



**Input, DC, Output Inductors.
Current harmonic and dv/dt mitigation**

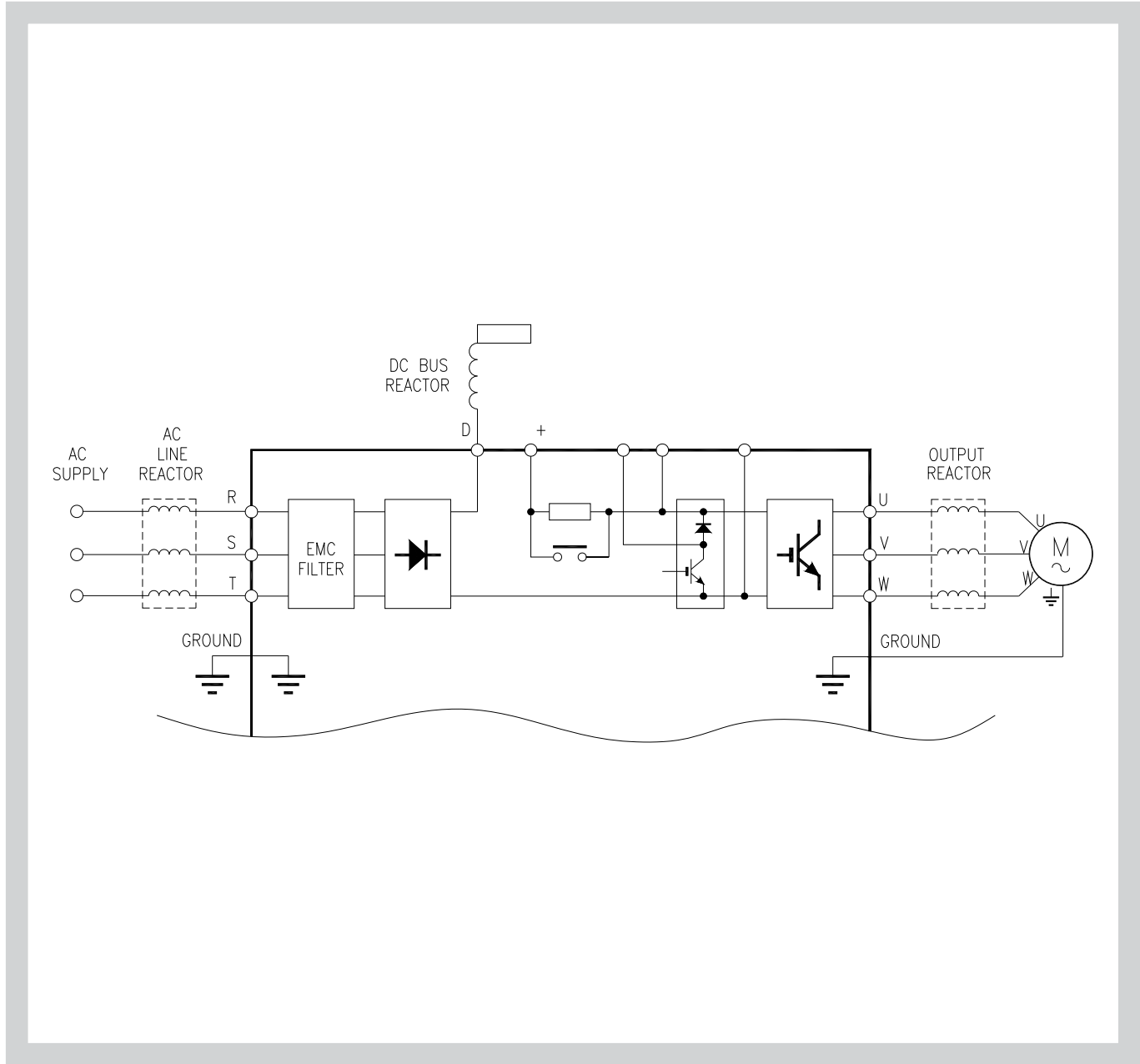
- Limit input current peaks on the input circuit of the inverter
limit di/dt due to the input rectifier and to the capacitive load of the capacitors set;
- Reduce supply harmonic current;
- Increase power factor, thus reducing line current;
- Increase the duration of line capacitors inside the inverter.
- The output inductors reduce the dv/dt on motor cable and windings.

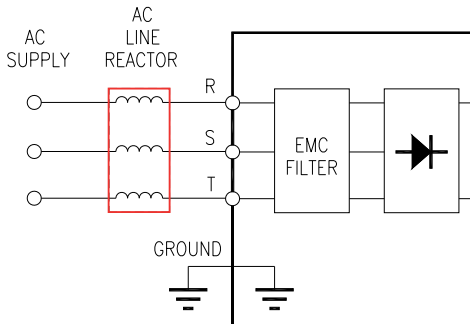
Harmonic currents

Harmonic current is generated by non linear loads absorbing non-sinusoidal current. Typical sources of this type are bridge rectifiers (power electronics), switching power supply units and fluorescent lamps. Three-phase rectifiers absorb line current with a harmonic content $n=6K\pm1$ with $K=1,2,3,\dots$ (e.g. 5th, 7th, 11th, 13th, 17th, 19th, etc.). Harmonic current amplitude decreases when frequency increases. Harmonic current carries no active power; it is additional current carried by electrical cables. Typical effects are: conductor overload, power factor decrease and measurement systems instability. Voltage generated by current flowing in the transformer reactance may also damage other appliances or interfere with mains-synchronized switching equipment.

Santerno inverters

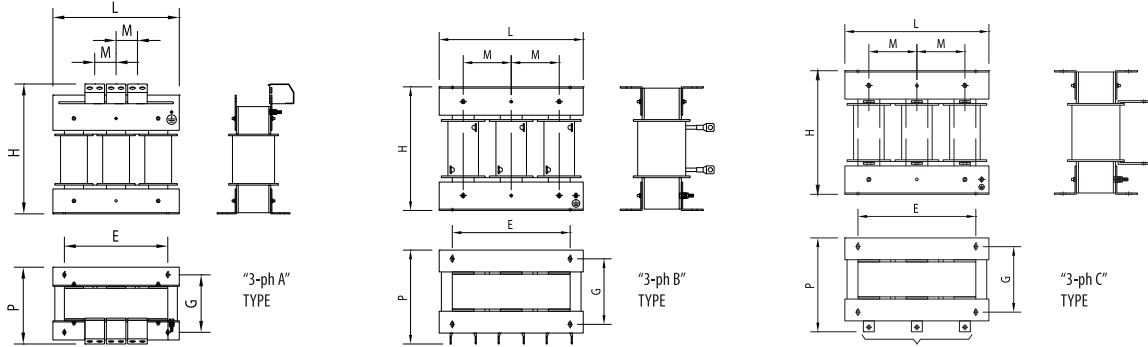
Santerno inverters are specifically designed to reduce line harmonics thanks to mutual design and dimensioning of the DC capacitors, rectifier diodes and the input EMI filter inductors. Input AC line reactors and DC reactors can be selected to further reduce harmonics.





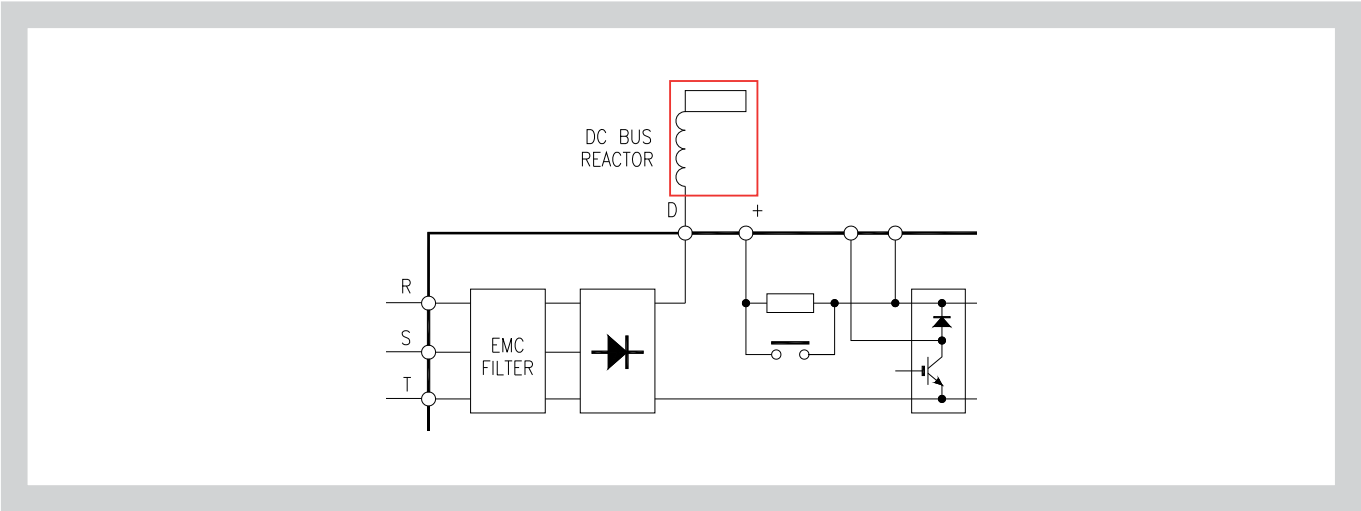
Class 2T – AC Input Inductors

Size	Sinus Penta Model	Input AC 3-phase inductor	Inductance ratings		Max Freq	Dimensions				weight
	Model		mH	Arms		Type	W (mm)	H (mm)	D (mm)	
S05	SINUS 0007	IM0126004	2.00	11	60	3-ph A	120	125	75	2.9
	SINUS 0008	IM0126044	1.27	17	60	3-ph A	120	125	75	3
	SINUS 0010									
	SINUS 0015	IM0126084	0.70	32	60	3-ph B	150	130	115	5.5
	SINUS 0016									
	SINUS 0020									
S12	SINUS 0023	IM0126124	0.51	43	60	3-ph B	150	130	115	6
	SINUS 0033	IM0126144	0.30	68	60	3-ph B	180	160	150	9
	SINUS 0037									
S15	SINUS 0040	IM0126164	0.24	92	60	3-ph B	180	160	150	9.5
	SINUS 0049									
S20	SINUS 0060	IM0126204	0.16	142	60	3-ph B	240	210	175	17
	SINUS 0067									
	SINUS 0074									
	SINUS 0086									
S30	SINUS 0113	IM0126244	0.09	252	60	3-ph B	240	210	220	25
	SINUS 0129									
	SINUS 0150									
	SINUS 0162									
S41	SINUS 0180	IM0126282	0.063	360	60	3-ph C	300	286	205	44
	SINUS 0202									
	SINUS 0217	IM0126332	0.050	455	60	3-ph C	300	317	217	54
	SINUS 0260									
S51	SINUS 0313	IM0126372	0.031	720	60	3-ph C	360	342	268	84
	SINUS 0367									
	SINUS 0402									
S60	SINUS 0457	IM0126404	0.023	945	60	3-ph C	360	320	240	67
	SINUS 0524									



Class 4T – AC Input Inductors

Size	Sinus Penta Model	Input AC 3-phase inductor	Inductance ratings		Max Freq	Dimensions				weight
	Model		mH	Arms		Type	W (mm)	H (mm)	D (mm)	
S05	SINUS 0005	IM0126004	2.00	11	60	3-ph A	120	125	75	2.9
	SINUS 0007	IM0126044	1.27	17	60	3-ph A	120	125	75	3.0
	SINUS 0009									
	SINUS 0011									
	SINUS 0014									
	SINUS 0016	IM0126084	0.70	32	60	3-ph B	150	130	115	5.5
S12	SINUS 0017									
	SINUS 0020	IM0126124	0.51	43	60	3-ph B	150	130	115	6.0
	SINUS 0025									
	SINUS 0030									
	SINUS 0034	IM0126144	0.30	68	60	3-ph B	180	160	150	9.0
	SINUS 0036									
S15	SINUS 0040	IM0126164	0.24	92	60	3-ph B	180	160	150	9.5
	SINUS 0049									
	SINUS 0060									
S20	SINUS 0067	IM0126204	0.16	142	60	3-ph B	240	210	175	17
	SINUS 0074									
	SINUS 0086									
	SINUS 0113									
S30	SINUS 0129	IM0126244	0.09	252	60	3-ph B	240	210	220	25
	SINUS 0150									
	SINUS 0162									
	SINUS 0180									
S41	SINUS 0202	IM0126282	0.063	360	60	3-ph C	300	286	205	44
	SINUS 0217									
	SINUS 0260	IM0126332	0.050	455	60	3-ph C	300	317	217	54
	SINUS 0313									
S51	SINUS 0367	IM0126372	0.031	720		3-ph C	360	342	268	84
	SINUS 0402									
	SINUS 0457									
S60	SINUS 0524	IM0126404	0.023	945	60	3-ph C	300	320	240	67
	SINUS 0598									
S65	SINUS 0748	IM0126444	0.018	1260	60	3-ph C	360	375	280	82
	SINUS 0831									
	SINUS 0964									
S75	SINUS 1130	2 x IM0126404	0.023	945	60	3-ph C	300	320	240	67
	SINUS 1296	2 x IM0126444	0.018	1260	60	3-ph C	360	375	280	82
S90	SINUS 1800	3 x IM0126404	0.023	945	60	3-ph C	300	320	240	67
	SINUS 2076		0.018	1260	60	3-ph C	360	375	280	82

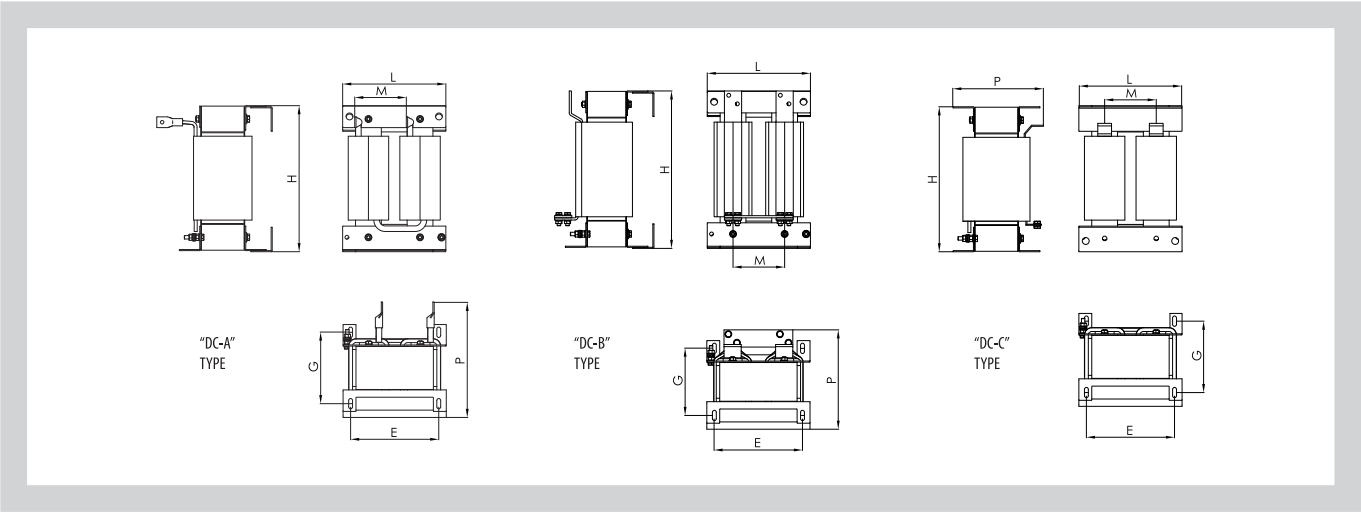


Class 5T-6T – AC Input Inductors

Size	Sinus Penta Model	Input AC 3-phase inductor	Inductance ratings		Max Freq	Dimensions				weight
	Model		mH	Arms	Hz	Type	W (mm)	H (mm)	D (mm)	Kg
S12 5T S14 6T	SINUS 0003	IM0127042	6.4	6.5	60	Please contact Elettronica Santerno				
	SINUS 0004	IM0127062	4.1	10.5	60					
	SINUS 0006									
	SINUS 0012	IM0127082	2.6	16	60					
SINUS 0018										
S14	SINUS 0019	IM0127102	1.8	23	60					
	SINUS 0021									
	SINUS 0022	IM0127122	1.1	40	60					
	SINUS 0024									
S22	SINUS 0032	IM0127142	0.70	57	60					
	SINUS 0042									
	SINUS 0051	IM0127167	0.43	95	60	3-ph B	240	224	187	27
	SINUS 0062									
S32	SINUS 0069	IM0127202	0.29	140	60	3-ph B	300	254	190	35
	SINUS 0076									
	SINUS 0088	IM0127227	0.19	210	60	3-ph B	300	285	218	48
	SINUS 0131									
S42	SINUS 0164	IM0127274	0.12	325	60	3-ph C	300	286	234	60
	SINUS 0181									
	SINUS 0201	IM0127330	0.096	415	60	3-ph C	360	340	250	80
	SINUS 0218									
S52	SINUS 0259	IM0127350	0.061	650	60	3-ph C	360	411	298	113
	SINUS 0290									
	SINUS 0314	IM0127404	0.040	945	60	3-ph C	360	385	260	88
	SINUS 0368									
S65	SINUS 0401	IM0127444	0.030	1260	60	3-ph C	420	440	290	110
	SINUS 0457									
	SINUS 0524	IM0127404	0.040	945	60	3-ph C	360	385	260	88
	SINUS 0598									
S70	SINUS 0748	IM0127444	0.030	1260	60	3-ph C	420	440	290	110
	SINUS 0831									
S75	SINUS 0831	2 x IM0127364	0.058	662	60	3-ph C	360	310	275	79
	SINUS 0964	2 x IM0127404	0.040	945	60	3-ph C	360	385	260	88
S80	SINUS 1130	2 x IM0127444	0.030	1260	60	3-ph C	420	440	290	110
	SINUS 1296	3 x IM0127404	0.040	945	60	3-ph C	360	385	260	88
SINUS 1800										
S90	SINUS 1800	3 x IM0127444	0.030	1260	60	3-ph C	420	440	290	110
	SINUS 2076									

Class 2T – DC Inductors

Size	Sinus Penta Model	DC inductor	Inductance ratings		Dimensions				weight
	Model		mH	Arms	Type	W (mm)	H (mm)	D (mm)	Kg
S05	SINUS 0007	IM0140054	8.0	10.5	DC - A	110	125	100	4.5
	SINUS 0008	IM0140104	5.1	17	DC - A	110	125	100	5
	SINUS 0010								
	SINUS 0015	IM0140154	2.8	32.5	DC - A	120	140	160	8
	SINUS 0016								
S12	SINUS 0020	IM0140204	2.0	47	DC - A	160	240	160	12
	SINUS 0023								
	SINUS 0033	IM0140254	1.2	69	DC - A	160	240	160	13
S15	SINUS 0037								
	SINUS 0040	IM0140284	0.96	100	DC - A	170	240	205	21
	SINUS 0049								
S20	SINUS 0060	IM0140304	0.64	160	DC - A	240	260	200	27
	SINUS 0067								
	SINUS 0074	IM0140404	0.36	275	DC - A	260	290	200	35
S30	SINUS 0086								
	SINUS 0113	IM0140454	0.18	420	DC - B	240	380	220	49
	SINUS 0129								
S41	SINUS 0150	IM0140604	0.14	520	DC - B	240	380	235	57
	SINUS 0162								
	SINUS 0180	IM0140664	0.090	830	DC - B	260	395	270	75
S51	SINUS 0202								
	SINUS 0217	IM0140754	0.092	1040	DC - C	310	470	320	114
	SINUS 0260								
S60	SINUS 0313	IM0140754	0.092	1040	DC - C	310	470	320	114
	SINUS 0367								
	SINUS 0402	IM0140754	0.092	1040	DC - C	310	470	320	114
	SINUS 0457								
	SINUS 0524	IM0140754	0.092	1040	DC - C	310	470	320	114
	SINUS 0524								



Class 4T – DC Inductors

Size	Sinus Penta Model	Input AC 3-phase inductor	Inductance ratings		Dimensions				weight
	Model		mH	Arms	Type	W (mm)	H (mm)	D (mm)	Kg
S05	SINUS 0005	Not applicable							
	SINUS 0007								
	SINUS 0009								
	SINUS 0011								
	SINUS 0014								
S12	SINUS 0016	IM0140154	2.8	32.5	DC-A	120	140	160	8
	SINUS 0017	IM0140204	2.0	47	DC-A	160	240	160	12
	SINUS 0020								
	SINUS 0025	IM0140254	1.2	69	DC-A	160	240	160	13
	SINUS 0030								
S15	SINUS 0034	IM0140254	1.2	69	DC-A	160	240	160	13
	SINUS 0036								
S15	SINUS 0040	IM0140284	0.96	100	DC-A	170	240	205	21
	SINUS 0049								
S20	SINUS 0060	IM0140304	0.64	160	DC-A	240	260	200	27
	SINUS 0067								
	SINUS 0074								
	SINUS 0086								
S30	SINUS 0113	IM0140404	0.36	275	DC-A	260	290	200	35
	SINUS 0129								
	SINUS 0150								
	SINUS 0162								
S41	SINUS 0180	IM0140454	0.18	420	DC-B	240	380	220	49
	SINUS 0202								
	SINUS 0217	IM0140604	0.14	520	DC-B	240	380	235	57
	SINUS 0260								
S51	SINUS 0313	IM0140664	0.090	830	DC-B	260	395	270	75
	SINUS 0367								
	SINUS 0402								
S60	SINUS 0457	IM0140754	0.092	1040	DC-C	310	470	320	114
	SINUS 0524								
S65	SINUS 0598	IM0140854	0.072	1470	DC-C	330	540	320	152
	SINUS 0748								
	SINUS 0831								
S75	SINUS 0964	2 x IM0140754	0.092	1040	DC-C	310	470	320	114
	SINUS 1130	3 x IM0140754	0.092	1040	DC-C	310	470	320	114
S90	SINUS 1296								
	SINUS 1800								
S90	SINUS 2076	3 x IM0140854	0.072	1470	DC-C	330	540	320	152

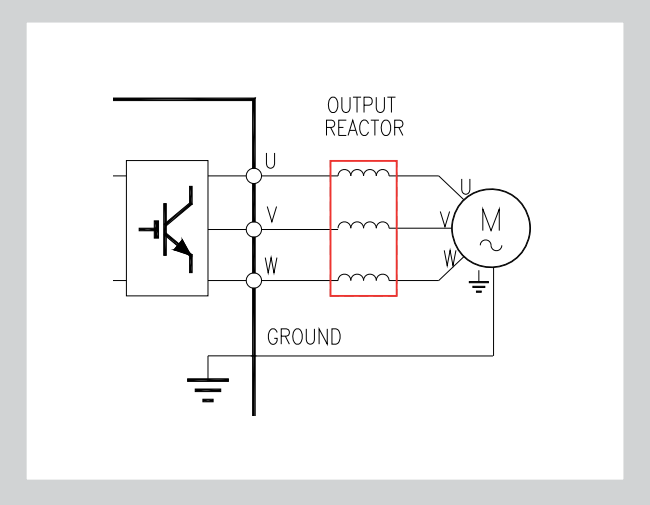
Class 5T-6T – DC Inductors

Size	Sinus Penta Model	Input AC 3-phase inductor	Inductance ratings		Dimensions				weight
	Model		mH	Arms	Type	W (mm)	H (mm)	D (mm)	Kg
S12 5T S14 6T	SINUS 0003	Please contact Elettronica Santerno							
	SINUS 0004								
	SINUS 0006								
	SINUS 0012								
	SINUS 0018								
S14	SINUS 0019								
	SINUS 0021								
	SINUS 0022								
	SINUS 0024								
	SINUS 0032								
S22	SINUS 0042	IM0141404	1.2	110	DC-A	170	205	205	21
	SINUS 0051								
	SINUS 0062								
S32	SINUS 0069	IM0141414	0.80	160	DC-A	200	260	215	27
	SINUS 0076								
	SINUS 0088								
	SINUS 0131	IM0141424	0.66	240	DC-A	240	340	260	53
S42	SINUS 0164								
	SINUS 0181	IM0141434	0.32	375	DC-B	240	380	235	56
	SINUS 0201								
	SINUS 0218	IM0141554	0.27	475	DC-B	240	380	265	66
S52	SINUS 0259								
	SINUS 0290								
	SINUS 0314	IM0141664	0.17	750	DC-B	260	395	295	90
	SINUS 0368								
S65	SINUS 0401								
	SINUS 0457	IM0141804	0.16	1170	DC-C	350	630	360	230
	SINUS 0524								
	SINUS 0598								
S70	SINUS 0748	IM0141904	0.12	1290	DC-C	350	630	360	230
	SINUS 0831								
S75	SINUS 0831	2 x IM0141704	0.232	830	DC-C	330	550	340	163
	SINUS 0964	2 x IM0141804	0.16	1170	DC-C	350	630	360	230
S80	SINUS 1130								
S90	SINUS 1296	3 x IM0141804	0.16	1170	DC-C	350	630	360	230
	SINUS 1800								
S90	SINUS 2076	3 x IM0141904	0.12	1290	DC-C	350	630	360	230

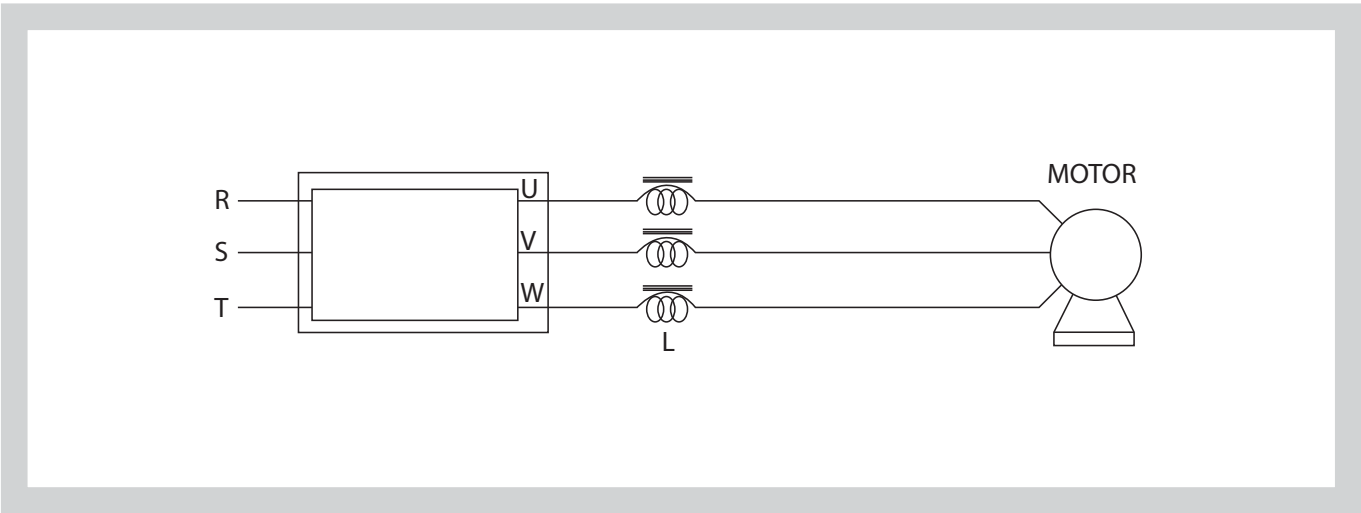
OUTPUT INDUCTORS

Output Inductors (Du/dT filters)

Installations requiring cable lengths over 100m between the inverter and the motor may cause overcurrent protections to frequently trip. This is due to the wire parasite capacity generating current pulses at the inverter output; those current pulses are generated from the high du/dt ratio of the inverter output voltage. The current pulses may be limited by an inductor installed on the inverter Woutput. Shielded cables even have a higher capacity and may cause problems with shorter cable lengths. An adverse effect can also be the stress produced on the motor insulation due to the high du/dt ratio at the inverter output.



OUTPUT INDUCTORS



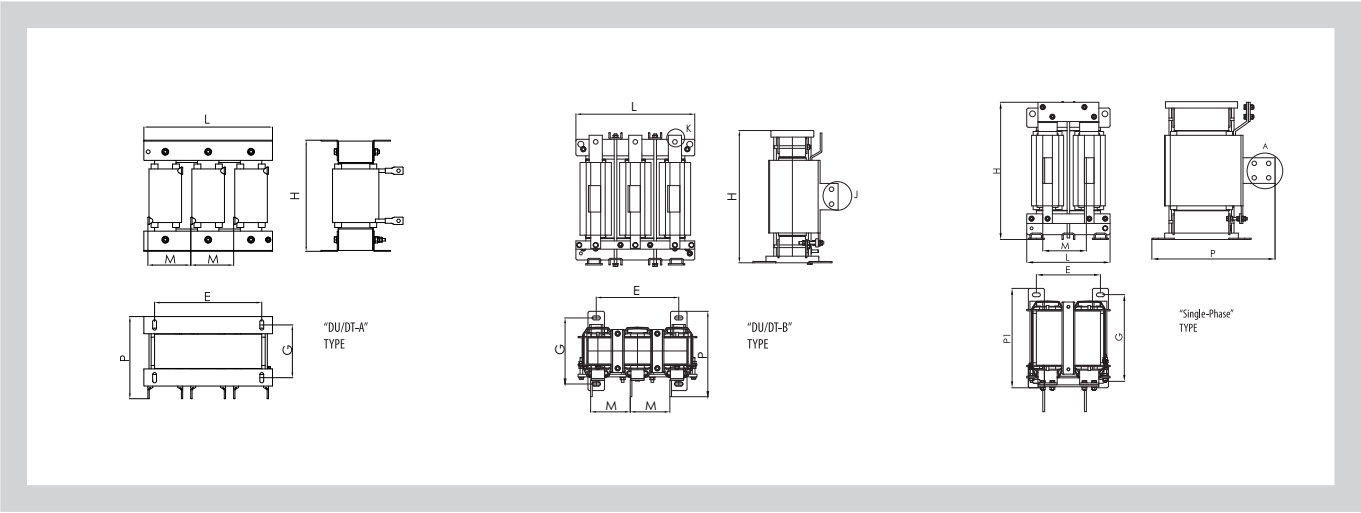
Class 2T – AC Output Inductors

Size	Sinus Penta Model	Input AC 3-phase inductor	Inductance ratings		Max Freq	Dimensions				weight
	Model		mH	Arms		Type	W (mm)	H (mm)	D (mm)	
S05	SINUS 0007	IM0126004	2.00	11	60	3-ph A	120	125	75	2.9
	SINUS 0008	IM0126044	1.27	17	60	3-ph A	120	125	75	3
	SINUS 0010									
	SINUS 0015	IM0126084	0.70	32	60	3-ph B	150	130	115	5.5
	SINUS 0016									
	SINUS 0020									
S12	SINUS 0023	IM0126124	0.51	43	60	3-ph B	150	130	115	6
	SINUS 0033	IM0126144	0.30	68	60	3-ph B	180	160	150	9
	SINUS 0037									
S15	SINUS 0040	IM0126164	0.24	92	60	3-ph B	180	160	150	9.5
	SINUS 0049									
S20	SINUS 0060	IM0126204	0.16	142	60	3-ph B	240	210	175	17
	SINUS 0067									
	SINUS 0074									
	SINUS 0086									
S30	SINUS 0113	IM0126244	0.09	252	60	3-ph B	240	210	220	25
	SINUS 0129									
	SINUS 0150									
	SINUS 0162									
S41	SINUS 0180	IM0138200	0.07	360	120	DU/DT B	360	401	269	77
	SINUS 0202									
	SINUS 0217	IM0138250	0.035	440	120	DU/DT B	360	401	269	75
	SINUS 0260									
S51	SINUS 0313	IM0138300	0.025	700	120	DU/DT B	360	401	269	93
	SINUS 0367									
	SINUS 0402									
S60	SINUS 0457	IM0126404	0.023	945	60	3-ph C	300	320	240	67
	SINUS 0524									

Class 4T – AC Output Inductors

Size	Sinus Penta Model	Input AC 3-phase inductor	Inductance ratings		Max Freq	Dimensions				weight
	Model		mH	Arms		Type	W (mm)	H (mm)	D (mm)	
S05	SINUS 0005	IM0126004	2.00	11	60	3-ph A	120	125	75	2.9
	SINUS 0007	IM0126044	1.27	17	60	3-ph A	120	125	75	3.0
	SINUS 0009									
	SINUS 0011									
	SINUS 0014									
	SINUS 0016	IM0126084	0.70	32	60	3-ph B	150	130	115	5.5
S12	SINUS 0017									
	SINUS 0020									
	SINUS 0025	IM0126124	0.51	43	60	3-ph B	150	130	115	6.0
	SINUS 0030									
	SINUS 0034	IM0126144	0.30	68	60	3-ph B	180	160	150	9.0
	SINUS 0036									
S15	SINUS 0040	IM0126164	0.24	92	60	3-ph B	180	160	150	9.5
	SINUS 0049									
	SINUS 0060									
S20	SINUS 0067	IM0126204	0.16	142	60	3-ph B	240	210	175	17
	SINUS 0074									
	SINUS 0086									
	SINUS 0113									
S30	SINUS 0129	IM0126244	0.09	252	60	3-ph B	240	210	220	25
	SINUS 0150									
	SINUS 0162									
	SINUS 0180									
S41	SINUS 0202	IM0138200	0.07	360	120	DU/DT - B	360	401	269	77
	SINUS 0217	IM0138250	0.035	440	120	DU/DT - B	360	401	269	75
	SINUS 0260									
	SINUS 0313									
S51	SINUS 0367	IM0138300	0.025	700	120	DU/DT - B	360	401	269	93
	SINUS 0402									
	SINUS 0457									
S60	SINUS 0524	IM0126404	0.023	945	60	3-ph C	300	320	240	67
	SINUS 0598									
S65	SINUS 0748	IM0126444	0.018	1260	60	3-ph C	360	375	280	82
	SINUS 0831									
	SINUS 0964									
S75	SINUS 1130	6 x IM0141782	0.015	1250	60	Single-Phase	260	430	385	100
	SINUS 1296									
	SINUS 1800									
S90	SINUS 2076	9 x IM0141782	0.015	1250	60	Single-Phase	260	430	385	100
	SINUS 2076									

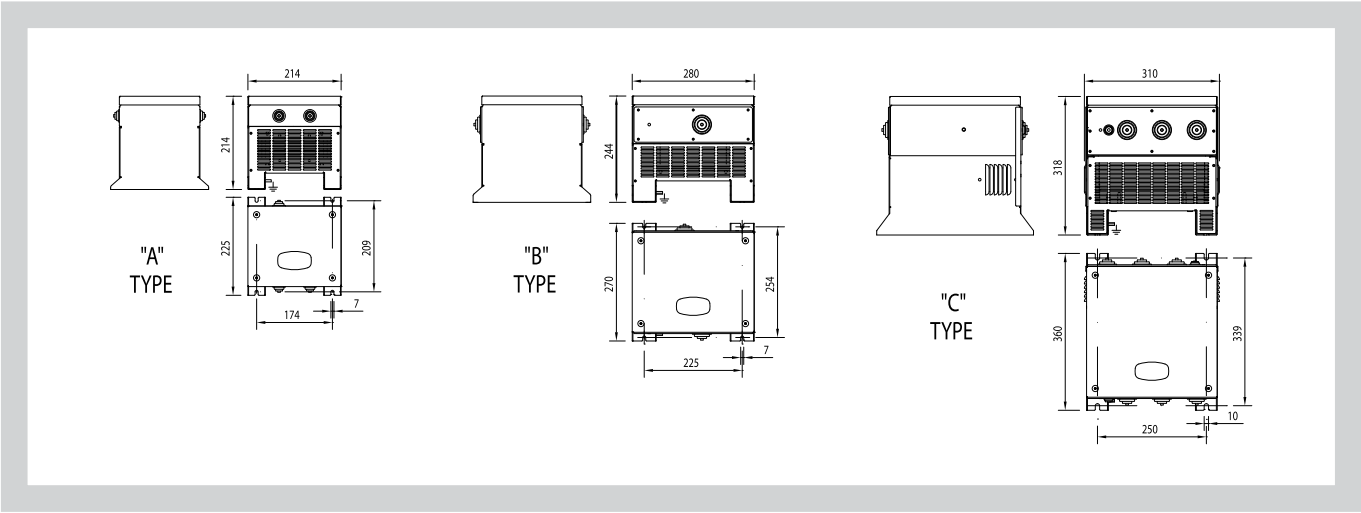
OUTPUT INDUCTORS



Class 5T-6T – AC Output Inductors

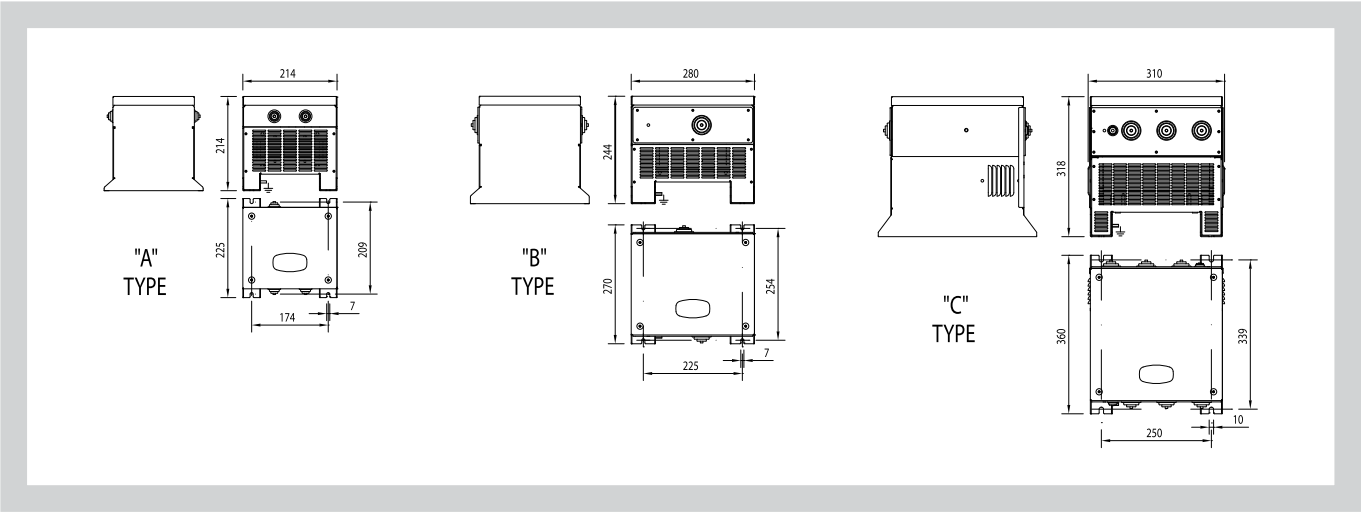
Size	Sinus Penta Model	Input AC 3-phase inductor	Inductance ratings		Max Freq	Dimensions				weight
	Model		mH	Arms	Hz	Type	W (mm)	H (mm)	D (mm)	Kg
S12 5T S14 6T	SINUS 0003	IM0138000	1.5	9.5	120	Please contact Elettronica Santerno				
	SINUS 0004									
	SINUS 0006	IM0138010	1.0	14	120					
	SINUS 0012									
SINUS 0018	IM0138020	0.80	18.5	120						
S14	SINUS 0019	IM0138030	0.60	27	120					
	SINUS 0021									
	SINUS 0022	IM0138040	0.42	43	120					
	SINUS 0024									
SINUS 0032	IM0138045	0.28	65	120						
SINUS 0042										
S22	SINUS 0051	IM0138050	0.17	105	120	DU/DT A	300	259	192	39
	SINUS 0062									
	SINUS 0069									
S32	SINUS 0076	IM0138100	0.11	165	120	DU/DT A	300	258	198	42
	SINUS 0088									
	SINUS 0131	IM0138150	0.075	240	120	DU/DT A	300	321	208	52
SINUS 0164										
S42	SINUS 0181	IM0138200	0.070	360	120	DU/DT B	360	401	269	77
	SINUS 0201									
	SINUS 0218	IM0138250	0.035	440	120	DU/DT B	360	401	268	75
	SINUS 0259									
S52	SINUS 0290	IM0138300	0.025	700	120	DU/DT B	360	411	279	93
	SINUS 0314									
	SINUS 0368									
S65	SINUS 0401	IM0127404	0.040	945	60	DU/DT C	360	385	260	88
	SINUS 0457									
	SINUS 0524									
	SINUS 0598									
S70	SINUS 0748	IM0127444	0.030	1260	60	DU/DT C	420	440	290	110
	SINUS 0831									
S75	SINUS 0964	6 x IM0141782	0.015	1250	60	Single-Phase	260	430	385	100
S80	SINUS 1130									
S90	SINUS 1296	9 x IM0141782	0.015	1250	60	Single-Phase	260	430	385	100
	SINUS 1800									
	SINUS 2076									

IP54 INDUCTORS



Class 2T - INPUT-OUTPUT 3-Phase AC Inductors in IP54 enclosure

Size	Sinus Penta model	Inductor model	Use	Mechanical dimensions	Weight	Losses
				Type	kg	W
S05	SINUS 0007	ZZ0112020	Input-output	A	7	48
	SINUS 0008					
	SINUS 0010					
	SINUS 0015	ZZ0112030	Input-output	A	9.5	70
	SINUS 0016					
S12	SINUS 0020	ZZ0112040	Input-output	A	10	96
	SINUS 0023					
	SINUS 0033	ZZ0112045	Input-output	B	14	150
S15	SINUS 0037					
	SINUS 0040	ZZ0112050	Input-output	B	14.5	183
	SINUS 0049					
S20	SINUS 0060	ZZ0112060	Input-output	C	26	272
	SINUS 0067					
	SINUS 0074					
	SINUS 0086	ZZ0112070	Input-output	C	32.5	342
S30	SINUS 0113					
	SINUS 0129					
	SINUS 0150					
	SINUS 0162					



Class 4T - INPUT-OUTPUT 3-Phase AC Inductors in IP54 enclosure

Size	Sinus Penta model	Inductor model	Use	Mechanical dimensions	Weight	Losses
				Type	kg	W
S05	SINUS 0005	ZZ0112010	Input-output	A	6.5	29
	SINUS 0007	ZZ0112020	Input-output	A	7	48
	SINUS 0009					
	SINUS 0011					
S12	SINUS 0014	ZZ0112030	Input-output	A	9.5	70
	SINUS 0016					
	SINUS 0017					
	SINUS 0020	ZZ0112040	Input-output	A	10	96
	SINUS 0025					
	SINUS 0030	ZZ0112045	Input-output	B	14	150
S15	SINUS 0034					
	SINUS 0036	ZZ0112050	Input-output	B	14.5	183
	SINUS 0040					
S20	SINUS 0049					
	SINUS 0060	ZZ0112060	Input-output	C	26	272
	SINUS 0067					
	SINUS 0074					
S30	SINUS 0086	ZZ0112070	Input-output	C	32.5	342
	SINUS 0113					
	SINUS 0129					
	SINUS 0150					
	SINUS 0162					

Class 5T-6T - INPUT 3-Phase AC Inductors in IP54 enclosure

Size	Sinus Penta model	Inductor model	Use	Mechanical dimensions	Weight	Losses
				Type	kg	W
S12 5T S14 6T	SINUS 0003	ZZ0112110	Input only	Please contact Elettronica Santerno		
	SINUS 0004	ZZ0112120	Input only			
	SINUS 0006		ZZ0112130			
	SINUS 0012	Input only				
S14	SINUS 0018	ZZ0112140	Input only			
	SINUS 0019		Input only			
	SINUS 0021		Input only			
	SINUS 0022		Input only			
S22	SINUS 0024	ZZ0112150	Input only			
	SINUS 0032	ZZ0112160	Input only			
	SINUS 0042		Input only			
	S32	SINUS 0051	ZZ0112170			
SINUS 0062		Input only				
SINUS 0069		ZZ0112180	Input only			
SINUS 0076			Input only			
S32	SINUS 0088	ZZ0112190	Input only			
	SINUS 0131		Input only			
	SINUS 0164					

Class 5T-6T - OUTPUT 3-Phase AC Inductors in IP54 enclosure

Size	Sinus Penta model	Inductor model	Use	Mechanical dimensions	Weight	Losses
				Type	kg	W
S12 5T S14 6T	SINUS 0003	ZZ0112115	Output only	Please contact Elettronica Santerno		
	SINUS 0004					
	SINUS 0006	ZZ0112125	Output only			
	SINUS 0012					
SINUS 0018	ZZ0112135	Output only				
S14	SINUS 0019	ZZ0112145	Output only			
	SINUS 0021					
	SINUS 0022	ZZ0112155	Output only			
	SINUS 0024					
S22	SINUS 0032	ZZ0112165	Output only			
	SINUS 0042					
	SINUS 0051	ZZ0112175	Output only			
	SINUS 0062					
S32	SINUS 0069	ZZ0112185	Output only			
	SINUS 0076					
	SINUS 0088	ZZ0112195	Output only			
	SINUS 0131					
	SINUS 0164					