

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.HOWCORE的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, HOWCORE 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。

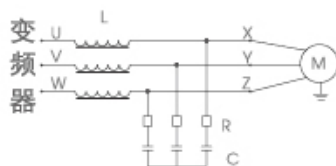
The dV/dT filters are designed to protect the motor filter as peak voltage disastrous to the motor will be generated if the cable between the inverter and the motor is too long. The cable length depends on the switching times of the power semiconductor in the inverter and the size of the motor. A cable 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: 400V AC-1140V AC
- 2.额定电流: 5~500A
- 3.频率: 50-60Hz
- 4.开关频率: 2~8KHz
- 5.防护等级: IP00-IP20
- 6.绝缘等级: class F,H
- 7.使用环境: -10~+45 °C,额定值不会降低。最高可达+55°C,
在45°C以上,每升高1°C,额定电流降低2%
- 8.最大电缆长度: 1000m
- 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°C~+45°C,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



1. Work Voltage: 220VAC-1140VAC
2. Work Current: 5A-500A
3. Work Frequency: 50/60Hz
4. Switching frequency: 2-8KHz
5. Protection class: IP00-IP22
6. Insulation Class: class F, H
7. Operation Environment: -10~+45 °C, rated value won't lower, when higher than 55 °C, and every 1 °C, the current will step down 2%
8. Maximum cable length: 1000m
9. Max Current: 1.5 × Rated current, continuous 60S
10. Noise: ≤ 65dB
11. Temperature Rise: ≤ 70K
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 °C ~ +45 °C, comparative moisture not over 90%.
16. No hazardous gas, no inflammables and explosives
17. With well-ventilated condition, ventilation devices shall be mounted if installation in panels

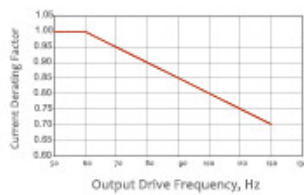
■ 执行标准 (Applicable Standards)

IEC289: 1987 Reactor

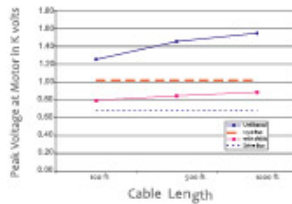
GB10229-88 Reactor (equiv IEC289: 1987)

JB9644-1999 Reactors used for semiconductor electrical driving

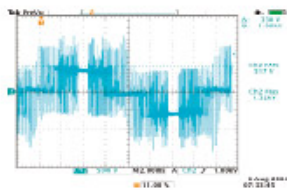
dV/dt Filter Current Derating for Drive Output Frequency



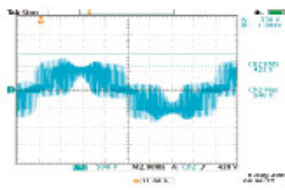
22 Amp dV/dt Overall Performance 30hp 480 Vac Motor



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



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



■ 成品识别码 (Product Identification Code)

VTR

dV/dt滤波器
dV/dt Filter

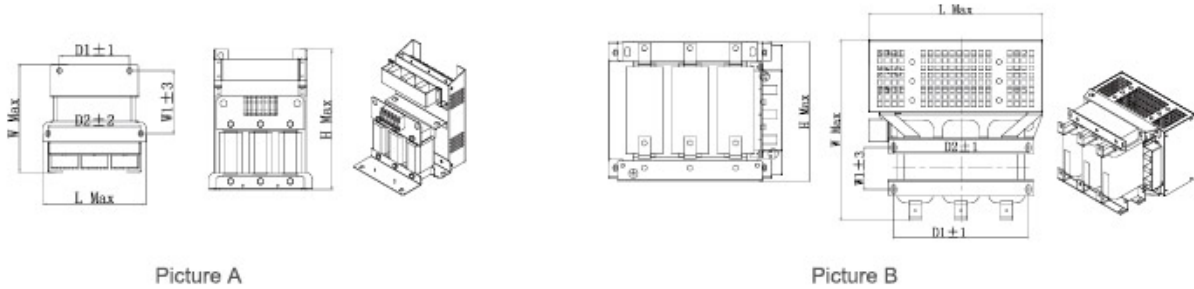
0330

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

■ 产品尺寸图 (Product Size)



Picture A

Picture B

滤波器型号 TYPE	材质 Material	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						
						L(max)	W(max)	H(max)	W1±2	D1±2	D2±2	A*B
VTR-0005N-0.4SC	CU	2.2	图 A Picture A	5	F	200	235	270	68	55/95	160	8.5*14/6*15
VTR-0010N-0.4SC	CU	3.7-4.5		10	F	200	235	270	68	55/95	160	8.5*14/6*15
VTR-0015N-0.4SC	CU	5.5		15	F	200	240	270	104	130	160	8.5*14
VTR-0020N-0.4SC	CU	7.5		20	F	200	240	270	120	130	160	8.5*14
VTR-0030N-0.4SA	AL	11		30	F	240	240	320	115	150	200	8.5*14
VTR-0040N-0.4SA	AL	15		40	F	240	250	320	135	150	200	8.5*14
VTR-0050N-0.4SA	AL	18.5		50	F	240	260	325	135	150	200	8.5*14
VTR-0060N-0.4SA	AL	22		60	F	240	260	330	143	150	200	8.5*14
VTR-0080N-0.4SA-YT	AL	30	图 B Picture B	80	F	355	370	255	73	245	245	11*18
VTR-0090N-0.4SA-YT	AL	37		90	F	355	370	255	73	245	245	11*18
VTR-0120N-0.4SA-YT	AL	45		120	F	390	385	230	83	280	280	11*18
VTR-0150N-0.4SA-YT	AL	55		150	F	390	400	285	103	280	280	11*18
VTR-0200N-0.4SA-YT	AL	75		200	F	390	385	285	87	280	280	11*18
VTR-0250N-0.4SA-YT	AL	90/110		250	F	370	385	300	87	280	280	11*18
VTR-0290N-0.4SA-YT	AL	132		290	F	370	385	300	87	280	280	11*18
VTR-0330N-0.4SA-YT	AL	160		330	F	440	400	300	97	280	280	11*18
VTR-0390N-0.4SA-YT	AL	185		390	F	440	410	300	107	280	280	11*18
VTR-0490N-0.4SA-YT	AL	220/250		490	F	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