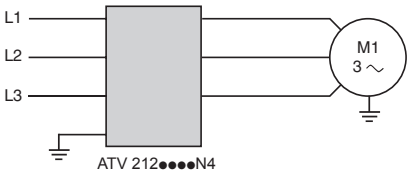
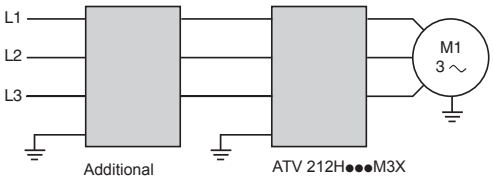
Variable speed drives
Altivar 212
Management of electromagnetic compatibility
Integrated EMC filters and optional additional filters



ATV 212●●●●N4
ATV 212W●●●N4C
with integrated
filter



Additional
EMC filter

ATV 212H●●●M3X
ATV 212H●●●N4

PF100624

Mounting the filter beside the Altivar 212 drive

PF100625

Mounting the filter under the Altivar 212 drive

Integrated EMC filters

Altivar 212 drives, except for ATV 212H●●●M3X, have integrated radio interference input filters to comply with the EMC standard for variable speed electrical power drive “products” IEC/EN 61800-3, edition 2, category C1, C2 or C3 in environment 1 or 2 and to comply with the European EMC (electromagnetic compatibility) directive.

Drives	Maximum length of shielded cable *(1)* according to			Leakage current *(2)*
	EN 55011 class B Gr1	EN 55011 class A Gr1		
	IEC/EN 61800-3	IEC/EN 61800-3		
	Category C1	Category C2	Category C3	
	m	m	m	mA
IP 21 drives				
ATV 212H075N4…HU22N4	–	20	20	4.5
ATV 212HU30N4…HU55N4	–	5	20	5.8
ATV 212HU75N4, HD11N4	–	5	20	2.9
ATV 212HD15N4, HD18N4	–	5	20	4.8
ATV 212HD22N4S	–	–	5	25.3
ATV 212HD22N4, HD30N4	–	–	20	25.3
ATV 212HD37N4, HD45N4	–	–	20	21.5
ATV 212HD55N4, HD75N4	–	–	100	9.1
UL Type 12/IP 55 drives				
ATV 212W075N4…WU22N4	–	5	–	4.5
ATV 212WU30N4…WU55N4	–	5	20	5.8
ATV 212WU75N4	–	5	10	2.9
ATV 212WD11N4, WD15N4	–	5	10	13.3
ATV 212WD18N4	–	5	20	9.4
ATV 212WD22N4, WD30N4	–	5	–	25.3
ATV 212WD37N4, WD45N4	–	–	20	21.5
ATV 212WD55N4, WD75N4	–	–	100	9.1
ATV 212W075N4C…WU22N4C	20	20	20	18.4
ATV 212WU30N4C…WU55N4C	20	50	50	42.8
ATV 212WU75N4C	20	50	50	37.2
ATV 212WD11N4C, WD15N4C	20	50	50	81
ATV 212WD18N4C	20	50	50	77.2
ATV 212WD22N4C, WD30N4C	20	50	50	84.5
ATV 212WD37N4C, WD45N4C	20	50	50	53.6
ATV 212WD55N4C, WD75N4C	20	20	50	56.9

Additional EMC input filters

Applications

Additional EMC input filters enable drives to meet more stringent requirements: they are designed to reduce conducted emissions on the line supply below the limits of standards EN 55011 group 1, class A or B, and IEC/EN 61800-3 category C1, C2 or C3.

The additional EMC filters can be mounted beside or under the drive. The drive's power supply is then connected directly via the filter output cable.

The filters act as a support for the drives and are attached to them via tapped holes.

(1) Maximum lengths for shielded cables connecting motors to drives for a switching frequency of 6 to 16 kHz. If motors are connected in parallel, the sum of the cable lengths must be taken into account.
(2) Maximum earth leakage current at 480 V 60 Hz on a TT system.

Variable speed drives
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Management of electromagnetic compatibility
Option: additional EMC input filters

PF511750

VW3 A31 404

Additional EMC input filters (continued)

Use according to the type of line supply

Additional filters can only be used on TN (neutral connection) and TT (neutral to earth) type systems.

Standard IEC/EN 61800-3, appendix D2.1, states that on IT systems (isolated or impedance earthed neutral), filters can cause permanent insulation monitors to operate in a random manner.
In addition, the effectiveness of additional filters on this type of system depends on the type of impedance between neutral and earth, and therefore cannot be predicted.
If a machine has to be installed on an IT system, the solution would be to insert an isolation transformer and connect the machine locally on a TN or TT system.

ATV 212●●●●N4 and ATV 212W●●●N4C drives have integrated EMC filters. These filters can be easily disconnected for use on the line supply and, if necessary, reconnected just as easily (see the User Manual).

References

For drives	Maximum length of shielded cable *(1)* according to		In *(2)*	If *(3)*	Loss *(4)*	Reference	Weight
	EN 55011 class B Gr1 / IEC/EN 61800-3 category C1	EN 55011 class A Gr1 / IEC/EN 61800-3 category C2 or C3					
	m	m	A	mA	W		kg
Three-phase supply voltage: 200…240 V 50/60 Hz							
ATV 212H075M3X	20	20	15	6.7	0.47	**VW3 A31 404**	1.000
ATV 212HU15M3X	20	20	15	6.7	1.6	**VW3 A31 404**	1.000
ATV 212HU22M3X	20	20	15	6.7	3.3	**VW3 A31 404**	1.000
ATV 212HU30M3X	20	20	25	17.8	3.6	**VW3 A31 406**	1.650
ATV 212HU40M3X	20	20	25	17.8	6.2	**VW3 A31 406**	1.650
ATV 212HU55M3X	–	20	47	20.6	3.7	**VW3 A31 407**	3.150
ATV 212HU75M3X	–	20	47	20.6	6.8	**VW3 A31 407**	3.150
ATV 212HD11M3X	–	20	83	14.5	9.1	**VW3 A31 408**	5.300
ATV 212HD15M3X	–	20	83	14.5	16	**VW3 A31 408**	5.300
ATV 212HD18M3X	–	20	83	14.5	23.1	**VW3 A31 408**	5.300
ATV 212HD22M3X	–	100	90	40.6	27.1	**VW3 A4 406**	15.000
ATV 212HD30M3X	–	20	180	86.3	23.1	**VW3 A4 408**	40.000
Three-phase supply voltage: 380…480 V 50/60 Hz							
ATV 212H075N4	20	50	15	13.8	0.13	**VW3 A31 404**	1.000
ATV 212HU15N4	20	50	15	13.8	0.45	**VW3 A31 404**	1.000
ATV 212HU22N4	20	50	25	13.8	0.9	**VW3 A31 404**	1.000
ATV 212HU30N4	20	50	25	37	1	**VW3 A31 406**	1.650
ATV 212HU40N4	20	50	25	37	1.6	**VW3 A31 406**	1.650
ATV 212HU55N4	20	50	25	37	3	**VW3 A31 406**	1.650
ATV 212HU75N4	20	90	47	42.8	1.9	**VW3 A31 407**	3.150
ATV 212HD11N4	20	90	47	42.8	3.9	**VW3 A31 407**	3.150
ATV 212HD15N4	20	50	49	42.8	9.2	**VW3 A31 409**	4.750
ATV 212HD18N4, HD22N4S	20	50	49	42.8	13.8	**VW3 A31 409**	4.750
ATV 212HD22N4	–	100	90	84.5	7.3	**VW3 A4 406**	15.000
ATV 212HD30N4	–	100	90	84.5	13.5	**VW3 A4 406**	15.000
ATV 212HD37N4	100	100	92	106	16	**VW3 A4 407**	17.000
ATV 212HD45N4	100	100	92	106	23	**VW3 A4 407**	17.000
ATV 212HD55N4	100	100	180	193	18	**VW3 A4 408**	40.000
ATV 212HD75N4	100	100	180	193	34	**VW3 A4 408**	40.000

(1) The above table gives the maximum lengths for shielded cables connecting motors to drives for a switching frequency of 6 to 16 kHz. These limits are given as examples only as they vary depending on the stray capacitance of the motors and the cables used. If motors are connected in parallel, the sum of the cable lengths must be taken into account.
(2) Nominal filter current.
(3) Maximum earth leakage current at 230 V and at 480 V 60 Hz on a TT system.
(4) Via heat dissipation.