

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、轴承电流和共模漏电流以及严重的电磁干扰(EMI)。当逆变器用长电缆与电机连接时，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，导致线圈绝缘失效。dv/dt滤波器增加了传输距离，减小了谐波电压和电流。

when the PWM inverter directly drives the motor, it will produce high dv/dt, bearing current, common-mode leakage current and sever electromagnetic interference (EMI). Especially when the inverter is connected to the motor with long cables, due to the distribution parameters in the cables, a more than 2 times overvoltage will occur in the motor because of voltage reflection, which makes coil insulation failed. dv/dt filter increases the transmission distance and reduces harmonic voltages and currents.



■ 产品应用(Product Application)

dv/dt滤波器是用于保护电机的滤波器。

- 1.有效降低变频伺服电动机端的dv/dt电压
- 2.防止传输电缆和伺服电机线圈的过早老化和击穿
- 3.延长伺服电机的使用寿命，提高伺服的可靠性和正常运行时间
- 4.降低对邻近设备或线路的干扰传播
- 5.减小电机接地泄露电流
- 6.减小打开滤波器与电机之间的接触器所引起的干扰
- 7.有效降低伺服电机端脉冲尖峰电压
- 8.输出满足IEC 60034-17, 60034-25要求

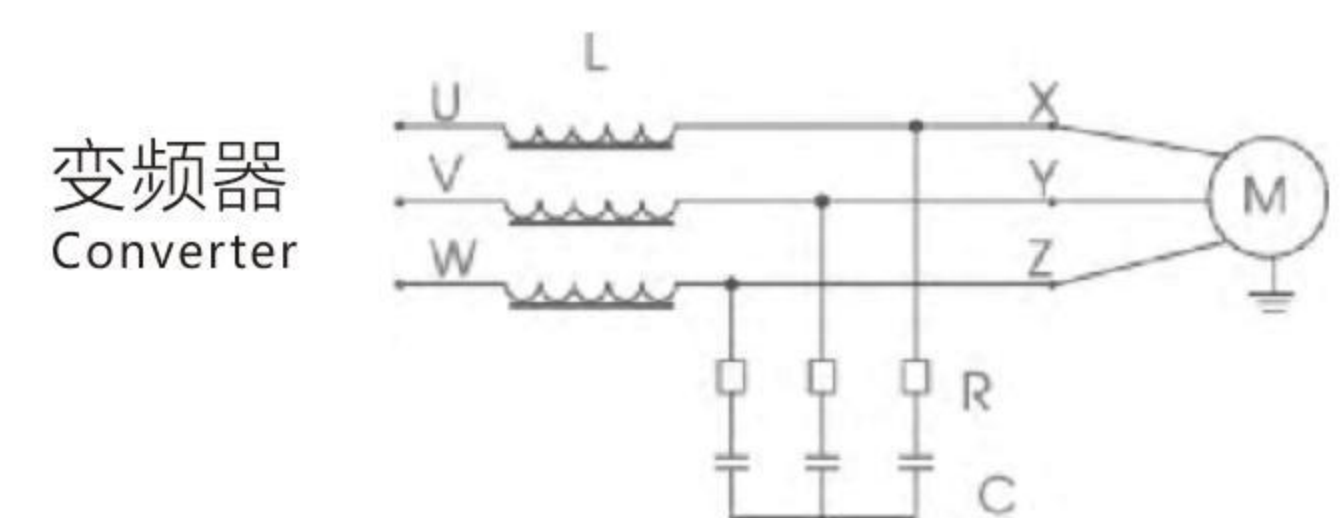
The dv/dt filter is a filter used to protect the motor.

- 1.Effectively reduce the dv/dt voltage of the inverter servo motor ends
- 2.Prevent transmission cables and servo motor coil from early aging and breakdown
- 3.Extend the service life of the servo motors and improve the reliability and uptime of the servo
- 4.Reduce the interference to adjacent equipment or lines
- 5.Reduce the motor ground leakage current
- 6.Reduce the interference when the contactor between filters and the motors is switched on
- 7.Effectively reduce the spike pulse voltage of the servo motor ends
- 8.Meet the output requirements of IEC 60034-17, 60034-25

■ 技术规格 (Technical Specification)

- 1.额定电压：400 ~ 1140VAC
- 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：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.过载能力：1.5 × 额定电流，持续60s
- 10.噪音：≤65dB
- 11.温升：≤70K
- 12.抗电强度：铁芯-绕组 绕组-绕组 3000VAC/50Hz/60s 无飞弧击穿
- 13.绝缘电阻：1000VDC，100MΩ
- 14.海拔高度不超过2000米
- 15.运行环境温度-25 ~ +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
Typical Circuit Diagram

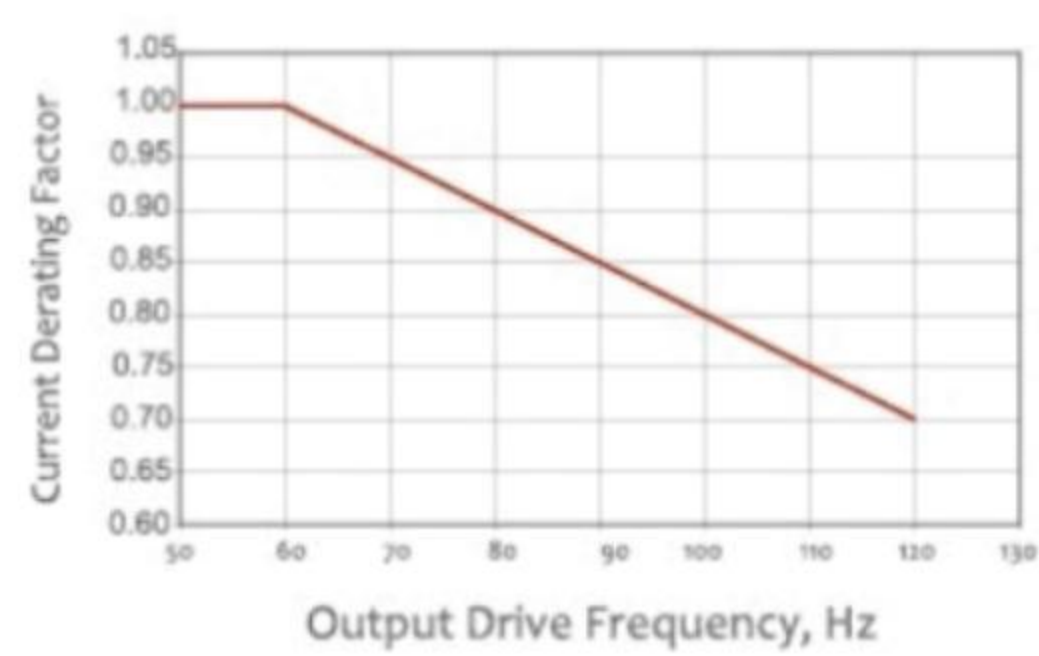


1. Work Voltage: 400 ~ 1140VAC
2. Rated Current: 5 ~ 500A
3. Frequency: 50/60Hz
4. Switching Frequency: 2 ~ 8kHz
5. Protection Class: IP00-IP22
6. Insulation Class: F, H
7. Operation Environment: -10 ~ +45°C, the rated value doesn't decrease. The tolerance temperature is up to +55°C. Above +45°C, the rated current decreases by 2% for every 1°C increase
8. Maximum Length of cable: 1000m
9. Overload Capacity: 1.5 x rated current, 60s
10. Noise: ≤65dB
11. Temperature Rise: ≤85K
12. Dielectric Strength: core-winding, winding-winding 3000VAC/50Hz/60s, no electric arc or electric breakdown
13. Insulation Resistance: 1000VDC, ≥100MΩ
14. Work under 2000m
15. Ambient Temperature -25 ~ +45°C, and the relative humidity is not over 90%
16. No hazardous gas, flammable and explosive
17. With well-ventilated condition. Ventilation devices shall be mounted if reactors are installed in cabinets.

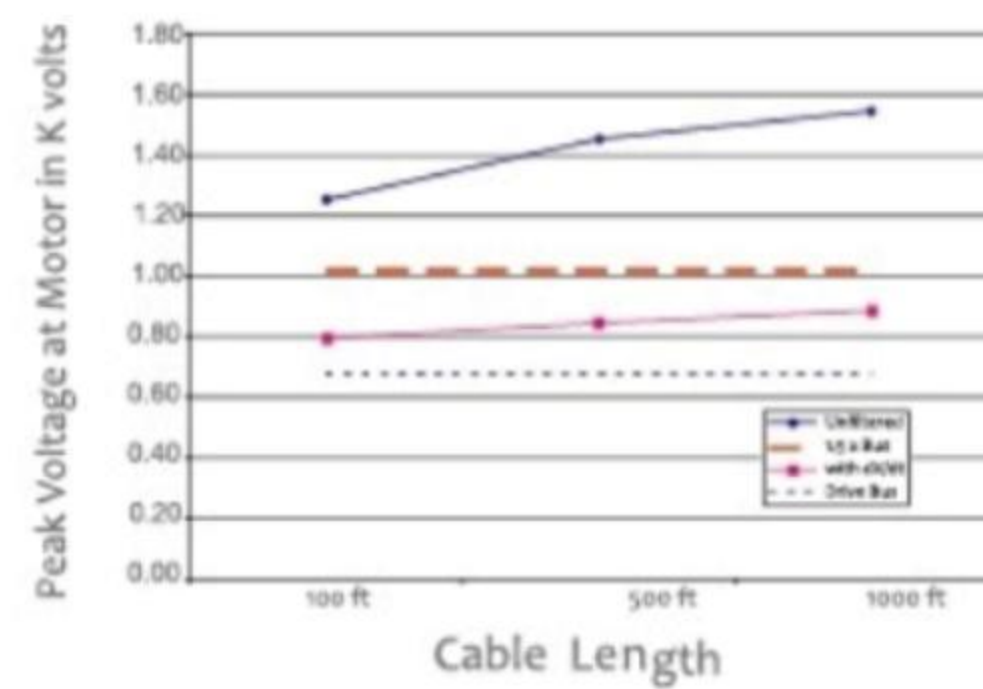
■ 执行标准(Applicable Standard)

- IEC 60076-6 Reactors
- GB/T1094.6 Reactors
- JB9644 Reactors or semiconductor electric drive

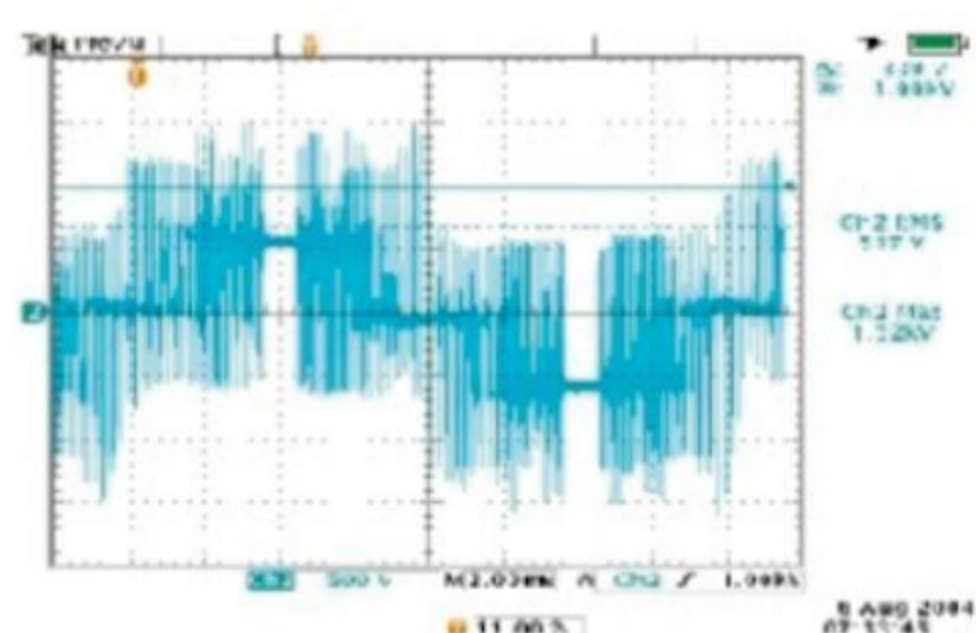
dV/dt Filter Current Derating for Drive Output Frequency



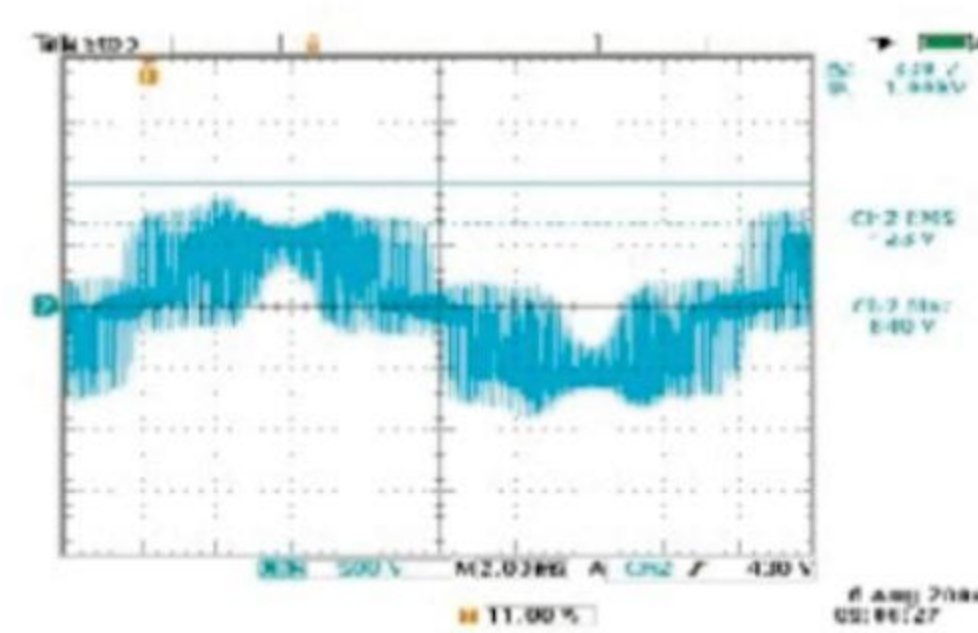
22 Amp dV/dt Overall Performance 30hp 480 Vac Motor



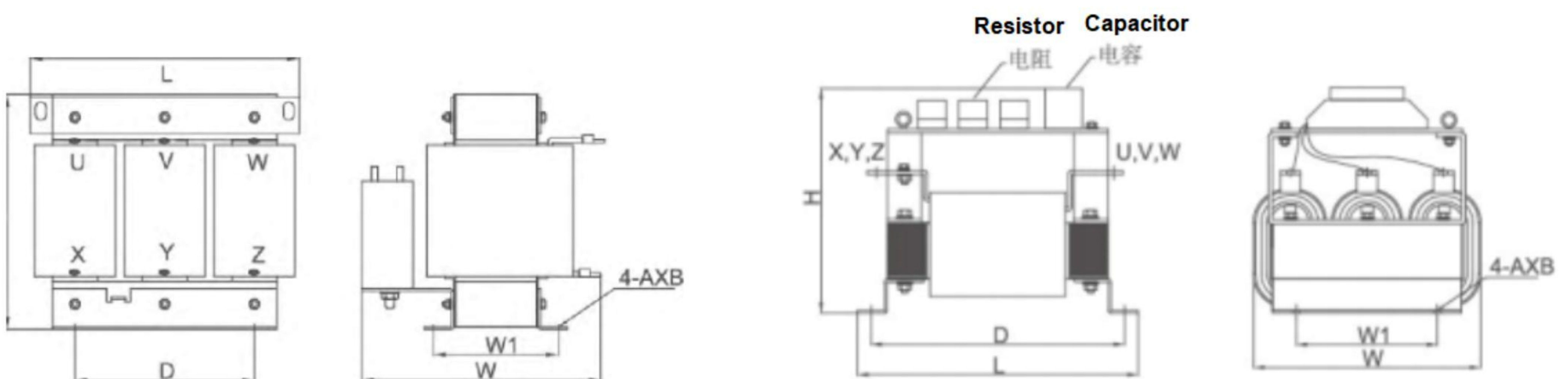
1000 ft Full Load, 8kHz Switching, Unfiltered Shielded Cable



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



■ 产品尺寸图(Product Size)



Picture A (电阻器另置 Resistor coil figured separately)

Picture B

| 380V滤波器型号 Type | 图号 Picture No. | 适配功率 Power (kW) | 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 |
| VTR-0015-04SC | A (电阻器另置 Resistor configured separately) | 5.5 | 15 | H | 200 | 240 | 200 | 72 | 120 | 11*18 |
| VTR-0020-0.4SC | | 7.5 | 20 | H | 200 | 240 | 200 | 72 | 120 | 11*18 |
| VTR-0030-0.4SC | | 11 | 30 | H | 200 | 240 | 200 | 92 | 120 | 11*18 |
| VTR-0040-0.4SC | | 15 | 40 | H | 200 | 240 | 200 | 92 | 120 | 11*18 |
| VTR-0050-0.4SC | | 18.5 | 50 | H | 245 | 250 | 200 | 96 | 182 | 11*18 |
| VTR-0060-0.4SC | | 22 | 60 | H | 245 | 250 | 200 | 96 | 182 | 11*18 |
| VTR-0080-0.4SC | | 30 | 80 | H | 245 | 250 | 200 | 96 | 182 | 11*18 |
| VTR-0090-0.4SC | | 37 | 90 | H | 245 | 250 | 200 | 96 | 182 | 11*18 |
| VTR-0120-0.4SA | | 45 | 120 | H | 245 | 250 | 200 | 108 | 182 | 11*18 |
| VTR-0150-0.4SA | | 55 | 150 | H | 245 | 250 | 200 | 120 | 182 | 11*18 |
| VTR-0200-0.4SA | B | 75 | 200 | H | 330 | 310 | 420 | 220 | 270 | 11*18 |
| VTR-0250-0.4SA | | 90 | 250 | H | 330 | 310 | 430 | 220 | 272 | 11*18 |
| VTR-0260-0.4SA | | 110 | 260 | H | 380 | 330 | 420 | 250 | 335 | 11*18 |
| VTR-0290-0.4SA | | 132 | 290 | H | 380 | 340 | 420 | 250 | 335 | 12*20 |
| VTR-0330-0.4SA | | 160 | 330 | H | 380 | 340 | 420 | 250 | 335 | 12*20 |
| VTR-0390-0.4SA | | 185 | 390 | H | 380 | 350 | 420 | 250 | 335 | 12*20 |
| VTR-0490-0.4SA | | 250 | 490 | H | 350 | 390 | 420 | 250 | 278 | 12*20 |
| VTR-0600-0.4SA | | 280 | 600 | H | 350 | 370 | 430 | 250 | 278 | 12*20 |
| VTR-0840-0.4SA | | 315 | 840 | H | 385 | 400 | 500 | 250 | 320 | 12*20 |
| VTR-1000-0.4SA | | 450 | 1000 | H | 460 | 400 | 500 | 250 | 395 | 12*20 |
| VTR-1400-0.4SA | 560 | 1400 | H | 500 | 400 | 540 | 265 | 420 | 12*20 | |

备注：其他规格尺寸，可根据用户要求制造 Remark: Customized if necessary.

| 690V滤波器型号 Type | Picture No. | Power (kW) | Rated Current(A) | Insulation Class | 尺寸 Dimension(±5mm) | | | | | |
|-------------------|-------------|------------|------------------|------------------|-----------------------|--------|--------|------|-----|-------|
| | | | | | L(max) | W(max) | H(max) | W1±2 | D±2 | A*B |
| VTR-0080-0.7SC | B | 75 | 80 | H | 330 | 290 | 410 | 200 | 280 | 11*18 |
| VTR-0120-0.7SA | | 110 | 120 | H | 380 | 340 | 400 | 250 | 330 | 11*18 |
| VTR-0150-0.7SA | | 132 | 150 | H | 340 | 390 | 420 | 250 | 265 | 12*20 |
| VTR-0215-0.7SA | | 160-200 | 215 | H | 350 | 390 | 450 | 250 | 265 | 12*20 |
| VTR-0250-0.7SA | | 220 | 250 | H | 350 | 390 | 460 | 250 | 280 | 12*20 |
| VTR-0330-0.7SA | | 250-300 | 330 | H | 370 | 400 | 500 | 250 | 280 | 12*20 |
| VTR-0390-0.7SA | | 315-380 | 390 | H | 420 | 390 | 480 | 250 | 300 | 12*20 |
| VTR-0410-0.7SA | | 400 | 410 | H | 460 | 445 | 520 | 320 | 350 | 15*25 |
| VTR-0490-0.7SA | | 450 | 575 | H | 460 | 445 | 520 | 320 | 390 | 15*25 |
| VTR-0575-0.7SA | | 560 | 575 | H | 460 | 445 | 550 | 320 | 390 | 15*25 |
| VTR-0810-0.7SA | | 710-800 | 810 | H | 510 | 485 | 560 | 320 | 430 | 15*25 |

备注：其他规格尺寸，可根据用户要求制造 Remark: Customized if necessary.

■ 成品识别码(Product Identification Code)

| | | |
|-------------------------|-----------------------|--|
| VTR | 0330 | 0.4SC |
| dv/dt滤波器 dv/dtFilter | 额定电流 Rated Current | 0.4: Rated Voltage 0.2=220V,0.4=380V,0.7=690V,1.1 = 1140V D: Single Phase S: Three Phase C:Copper A: Aluminum |

对应CE认证的型号Corresponding CE code:

| | | |
|--------------------------|--|--|
| VTR | 400SC | 0015F/H |
| dv/dt滤波器 dv/dt Filter | 400: 额定电压 Rated Voltage, 1~5000V S: Three Phase C: Copper L: Aluminum | 0015: 额定电流 Rated Current, 0.1~5000A |