

Dv/dt滤波器

Dv/dt Filters

功能和作用 (100m以上用dv/dt滤波器)

Fuction and Application(dv/dt filters are applied to cable over 100m)

- 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

Dv/dt filters can support our customers with:

- 1.effectively reducing the dt/dv voltage of the inverter servo motor ends;
- 2.preventing the transmission cable and the servo motor coil from early aging and breakdown;
- 3.extending the service life of the servo motors and operation period and improving the servo's reliability;
- 4.reducing the interference to the nearby equipment and circuits;
- 5.reducing the motor grounding leaking current;
- 6.reducing the interference when the contactor between filters and the motors is switched on;
- 7.effectively reducing the peak pulse voltage of the servo motor ends.
- 8.meeting the output requirements of IEC 60034-17, 60034-25.

一般电缆参数 (不加输出电抗器)General Cable Parameters(without output reactors)

电压等级 (KW) Power rating (KW)	最大电流 (A) Max. current (A)	主电缆 (UL AWG) Main cable (UL AWG)	额定电感 Rated inductance			导体对导体额定电感 Rated capacitance conductor to conductor			导体对导体/防护 罩额定电感 Rated capacitance conductor to conductor&shield		导体额定直流电阻 @200C Rated conductor DC resistance@20 C		推荐最大 电流@30°C (Amps) Max. Recommended current@30 C (Amps)
			(Uh/ft)	(Uh/m)	(H/Km)	(pF/ft)	(pF/m)	F/KM	(pF/m)	(pF/m)	(Ohm/1000ft)	(Ohm/1000m)	
5.5	12.8	AWG14	0.213	0.699	6.988189E-04	23	75.5	7.545932E-08	75.5	137.8	2.52	8.268	25
11	24.8	AWG10	0.184	0.604	6.036745E-04	29	95.1	9.514436E-08	95.1	173.9	0.989	3.245	40

变频器输出dv/dt为3000V/us根据屏蔽电缆分布参数，不会发生行波反射的临界长度一般为15m左右，则不加输出电抗器。工程上因为电缆的分布参数不一致，伺服驱动器输出的dv/dt要比3000V/μS大许多，所以不加电抗器建议电缆长度为10m.超过10m,建议加1%的输出电抗器。

The dt/dv the inverters output is 3000V/μS. According to the distribution parameters of the shielded cable, the critical length of traveling wave reflection is about 15m. If the cable is less than 15m, the output reactor can be spared.Due to the inconformity of the distribution parameters of cables in the engineering, the dt/dv the servo drivers output is much larger than 3000V/μS, so it is advised that reactors with 1% voltage drop should be used if the cable length is more than 10m.

差模测试数据 Differential Mode Test Data

开关频率 Switch frequency	测试点 Test point	50m非屏蔽电缆 50m unshielded cable			150m非屏蔽电缆 150m unshielded cable			500m非屏蔽电缆 500m unshielded cable		
		母线电压 Ubus	峰值电压 Upeak	dv/dt	母线电压 Ubus	峰值电压 Upeak	dv/dt	母线电压 Ubus	峰值电压 Upeak	dv/dt
4KHz	驱动输出 Drive output	525	603	2275	525	588	2218	525	603	2394
	滤波器输出 Filter output	537	594	63	528	609	98	528	744	69
	电机侧 Moter side	501	564	70	501	570	109	438	696	79
8KHz	驱动输出 Drive output	528	603	2353	528	594	2215	525	603	2275
	滤波器输出 Filter output	525	573	68	528	615	91	525	744	69
	电机侧 Moter side	501	537	81	498	582	101	414	672	82

如果不加dv/dt滤波器，100m以上的电缆电机端的尖峰电压可达1000V以上。

Without dt/dv filters, the peak voltage of the motor ends can reach over 1000V. (Wire length: 100m)

共模测试数据 Common Mode Test Data

工作电流(A) Operating current(A)	加载情况 Load	共模电压(V) CM voltage(V)	共模电流(A) CM current(A)
76	80%	538	13
		275.5	1.9

导线长度100米，95Adv/dt滤波器共模测试数据。

CM Test Date of 95A dv/dt filter (Wire length: 100m)