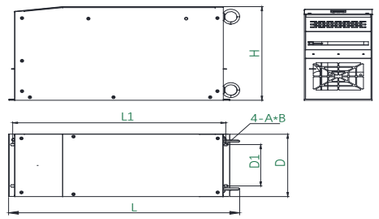
Typical Circuit Diagram

■ 电气数据 （Electrical data）

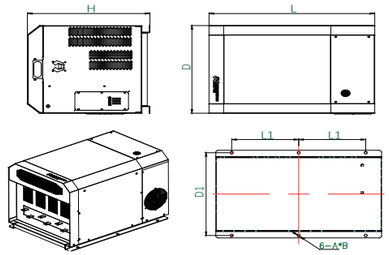
序号 NO.	380V 谐波滤波器型号 Harmonic filter type THDI≤5%	损耗（W） Wear andtear	THDI≤10%	损耗（W） Wear andtear	额定功率 Rated power (KW)	额定电流 rated current (A)	噪声 Noise (dB)	机箱尺寸 Size of chassis
1	HFR005X4SC005N06	115	HFR010X4SC005N06	108	5.5	10.5	<70	H1
2	HFR005X4SC007N06	140	HFR010X4SC007N06	125	7.5	14.4	<70	H1
3	HFR005X4SC011N10	210	HFR010X4SC011N10	200	11	22	<70	H2
4	HFR005X4SA015N10	265	HFR010X4SA015N10	250	15	29	<70	H3
5	HFR005X4SA018N16	283	HFR010X4SA018N16	265	18.5	34	<70	H4
6	HFR005X4SA022N16	304	HFR010X4SA022N16	280	22	40	<70	H4
7	HFR005X4SA030N16	346	HFR010X4SA030N16	320	30	55	<72	H4
8	HFR005X4SA037N35	422	HFR010X4SA037N35	390	37	66	<72	H4
9	HFR005X4SA045N35	465	HFR010X4SA045N35	435	45	80	<72	H5
10	HFR005X4SA055N50	535	HFR010X4SA055N50	490	55	96	<75	H6
11	HFR005X4SA075N99	627	HFR010X4SA075N99	570	75	133	<75	H7
12	HFR005X4SA090N99	860	HFR010X4SA090N99	780	90	171	<75	H7
13	HFR005X4SA110N99	945	HFR010X4SA110N99	870	110	204	<75	H8
14	HFR005X4SA132N99	1062	HFR010X4SA132N99	970	132	251	<75	H8
15	HFR005X4SA160N99	1140	HFR010X4SA160N99	1050	160	304	<75	H9
16	HFR005X4SA200N99	1483	HFR010X4SA200N99	1350	200	381	<75	H9
17	HFR005X4SA250N99	1895	HFR010X4SA250N99	1730	250	472	<75	H9
18	HFR005X4SA315N99	2408	HFR010X4SA315N99	2200	315	600	<75	H9
19	HFR005X4SA355N99	2710	HFR010X4SA355N99	2500	355	675	<75	H9

序号 NO.	690V谐波滤波器型号 Harmonic filter type THDI≤5%	损耗（W） Wear andtear	THDI≤10%	损耗（W） Wear andtear	额定功率 Rated power (KW)	额定电流 rated current (A)	噪声 Noise (dB)	机箱尺寸 Size of chassis
1	HFR005X7SC011N10	300	HFR010X7SC011N10	270	11	15	<70	H3
2	HFR005X7SA018N10	410	HFR010X7SA018N10	370	18.5	20	<70	H3
3	HFR005X7SA022N16	430	HFR010X7SA022N16	390	22	25	<70	H3
4	HFR005X7SA030N16	470	HFR010X7SA030N16	425	30	36	<70	H5
5	HFR005X7SA037N35	530	HFR010X7SA037N35	470	37	43	<72	H5
6	HFR005X7SA045N35	570	HFR010X7SA045N35	510	45	52	<72	H7
7	HFR005X7SA055N50	630	HFR010X7SA055N50	560	55	63	<72	H7
8	HFR005X7SA075N50	800	HFR010X7SA075N50	720	75	86	<75	H8
9	HFR005X7SA090N50	970	HFR010X7SA090N50	870	90	101	<75	H8
10	HFR005X7SA110N99	1100	HFR010X7SA110N99	990	110	125	<75	H9
11	HFR005X7SA132N99	1260	HFR010X7SA132N99	1130	132	144	<75	H9
12	HFR005X7SA160N99	1365	HFR010X7SA160N99	1230	160	180	<75	H10
13	HFR005X7SA200N99	1750	HFR010X7SA200N99	1580	200	217	<75	H10
14	HFR005X7SA250N99	2600	HFR010X7SA250N99	2340	250	289	<75	H10
15	HFR005X7SA315N99	2900	HFR010X7SA315N99	2610	315	324	<75	H10
16	HFR005X7SA400N99	3250	HFR010X7SA400N99	2920	400	420	<75	H10
17	HFR005X7SA560N99	3430	HFR010X7SA560N99	2100	560	600	<75	H10

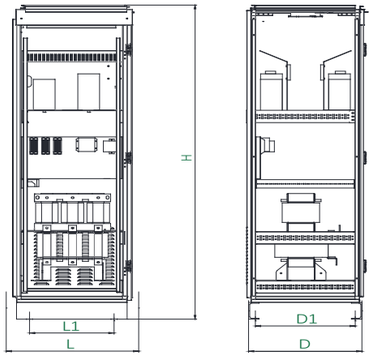
■ 产品尺寸图 (Product Size)



H1-H6



H7-H8

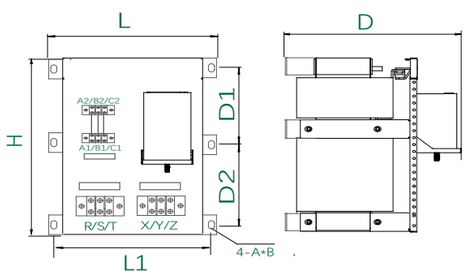


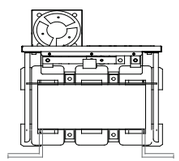
H9-H10

机箱型号 Case type	尺寸 Size ±2 (mm) L	D	H	L1	D1
H1	530	180	255	500	150
H2	530	210	275	500	150
H3	630	230	300	600	150
H4	715	245	350	650	150
H5	750	330	370	675	150
H6	800	340	370	720	150
H7	680	470	385	275*2	440
H8	690	480	510	275*2	445
H9	600	600	2200	535	525
H10	800	800	2200	735	725

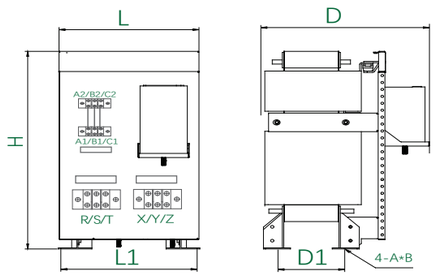
备注：其他规格尺寸，可根据用户要求制造。
Remark：Dimension can be customization

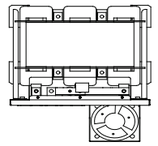
■ 模块尺寸图 (Module Size)





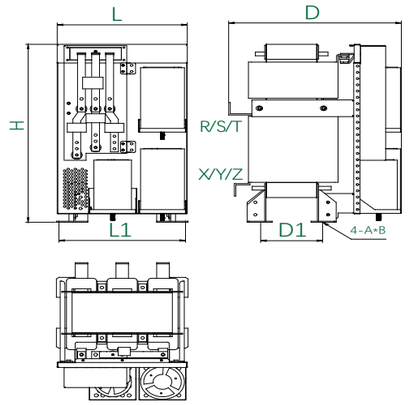
Picture A



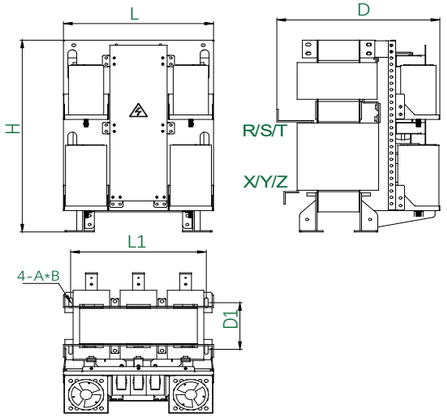


Picture B

谐波滤波器型号 Harmonic filter type	适配功率 Power(KW)	图号 Picture NO.	额定电流 Current(A)	尺寸Size (±2mm) L	D	H	L1	D1	D2	A/B	Weight (Kg)
HFR005M4SA004N99	4	图A Picture A	8	245	290	265	225	102	122	12*40	20
HFR005M4SA005N99	5.5		10.5	245	290	265	225	102	122	12*40	20
HFR005M4SA007N99	7.5		14.4	245	308	265	225	102	122	12*40	26
HFR005M4SA011N99	11		22	287	318	275	267	88.5	136	12*40	35
HFR005M4SA015N99	15		29	322	318	340	302	125	162	12*40	44
HFR005M4SA018N99	18.5	图B Picture B	34	310	300	415	213	135	--	12*20	52
HFR005M4SA022N99	22		40	310	300	415	213	135	--	12*20	52
HFR005M4SA030N99	30		55	310	320	415	213	155	--	12*20	64
HFR005M4SA037N99	37		66	310	320	415	213	155	--	12*20	66
HFR005M4SA045N99	45		80	310	350	445	213	185	--	12*20	87
HFR005M4SA055N99	55		96	310	370	445	213	205	--	12*20	103



Picture C



Picture D

谐波滤波器型号 Harmonic filter type	适配功率 Power(KW)	图号 Picture NO.	额定电流 Current(A)	尺寸Size (max) L	D	H	L1	D1	A/B	接线孔 Connection Hole	Weight (Kg)
HFR005M4SA075N99	75	图C Picture C	133	400	560	500	380	180	12*40	ϕ13	190
HFR005M4SA090N99	90		171	400	560	500	380	180	12*40	ϕ13	200
HFR005M4SA110N99	110		204	400	560	500	380	180	12*40	ϕ13	210
HFR005M4SA132N99	132		251	400	560	500	380	180	12*40	ϕ13	220
HFR005M4SA160N99	160	图D Picture D	304	440	565	735	380	200	12*40	ϕ13	230
HFR005M4SA200N99	200		381	520	560	800	461	164	12*40	ϕ13	255
HFR005M4SA250N99	250		472	520	600	800	461	184	12*40	ϕ13	300
HFR005M4SA315N99	315		600	520	600	840	461	186	12*40	ϕ13	325
HFR005M4SA355N99	355		675	530	640	930	461	226	12*40	ϕ13	390

■ 成品识别码 (Product Identification Code)

HFR	005X	4SA	110	N99
谐波滤波器 Harmonic Filter	总谐波电流畸变THID Total harmonic current distortion THID 005：THDI≤5% X:X=带外壳 With a shell M=无外壳 No shell	4: Working Voltage 4=380V,7=690V S: D=Single Phase Reactor S=Three Phase Reactor A: C=Copper A=Aluminium	变频器功率 Inverter power 110：110KW	接线方式 Connection mode

dv/dt滤波器（VTR） dv/dt Filter

■ 产品概述 （Product Introduction）

PWM逆变器直接驱动电机时会产生较高dv/dt的共模电压,并由此产生轴承电流和共模漏电流以及严重的电磁干扰(EMI).特别是当逆变器通过长线电缆与电机连接时,由于电缆中分布参数的影响,会在电机端产生电压反射现象,从而在电机端会产生2倍以上的过电压,导致线圈绝缘失败. dv/dt滤波器降低电机电缆传输线效应电压的增大而衰减率，并最大限度地减少在电机端子上所发生的峰值电压。

When the PWM inverter will produce high common-mode voltage of dv/dt when directly driving the motor, resulting in bearing current and common-mode leakage current as well as severe electromagnetic interference (EMI). Especially when the inverter is connected to the motor with a long cable, the influence of the distribution parameters of the cable will result in voltage reflection, which will produce over-voltage of over two times at the motor terminal, causing failure of the coil insulation. However, dv/dt filters can reduce the rate of decay due to increase of the effect voltage during transmission of the motor cable, and minimize the peak voltage generated at the motor terminal.

■ 产品应用 （Product Application）

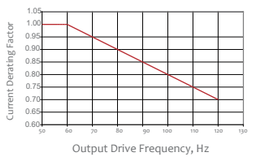
dV/dT滤波器是设计用于保护电机的滤波器，由于变频器与电机之间运行电缆过长会引起对电机产生毁灭性影响峰值电压。电缆的长度取决于用在变频器中的电力半导体的开关次数和电机的大小，如果电缆短到2.5米则会导致电机承受的峰值电压超过电机绝缘系统的额定值。然而，如果电缆太长则问题更大，在这种情况下就需要用dV/dT滤波器来保护电机不受峰值电压的毁灭性影响。

The dV/dT filters are designed to protect the motor filter as peak voltage disastrous to the motor will be generated if the cable between the inverter and the motor is too long. The cable length depends on the switching times of the power semiconductor in the inverter and the size of the motor. A cable as short as 2.5m will result in peak voltage of the motor exceeding the rated value of the motor insulation system. However, the problem is even greater if the cable is too long, in which case you need to use a dV/dT filter to protect the motor from the devastating impact of the peak voltage.

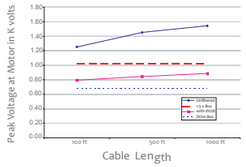
■ 技术规格 （Technical Specifications）

1.最大工作电压 Work Voltage：400V AC-1140V AC
2.额定电流 Work Current：5~500A
3.频率 Work Frequency：50-60Hz
4.开关频率 Switching frequency：2~8KHz
5.防护等级 Protection class：IP00-IP20
6.绝缘等级 Insulation Class：class F,H
7. 使用环境：-10…+45 ℃,额定值不会降低。最高可达+55℃,在45℃以上，每升高1℃，额定电流降低2%
Operation Environment:-10~+45 ℃,rated value wont Up to+55 ℃, above 45 ℃, for every 1 ℃ increase, the rated current decreases by 2%
8.最大电缆长度 Maximum cable length：1000m
9. 最大电流 Max Current：1.5×额定电流，持续60S 1.5 × Rated current,continuous 60S
10. 噪 音 Noise：≤65dB
11. 温 升 Temperature Rise：≤85K
12.抗电强度：铁芯-绕组 3000VAC/50Hz/5mA/10s无飞弧击穿(工厂测试)
Dielectric strength: Core Coil 3000VAC/50Hz/5mA/10s no electric arcing puncture (factory test)
13.绝缘电阻 Insulation Resistor：1000VDC insulation resistance value≥100MΩ
14.海拔高度不超过2000米。Under seal level 2000m
15.运行环境温度-25℃～+45℃，相对湿度不超过90%。
Running ambient temperature -25 ℃ ~ +45 ℃, comparative moisture not over 90%.
16.周围无有害气体，无易燃易爆物品。No hazardous gas,no inflammables and explosives
17.周围环境应有良好的通风条件，如装在柜内，应加装通风设备。
With well-ventilated condition,ventilation devices shall be mounted if installatioh in panels

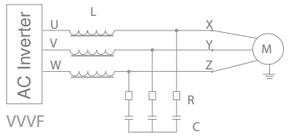
dV/dt Filter Current Derating for Drive Output Frequency



22 Amp dV/dt Overall Performance 30hp 480 Vac Motor



典型电路图
（Typical circuit diagram）



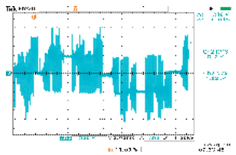
VVVF

DV / DT Filter

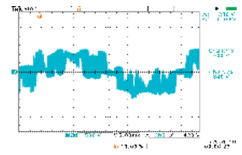
■ 执行标准 （Applicable Standards）

IEC289: 1987 Reactor
GB10229-88 Reactor (eqvIEC289: 1987)
JB9644-1999 Reactors used
for semiconductor electrical driving

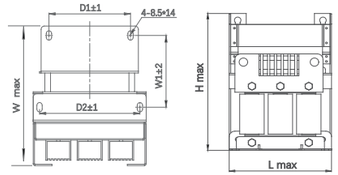
1000 ft Full Load, 8kHz Switching, Unfiltered Shielded Cable



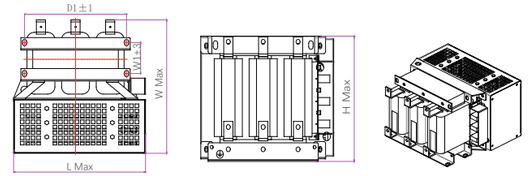
1000 ft Full Load, 8kHz Switching with dV/dt Filter



■ 产品尺寸图 （Product Size）



Picture A



Picture B

380V滤波器型号 TYPE	适配功率 Power(kw)	图号 Picture NO.	额定电流 Rated Current（A）	绝缘等级 Insulation Class	尺寸 Dimension(±5mm) L(max)	W(max)	H(max)	W1±2	D1±2	D2±2	A*B
VTR-0005-0.4SC	2.2	图 A Picture A	5	F,H	200	235	270	68	55/95	160	8.5*14/6*15
VTR-0010-0.4SC	3.7-4.5		10	F,H	200	235	270	68	55/95	160	8.5*14/6*15
VTR-0015-0.4SC	5.5		15	F,H	200	240	270	104	130	160	8.5*14
VTR-0020-0.4SC	7.5		20	F,H	200	240	270	120	130	160	8.5*14
VTR-0030-0.4SA	11		30	F,H	240	240	320	115	150	200	8.5*14
VTR-0040-0.4SA	15		40	F,H	240	250	320	135	150	200	8.5*14
VTR-0050-0.4SA	18.5		50	F,H	240	260	325	135	150	200	8.5*14
VTR-0060-0.4SA	22		60	F,H	240	260	330	143	150	200	8.5*14
VTR-0080-0.4SA-YT	30		80	F,H	355	370	255	73	245	245	11*18
VTR-0090-0.4SA-YT	37		90	F,H	355	370	255	73	245	245	11*18
VTR-0120-0.4SA-YT	45	图 B Picture B	120	F,H	390	385	230	83	280	280	11*18
VTR-0150-0.4SA-YT	55		150	F,H	390	400	285	103	280	280	11*18
VTR-0200-0.4SA-YT	75		200	F,H	390	385	285	87	280	280	11*18
VTR-0250-0.4SA-YT	90/110		250	F,H	370	385	300	87	280	280	11*18
VTR-0290-0.4SA-YT	132		290	F,H	370	385	300	87	280	280	11*18
VTR-0330-0.4SA-YT	160		330	F,H	440	400	300	97	280	280	11*18
VTR-0390-0.4SA-YT	185		390	F,H	440	410	300	107	280	280	11*18
VTR-0490-0.4SA-YT	220/250		490	F,H	370	410	400	97	280	280	11*18

备注：其他规格尺寸，可根据用户要求制造。 Remark：Dimension can be customization

■ 成品识别码 (Product Identification Code)

VTR — 0330 — 0.4SA — YT

- VTR：dv/dt滤波器 dv/dt Filter
- 0330：额定电流 Rated Current
- 0.4SA：0.4:Working Voltage 0.2=220V,0.4=380V,0.7=690V,1.1=1140V; S: D=Single Phase Reactor; S=Three Phase Reactor; C: C=Copper; A:Aluminium
- YT：一体式 All in one

正弦波滤波器（SFR） Sine Wave Filter

■ 产品概述 （Product Introduction）

正弦波滤波器是在PWM变频器驱动下，其开关频率范围在2 – 8kHz之间仍提供正弦波输出电压。 在变频器驱动应用中，这种滤波器可以消除电机绝缘失效问题并通过消除与变频器输出波形相关的高dV/dT来减少电磁干扰，改善电机的性能和寿命，延长变频器输出距离，最长可达3KM。为保护电线电缆，使用正弦波滤波器可防止长引线驱动电机的过电压问题。在其他能源应用下，比如风力发电机，逆变器将电力通过升压变压器还原到实用的配电系统,这种滤波器可以允许使用标准变压器。满载并在60Hz时给变压器输入的谐波电压畸变最大值是5%的话，那么满载时给电机输入的谐波电压畸变一般就是5%。

Driven by the PWM inverter, the sine filter still provides sine wave output voltage when the switching frequency range is within the range of 2-8kHz. In the applications of inverter drives, such a filter can eliminate the problem of motor insulation failure and decrease electromagnetic interference by eliminating the high dV/dT related to inverter output waveform, so as to extend the life and improve the performance of the motor, and extend the output length of the inverter to up to 3KM. For the protection of wires and cables, the sine filter can avoid over-voltage of the drive motor with a long lead. In the application of other energy resources, wind generator, for example, the invertor restores the power to the utility power system through a step-up transformer. And such filters allow the use of a standard transformer. If the maximum value of the harmonic voltage distortion input to the transformer at full load and 60Hz is 5%, the harmonic voltage distortion input to the motor at full load is generally 5%.

■ 产品应用 （Product Application）

1.将变频器输出的PWM波转换成为正弦波
2.降低电机的涡流损耗以及电机噪声
3.减少输出电缆上和电机中的脉冲电流，延长电机寿命
4.可在变频器与电机间使用更长的电缆联线
5.减小对外的辐射,在一定场合可以使用非屏蔽电缆，降低了对现场布线的要求
6.有效防止高DV/DT、过电压、电机过热和涡流损耗造成的电机提前损坏。

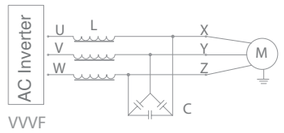
1. Convert the PWM waves output by the inverter sine waves
2. Reduce the eddy current losses of the motor and the motor noise
3. Reduce the pulse current of the output cable and motor, extending the life of the motor"
4. A longer cable wire can be used between the inverter and motor
5. Reduce the external radiation, by using unshielded cable in certain situations, lowering the requirements for on-site wiring requirements
6. Effectively prevent fatigue damage of the motor caused by high DV/DT, over voltage, motor overheating and eddy current loss.

■ 技术规格 （Technical Specifications）

1. 工作电压：220VAC-690VAC
2. 工作电流：15A-1500A
3. 工作频率：50/60Hz.
4. 载波频率：2K-8K
5. 绝缘等级：class F,H
6. 压降：8%-12%
7. 电压谐波畸变失真THD≤5%
8. 空载电流≤8%
9. 使用环境：-10…+45 ℃,额定值不会降低。最高可达+55℃，
   在45℃以上，每升高1℃，额定电流降低2%
10. 防护等级：IP00-IP22

典型电路图

（Typical circuit diagram）



VVVF

NIETZ

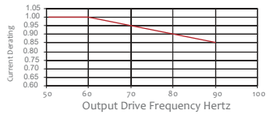
11. 最大电流：1.5×额定电流，持续60S
12. 噪　　音：≤65dB
13. 温　　升：≤85K
14.抗电强度：铁芯-绕组 3000VAC/50Hz/5mA/10s无飞弧击穿(工厂测试)
15.绝缘电阻：1000VDC绝缘阻值≥100MΩ
16.海拔高度不超过2000米。
17.运行环境温度-25℃～+45℃，相对湿度不超过90%。
18.周围无有害气体，无易燃易爆物品。
19.周围环境应有良好的通风条件，如装在柜内，应加装通风设备。

1.Work Voltage: 220VAC-690VAC
2.Work Current: 15A-1500A
3.Work Frequency: 50/60Hz
4.Switching frequency：2~8KHz
5.Insulation Class: class F, H
6.Rated voltage drop：8～12%
7.Voltage harmonic distortion：THD≤5%
8.Load Current≤8%
9.Operation Environment:-10~+45 ℃,rated value wont′ t lower,when higer than 55℃,
and every 1℃,the current will step down 2%
10.Protection class: IP00-IP22
11.Max Current: 1.5 × Rated current,continuous 60S
12:Noise: ≤ 65dB
13.Temperature Rise: ≤85K
14 Dielectric strength: Core Coil 3000VAC/50Hz/5mA/10s no electric arcing puncture (factory test)
15.Insulation Resistor: 1000VDC insulation resistance value ≥ 100MΩ
16.Under seal level 2000m
17.Running ambient temperature -25 ℃ ~ +45 ℃, comparative moisture not over 90%.
18.No hazardous gas,no inflammables and explosives
19.With well-ventilated condition,ventilation devices shall be mounted if installatioh in panels

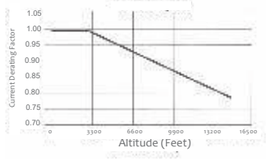
■ 执行标准 （Applicable Standards）

IEC289: 1987 Reactor
GB10229-88 Reactor (eqvIEC289: 1987)
JB9644-1999 Reactors used for semiconductor electrical driving

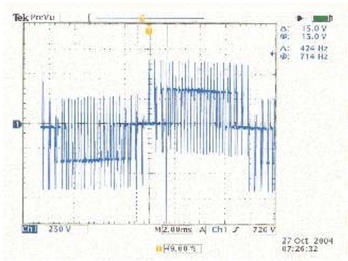
Sine Wave Filter Current Deratin g for Drive Output Frequency



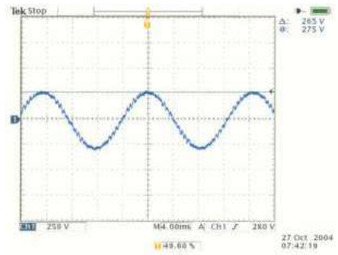
Altitude Derating Curve



Raw output voltage waveform

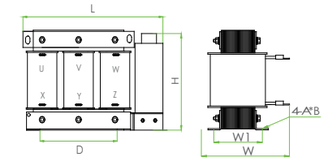


Output Voltage after Sine Wave Filter

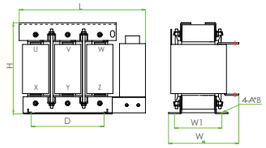


Sine Wave Filter

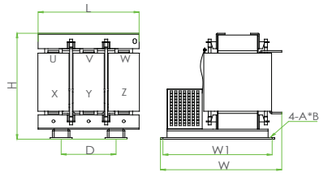
■ 产品尺寸图（Product Size）



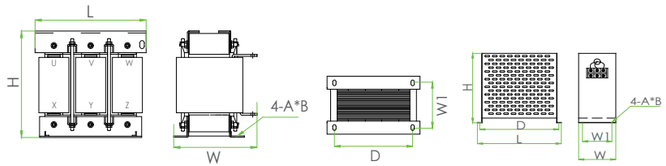
Picture A



Picture B



Picture C



Picture D

滤波器型号 TYPE	适配功率 Power(kw)	图号 Picture NO.	额定电流 Rated Current（A）	绝缘等级 Insulation Class	尺 寸 Dimension(±5mm)					
					L(max)	W(max)	H(max)	W1±2	D±2	A*B
SFR-0007-8M00-0.4SC	2.2	图 A Picture A	7	F,H	195	200	195	72	120	8.5*20
SFR-0010-6M00-0.4SC	3.7		10	F,H	275	160	265	92	120	8.5*20
SFR-0015-4M000.4SC	5.5		15	F,H	275	160	265	92	120	8.5*20
SFR-0020-3M00-0.4SC	7.5		20	F,H	290	160	250	110	120	11*18
SFR-0030-2M00-0.4SC	11		30	F,H	330	185	250	104	182	11*18
SFR-0040-1M50-0.4SC	15		40	F,H	330	185	250	104	182	11*18
SFR-0050-1M20-0.4SC	18.5		50	F,H	380	210	260	118	214	11*18
SFR-0060-1M10-0.4SC	22		60	F,H	380	210	260	118	214	11*18
SFR-0080-0M85-0.4SA	30		80	F,H	460	230	290	149	243	11*18
SFR-0090-0M80-0.4SA	37	图 B Picture B	90	F,H	460	230	290	149	243	11*18
SFR-0120-0M52-0.4SA	45		120	F,H	525	270	335	164	260	15*25
SFR-0150-0M45-0.4SA	55		150	F,H	525	270	350	174	260	15*25
SFR-0200-0M30-0.4SA	75		200	F,H	525	310	350	194	260	15*25
SFR-0250-0M28-0.4SA	110		250	F,H	550	335	375	214	260	15*25
SFR-0290-0M23-0.4SA	132		290	F,H	540	330	430	216	260	15*25
SFR-0330-0M20-0.4SA	160		330	F,H	600	340	450	204	350	15*25
SFR-0390-0M17-0.4SA	185		390	F,H	600	340	460	216	350	15*25
SFR-0490-0M14-0.4SA	220	图 C Picture C	490	F,H	480	580	560	480	300	15*25
SFR-0600-0M12-0.4SA	280		600	F,H	480	640	575	510	300	15*25
SFR-0660-0M10-0.4SA	315		660	F,H	480	640	575	510	300	15*25
SFR-0800-087U-0.4SA	380	图 D Picture D	800	F,H	550	400	640	320	360	15*25
电容+壳体					520	165	310	100	480	11*18
SFR-1000-070U-0.4SA	450		1000	F,H	680	490	750	320	400	15*25
电容+壳体					565	180	380	100	540	11*18
SFR-1200-058U-0.4SA	500		1200	F,H	680	510	780	320	400	15*25
电容+壳体					410	360	380	275	380	11*18
SFR-1500-050U-0.4SA	630		1500	F,H	700	530	800	370	400	15*25
电容+壳体					565	365	380	275	540	11*18

备注：其他规格尺寸，可根据用户要求制造。Remark：Dimension can be customization

■ 成品识别码 (Product Identification Code)

SFR — 0330 — 0M20 — 0.4SC

- SFR：正弦波滤波器 Sine Wave Filter
- 0330：额定电流 Rated Current
- 0M20：电感量 Inductance
- 0.4SC：0.4:Working Voltage 0.2=220V,0.4=380V,0.7=690V,1.1=1140V S: D=Single Phase Reactor S=Three Phase Reactor C: C=Copper A:Aluminium

LCL滤波器（LCR） LCL Filter

■ 产品概述（Product Introduction）

LCL 滤波器在现代的可再生能源行业十分普遍，可以有效、经济地确保和提高从能源到电网的馈电质量。滤波器用于过滤逆变器的开关频率。达到目标畸变水平时，滤波器将节约可观的成本。LCL 滤波器的典型特点是损失小、体积小、重量轻、电容大

LCL filters are very commonly used in the modern renewable energy industry, and can efficiently and economically ensure and improve the feed quality from energy sources to the grid. The filters are used for filtration of the switching frequency of the invertor. When reaching the target distortion level, the filters can save considerable costs. LCL filters are typically characterized by small loss, small size, light weight, and high capacitance.

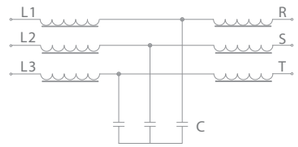
■ 产品特点（Product Features）

功率半导体开关器件技术的进步，促进了电力电子变流装置技术的迅速发展，出现了以脉宽调制(PWM)控制为基础的各类变流装置，比如逆变电源，变频器等各类变流器，并且这些变流器已经在全国的各个领域中得到了广泛的应用。三相电压型PWM整流器具有着电能双向传输，较快的动态控制响应。当前的PWM整流器采用的功率开关器件多是IGBT，就可以实现很高的开关频率，一般开关频率为2kHz～15kHz。然而功率开关器件的高开通关断频率却会产生高次谐波，注入到电网中，产生谐波污染。为了解决LCL滤波器所碰到的难题，我们一般选择LCL滤波器。LCL滤波器可以选取较小的电感电容值，在千瓦至上百千瓦间实现满意的滤波效果。

The advancement of the technology of the high power semiconductor switching device promotes the rapid development of the technology of power electronic converters, giving birth to various types of converters, such as inverter power supplies, frequency converters, etc. And these converters have been widely used in various fields all over the country. Three-phase voltage-type PWM rectifiers have the functions of bidirectional power transmission and fast dynamic control response. Most PWM rectifiers currently adopt IGBT as the power switch device, which can achieve very high switching frequency compared to the general switching frequency of 2kHz-15kHz. However, the high on/off frequency of power switch device will generate high order harmonics to be injected into the grid, thus causing harmonic pollution. In order to solve the problems encountered by LCL filters, we generally choose LCL filters. Smaller inductance and capacitance values can be selected for the LCL filters to achieve satisfactory filtering effects between one kilowatt to hundreds of kilowatts.

电流范围 Current Range: 10-1600A
电压范围 Voltage Range: 220-1140V

典型电路图
（Typical circuit diagram）



■ 成品识别码 (Product Identification Code)

LCR — 250 — 0.4SC

- LCR：LCL滤波器 LCL Filter
- 250：额定电流 Rated Current
- 0.4SC：0.4:Working Voltage 0.2=220V,0.4=380V,0.7=690V,1.1=1140V S: D=Single Phase Reactor S=Three Phase Reactor C: C=Copper A:Aluminium

能量回馈电抗器（EFR) Energy Regenerated Reactor

■ 产品概述 （Product Introduction）

变频器制动时所产生的再生能量回馈到电网，并加以利用，但是整流单元是IGBT，会产生较多的高次谐波电流，进而会对电网污染。所以在变频器的前端加上能量回馈电抗器和滤波器组合以改善电能质量。

The regenerative energy generated during the braking of the frequency converter is fed back to the power grid and utilized, but the rectifier unit is an IGBT, which generates a large amount of high-order harmonic current and can pollute the power grid. So adding an energy feedback reactor and filter combination at the front end of the frequency converter to improve power quality.

电流范围 Current Range: 10-1000A
电压范围 Voltage Range: 220-1140V

■ 成品识别码 (Product Identification Code)

EFR	–	0080	–	0M54	–	0.4SC
能量回馈电抗器 Energy Regenerated Reactor		额定电流 Rated Current 30A-1600A		电感量 Resistance Value M:mH U:uH		0.4:Working Voltage 0.2=220V,0.4=380V,0.7=690V,1.1=1140V S: D=Single Phase Reactor S=Three Phase Reactor C: C=Copper A:Aluminium

矿用防爆电抗器（BFR) Mine Explosion Reactor

■ 产品概述 （Product Introduction）

矿用防爆变频器为封闭金属外壳，变频器及其外围器件都安装在封闭的空间内，由于结构的特殊性，变频器的主要发热器件即功率模块IGBT采用真空热管或者水冷散热方式，但是电抗器等器件也是系统内较大的发热源，像一个电炉在持续发热，如何减小电抗器的发热量，关系到变频器的运行可靠性及机器寿命。我们通过磁芯和导体发热的合理选择，处理以及反复验算，保证了电抗器在密闭条件下的高性能运行。

Mine explosion-proof inverter has a closed metal housing, and the inverter and peripheral devices are installed in a closed space. Because of the special structure, the main heating device of the inverter, i.e., the power module IGBT, uses vacuum heat pipe cooling or water cooling method. However, the reactors and other devices are also large heat source within the system, just like a continuously heating furnace. The method to reduce the reactor's heat is related to the operational reliability of the inverter and the life of the machine. Through processing and repeated checking based on a reasonable choice of magnetic core and conductor heating, ensuring the high-performance operation in confined conditions.

电流范围 Current Range: 10-1000A
电压范围 Voltage Range: 220-1140V

■ 成品识别码 (Product Identification Code)

BFR	–	0080	–	0M54	–	0.4SC
防爆四象限电抗器 Explosion four quadrant reactor		额定电流 Rated Current 30A-1600A		电感量 Resistance Value M:mH U:uH		0.4:Working Voltage 0.2=220V,0.4=380V,0.7=690V,1.1=1140V S: D=Single Phase Reactor S=Three Phase Reactor C: C=Copper A:Aluminium

NIETZ

空心电抗器（HAR) Core Reactor

■ 产品概述 （Product Introduction）

采用高品质的环氧树脂真空浸渍，并高温固化。该产品具有节能、电感线性度好，电抗值精确、线圈温升分布均匀、动热稳定性能高，抗短路、过载能力强，绝缘强度好，电磁场均匀性好，损耗低，温升低使用寿命长，基本免维护，噪声低，阻燃、无污染体积小、重量轻和安装运用使用方便等特点。

It applies the high quallty epoxy resin vacuum impregnatlon, solldficatlon through high temperature. The product has the features of energy saving. good inductiveine perfomance. accurate resistance value, uniform dlistibution of coll temperature rise, high dynamic thermal stabililty, anti-short circuit, strong overload ability, good insulation intensity, good uniform distribution of electromagnetic field, low loss, low temperature rise, long service life, maintenance-free, low noise, flame-retardant, pollution-free, small size, light weight, and easy to Installation and use and so on.

■ 产品应用 （Product Application）

一般用于配电线路。从同一母线引出的分支馈线上往往串有空心限流电抗器，以限制馈线的短路电流并维持母线电压，不致因馈线短路而致过低。并在其表面进行耐候涂层处理：喷涂具有高绝缘电阻和憎水性的室温硫化硅橡胶(RTV),利用RTV胶的优良绝缘性能，使电抗器沿面电阻保持较好的绝缘性能，对电抗器产品表面树技状放电现象具有很好的抑制作用。从而保证空心限流电抗器在户外环境下安全运行。该产品应用计算机进行电磁优化计算和空间三维结构设计，采用环氧玻纤增强的多包封并联结构、使用先进的工艺技术和微机控制的生产设备及引进的检验设备进行生产和检验。该产品具有电感线性好、损耗低、温度分布均匀、绝缘强度好、机械强度高、局放小、喉音低、体积小、重量轻、防潮、阻燃、过载能力强、可靠性高、无污染、免维护、环境效果好等优点。

Generally used for distribution lines. Hollow current limiting reactors are often connected in series on branch feeders from the same busbar to limit the short-circuit current of the feeder and maintain the busbar voltage, so as not to be too low due to feeder short circuits. And weather resistant coating treatment is applied to its surface: spraying room temperature vulcanized silicone rubber (RTV) with high insulation resistance and hydrophobicity, utilizing the excellent insulation performance of RTV rubber to maintain good insulation performance along the surface resistance of the reactor, and effectively suppressing the dendritic discharge phenomenon on the surface of the reactor product. Thus ensuring the safe operation of hollow current limiting reactors in outdoor environments. This product uses computers for electromagnetic optimization calculations and spatial 3D structure design. It adopts a multi encapsulated parallel structure reinforced with epoxy fiberglass, advanced process technology, microcomputer controlled production equipment, and imported inspection equipment for production and inspection. This product has the advantages of good inductance linearity, low loss, uniform temperature distribution, good insulation strength, high mechanical strength, small partial discharge, low throat sound, small size, light weight, moisture-proof, flame retardant, strong overload capacity, high reliability, pollution-free, maintenance free, and good environmental effect.

电流范围 Current Range: 30-1600A
电压范围 Voltage Range: 220-35KV

■ 成品识别码 (Product Identification Code)

HAR	–	0080	–	0M54	–	0.4SC
空心电抗器 Core reactor		额定电流 Rated Current 30A-1600A		电感量 Resistance Value M:mH U:uH		0.4:Working Voltage 0.2=220V,0.4=380V,0.7=690V,1.1=1140V S: D=Single Phase Reactor S=Three Phase Reactor C: C=Copper A:Aluminium

NIETZ

高频电抗器（HER） High frequency Reactor

■ 产品概述（Product Introduction）

在现代电力电子设备中随着设备中功率及开关频率的不断提高，中高频大电流电抗器的需求和应用因此越来越多，结合我们的专有技术和行业经验，在此类电抗器的设计和制造中，我们通过磁芯和导体发热的合理选择，处理以及反复验算，保证了电抗器在高频大电流条件下的高性能运行。目前此类产品广泛应用于UPS和新能源等领域的变流器中。开关频率达40KHz

In modern power electronic equipment with the continuous improvement of equipment in the power and switching frequency and high frequency in large current reactor, so more and more application needs and, combined with our proprietary technology and industry experience, in this kind of reactor design and manufacturing, we through the core and the conductor heating reasonable choice, handling, and repeatedly check, ensure the reactor under the condition of high frequency large current high performance operation. At present this kind of products are widely used in UPS and inverter in the field of new energy and so on. Switching frequency of 40 KHZ

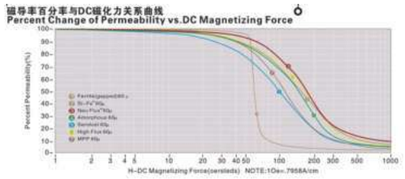
■ 产品应用（Product Application）

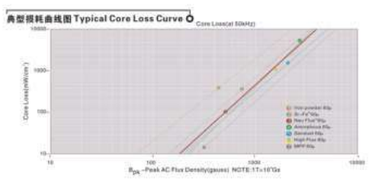
目前此类产品广泛应用于UPS，APF和新能源等领域的变流器中
电流范围 Current Range: 5-500A
电压范围 Voltage Range: 220V-1140V

■ 软磁材料性能对照表 （Reference Table of Soft Magnetic Material Properties）

材料特性 Property	材料成份 Composition	铁心损耗 Core Loss (mW/cm³) @1000Gs/50kHz	直流偏压 DC-Bias(%μo) @100 Oe	磁通密度 Flux Density (Sat.)	耐温 Curie Temp.	温度稳定性 Temp Stability	颜色代码 Color Code	相对成本 Relative cost
铁粉 Iron Powder	99%Fe	2000	40	12000Gs	750℃	Medium	Mix Color	0.3
铁硅铝 Sendust	85%Fe,9%Si,6%AL	300	45	10500Gs	600℃	Good	Black	1
硅铁 Si-FE	94Fe,6%Si	750	70	16000Gs	700℃	Good	Blue	1.5
高磁通铁镍 High Flux	50%Fe,50%Ni	400	70	15000Gs	500℃	Better	Khaki	4
铁镍钼 MPP	17%Fe,81%Ni,2%Mo	280	50	7500Gs	400℃	Best	Gray	6
高温超导体 Amorphos Powder Cores	78%Fe,9%Si,13%B	420	68	15000Gs	400℃	Poor	-	3.5
铁硅镍 Neu Flux	85%Fe,15%Si-Ni	480	78	16000Gs	650℃	Better	Brown	2

备注：其他规格尺寸，可根据用户要求制造。 Remark：Dimension can be customization



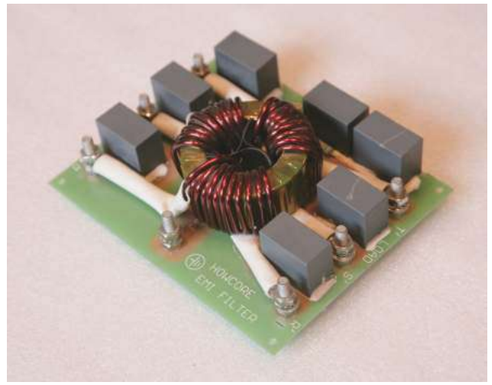


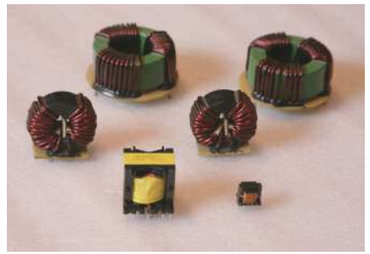
■ 成品识别码 (Product Identification Code)

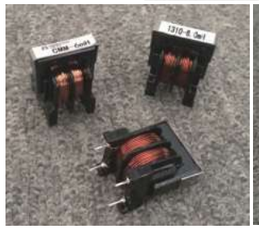
HER — 0080 — 0M54 — 0.4 SC

- HER：高频电抗器 High frequency reactor
- 0080：额定电流 Rated Current 30A-1000A
- 0M54：电感量 Resistance Value M:mH U:uH
- 0.4 SC：
  - 0.4 :工作电压 0.4 380V 0.7 690V
  - D 单相电抗器 S 三相电抗器 C 铜材 A 铝材

High Frequency Reactor







高频电感 High-frequency inductance

为您设计，制造专业的高频电感，详情请致电我们。

our designs and manufactures the most professional high-frequency inductors for you. For more details, please call us.

调谐电抗器（ATR） Tuning Reactor

■ 产品概述 （Product Introduction）

现代电力电子设备的大量使用产生的非线性电流正以谐波方式影响电网并加重电网污染，并导致电容器，变压器及传输设备过载并故障，对测量，传动，计算等设备产生的严重干扰，谐振及电压畸变还造成供电事故。串联电抗器可得以改善与避免。电容器串联电抗器后谐振频率低于系统最低（一般为5次及7次），使其在工频下呈容性，以改善功率因数，而在谐振并无放大谐波之滤，良好的阻抗匹配后，电容器组可吸收谐波电流(如5次)30%-60%。

The nonlinear currents generated by the massive use of modern power and electric equipment are impacting the power grid and aggravate its pollution in the harmonic form, cause overload failures to capacitors, transformers and transmission devices and generate serious interference to measuring, transmitting and calculating devices; in addition, resonance and voltage distortions may also result in power supply accidents, Series reactors could effectively improve or avoid such problems. After installing the capacitor and reactor in series, the resonance frequency is lower than the minimum of the system (usually 5th and 7th waves), so that compatibility is showed under power frequency and power factor is improved; meanwhile, there is no need to worry about the amplification of harmonic wave. With satisfactory impedance matching. the capacitor bank could absorb 30% to 60% of the harmonic currents (5th harmonic wave, for example).

■ 技术规格 （Technical Specifications）

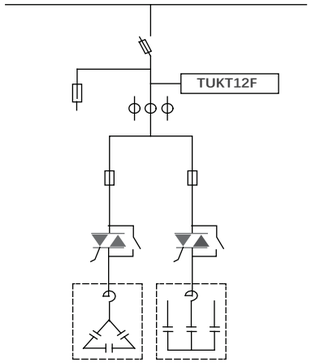
基波电流 Fundamental Current	I_1=1.06*I_R (I_R为电容器额定电流 I_R is capacitor rated current) U_3 =0.5% U_R (基波电压为100% The fundamental voltage is 100%) U_5 =6.0% U_R
谐波电压 Harmonic voltage	U_7 =5.0% U_R U_{11} =3.5% U_R U_{13} =3.0% U_R
有效电流 Effective current	$I_{RMS}=\sqrt{I_1^2+I_3^2+....+I_{13}^2}$
线性度 Linearity	$2.08*I_1$ P=5.67%　$1.73*I_1$ P=7%　$1.4*I_1$ P=14% L≥0.95*L_N
温度保护 Temperature protection	微型开关（常闭） Miniature switch (normally closed)
频率 Frequency	50Hz/60Hz
电压等级 Voltage level	400V,440V,480V,525V,690V
输出容量 Output capacity	5-100Kvar
电 抗 率 Reactance	5.67%，7%，14%

■ 功能特点 （Functional characteristics ）

采用多段气隙 Adopt multi-section air gap	分隔芯柱 Separate core column	温度保护 Temperature protection
采用真空浸漆 Use vacuum dip paint	低噪音 Low noise	F/H级 Grade F/H
高线性度 High linearity	低损耗 Low loss	耐高温绝缘 High temperature resistant insulation

芯柱与绕组之间设置通风道散热
A ventilation channel is arranged between the core column and the winding for heat dissipation

典型电路图
（Typical circuit diagram）



Tuning Reactor

■ 调谐电抗器选型表 （Type list of tuning reactor）

三相共补Three-phase complement 400V,50Hz,P=7%,fr=189Hz for 480V Capacitor

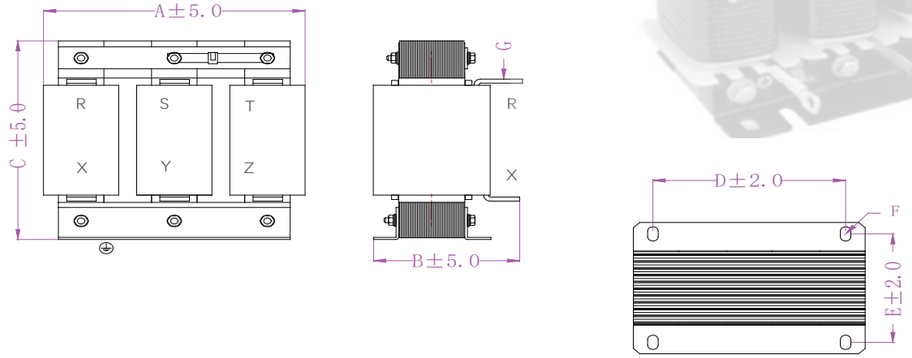
规格型号 TYPE	额定容量 Nameplate capacity (Kvar)	额定电流 Rated current (A)	额定电感 Rated inductance (mH)	外形尺寸External dimensions(mm) A	B	C	D	E	F	G
ATR-0025-2M58-0.4SAL	20	24.4	2.568	235	160	160	150	93	7*14	7.5
ATR-0031-2M05-0.4SAL	25	30.5	2.054	235	160	160	150	93	7*14	7.5
ATR-0037-1M73-0.4SAL	30	36.6	1.712	235	150	160	150	93	7*14	7.5
ATR-0050-1M29-0.4SAL	40	48.8	1.285	255	185	215	150	125	9*17	10.5
ATR-0061-1M03-0.4SAL	50	61.0	1.028	255	185	215	150	125	9*17	10.5
ATR-0074-0M86-0.4SAL	60	73.3	0.856	250	185	215	150	125	9*17	10.5

三相共补 Three-phase complement 400V,50Hz,P=14%,fr=134Hz for 525V Capacitor

规格型号 TYPE	额定容量 Nameplate capacity (Kvar)	额定电流 Rated current (A)	额定电感 Rated inductance (mH)	外形尺寸External dimensions(mm) A	B	C	D	E	F	G
ATR-0028-4M92-0.4SAL	25	27.5	4.916	255	185	215	150	125	9*17	10.5
ATR-0042-3M28-0.4SAL	37	41.2	3.279	285	190	215	175	125	9*17	10.5
ATR-0055-2M46-0.4SAL	50	55.0	2.457	300	190	215	175	125	9*17	10.5
ATR-0083-1M64-0.4SAL	75	82.4	1.640	335	190	255	175	150	11*18	12.5

备注：其他规格尺寸，可根据用户要求制造。Remark：Dimension can be customization

■ 调谐电抗器外形尺寸 （External dimension of tuning reactor）



■ 成品识别码 (Product Identification Code)

ATR – 0037 – 1M73 – 0.4SAL

- ATR：**调谐电抗器** Tuning Reactor
- 0037：额定电流 Rated Current
- 1M73：电感量 Inductance
- 0.4SAL：0.4:Working Voltage 0.2=220V,0.4=380V,0.7=690V,1.1=1140V; S: D=Single Phase Reactor, S=Three Phase Reactor; C: C=Copper, A:Aluminium

水冷电抗器（WCR）Water-cooled reactor

■ 产品概述（Product Introduction）

水冷电抗器主要用于高温系统中，它不仅能够达到普通电抗器的各项性能指标，而且水冷电抗器采用水冷循环，提高耐热温度材料效率从而来适应高温环境要求。

Water-cooled reactor is mainly used in high-temperature system, it can not only achieve the performance of ordinary reactor, and water-cooled reactor using water-cooled cycle, improve the efficiency of heat-resistant materials to adapt to high temperature environment requirements.

■ 产品应用（Product Application）

水冷电抗器主要用于高温系统中，它不仅能够达到普通电抗器的各项性能指标，而且水冷电抗器采用水冷循环，提高耐热温度材料效率从而来适应高温环境要求。尤其在高原风电系统中，要求电抗器散热能力，和多层防尘、防湿防雾措施，这样才能适应整体设备在恶劣的环境要求，因此在高原风电系统中多采用水冷电抗器。

Water-cooled reactor is mainly used in high-temperature system, it can not only achieve the performance of ordinary reactor, and water-cooled reactor using water-cooled cycle, improve the efficiency of heat-resistant materials to adapt to high temperature environment requirements. Especially in the plateau wind power system, the requirements of reactor cooling capacity, and multi-layer dust, moisture and fog prevention measures, so as to adapt to the overall equipment in the harsh environmental requirements, therefore, water-cooled reactor is often used in plateau wind power system.

■ 产品性能（Product performance）

水路：水路使用材料为不锈钢材质，强度高，耐腐蚀，使用寿命长；水管和连接方式采用强力紧锁结构，保证冷却介质不剩漏。

Waterways: waterways use stainless steel material, high strength, corrosion resistance, long service life; water pipes and connections using strong locking structure to ensure no leakage of cooling medium.

水冷散热板安置在板式水冷电抗器线包中，电抗器产生的热量通过散热板导热后由水介质将热量导出以达到降低温升的目的，水冷电抗器水电分离，无漏电流产生。广泛使用在风力发电的变频器中及电力设备中。

The water-cooled heat sink is arranged in the wire package of the plate-type water-cooled reactor, and the heat generated by the reactor is exported by the water medium after the heat conduction through the heat sink, so as to reduce the temperature rise, no leakage current generated. Widely used in wind power inverter and electrical equipment.

电流范围 Current Range: 100-1500A
电压范围 Voltage Range: 220V-1140V

■ 成品识别码 (Product Identification Code)

WCR – 0080 – 0M54 – 0.4 SC

- WCR：水冷电抗器 Water-cooled reactor
- 0080：额定电流 Rated Current 30A-1000A
- 0M54：电感量 Resistance Value M:mH U:uH
- 0.4：Voltage 0.4 380V / 0.7 690V
- SC：D=Single Phase Reactor；S=Three Phase Reactor；C=Copper；Aluminium

变频器专用滤波器　Special Filter For Inverter

■ 产品概述（Product Introduction）

1.降低变频器对电网的传导干扰
2.在150kHz~30MHz范围内拥有优越的插入衰减表现
3.端子系列采用紧凑超薄设计
4.提高整个系统可靠性
5.N99为使用铜排接头，其他为端子
6.端子为铜排以及后缀P系列的滤波器为高泄漏电流，适合过证测试使用，但不适用于有漏电保护器场合。
7.铜排以及后缀P系列的滤波器在电网电压不平衡及电容精度造成最大漏电流为33mA（400VAC/50Hz）

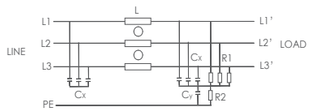
1.Reducing the conducted emission from inverter to power network.
2.Exceptional attenuation performance from 150kHz~30MHz.
3.Terminal series filter with most compact and slim design.
4.Improve the reliability of the whole system.
5.N99 uses copper bar connectors, while others are terminals
6.Terminals for copper and suffix P series of filter for high leakage currents, suitable for testing use, but does not apply to leakage protector occasions
7.Copper bar and filter the suffix P Series in non symmetrical and capacitance tolerance caused maximum leakage current is 33mA（400VAC/50Hz）

■ 技术参数（Technical Data）

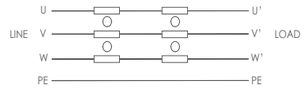
1.额定电压：440/250 VAC
2.工作频率：50Hz
3.额定电流：10A~2500A
3.高压试验：P-E　2100VDC/2sec　　P-P　2100VDC/2sec
4.温度范围：-25℃~100℃（25/100/21）
5.设计依据：IEC/EN 60939、UL1283
6.典型滤波频率：150kHz~30MHz

1.Rated voltage：440/250 VAC
2.Operating frequency：50Hz
3.Rated current：10A~2500A
3.High potential test voltage：P-E　2100VDC/2sec　　P-P　2100VDC/2sec
4.Temperature range：-25℃~100℃（25/100/21）
5.Design corresponding to：IEC/EN 60939、UL1283
6.Typical work frequency：150kHz~30MHz

输入滤波器典型电路图
Typical circuit diagram of input filter



输出滤波器典型电路图
Typical circuit diagram of output filter



■ 典型应用（Typical Applications）

1.三相调速电机驱动、伺服驱动、变频器及逆变器
2.能量转换装置，如机器及自动化设备
3.空调设备，电梯，电力供应，UPS，注塑机
4.风能，太阳能等新能源逆变系统

1.Three-phase variable speed motor drives, servo drives, inverter and converters
2.Energy conversion devices, such as machines and automatic equipment
3.HVAC equipment, elevators, power suppliers, UPS, injection molding machine and further three-phase applies
4.Wind energy, solar energy and other new energy inverter system

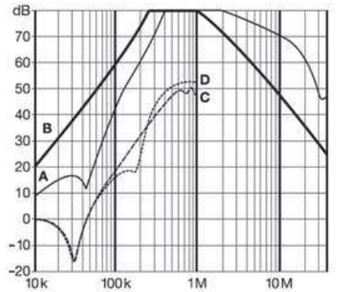
NIETZ

■ 滤波器选型表（Filter Selection Table）

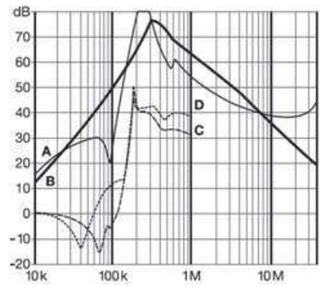
适配变频器参数 Adapter inverter parameter		滤波器型号 Filter type			额定电流 Rated current	端子代码 Connector code
功率 Drive power rating	额定电压 Rated voltage	输入滤波器 Input filter		输出滤波器 Output filter		
5.5kW	440VAC	RFI4C10N6	RFI4C10N6P	RFO4C10N6	10A	-N6
7.5kW	440VAC	RFI4C20N6	RFI4C20N6P	RFO4C20N6	20A	-N6
15kW	440VAC	RFI4C30N10	RFI4C30N10P	RFO4C30N10	30A	-N10
18.5kW	440VAC	RFI4C40N10	RFI4C40N10P	RFO4C40N10	40A	-N10
22kW	440VAC	RFI4C50N16	RFI4C50N16P	RFO4C50N16	50A	-N16
30kW	440VAC	RFI4C65N16	RFI4C65N16P	RFO4C65N16	65A	-N16
37kW	440VAC	RFI4C80N35	RFI4C80N35P	RFO4C80N35	80A	-N35
45kW	440VAC	RFI4C100N35	RFI4C100N35P	RFO4C100N35	100A	-N35
55kW	440VAC	RFI4C130N50	RFI4C130N50P	RFO4C130N50	130A	-N50
90kW	440VAC	RFI4C180N95	RFI4C180N95P	RFO4C180N95	180A	-N95
75kW	440VAC	RFI4C150N99		RFO4C150N99	150A	
110kW	440VAC	RFI4C200N99		RFO4C200N99	200A	
132kW	440VAC	RFI4C250N99		RFO4C250N99	250A	
160kW	440VAC	RFI4C320N99		RFO4C320N99	320A	
220kW	440VAC	RFI4C400N99		RFO4C400N99	400A	
315kW	440VAC	RFI4C600N99		RFO4C600N99	600A	
400kW	440VAC	RFI4C800N99		RFO4C800N99	800A	
560kW	440VAC	RFI4C1000N99		RFO4C1000N99	1000A	
900kW	440VAC	RFI4C1600N99		RFO4C1600N99	1600A	
1320kW	440VAC	RFI4C2500N99		RFO4C2500N99	2500A	

■ 输入滤波器插入损耗（Input Filter Attenuation）

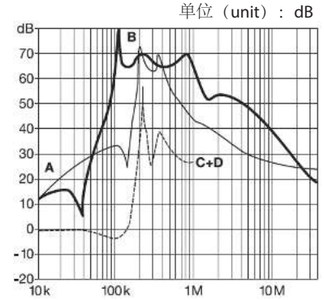
单位（unit）：dB



10A~50A



65A~180A(端子) connector



150A~2500A(铜排) Copper bar

A:50N/50Ω sym，B:50N/50Ω asym，C：0.1Ω/100Ω sym D:100N/0.1Ω sym

■ 滤波器输入输出端子接线范围及扭矩选择　（Filter Input/output Connector Cross Sections）

	-N6	-N10	-N35	-N35	-N50	-N95
多股软线/mm² Flex wire	0.5~6	0.5~10	1~16	10~35	16~50	25~95
美标线规 AWG number	AWG8-26	AWG6-24	AWG4-20	AWG2-8	AWG6-1/0	AWG4-4/0
推荐扭矩/N.m Recommended torque	1.36	1.36	2.71	4.41	4.41	19.2

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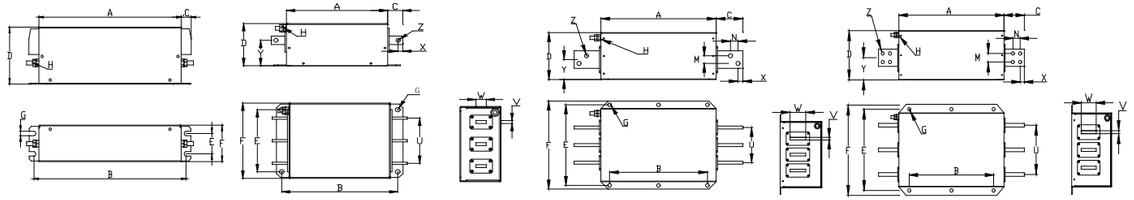
■ 产品尺寸图 (Product Size)



10A~180A(端子connector) 150A~1000A(铜排copper bar) 1600A 2500A

代号 Code / 电流 Current	A	B	C	D	E	F	G	H	M	N	U	V	W	X	Y	Z
10A	168	180	15.5	75	20	40	4.5	M5								
20A	220	235	15.5	75	25	45	5.5	M5								
30A~40A	240	255	35	85	30	50	5.5	M5								
50A~65A	220	235	35	90	60	85	5.5	M6								
80A~100A	240	255	38.5	140	60	85	6.5	M8								
130A	240	255	43	150	65	95	6.5	M8								
180A	350	365	50	170	102	120	6.5	M8								
150A~250A	240	275	40	100	165	205	11.5	M10			120	3	20	10	51.5	9
320A								M10			120	4	25	12.5	51.5	11
400A								M10			120	6	25	12.5	51.5	11
600A								M10			120	8	25	12.5	51.5	11
800A	310	345	50	130	155	205	11.5	M10			120	6	40	20	68.5	13.5
1000A								M10			120	8	40	20	68.5	13.5
1600A	400	340	93	160	275	300	12.5	M12	26	26	120	10	60	17	68	14
2500A	600	500	98	200	330	370	14.5	M12	35	35	200	15	70	20	90	14

(单位 unit：mm)

■ 成品识别码 (Product Identification Code)

RFI — 4NC — 250 — N99

- RFI：变频器专用滤波器 Special Filter For Inverter；RFI：Input filter；RFO: Output filter
- 4NC：4:Working Voltage 4=380V,7=690V；N:N=Three-phase four-wire 无=Three-phase three-wire；C: C=Three-stage filtering B:Second-order filtering
- 250：额定电流 Rated Current 10A-2500A
- N99：接线方式 Connection mode

三相四线滤波器 3-phase + Neutral Line Filters

■ 产品概述 (Product Introduction)

1.降低整个系统对电网的传导干扰
2.在150kHz~30MHz范围内拥有优越的插入衰减表现
3.设计紧凑，优化工业设计
4.系统进线安装该系列的滤波器，可以提高整个系统可靠性
5.N99为使用铜排接头，其他为端子

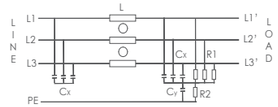
1.Reducing the conducted emission from inverter to power network.
2.Exception attenuation performance from 150kHz~30MHz
3.Compact, space-saving design, optimized forindustrial machinery
4.Increases also the immunity if operated directlyon the mains input
5.N99 uses copper bar connectors, while others are terminals

■ 技术参数 (Technical Data)

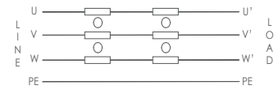
1.额定电压：440/250 VAC
2.工作频率：50Hz
3.额定电流：10A~600A（@50℃）
3.高压试验：P-E 2100VDC/2sec P-P 2100VDC/2sec
4.温度范围：-25℃~100℃（25/100/21）
5.设计依据：IEC/EN 60939、UL1283
6.典型滤波频率：150kHz~30MHz

1.Rated voltage：440/250 VAC
2.Operating frequency：50Hz
3.Rated current：10A~600A（@50℃）
3.High potential test voltage：P-E 2100VDC/2sec P-P 2100VDC/2sec
4.Temperature range：-25℃~100℃（25/100/21）
5.Design corresponding to：IEC/EN 60939、UL1283
6.Typical work frequency：150kHz~30MHz

输入滤波器典型电路图
Typical circuit diagram of input filter



输出滤波器典型电路图
Typical circuit diagram of output filter



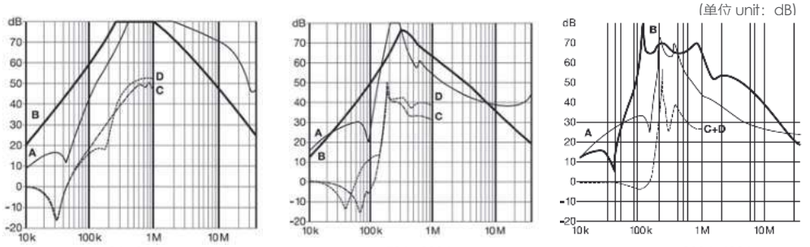
■ 典型应用 (Typical Applications)

主要应用于工业设备，机械，机床及其他自动化控制的三相四线电力系统。由于出色的性能衰减，该系列滤波器也是嘈杂的电源的首选，应用于可再生能源、大功率的办公设备和其他三相四线的设备。因为相对较低的漏电流，该系列滤波器甚至可以用于一些医疗设备。

Mainly industrial equipment, machinery, machinetools and diverse process auto- mation systems withthree-phase and neutral electricity supply. Due to theoutstanding attenuation performance, The series is alsothe first choice for noisy power supplies, renewableenergy applications, highpower office equipment andfurther three-phase and neutral devices. Because ofthe relatively low leakage current, The series may evenbe used for some medical devices.

■ 输入滤波器插入损耗 (input filter attenuation)

(单位 unit：dB)



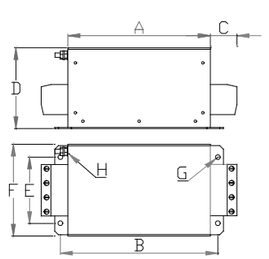
8A~36A 50A~200A 300A-600A

A:50N/50Ω sym，B:50N/50Ω asym，C：0.1Ω/100Ω sym D:100N/0.1Ω sym

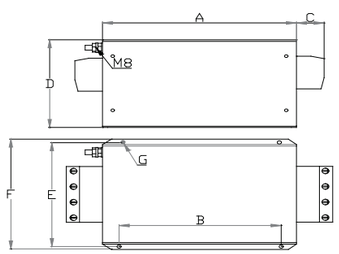
■ 滤波器选型表 (Filter Selection Table)

滤波器型号 Filter type	额定电流 Rated current @40℃ [A]	漏电流 Leakage current @230VAC/50Hz [mA]	能量损耗 Power loss @25℃/50Hz [W]	端子类型 Connector type
RFI4NC8N06	8	<1	3.2	端子 solid safety connector
RFI4NC16N06	16	<1	6.5	端子 solid safety connector
RFI4NC25N10	25	<1	11.8	端子 solid safety connector
RFI4NC36N10	36	<1	15.3	端子 solid safety connector
RFI4NC50N16	50	<1	17.4	端子 solid safety connector
RFI4NC65N16	65	<1	18.9	端子 solid safety connector
RFI4NC100N35	100	<1	23.6	端子 solid safety connector
RFI4NC130N50	130	<1	28.5	端子 solid safety connector
RFI4NC160N95	160	<1	31	端子 solid safety connector
RFI4NC200N95	200	<1	47.4	端子 solid safety connector
RFI4NC300N99	300	<1	20.3	铜排 copper bar
RFI4NC400N99	400	<1	36	铜排 copper bar
RFI4NC600N99	600	<1	64.8	铜排 copper bar

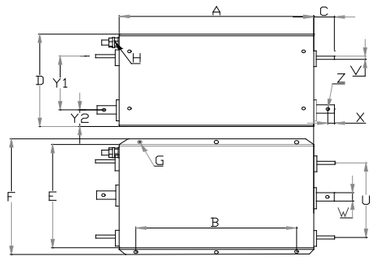
■ 产品尺寸图 (Product Size)



8A-65A



100A-200A



300A-600A

代号 Code / 电流 Current	A	B	C	D	E	F	G	H	U	V	W	X	Y1	Y2	Z
8A~16A	160	180	15.5	80	65	100	5.5	M5							
25A~36A	160	180	35	100	75	115	5.5	M5							
50A~65A	190	210	35	110	90	125	6.4	M6							
100A	230	120	38.5	125	150	163	6.4	M8							
130A	250	200	43	140	157	170	6.4	M8							
160A~200A	280	220	52	170	166	180	6.4	M8							
300A	325	240	58	150	195	220	11	M10	120	4	25	12.5	72	43	11
400A	325	240	58	150	195	220	11	M10	120	6	25	12.5	72	43	11
600A	325	240	58	150	195	220	11	M10	120	8	25	12.5	72	43	11

(单位 unit：mm)

■ 滤波器输入输出端子接线范围及扭矩选择 (Filter Input/output Connector Cross Sections)

	-N6	-N10	-N16	-N35	-N50	-N95
多股软线/mm² Hex wire	0.5~6	0.5~10	1~16	10~35	16~50	25~95
美标线规 AWG number	AWG8-26	AWG6-24	AWG4-20	AWG2-8	AWG6-1/0	AWG4-4/0
推荐扭矩/N.m Recommended torque	1.36	1.36	2.71	4.41	4.41	19.2

NIETZ

单相滤波器 1-phase filter

■ 产品概述 (Product Introduction)

1.具有高衰减性能的通用滤波器
2.具有良好的共模差模滤波性能
3.广泛应用于开关电源，UPS，变频逆变等场合
4.超过50A一定要确保接地良好，否则有电击危险
5.医用型的滤波器后缀为A

1.General purpose EMI filter with high attenuation performance
2.High common-modeand differential-mode attenuation
3.Widely used in switching power , UPS, inverter, etc.
4.Exceed 50A must ensure that the ground is good, otherwise there is a risk of electric shock
5.Medical type filter suffix for A

■ 技术参数 (Technical Data)

额定电压：250 VAC
工作频率：0~60Hz
额定电流：3A~200A
高压试验：P/N-E 2000VAC/2sec θP-N 1100VDC/2sec
温度范围：-25℃~85℃（25/85/21）
设计依据：IEC/EN 60939
典型滤波频率：150kHz~30MHz

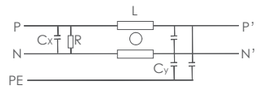
Rated voltage：250 VAC
Operating frequency：0~60Hz
Rated current：3A~200A
High potential test voltage：ΟP/N-E 2000VAC/2sec 0P-N 1100VDC/2sec
Temperature range：-25℃~85℃（25/85/21）
Design corresponding to：IEC/EN 60939
Typical work frequency：150kHz~30MHz

■ 典型应用 (Typical Applications)

1.电气和电子设备
2.消费品
3.家庭设备
4.电子数据处理设备
5.办公自动化和数据通信设备
6.电磁环境恶劣且需要高性能滤波滤波器

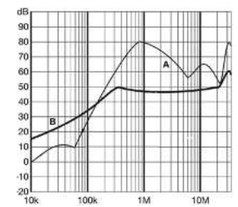
Electrical and electronic equipment
Consumer goods
Household equipment
Electronic data processing equipment
Office automation and datacom equipment
Various noisy applications requiring high filter performance

典型电路图
typical electrical schematic

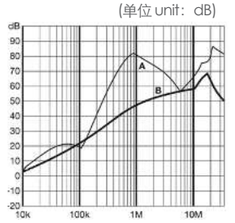


■ 输入滤波器插入损耗 (Input Filter Attenuation)

(单位 unit：dB)



3A~20A



30A~200A

A:50N/50Ω sym，B:50N/50Ω asym

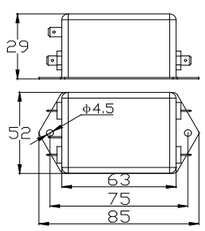
NIETZ

■ 滤波器选型表 (Filter Selection Table)

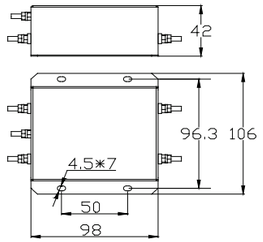
滤波器型号 Filter type		额定电流 Rated current @40℃ [A]	漏电流 Leakage current @230VAC/50Hz [mA]		能量损耗 Power loss @25℃/50Hz [W]	端子类型 Connector type
通用型 Universal filter	医用型 Medical filter		通用型 Universal filter	医用型 Medical filter		
RFD2B3N01	RFD2B3N01A	3	0.87	0.074	2.3	
RFD2B6N01	RFD2B6N01A	6	0.87	0.074	3.2	
RFD2B10N01	RFD2B10N01A	10	0.87	0.074	3.8	
RFD2B16N01	RFD2B16N01A	16	0.87	0.074	4.7	
RFD2B20N01	RFD2B20N01A	20	0.87	0.074	5.6	
RFD2B30N05	RFD2B30N05A	30	0.87	0.074	8.5	
RFD2B50N05	RFD2B50N05A	50	1.75	0.074	13.3	
RFD2B100N05	RFD2B100N05A	100	1.75	0.074	30.2	
RFD2B200N05	RFD2B200N05A	200	3.5	0.074	46.9	

■ 产品尺寸图 (Product Size)

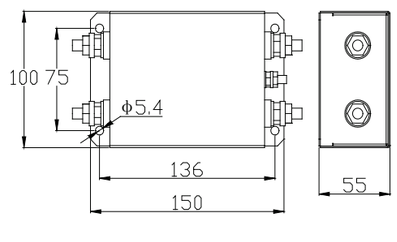
(单位 unit：mm)



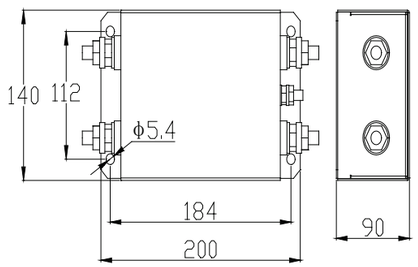
3A~20A



30A



50A



100A-200A

■ 成品识别码 (Product Identification Code)

RFD	—	2B	—	10	—	N05
单相滤波器 1 phase Filter		2:Working Voltage 2=220V B:Second-order filtering		额定电流 Rated Current 10A-2500A		接线方式 Connection mode

单/三相隔离变压器（BKSC)

Single/Three-phase Isolation transformer

■ 产品概述 (Product Introduction)

该类隔离变压器的目的是提供负载和电源侧之间的电隔离，在IT配电系统中，防止电冲击，以保护所连接设备的绝缘损坏，还提供中性点连接形成隔离或接地。通过初次级间与连接的静电屏蔽及加强的绝缘，该类隔离变压器能提供敏感负载的隔离以防止电源系统遭受严峻的大气干扰。 另外， 利用其铁芯的高频损耗大的特点， 从而抑制高频杂波传入控制回路。

The purpose of such isolation transformers is to provide electrical isolation between the load and the power supply, prevent electric shock in the IT distribution system so as to protect the insulation of the device connected from being damaged, and provide neutral point connection for isolation or grounding. Through the shielding between the primary and secondary levels and the static electricity connected as well as reinforced insulation.

■ 产品特点 (Product Features)

我公司多年来采用优质材料和先进的工艺技术专业生产 160VA--800KVA 之间，单/三相干式隔离变压器，产品参照国外同类产品最新研制开发进口设备用变压器，广泛适用于交流 50/60HZ ，输入、输出电压不超过1000V 的各种供电场合。产品的各种输入、输出，电压高低，联接组别，调节抽头位置，绕组容量分配，次级绕组配备，是否要求带外壳等，均根据用户的要求进行精心的设计与制造。 该系列隔离变压器广泛用于地铁、高层建筑、机车、电梯、车站、印刷、机床、码头、工矿企业及隧道的输配电及进口设备的使用等场所。

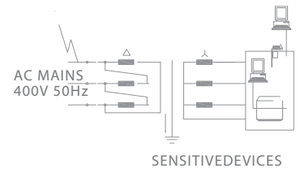
Our company has been using high-quality materials and advanced process technology to professionally produce single/three-phase dry-type isolation transformers between 160VA and 800KVA for many years. The products are based on the latest research and development of imported equipment transformers for similar foreign products, and are widely used in various power supply scenarios with AC 50/60HZ and input and output voltages not exceeding 1000V. The various inputs and outputs, voltage levels, connection groups, tap position adjustment, winding capacity allocation, secondary winding configuration, and whether to require a casing of the product are carefully designed and manufactured according to the user's requirements. This series of isolation transformers is widely used in places such as subways, high-rise buildings, locomotives, elevators, stations, printing, machine tools, docks, industrial and mining enterprises, and tunnels for power transmission and distribution, as well as the use of imported equipment.

■ 技术规格 (Technical Specifications)

功率范围 Power Range:	160-800KVA
输入电压 Input Voltage	Rated voltage≤1000V±10% Δ/Y
输出电压 Output Voltage	Rated voltage≤1000V+5%(No Load) Δ/Y
效率 Efficiency	≥95%
波形失真 Waveform distortion	No additional waveform distortion
功能 Function	With input voltage, output voltage, current indication
保护 protect	Overcurrent protection
绝缘电阻 Insulation resistance	1000VDC insulation resistance value ≥ 100MΩ
电气强度 Dielectric strength	Core Coil 3000VAC/50Hz/5mA/10s no electric arcing puncture (factory test)
过载能力 Max Current	2 × Rated current,continuous 60S

典型电路图

(Typical circuit diagram)



海拔高度不超过2000米。
运行环境温度-25℃～+45℃，相对湿度不超过90%。
周围无有害气体，无易燃易爆物品。
周围环境应有良好的通风条件，如装在柜内，应加装通风设备。

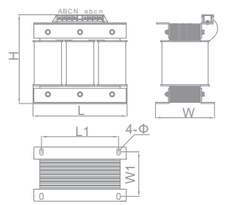
Under seal level 2000m
Running ambient temperature -25 ℃ ~ +45 ℃, comparative moisture not over 90%.
There are no harmful gases or flammable or explosive materials around.
With well-ventilated condition,ventilation devices shall be mounted if installatioh in panels

■ 执行标准 （Applicable Standards）

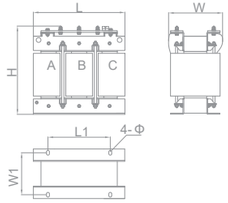
VDE0550 、 IEC439 、 JB5555 、 GB5226

■ 产品尺寸图 （Product Size）

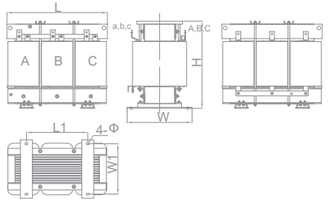
三相隔离变压器 （Three-phase Isolation transformer）



Picture A



Picture B



Picture C

型号规格 TYPE	容量(kVA) Capacity	图号 Picture NO.	绝缘等级 Insulation rank	外形尺寸(±5mm) Dimension	安装尺寸(±2mm) Installation	安装孔(mm) Mounting holes
				L*W*H	L1*W1	4-Φ
BKSC-0.5K	0.5		F，H	150*185*205	100*90	8.5*14
BKSC-1.0K	1.0		F，H	185*250*270	200*90	11*18
BKSC-1.5K	1.5		F，H	195*250*270	200*110	11*18
BKSC-2.0K	2.0		F，H	205*250*270	200*120	11*18
BKSC-3.0K	3.0	图 A Picture A	F，H	175*300*310	240*120	11*18
BKSC-4.0K	4.0		F，H	200*300*310	240*120	11*18
BKSC-5.0K	5.0		F，H	210*300*310	240*140	11*18
BKSC-6.0K	6.0		F，H	240*300*310	240*170	11*18
BKSC-8.0K	8.0		F，H	240*300*310	240*170	11*18
BKSA-10K	10		F，H	250*360*380	300*172	11*18
BKSA-15K	15		F，H	260*460*510	260*144	15*25
BKSA-20K	20	图 B Picture B	F，H	290*460*510	260*154	15*25
BKSA-30K	30		F，H	320*460*510	260*174	15*25
BKSA-50K	50		F，H	340*460*550	260*230	15*25
BKSA-70K	70		F，H	420*700*680	520*250	15*25
BKSA-80K	80	图 C Picture C	F，H	420*700*680	520*250	15*25
BKSA-90K	90		F，H	480*850*820	570*250	15*25
BKSA-100K	100		F，H	480*850*820	570*250	15*25

备注：其他规格尺寸，可根据用户要求制造。 Remark：Dimension can be customization

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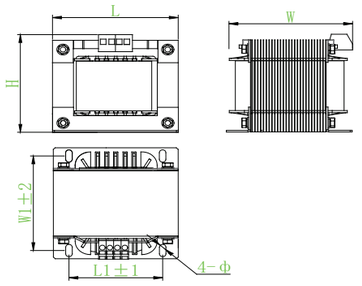
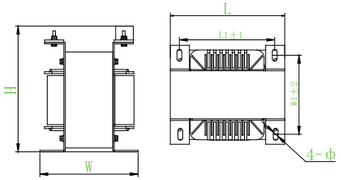
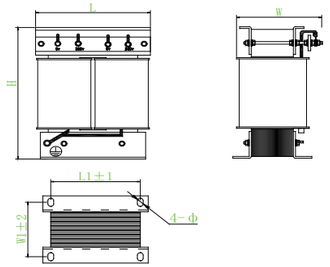
单相隔离变压器 （Single-phase Isolation transformer）



Picture A



Picture B



Picture C

型号规格 TYPE	容量(kVA) Capacity	图号 Picture NO.	绝缘等级 Insulation rank	外形尺寸(±5mm) Dimension	安装孔(±2mm) Mounting holes	安装孔(mm) Mounting holes
				L*W*H	L1*W1	4-Φ
BKDC-0.088K	0.088		F，H	106*85*72	90*-	5*8
BKDC-0.15K	0.15		F，H	88*110*90	71.5*78	6*8
BKDC-0.2K	0.2		F，H	100*115*120	80*105	6.5*11
BKDC-0.3K	0.3		F，H	125*130*150	100*84	8*11
BKDC-0.5K	0.5	图 A Picture A	F，H	125*115*125	85*93	6.5*11
BKDC-0.63K	0.63		F，H	155*135*147	120*105	7*14
BKDC-0.7K	0.7		F，H	155*135*147	120*105	7*14
BKDC-0.8K	0.8		F，H	155*135*147	120*105	7*14
BKDC-1.0K	1.0		F，H	152*140*145	120*120	7*14
BKDC-1.5K	1.5		F，H	152*170*145	120*140	7*14
BKDC-2.0K	2.0		F，H	195*195*180	155*155	10*20
BKDC-3.0K	3.0	图 B Picture B	F，H	195*200*180	155*165	10*20
BKDC-4.0K	4.0		F，H	243*210*260	200*166	10*25
BKDC-5.0K	5.0		F，H	243*210*260	200*166	10*25
BKDC-6.0K	6.0		F，H	300*290*400	200*160	11*18
BKDC-8.0K	8.0	图 C Picture C	F，H	300*290*400	200*160	11*18
BKDC-10K	10		F，H	300*290*400	200*160	11*18

备注：其他规格尺寸，可根据用户要求制造。 Remark：Dimension can be customization

■ 成品识别码 (Product Identification Code)

BKSA	–	10K	–	660	–	380
BK:隔离变压器 Isolation transformer S: D=Single Phasec S=Three Phasec C: C=Copper A:Aluminium		容量 Capacity		初级电压 Input Voltage		初级电压 Output Voltage

NIETZ

自耦变压器（BYSC） Autotransformer

■ 产品概述 （Product Introduction）

自耦变压器用于交流50HZ额定电压308V。功率11～315(KW)三相鼠笼感应电动机的不频繁降压启动，以改善电动机启动时对输电网络的影响。

The autotransformers are used for AC 50HZ at rated voltage 308V. The infrequent partial voltage starting of the three-phase squirrel-cage induction motor of power of between 11 and 315 (KW) is to minimize the impact of the motor on the transmission network at the time of startup.

■ 产品特点 （Product Features）

采用F，H级为基础的绝缘系统，在自耦变压器的整个使用寿命期都保持极佳的电气性能和机械性能，F，H级材料不易老化，耐收缩和抗压缩，加上弹力特强，因此可以确保变压器使用数年后任保持结构紧密，并却能够承受短路的压力，自耦变压器整体由H级侵渍漆在真空压力下侵渍(VPI)，然后再烘箱里高温固化。

It adopts F and H-grade insulation system, and maintains splendid electrical and mechanical performance throughout the life of the autotransformer. The F and H-grade materials are anti-aging, anti-shrinkage and anti-compression with particularly strong elasticity, thus ensuring the compact structure of the transformer after several years of use and the capability to the pressure of short-circuit. The entire autotransformer is macerated is macerated in Class H maceration paint under vacuum pressure (VPI), and is cured at high temperature in oven.

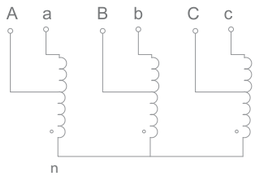
■ 技术规格 （Technical Specifications）

功率范围 Power Range:	160-800KVA
输入电压 Input Voltage	Rated voltage≤1000V±10% Δ/Y
输出电压 Output Voltage	Rated voltage≤1000V+5%(No Load) Δ/Y
效率 Efficiency	≥95%
波形失真 Waveform distortion	No additional waveform distortion
功能 Function	With input voltage, output voltage, current indication
保护 protect	Overcurrent protection
绝缘电阻 Insulation resistance	1000VDC insulation resistance value ≥ 100MΩ
电气强度 Dielectric strength	Core Coil 3000VAC/50Hz/5mA/10s no electric arcing puncture (factory test)
过载能力 Max Current	2 × Rated current,continuous 60S

海拔高度不超过2000米。
运行环境温度-25℃～+45℃，相对湿度不超过90%。
周围无有害气体，无易燃易爆物品。
周围环境应有良好的通风条件，如装在柜内，应加装通风设备。

Under seal level 2000m
Running ambient temperature -25 ℃ ~ +45 ℃, comparative moisture not over 90%.
hazardous gas,no inflammables and explosives
With well-ventilated condition,ventilation devices shall be mounted if installatioh in panels

典型电路图
（Typical circuit diagram）



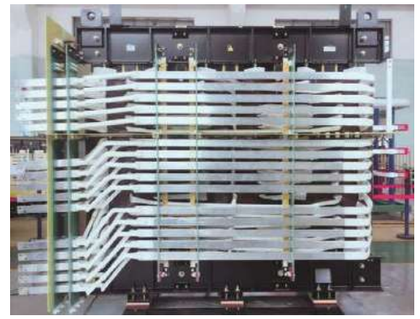
■ 成品识别码 (Product Identification Code)

BYDA	–	10K	–	660	–	380
BK:隔离变压器 Isolation transformer S: D=Single Phasec S=Three Phasec C: C=Copper A:Aluminium		容量 Capacity		初级电压 Input Voltage		初级电压 Output Voltage

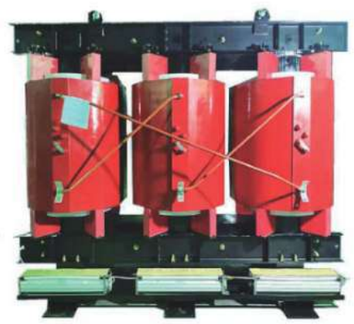
整流变压器
Rectifier transformer

移向变压器
Move to the transformer

逆变输出变压器
Inverter transformer



变频调速用干式整流变压器
Dry-type rectifier transformer for frequency conversion speed regulation



升压变压器
Isolating transformer

隔离变压器
Isolating transformer

波纹电阻器（RXHG） Wire Wound Resistor

■ 产品概述 （Product Introduction）

RXHG型涂料绕线电阻器是一种功率型绕线电阻器，该产品采用波状电阻合金带以侧立形式缠绕在陶瓷骨架上，表面被覆绝缘耐高温涂料，有利于散热，并配有安装支架，电阻器具有功率大，耐过载能力强，安装方便等特点。

RXHG coatings type winding resistor is a kind of power mode, the product use the wave resistance alloy in the form of side winding on the ceramic matrix The surface coating insulation resistance to high temperature coating,is conducive to heat dissipation,and is equipped with a mounting bracket,a resistor has large power,strong overload capacity resistance,convenient installation and other feature

■ 产品应用 （Product Application）

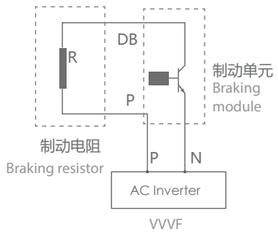
1.做为制动电阻保护变频器、伺服等不受电机再生电能的危害
2.电力电子负载测试中做为阻性负载
3.在电力电子设备中做为取样电阻、限流电阻、起动电阻、保护电阻

1. As a braking resistor to protect the inverters, servos, etc., from damage by regenerative energy of the motor;
2. As a resistive load in power electronic load tests;
3. As a sampling resister, limiting resistor, starting resistor, or protective resistor in power electronic equipment."

■ 技术规格 （Technical Specifications）

1.阻值及阻值允许偏差：1Ω≤R ±5%（J），1Ω>R ±10%（K）"
2.额定负荷：表面最高温度:50~200W≤275℃, > 200W≤350℃
3.短时过负荷：无可见损伤，ΔR≤±（5%R+0.05Ω）10倍 5s
4.绝缘电阻：R≥100MΩ1min DC 1000V
5.耐电压：无可见损伤，无飞弧击穿 ΔR≤±（0.1%R+0.05） AC 3000V 5S
6.电阻温度特性：±260PPM/℃ (小于5Ω以不作检测)
7.端子强度：无松动或机械损伤 45N 30S"
8.电阻体强度：无可见损伤 200N 30S
9.耐振性：无可见损伤， ΔR≤±（0.1%R+0.05Ω）f:5-200Hz a=1g X.Y.Z各2h
10.耐热性：除端子外无明显变色和损伤，标志清晰350℃ 2hours
11.热冲击：无可见机械损伤 额定负载30分钟后-55℃温度下15min
12.耐湿性：无可见损伤，标志清晰，ΔR≤±（5%R+0.05Ω）
绝缘电阻≥10MΩDC100 40℃ 95%RH 500hours
13.耐久性(额定负载)：外观无可见损伤，标志清晰，ΔR≤±（5%R±0.05Ω） 100%负荷

典型电路图
（Typical circuit diagram）



1.Resistance value and the change range :1Ω≤R ±5%（J），1Ω>R ±10%（K）
2.Rated load:The maximum surface temperature,50~200W≤275℃,＞200W≤350℃
3.Short-time overload:No visible damage ΔR≤±（5%R+0.05Ω）10 times 5s
4.Insulation resistance:R≥100MΩ1min DC 1000V
5.Withstanding voltage:No visible damage,no arcing breakdown ΔR≤±（0.1%R+0.05）AC 3000V 5S
6.Resistance-temperature characteristic:±260PPM/℃((less than 5Ωdon′t test
7.Terminial strength No looseness or mechanical damage 45N 30s
8.Resistance strength No visible damage 200N 30S
9.Withstanding vibration:No visible damage ΔR≤±（0.1%R+0.05Ω）f:5-200Hz a=1gX.Y.Z/2h
10.Heart resistance:In addition to the terminal no pbvious discoloration and damage, marked clearly 350 ℃ 2hours
11.Heat shock No visible mechanical damage,after 30miniute rated overload
12.Waterlogging resistance:No visible mechanical damage,marked clearly ΔR≤±（5%R+0.05Ω）
Insulation resistance≥ 10MΩDC100 40℃ 95%RH 500hours
13.Durability(rated overload):No visible damage,marked clearly ΔR≤±（5%R±0.05Ω）load 100%
8.Withstanding vibration:No visible damage ΔR≤±（0.1%R+0.05Ω）f:5-200Hz a=1g X.Y.Z/2h
9.Resistance :In addition to the terminal no obvious discolorati on and damage,marked clearly. 350±5℃， 120±5

NIETZ

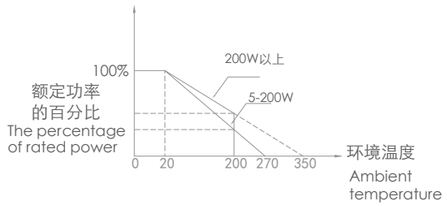
Brake Resistor

■ 执行标准 （Applicable Standards）

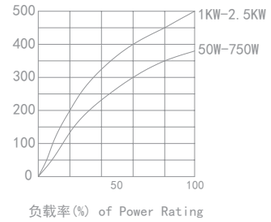
GB/T5729-1994 Fixed redsistor used in electronic equipment

■ 降额曲线 （Rundown Curve）

环境温度 Ambient temperature	0-20℃	>20℃
功率损耗 Power loss	100%	See figure



■ 表面温升 （Surface Temperature Rise）



■ 产品尺寸图 （Product Size）

规格 Type	额定功率(W) Rated Power	尺寸Dimension （±1mm）							
		L	L1	L2	D	B	H	N	Φd
RXHG	50	90	132	146	28	6.5	62	10	4.5
RXHG	60	90	132	146	28	6.5	62	10	4.5
RXHG	80	140	182	198	28	6.5	62	10	4.5
RXHG	100	170	212	198	28	6.5	62	10	4.5
RXHG	150	192	222	238	40	8	90	12	5.5
RXHG	200	192	222	238	40	8	90	12	5.5
RXHG	300	280	310	326	40	8	90	12	5.5
RXHG	400	280	310	326	40	8	90	12	5.5
RXHG	500	316	346	360	50	8	107	16	6
RXHG	600	316	346	360	50	8	107	16	6
RXHG	750	316	346	360	50	8	107	16	6
RXHG	1000	300	334	350	60	8.5	127	16	6
RXHG	1200	415	449	465	60	8.5	127	16	6
RXHG	1500	415	449	465	60	8.5	127	16	6
RXHG	2000	510	544	560	60	8.5	127	16	6
RXHG	2500	600	636	652	60	8.5	127	16	6

备注：其他规格尺寸，可根据用户要求制造。Remark：Dimension can be customization

■ 成品识别码 (Product Identification Code)

RXHG	—	1500W	—	40R	—	J
波纹电阻器 Wire Wound Resistor		额定功率 Rated Power		电阻阻值 Resistance Value		阻值误差 Resistance Tolerance H=±3% J=±5% K=±10%

NIETZ

铝壳电阻器（RXLG） Aluminum Enclosure Resistor

■ 产品概述 （Product Introduction）

RXLG系列铝壳绕线电阻器采用铝合金外壳，外形美观，该电阻具有耐气候性、耐振动、安全性优于传统瓷骨架电阻器。 RXLG电阻器是用一种耐高温的有机硅树脂和硅粉作基本材料封装的功率型绕线电阻。易紧密安装，易附加散热器。

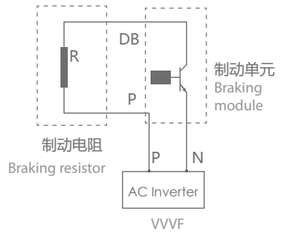
RXLG series aluminum shell winding resistor using alloy enclosure,beautiful shape,beautiful shape,the resistance have the weather resistance,vibration resistance security is superior to the traditional porcelain skeleton resistor resistor .

■ 产品应用 （Product Application）

1.做为制动电阻保护变频器、伺服等不受电机再生电能的危害
2.电力电子负载测试中做为阻性负载
3.在电力电子设备中做为取样电阻、限流电阻、起动电阻、保护电阻

1. As a braking resistor to protect the inverters, servos, etc., from damage by regenerative energy of the motor;
2. As a resistive load in power electronic load tests;
3. As a sampling resister, limiting resistor, starting resistor, or protective resistor in power electronic equipment.

典型电路图
（Typical circuit diagram）



■ 技术规格 （Technical Specifications）

1.电阻值以及变化范围：1Ω≤R ±5%（J）， 1Ω>R ±10%（K）
2.温度系数：R>20Ω,±260 ppm/℃ R≤20Ω,±400 ppm/℃ 在－25~200℃温度下实验
3.额定负荷：表面温度≤375℃ 放在300×300×3mm铝板上
4.短时过载：ΔR≤±（2%R+0.05Ω） 无异常同样环境下 10倍额定电压，5秒
5.绝缘电阻：R≥100MΩ 1min 无异常 DC 1000V， 焊片和外壳之间的绝缘电阻要求大于或等于100MΩ
6.耐电压：ΔR≤±（0.1%R+0.05Ω）无异常 无破坏焊片与外壳之间加AC 3000V 5S
7.端子强度：无松动无异常 100N力加在焊片引出方向，30秒
8.耐振性：无可见损伤， ΔR≤±（0.1%R+0.05Ω）f:10-55Hz a=1.5g X.Y.Z各2h
9.耐热性：除端子外无明显变色和损伤，标志清晰加热至350±5℃， 120±5分钟
10.热冲击：ΔR≤±（2%R+0.05Ω） 无异常 额定电压30分钟，
常温，8-12秒放到 -40±2℃环境下，15+5分钟。再在常温下放置2小时
11.耐湿性：无可见损伤，标志清晰， ΔR≤±（3%R+0.05Ω），绝缘电阻≥R≥25MΩ
直流电压100V，40±2℃，相对湿度90-95%，60分钟开，30分钟关，持续500+24小时
12.负载寿命：外观无可见损伤，标志清晰， ΔR≤±（5%R±0.05Ω） 放置在300×300×3
20±7℃，额定直流电压，90分钟开，30分钟关，循环500+24小时

1.Resistance value and the change range : 1Ω≤R ±5%（J）, 1Ω>R ±10%（K）
2.Temperature coefficient:R>20Ω,±260 ppm/℃ R≤20Ω,±400 ppm/℃ Test when the temperaturature is –25~200℃
3.Rated load:The surface temperature≤375℃ on the 300×300×3mm aluminum plate
4.Short-time overload: ΔR≤±（2%R+0.05Ω） No abnormal environment also 10 times the rated voltage,5second
5.Insulation resistance:R≥100MΩ1min Without abnormal DC1000v,insulation resistance between welding plate and shell is no less than 100MΩ
6.Withstand voltage: ΔR≤±（ 0.1%R+0.05Ω）No abnormal damage welding piece between the shell and AC3000V5S
7.Terminial strength :Without loosing without exception 100n force on welding lead direction,30seconed
10.Thermal:ΔR≤±（2%R+0.05Ω）No abnormal voltage rating for30 minutes,room emperature,8-12seconds into 2-40 environment,,15+5minutes,then place 2hours at room temperature
11,Wetresistance :No visible damage,marked clearly ΔR≤±（3%R+0.05Ω）， Insulation resistance≥R≥ 25MΩ DC voltage100v,40±2℃，Relative humidity 90-95%，60minutes on 30 minutes off for 500+24
12.Overload: No visible damage,marked clearlyΔR≤±（5%R±0.05Ω） on the 300×300×3mm aluminum plate±7℃，Rated Dcvoltage，90 minutes on 30 minutes off for 500+24 hours

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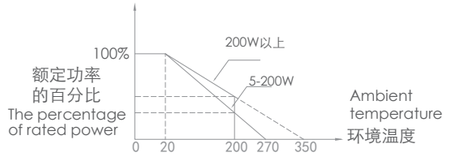
■ 执行标准 （Applicable Standards）

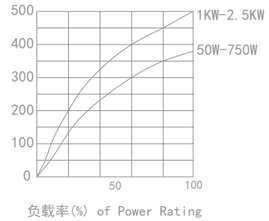
GB/T5729-1994 Fixed redsistor used in electronic equipment

■ 降额曲线 （Rundown Curve）

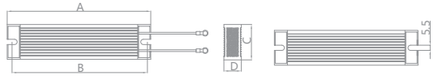
环境温度 Ambient temperature	0-20℃	>20℃
功率损耗 Power loss	100%	See figure



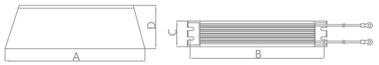
■ 表面温升 （Surface Temperature Rise）



■ 产品尺寸图 （Product Size）



Picture A



Picture B

规格 Type	图号 Product Picture	额定功率(W) Rated Power	尺寸Dimension （±1mm） A	B	C	D	配线 (mm) Connecting Wire	引线长度 (mm) Lead Length	端子 Terminal
RXLG	图 A Picture A	60	115	102	40	20	1.5	250	2-5S
RXLG		80	140	127	40	20	1.5	250	2-5S
RXLG		100	165	152	40	20	1.5	250	2-5S
RXLG		120	190	177	40	20	1.5	250	2-5S
RXLG		150	215	202	40	20	2.5	250	2-5S
RXLG		200	165	152	60	30	2.5	250	2-5S
RXLG		300	215	202	60	30	2.5	250	2-5S
RXLG		400	265	252	60	30	2.5	250	2-5S
RXLG		500	335	322	60	30	2.5	250	2-5S
RXLG		800	400	41*387	61	59			M6
RXLG	图 B Picture B	1000	400	30*387	50	107			M6
RXLG		1200	450	30*437	50	107			M6
RXLG		1500	485	30*472	50	107			M6
RXLG		2000	550	30*537	50	107			
RXLG		2500	550	30*537	50	107			M6

备注：其他规格尺寸，可根据用户要求制造。Remark：Dimension can be customization

■ 成品识别码 (Product Identification Code)

RXLG	—	2500W	—	40R	—	J
铝壳电阻器 Aluminum Enclosure Resistor		额定功率 Rated Power		电阻阻值 Resistance Value		阻值误差 Resistance Tolerance H=±3% J=±5% K=±10%

NIETZ

波纹电阻箱/柜

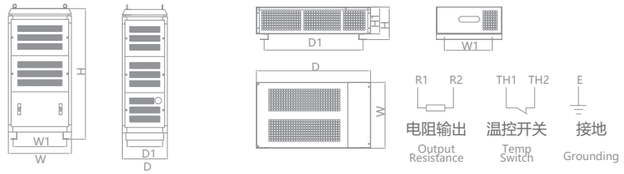
Resistor Assemblies/High Power Resistor Assemblies

■ 产品概述 （Product Introduction）

Resistor assemblies was made by general resistor and settled in cabinet,

BRU （Power range):0.5KW-12.5KW
HRU (Power range): 20KW-200KW

■ 产品尺寸图 （Product Size）



HRU　　BRU

规格 Type	功率(KW) Power	尺寸Dimension （±1mm） W	D	H	W1	D1	端子台螺钉 Terminal	重量(Kg) Weight	配线(mm) Cable	组合Combi-nation
BRU	1	242	500	140	150	470	M6	5.3	6	1KW*1
	2	242	500	140	150	470	M6	6.5	6	1KW*2
	3	242	500	140	150	470	M6	7.8	6	1.5KW*2
	4.5	345	600	170	325	530	M6	12	10	1.5KW*3
	6	345	600	170	325	530	M6	14	10	1.5KW*4
	8	415	690	170	395	665	M6	16.5	10	2KW*4
	10	415	690	170	395	665	M6	18.5	16	2KW*5
	12.5	415	690	170	395	665	M6	20	16	2.5KW*5
HRU	20	700	500	845	340	620	M6	50	16	2.5KW*8
	40	700	500	1245	340	620	M6	86	25	2.5KW*16
	50	700	500	1445	340	620	M7	100	25	2.5KW*20
	60	700	500	1645	340	620	M8	115	35	2.5KW*24
	80	700	500	2045	340	620	M8	140	50	2.5KW*32
	100	700	700	2045	540	620	M8	165	50	2.5KW*40
	120	700	800	1945	640	620	M8	190	75	2.5KW*48

供选配件：散热轴流风机，户外防雨百叶窗盖板，底部轮子。
For Options: cooling axial fan,Outdoor rain shutters cover，The bottom of the wheel.

备注：其他规格尺寸，可根据用户要求制造。
Remark：Dimension can be customization

■ 成品识别码 (Product Identification Code)

BRU — 6KW — 20R — J

- BRU：BRU :Resistor Assemblies / HRU :High Power Resistor Assemblies
- 6KW：额定功率 Rated Power
- 20R：电阻阻值 Resistance Value
- J：阻值误差 Resistance Tolerance H=±3% J=±5% K=±10%

铝壳电阻箱（LRA)

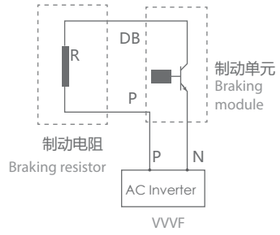
Aluminum Enclosure Resistor Assemblies

■ 产品概述 （Product Introduction）

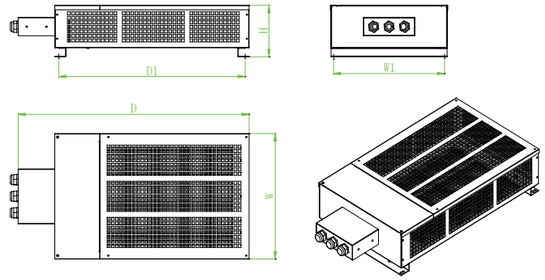
LRA系列铝壳电阻箱是由铝壳电阻器组合而成的
Resistor assemblies was made by Aluminum Enclosure resistor and settled in cabinet,

功率范围(Power range): 0.5KW-12.5KW

典型电路图
（Typical circuit diagram）



■ 产品尺寸图 （Product Size）



规格 Type	功率(KW) Power	尺寸Dimension （±1mm） W	D	H	W1	D1	端子台螺钉 Terminal	配线(mm) Cable	组合Combi-nation
LRA	1	242	500	140	150	470	M6	6	1KW*1
LRA	2	242	500	140	150	470	M6	6	1KW*2
LRA	3	242	500	140	150	470	M6	6	1.5KW*2
LRA	4.5	345	600	170	325	530	M6	10	1.5KW*3
LRA	6	345	600	170	325	530	M6	10	1.5KW*4
LRA	8	415	690	170	395	665	M6	10	2KW*4
LRA	10	415	690	170	395	665	M6	16	2KW*5
LRA	12.5	415	690	170	395	665	M6	16	2.5KW*5

备注：其他规格尺寸，可根据用户要求制造。
Remark：Dimension can be customization

■ 成品识别码 (Product Identification Code)

LRA — 6KW — 20R — J

- LRA：铝壳电阻箱 Aluminum Enclosure Resistor Assemblies
- 6KW：额定功率 Rated Power
- 20R：电阻阻值 Resistance Value
- J：阻值误差 Resistance Tolerance H=±3% J=±5% K=±10%

加热管电阻箱（JRA)

Heating pipe Resistor Assemblies

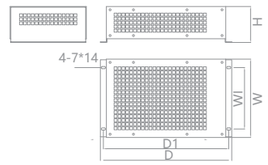
■ 产品概述（Product Introduction）

JRA 加热管电阻箱的绕线电阻器采用不锈钢管外包，外形美观，该电阻具有耐气候性、耐振动、散热快，防护等级高等特点，安全性优于传统瓷骨架电阻器。 该电阻器是用一种耐高温的有机硅树脂和硅粉作基本材料封装的功率型绕线电阻。易紧密安装，易附加散热器。做为制动电阻保护变频器、伺服等不受电机再生电能的危害，电力电子负载测试中做为阻性负载 。

The wire-wound resistor of the resistance box of the JRA heating pipe adopts stainless steel pipe as the wrap which has a good looking appearance. The resistor has the characteristics of weather resistance, vibration resistance, fast heat dissipation, high level of protection, etc. Its security is superior to traditional resistors of porcelain skeleton. The resistor is a power type wirewound resistor packaged with the basic materials of high temperature-resistant silicone resin and silica fume. Easy to install tightly and easy to attach heat sink. Usable as a braking resistor to protect the inverters, servos, etc., from damage by regenerative energy of the motor, and as a resistive load in power electronic load tests.

功率范围(RA Power range):1KW-12KW

■ 产品尺寸图（Product Size）



规格 Type	功率(KW) Power	尺寸Dimension（±1mm）					安装孔 Mounting holes
		D	D1	W	W1	H	
JRA	1	575	555	255	200	117	7*14
JRA	2	575	555	255	200	170	7*14
JRA	3	575	555	255	200	170	7*14
JRA	4	575	555	255	200	170	7*14
JRA	6	575	555	255	200	170	7*14
JRA	8	575	555	255	200	260	7*14
JRA	10	575	555	255	200	260	7*14
JRA	12	575	555	255	200	260	7*14

备注：其他规格尺寸，可根据用户要求制造。
Remark：Dimension can be customization

■ 成品识别码 (Product Identification Code)

JRA	–	1000W	–	40R	–	J
加热管电阻箱 Heating pipe Resistor Assemblies		额定功率 Rated Power		电阻阻值 Resistance Value		阻值误差 Resistance Tolerance H=±3% J=±5% K=±10%

NIETZ

不锈钢电阻柜（SRA)

SUS Resistor Assemblies

■ 产品概述（Product Introduction）

可用在变频器控制电机减速和制动的电路中，通常外接电阻器可以将来自电动机和负载的多余能量消耗掉，以保护变频器的过压保护。 在工业系统中，变频器制动电阻被广泛应用于电机起动制动调速、变频器制动、起吊行业大型机械制动、物料输送机构制动等领域。它们可以短时断续周期和持续的工作。

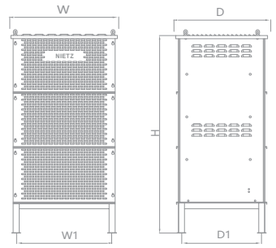
usable in a circuit of inverter to control the motor deceleration and braking. Usually an external resistor can consume the excess energy from the motor and load to protect the overvoltage crowbar of the inverter. In industrial systems, the inverter braking resistors are widely used in the fields of motor starting, braking and speed regulating, inverter braking, inverter braking, braking of large lifting machinery, braking of material handling mechanisms, etc. They can run both in short-term intermittent cycles and continuous cycles.

电流范围 Current Range: 10-1000A
电压范围 Voltage Range: 220-1140V

■ 执行标准（Applicable Standards）

GB/T5729-1994Fixed redsistor used in electronic equipment

■ 产品尺寸图（Product Size）



规格 Type	功率(KW) Power	尺寸Dimension（±1mm）				
		L	W	H	W1	D1
SRA	20KW	760	560	842	644	400
SRA	30KW	760	560	1140	644	400
SRA	40KW	760	560	1440	644	400
SRA	50KW	760	560	1740	644	400
SRA	51-80KW	880	760	1580	764	600
SRA	81-100KW	880	760	1930	764	600

备注：其他规格尺寸，可根据用户要求制造。
Remark：Dimension can be customization

■ 成品识别码 (Product Identification Code)

SRA	–	6KW	–	20R	–	J
不锈钢电阻箱 SUS Resistor Assemblies		额定功率 Rated Power		电阻阻值 Resistance Value		阻值误差 Resistance Tolerance H=±3% J=±5% K=±10%

NIETZ

中性点接地电阻（NRA)

Neutral Grounding Resistor

■ 产品概述（Product Introduction）

中性点接地电阻器连接于发电机、变压器的中性点与大地之间的一种限流电气保护设备，当电网线路出现故障时，电源中性点电压将产生偏移，尤其是在电缆供电的电网系统中，对地电容电流较大，当该电流大于规定值时会产生弧光接地过电压，从而使非故障相的对地电压极大地增加，使设备绝缘损坏形成两点或多点接地短路造成停电事故。采用中性点电阻接地方式的目的是给故障点注入阻性电流，使接地故障电流呈阻容性质，减小与电压的相位差，降低故障点电流过零熄弧后的重燃率，使过电压限制在一定水平以内，提高继电保护设备灵敏度以实现跳闸、快速寻找故障线路和备用切换，从而有效保护系统正常运行。

The neutral grounding resistor is a current limiting electrical protection device connected between the neutral points of the generator and transformer. In case of failure in the power network, the neutral voltage will produce an offset, especially in a grid system of cables whose capacitive earth current is high, arc grounding overvoltage will be produced when the current is greater than the specified value so that the non-fault phase-to-ground voltage will be greatly increased, the equipment insulation will be damaged, thus causing short circuit of earthing at two or more points and power outage.

■ 产品应用（Product Application）

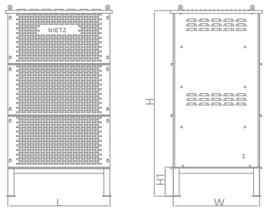
装置可适用于0.4～110kV电压等级配电网的中性点接地系统，在电力系统的变电所或发电厂也已经得到了广泛的应用，对提高系统供电可靠性及安全运行有明显的效果。

The device is suitable for use in the dead earthed neutral system of a distribution network of 0.4-110kV voltage level.

■ 执行标准（Applicable Standards）

GB/T5729-1994Fixed redsistor used in electronic equipment

■ 产品尺寸图（Product Size）



规格 Type	电压（KV) Voltage	电流 Current	阻值范围R(20℃) Resistance Range	尺寸Dimension（±1mm)		
				L	W	H
NRA	6.3	50-1000A	50-1000A	850	1000	1500
NRA	10.5	50-2000A	50-2000A	1000	1000	2000
NRA	20	50-2000A	50-2000A	1500	2000	2200
NRA	35	50-2000A	50-2000A	1600	2500	2500

备注：其他规格尺寸，可根据用户要求制造。 Remark：Dimension can be customization

■ 成品识别码 (Product Identification Code)

NRA	–	6.3KV	–	100A	–	100R
中性点接地电阻 Neutral Grounding Resistor		电压 Voltage		电流 Current		阻值 Resistance

Crowbar/Chopper Resistor

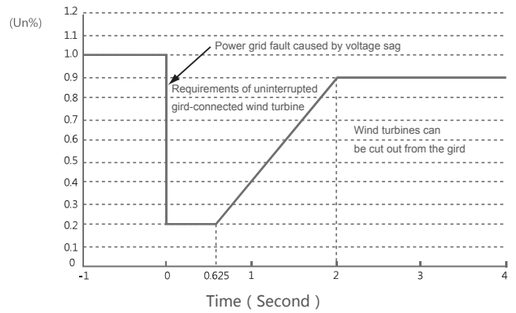
This crowbar resistor is mainly applied in the technology of low voltage ride through in the wind power generation inverter. Installed at the side of the wind power generator rotor, it works as a current transformer at the bypass rotor side. While low-voltage disturbance occurs in the power grid, it can prevent the over-high voltage of the DC bus and the ultra strong rotor current. It is mainly used for the fault state and damped stator flux linkage. The crowbar resistor can dissipate huge amount of energy instantaneously.

Life Evaluation of Crowbar Resistors

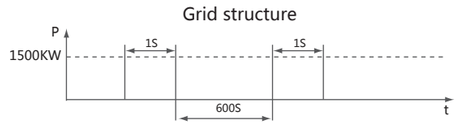
Take 1.5WM windmill generator for example,environmental temperature<60℃

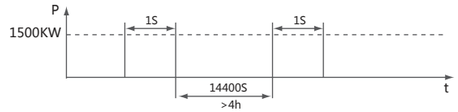
200J	1 time/second	
220KJ	1 time/half an hour	350000 times(20 years of life)
640KJ	1 time/week	1000 times(20 years of life)
1360KJ	1 time/month	250 times(20 years of life)

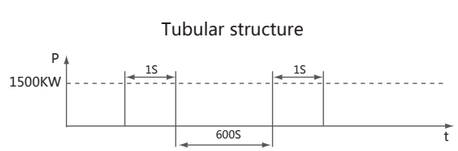
■ Low Voltage Ride Through Wind Turbine



■ Operating Condition Comparison







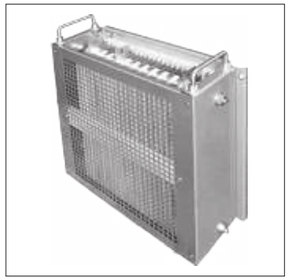
■ Framework Comparision

Type	Weight (kg)	Size (mm)	Temperature rise (℃)	Cost
Grid structure	26	500x450x150	450	Middle
Sandwich structure	28	491x320x200	200	Low
Tubular structure	45	300x200x120	400	High

■ Comparision of the Resistor Materials

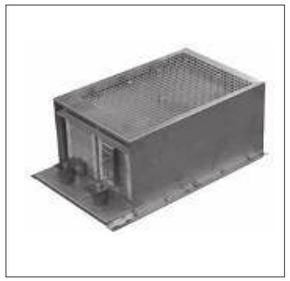
Material	Density g/mm³	Resistivity Ω·mm /m³	Heat capacity J/g·K	Thermal Conducitivity w/m ·℃	Temperature feature ppm/℃
SUS304	0.008	0.72	0.50	13.2	< 1400
SUS316	0.008	0.78	0.45	13.23	< 900
Cr20Ni80	0.008	0.84	0.46	13.2	< 600
Cr20Ni80	0.0084	1.09	0.441	16.0	< 100

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
Δt: Temperature Rise of resistor in K
Take 1.5MW Windturbine as an Example:
Qmax=1360kj C=0.5kj/kg.K Δt=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
Δt: Temperature Rise of resistor in K
Take 1.5MW Windturbine as an Example:
Qmax=1360kj C=0.5kj/kg.K Δt=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
Δt: Temperature Rise of resistor in K
Take 1.5MW Windturbine as an Example:
Qmax=1360kj C=0.5kj/kg.K Δt=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。

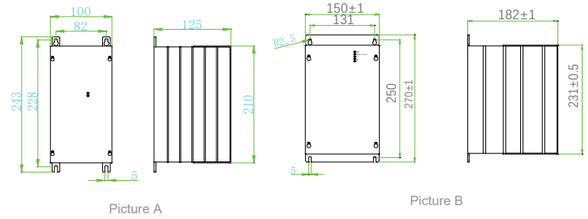
The function of the braking unit is to divert into a brake resistor the regenerative energy produced in the process of decelerating the motor, converting that energy into heat.Regenerative energy flows form the motor into the inverter DC bus,manifested as increased bus voltage .

■ 产品应用 （Product Application）

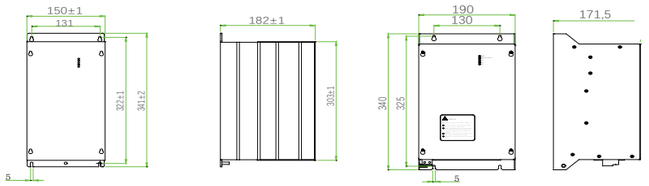
主要用在变频器拖动系统需要急剧减速，刹车，定位 等场合。变频器在减速时，由于拖动系统的惯性较大， 此时电动机处于发电状态，机械能快速回馈到直流母 线上，使直流母线电压迅速上升，从而危及变频器的 安全，因此必须将该回馈能量迅速消耗掉，保持直流 母线电压在某一安全范围以下，否则变频器将会过压 保护或故障。一般惯性较大，或需急剧减速，刹车的场合可使用本制动单元。列如：离心机，电梯，起重机，拉丝机，港口机械等均可使用。

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

■ 产品尺寸图 (Product Size)



Picture A　　Picture B



Picture C　　Picture D

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
AC380V~AC460V	DBU-4030D		50	15	20
	DBU-4045D		75	25	13.6
	DBU-4055		90	30	12
	DBU-4075		110	35	10
	DBU-4090		130	45	7.5
	DBU-4110	Picture B	150	50	6.5
	DBU-4160	Picture C	200	70	4.5
	DBU-4220		300	85	3
	DBU-4300		500	120	2.5
AC690	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

负载箱（TRA） Load Testing

■ 产品概述 （Product Introduction）

干式负载箱是我公司独自研发的电能负荷测试装置，操作容易，体积小，运输方便．可视负荷容量大小．并联电阻堆的电路增减负荷容量.调节负荷容量有手动型和电脑控制型.与传统水负荷和电阻片负载箱相比，无漏电，不产生有害气体和废水，负荷测试精度高， 调节更容易，无需测试准备时间，可连续长期使用等诸多优越性。本公司定型生产的三相交流干式负载箱有高压lOKV．6.6KV． 3.3KV和低压690V．400V．200V 及 DC12V．36V.48V等电压等级 。 功率因数从0-1.0可调，低压三相交流400V负载箱可测三相400V 和三相200V 。 单相220V和110V四个电压等级 高压负载箱为高压直接测试无需降压测试 （不需变压器）所以体积更小，测量更为便．更准确．

The dry-type load bank is the electrical energy load testing equipment which our company self research and develop: operate easily, small volume, convenient transportation，visible loading capacity, regulating the capacity according to the shunt resistance pile electric circuit. The adjustment of the loading capacity has manual control and computer control.Compared with the traditional water load and resistance load bank, it doesn't have the leakage, don't product the noxious gas and the waste water. The load test precision is high, the adjustment is easier, don't need to test the setup time,can continuously the long-time use and so on many superiorities. Our company lot product the three-phase AC dry-type load bank which has voltage classes: high voltage 10KV, 6.6KV,3.3KV and low voltage 690V, 400V, 200V and DC12V, 36V, 48V and so on.Power factor can regulate from 0-1.0, low voltage three-phase AC 400V load bank can test three-phase 400V and three-phase 200V, single-phase 220V and 110V voltage classes. The high-voltage load bank doesn't need test for the high-voltage directly test (not to need transformer),therefore the volume is smaller,the survey is more convenient and more accurate

高性能，高品质 High performance,High quality

采用我公司独自研发定型的温度系数低，低阻抗的电阻管。电阻管采用了不锈钢钢管和不锈钢散热片 ，管内充满（ Mgo ）材料．密封了钢管两头．防止湿气进入腐蚀电热元件品质 。因而可以长期保持高品质的质量。采用了强制空气对流方法来冷却 电阻管． 使电阳管可连续工作。

We select our company self research and develop low temperature coefficient, low impedance resistance tube. The resistance tube has used the stainless steel pipe and the stainless steel radiator fin,in the tube are full of the material(Mgo), has sealed the steel pipe two ends,preventing the moisture to enter to corrupt heating unit quality.Therefore the high quality may maintain for a long time. Using the forced air convection method to cool the resistance tube which can make the resistance tube continuously working

小型、经巧、占地少 Small-type,light and handy,space saving

干式负荷装置采用了独自研发定型的电阻管，使得负荷装置小型化，全身机架用型材 焊接而成．使它的重量更轻 ，容易搬动．而且占有空间小．可以在较小的空间内做测 试工作．

The dry-type load installment has used our self-developed fixed-type resistance tube, which can make the load installment miniaturization. The whole body is insisted of welded materials,for which it is lighter, easier moving and space saving. We can the test work in a small space.

优越的操作性 Superior operation

操作者可以通过本公司研发的软件进行轻松地操作本装置，可调整从0到最大的负荷容量，另外在条件许可的情况下可以在操作面板上预制所帮测试容量。通过一个开关直接投入所需负荷容量，大大提高了工作效率。在种种条件下都能发挥出优秀的可操作性。另外还可以选配远方操作控制箱，在远处就能操纵负荷装置。控制方式有：按扭、控制接触器、 PC控制接触豁、PLC控制接触器。在PC、PLC控制时可在电脑上显示被测的全部参数，包括电压、电流、频率、有功功率、功率因数等。电脑能够记录和保存测试的数据，可随时调出查看和打印。

The operator can easily operate the installment by our self research and develop software, can regulate the load capacity from 0 to max-value. Further more you can setup the expected capacity on the operation panel directly input the need capacity by switch, which greatly increase the efficiency. Its superiors is obviously in this situation.You can select far-way control box, you can control the load installment far away. The control mode includes:key control contact device, PC control contact device, PLC control contact device.When PC,PLC control may demonstrate the complete parameters on the computer including voltage,current,frequency,active power,power factor and so on. The computer can record and preserve the test data,may momentarily assign out the examination and printing.

NIETZ

■ 负载箱用途 （Application for load bank）

发电机制造业 Motor manufacturing

负载箱是测试发电机的功率、频率、电压、电流、功率因费虫 、发电机的稳定性等参数的理想检测设备。发电机使用的燃料多为柴油 ，柴油在低于50% 负载或长时间空载情况下会造成燃油不充分 、积碳、整机效率降低，、最终导致起动困难 、动力不足 、油耗增加、过早开缸维修导致报废，而负载箱是发电机的理想假负载。

The load bank is an ideal test equipment for generator power, the frequency, the voltage,the current, power factor and other generator parameters. Most of the generator use the diesel oil,which can cause the fuel oil unfilled，carbon deposition, complete machine efficiency reduced when the diesel oil load is lower than 50% or in idling situation for a long time and even cause starting difficulty, power insufficiency, oil consumption increased，finally,opening the cylinder for maintenance too early and the abandonment ,so the load bank will be generator's ideal false load.

变压器制造业 Transformer manufacturing

测试变压器的额定容量、电流、电压、 频率、温升、吵声等参数．
铁路、电力、通讯基站电源站负载检测．

Measuring the transformer's parameters include rated capacity, current, voltage, frequency, temperature-rise and noise and so on.
As a kind of load testing equipment for power station of the railway, power equipment and transportation.

■ 执行标准 （Normative Standards）

@ 国际标准：ISO 8528-5:1993 《往复式内燃交流发电机 第5部分：发电机组》
@ 国家标准：GB/T 2820. 5-1997 《往复式内燃交流发电机 第5部分：发电机组》
@ 国家标准：GB/T 13032-1991 《船用柴油发电机组通用技术条件》
@ 国家标准：GB/T 14048.1-2000 《低压开关设备和控制设备》
@ 行业标准：JB/T 10303-2001 《工频柴油发电机组技术条件》
@ 行业标准：JB/T 9696.1-1999 《低压成套开关和控制设备用接线端子排》

@ Intemational standard:IS0 8528-5：1993《Reciprocating intemal combustion altemator.Part5:Generating set.》
@ National standard:GB/T 2820.5-1997 《Reciprocating intemal combustion altemator.Part 5 Generating set.》
@ National standard:GB/T 13032- 1991 《General technical condition for Marine Diesel Generator Set. 》
@ National standard: GB/T 14048.1-2000 《Low-voltage Switchgear and Controlgear.)
@ Industry standard: JB/T 10303-2001 《Technical condition for Diesel Generating set.》
@ Industry standard:JB/T 9696.1-1999 《Connecting terminals for Low-voltage Switchgear and Controlgear》

■ 产品参数 （Product Parameters）

项目 Item	功率 Power		
总功率 Total power	10OKW	200KW	400KW
测试电压 Test voltage	三相AC400V Three-phase AC400V	三相AC400V Three-phase AC400V	三相AC400V Three-phase AC400V
功率分段 Power step	5KW X 2段 (step) IOKW X 6段 (step) 20KW X 2段 (step)	2.5KW * 1段 (step) 5KW *2段 (step) IOKW*2段 (step) 20KW*5段 (step) 40KW*2段 (step)	1kw x1 2kw x1 4kw x1 8kw x1 12kw x2 24kw x4 48kw x6
频 率 Frequency	50-60HZ	50-60HZ	50-60HZ
功率因素 Power factor	1.0	1.0	1.0
助电源 Auxiliary power	单相AC220V Single-phase AC220V	二相AC380 Single-phase AC380V	单相AC220V Single-phase AC220V
操作方式 Operation mode	手动 Manual	手动 Manual	手动 Manual
冷却方式 Cooling mode	强制风冷 Forced air cooling	强制风冷 Forced air cooling	强制风冷 Forced air cooling
外形尺寸 Overalldimension	L800 x W820 x H900	L800 x W820 ×H1300	L800 x W I250 x HI600
重量 Weight (KG)	150	220	420
选配 Selected fitting	远方控制箱／电脑控制 Far-away control box/Computer control	远方控制箱／电脑控制 Far-away control box/Computer control	远方控制箱／电脑控制 Far-away control box/Computer control

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项目 Item	功率 Power		
总功率 Total power	40OKW	800KW	1000KW
测试电压 Test voltage	三相AC400V AC220 Three-phase AC400V AC200V	三相AC400V AC220 Three-phase AC400V AC200V	三相AC400V AC220 Three-phase AC400V AC200V
功率分段 Power step	1kw x1 2kw x1 4kw x1 8kw x1 12kw x2 24kw x6 48kw x5	1kw x1 2kw x1 4kw x1 12kw x1 24kw x2 48kw x4 60kw x10	1kw x1 2kw x1 4kw x1 12kw x1 24kw x2 48kw x5 60kw x13
频 率 Frequency	50-60HZ	50-60HZ	50-60HZ
功率因素 Power factor	1.0	1.0	1.0
助电源 Auxiliary power	三相+N AC380V Three-phase AC380V	三相+N AC380V Three-phase AC380V	三相+N AC380V Three-phase AC380V
操作方式 Operation mode	手动 Manual	手动 Manual	手动 Manual
冷却方式 Cooling mode	强制风冷 Forced air cooling	强制风冷 Forced air cooling	强制风冷 Forced air cooling
外形尺寸 Overalldimension	L1100 x W1250 x H1600	L800 x W820 ×H1300	L800 x W I250 x HI600
重量 Weight (KG)	500	1000	1300
选配 Selected fitting	电脑控制 Computer control	电脑控制 Computer control	电脑控制 Computer control

总功率 Total power	100OKW	2000KW	1000KW
测试电压 Test voltage	三相AC3300V AC6600 Three-phase AC3300V AC6600V	三相AC3300V AC6600 Three-phase AC3300V AC6600V	三相AC3300V AC6600 Three-phase AC3300V AC6600V
功率分段 Power step	0-6kw x1 6kw x5 55kw x3 110kw x8	0-6kw x1 6kw x5 55kw x4 110kw x5 220kwx6	0-12kw x1 6kw x5 60kw x5 120kw x4 240kw x1
频 率 Frequency	50-60HZ	50-60HZ	50-60HZ
功率因素 Power factor	1.0	1.0	1.0
助电源 Auxiliary power	三相+N AC380V Three-phase AC380V	三相+N AC380V Three-phase AC380V	三相+N AC380V Three-phase AC380V
操作方式 Operation mode	电脑和手动 Computer&Manual	电脑和手动 Computer&Manual	电脑和手动 Computer&Manual
冷却方式 Cooling mode	强制风冷 Forced air cooling	强制风冷 Forced air cooling	强制风冷 Forced air cooling
外形尺寸 Overalldimension	L3600 x W1250 x H2000	L3600 x W2500 x H2000	L42600 x W 1710 x H2400
重量 Weight (KG)	2200	4500	3200

总功率 Total power	0.77KW	1.53KW	1.53KW	3KW
总电流 Total current	64A	128A	64A	128A
测试电压 Test voltage	DC 12V	DC 12V	DC 24V	DC 24V
功率分段 Power step	5段	5段	5段	5段
助电源 Auxiliary power	单相 AC220V Single phase AC220V		单相 AC220V Single phase AC220V	
操作方式 Operation mode	"手动 Manual"	"手动Manual"	"手动 Manual"	"手动 Manual"
冷却方式 Cooling mode	"强制风冷 Forced air cooling"	"强制风冷Forced air cooling"	"强制风冷 Forced air cooling"	"强制风冷Forced air cooling"
外形尺寸 Overalldimension	160 x 400 x300	160x 400 x 300	160 x 400 x 300	160x 400 x 300
重量 Weight (KG)	30	30	30	30

■ 成品识别码 (Product Identification Code)

TRA	–	200A	–	L	–	Y
TRA：三相负载柜 DRA：单相负载柜		电流 Current		L:感性负载 R：阻性负载		Y:星型 J:角型

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有源电力滤波器 Active power filters

产品概述 （Product Introduction）

经过多年研发，已成功应用于众多工业现场，是当今用于电能 优化技术中质量优良，性能稳定的高科技产品。
Active power filter is a high-tech product with excellent quality and stable performance power optimization technology after years of research and development, which has been successfully applied to many industrial sites.

有源滤波器拥有闭环控制系统和对每次谐波独立选择的两大功能。
The Active filter has two functions: a closed-loop control system and independent selection of each harmonic

- 闭环控制系统可以检测到电流中每一次谐波的大小和无功功率，通过与用户设定的目标对比从而实现自动修正。
  The closed-loop control system detects the magnitude and reactive power of each harmonic in the current and automatically corrects it by comparing it with the target set by the user.
- 对每次谐波进行独立选择的功能来自于先进的算法。滤波器所释放的补偿电流将完美地注入到所选定的目标谐波中，这保证了用户锁定的目标谐波将会完美滤除。
  The ability to independently select each harmonic comes from advanced algorithms. The compensation current released by the filter is perfectly injected into the selected target harmonic, which guarantees the user-locked target harmonic the waves will be filtered out perfectly.

有源电力滤波器闭环控制系统同样可帮助滤波器实现卓越的无功补偿功能和三相平衡功能。
The closed-loop control system of the active power filter also helps the filter achieve excellent reactive power compensation and three-phase balancing functions.

电能质量差带来的损失 Losses due to poor power quality

存在电能质量问题的电气系统将导致成本上升、环境污染和安全隐患在用户的供电系统中，种类繁多的负载会带来以下三个明显的电能质量问题
Electrical systems with power quality problems will lead to rising costs, environmental pollution and safety hazards In the user's power supply system, a wide variety of loads will bring the following three obvious power quality problems

- 谐波污染 Harmonic pollution
- 负载不平衡而导致的电压不平衡和相对零电压 Voltage imbalance and relative zero voltage due to load imbalance
- 无功功率 Reactive power

电能质量问题带来的不仅仅是金钱上的损失。它还会带来更多其它问题：
Power quality issues bring more than just monetary losses. It raises many other problems:

- 设备故障率上升 The equipment failure rate is rising
- 设备寿命下降 Reduced equipment life
- 产量下降 Production declined
- 配电系统的安全性下降 The safety of the power distribution system is reduced
- 增加碳排放 Increase carbon emissions
- 无法满足供电局相关规范要求 Unable to meet the relevant specifications of the power supply bureau

此外，谐波污染还会导致电网中诸如变压器、电缆和马达等设备的有功损耗上升，这些损耗又将占用发电站的输出能量并导致更多的二氧化碳排放。排放量的大小将取决于整个生产过程和发电所用的燃料类型。
In addition, harmonic pollution can lead to higher active losses in equipment such as transformers, cables, and motors in the grid, which in turn will take up the output energy of the power station and lead to more CO2 emissions. The magnitude of the emissions will depend on the entire production process and the type of fuel used to generate electricity.

■ 负载平衡式例 Example of load balancing

不带滤波器 Without filter

线电流 Line current 1	49.1Arms
线电流 Line current 2	5.3Arms
线电流 Line current 3	5.1Arms

带滤波器 With filter

线电流 Line current 1	19.6Arms
线电流 Line current 2	19.4Arms
线电流 Line current 3	19.5Arms

中性线电流 Neutral current	44.1Arms

中性线电流 Neutral current	3.5Arms

■ 解决方案 Solution

有源电力滤波器能解决谐波污染、三相不平衡和无功补偿等电能质量问题。
The active power filter solves power quality problems such as harmonic pollution, three-phase unbalance and reactive power compensation.

- 可应用于不同类型的场合，并同时适用于商业和工业环境。
  It can be used in different types of applications and is suitable for both commercial and industrial environments.
- 为客户提供谐波滤除、三相平衡和容性或感性无功补偿。
  Provide customers with harmonic filtering, three-phase balancing and capacitive or inductive reactive power compensation.
- 通过主从 模块的并联扩展，从几十安培到几千安培的丰富的滤波方案可以为每个系统提供最优化的解决方案。
  Through the parallel expansion of the master-slave modules, the rich filtering scheme from tens of amperes to thousands of amperes can provide the most optimized solution for each system.
- 有源动态滤波器可安装在低压电网中，并可通过合适的升压变压器联入中压系统使用。
  Active dynamic filters can be installed in low-voltage powe r grids and can be connected to medium-voltage systems via suitable step-up transformers.

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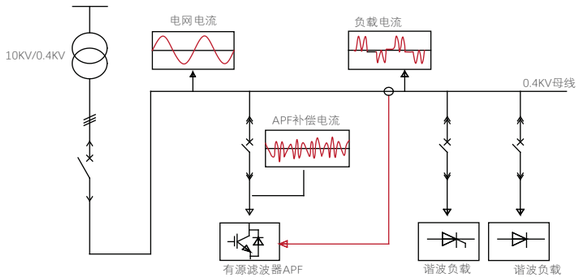


工作原理 How it works

有源电力滤波器为供电系统带来以下好处。
Active power filters bring the following benefits to power delivery systems.

- ●减少停机时间
  Reduce downtime
- ●提高系统运行效率，减少二氧化碳排放
  Improve the efficiency of system operation and reduce CO2 emissions
- ●满足严格的供电局要求，避免罚款或断电
  Meet stringent power bureau requirements and avoid fines or power outages
- ●无需对电网的特殊分析，方案实施快而简单
  No special analysis of the grid is required, and the implementation of the solution is quick and simple
- ●不会过载，特别适用于负载变化快的低压系统
  It will not be overloaded, and is especially suitable for low-voltage systems with fast load changes

应用范围 Scope of application

有源电力滤波器可提供不同结构、不同尺寸和不同电流容量的产品，完全满足不同场合的不同要求。
Active power filters can provide products with different structures, different sizes and different current capacities, which can fully meet the different requirements of different occasions.

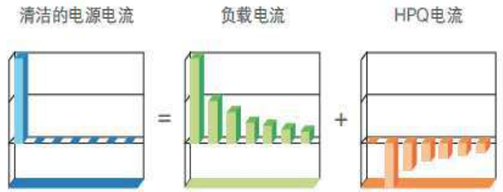
典型应用行业
Typical application industries

●石油和天然气行业（陆地和海上）	Oil & Gas Industry (Onshore & Offshore)
●钢铁行业	Iron and steel industry
●水处理行业	Water treatment industry
●水泥行业	Cement industry
●汽车行业	Automotive industry
●过程控制行业	Process control industry
●造纸行业	Paper industry
●太阳能行业	Solar energy industry
●印刷行业……	Printing Industry .....

模块化产品为商业和民用以及轻工业场合开发的一款紧凑型产品，同时适用于三相三线和三相四线。墙上安装的模式使得产品适用于空间有限的场合。同样它也能安装在盘柜中。
The modular product is a compact product developed for com mercial and residential as well as light industrial applications, and is suitable for both three-phase three-wire and three-phase Four-line. The wall-mounted mode makes the product suitable for applications where space is limited. It can also be installed in enclosures.

典型应用行业
Typical application industries

●办公室和商业大厦	Office and commercial buildings
●计算机和数据中心	Computers and Data Centers
●住宅	Residence
●UPS 系统，电梯和照明系统	UPS systems, elevators and lighting systems
●轻工业（例：远程泵站）	Light industry (e.g. remote pumping stations)
●轨道交通.....	Rail transit.....



谐波 Harmonic wave

有源滤波控制器 Active filter controller

简单的调试工作在应用过程中尤为重要，同时用户需要实时监视整个网络的电能质量情况。HK-070HE 是应用于所有型号的一款标准化用户图形操作界面。它能直接为用户提供滤波器控制、编程和电网参数监视等功能，还具备通讯、故障和实时事件记录等功能。
Simple commissioning is especially important during the application process, where users need to monitor the power quality of the entire network in real timeCircumstance. The HK-070HE is a standardized graphical user interface for all models. It can be direct Users are provided with functions such as filter control, programming, and grid parameter monitoring, as well as communication, faults, and real-time events Recording and other functions.

全图形化显示
Full graphical display

HK-070HE通过 64×132 像素的液晶面板，清晰地为用户提供了各类滤波器信息。
The HK-070HE provides users with a wide range of filter information through a 64×132 pixel LCD panel.

主要功能如下：
The main features are as follows:
启动、停止和重启滤波器测量、分析和记录各个参数对滤波器进行设定监视滤波器状态和故障记录足不同场合的不同要求。
Start, stop, and restart filters measure, analyze, and record individual parameters, set the filter, and monitor the filter Status and fault records meet the different requirements of different occasions.

操作键
Action keys

简单而又友好的操作键让整个操作简单而又直观。
Simple and user-friendly keys make the whole operation simple and intuitive.

通讯
Communication

HK-070HE 提供了 Modbus RTU 模式的通讯接口。通过Modbus RS-485 转换器（可选），能够联入上位机。所有参数、设定和测量值均能够进行传输。
The HK-070HE provides a communication interface in Modbus RTU mode. Pass Modbus RS-485 converter (optional),can be connected to the host computer .All parameters, settings and measured values can be transmitted.

帮助键
Help key

帮助键能够让用户便捷地获得各个功能特性的详细描述。
The help button allows the user to easily obtain a detailed description of each function.

调试简单
Commissioning is simple

自动检测和对误接CT进行校正的功能使得调试工作更加简单。
Automatic detection and correction of misconnected CT images makes commissioning easier.

用户收益
User Benefits

保护功能降低了停机时间	Protection features reduce downtime
直接获取电网关键参数	Direct access to key grid parameters
适用于不同工况下	It is suitable for different working conditions

尺寸安装
Dimensional mounting

外观尺寸 Exterior dimensions： 203*145*38 mm
开孔尺寸 Cut-out size： 192*138 mm

技术参数 Technical parameters

- 电气参数
  Electrical parameters

联接方式 Connection mode	三相三线 /三相四线 Three-phase three-wire / three-phase four-wire
电压等级 Voltage level	400V/690V(±20%)
电网频率 Grid frequency	50Hz/60Hz (± 5%)
滤波电流能力 Filtering current capability	50A75A100A125A150A
零线谐波滤除能力 Neutral harmonic filtering capability	三倍于相线 Three times as much as the phase
模块数量 Number of modules	≤8 PCS
冗余功能 Redundancy	主主 / 主从 Master Master/Master Slave
设备损耗 Wear and tear of equipment	≤3%
内部保护装置 Internal protection	短路，过流，过压，过热等 Short circuit, overcurrent, overvoltage, overheating, etc

- 滤波器参数
  Filter parameters

滤波范围 Filter range	2nd to 51st
谐波选择范围 Harmonic selection range	20次
滤波设定 Filter settings	可对每次谐波电流进行单独设定 Each harmonic current can be set individually
滤波能力 Filtering capabilities	≤5%THDi
整机效率 Overall machine efficiency	97.50%
谐波滤除率 Harmonic filtering rate	≥98%
涌入电流 Inrush current	少于额定电流值 Less than the rated current value
限流运转 Current-limited operation	限制在额定电流补偿 Limited to rated current compensation
瞬时响应时间 Instantaneous response time	≤0.1ms
全响应时间 Full response time	≤8ms
噪音（距离1米）Noise (distance of 1 meter)	≤60dB

- 无功补偿参数
  Reactive power compensation parameters

目标功率因数 Target power factor	可设定0.6（感性)-0.6（容性） Configurable 0.6 (sensibility) - 0.6 (capacitance)

- 负载平衡参数
  Load balancing parameters

模式 Mode	相相间 Interphased :ON/OFF

- 编程 / 通讯
  Programming / Communication

数字输入输出 Digital inputs and outputs	2 digital inputs/6 digital outputs
报警点 Alarm point	1 NO point, 1 NC point

- 安装
  Installation

海拔 Elevation	≤1500m，Indoor installation (1% reduction per 100 meters)
环境温度 Ambient temperature	-10° C 至 40° C
湿度 Humidity	95%，无凝露 No condensation

订货资料 - 选型表 Ordering Information - Selection Table

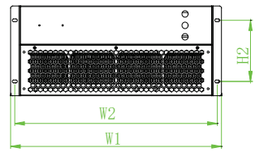
模块组合示例400V
Module combination example 400V

滤波电流Filtering current	APF 模块组合
50A	APF-400V-50A-XL
75A	APF-400V-75A-XL
100A	APF-400V-100A-XL
125A	APF-400V-125A-XL
150A	APF-400V-150A-XL
200A	APF-400V-100A-XL*2
250A	APF-400V-125A-XL*2
300A	APF-400V-150A-XL*2
350A	APF-400V-100A-XL*2+HPQ-APF-400V-150A-XL
400A	APF-400V-100A-XL+HPQ-APF-400V-150A-XL*2
450A	APF-400V-150A-XL*3
500A	APF-400V-50A-XL+HPQ-APF-400V-150A-XL*3
550A	APF-400V-100A-XL+HPQ-APF-400V-150A-XL*3
600A	APF-400V-150A-XL*4

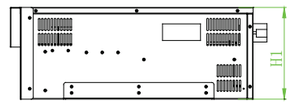
产品尺寸 Product dimensions

抽屉式 Drawer style

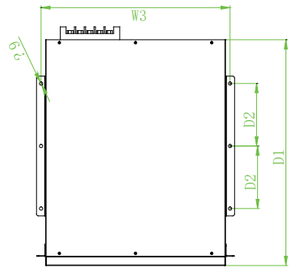
规格	外形尺寸(mm)						
	H1	H2	W1	W2	W3	D1	D2
50A	165	100	470	452	451	415	140
75A	165	100	470	452	451	415	140
100A	220	150	545	522	521	614	170
150A	220	150	545	522	521	614	170



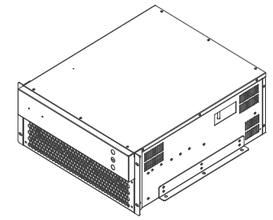
正视图



侧视图

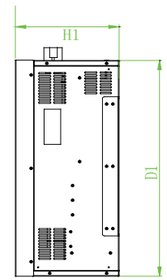


俯视图

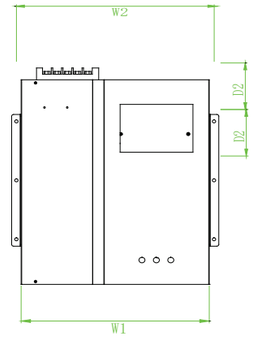


壁挂式 Wall-mounted

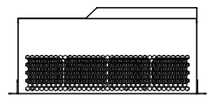
规格	外形尺寸(mm)				
	H1	W1	W2	D1	D2
50A	190	430	451	460	140
75A	190	430	451	460	140
100A	250	496	521	589	170
150A	250	496	521	589	170



侧视图



正视图



俯视图

Active Power Filters