



## Sinusfilter *Plus*<sup>++</sup><sup>®</sup>

Output filters for common-mode,  
high-frequency interference.

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### Output filters for common-mode, high-frequency interference

Inverters with a switching frequency of between 2 and 20 kHz produce a considerable amount of common-mode disturbances. Due to the fast switching of the DC voltage, spikes are induced in the motor cables - the longer the cable, the higher the peak amplitude. This results in a fast-rising voltage, which contains many harmonic frequencies. The rapid increase in voltage causes adverse ripple on the sinusoidal wave-form between the mains conductors and earth. The resulting switching disturbances and unwanted impulse currents may lead to the long-term damage of an electrical system.

The Sinusfilter Plus<sup>++</sup><sup>®</sup> is a combination of conventional differential and common-mode filters and is connected to the DC-link circuit to provide a low impedance path back to the source of the parasitic currents. Spindle-bearing currents in the motor originate from the DC-link and so protection of the mechanical system is ensured. In addition to the reduction of switching disturbances, radio frequency interference on the input side of the inverter is also reduced and the general EMC is greatly enhanced.

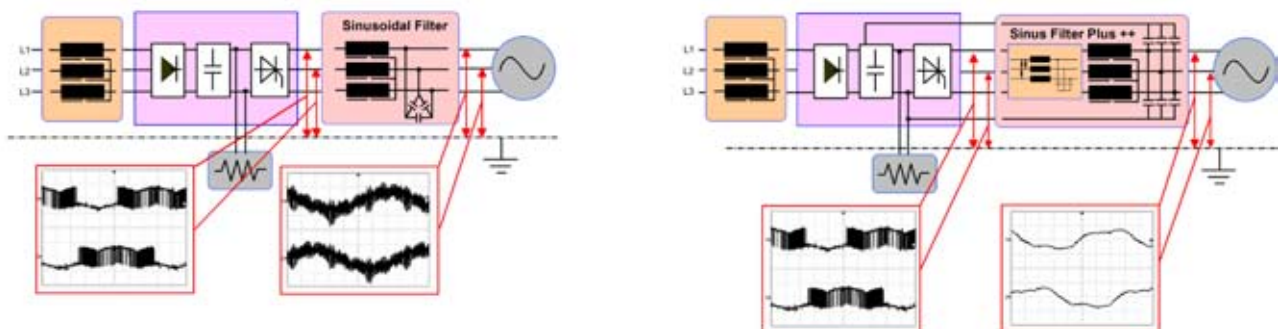
In long cable lengths, such as those necessary for use in heat-pumps or high-rise buildings, the common-mode disturbances take the path of lowest impedance back to earth. These disturbances can also cause inaccurate and unacceptable measurement of water flow-rates. Again, this problem can be solved by using the Sinusfilter Plus<sup>++</sup><sup>®</sup>.

In any application where long cable runs and common mode RF interference cause massive problems, the Sinusfilter Plus<sup>++</sup><sup>®</sup> is the best choice for providing long-term protection of mechanical equipment, and also insurance for the plant operator against costly repairs, or in the worst case replacement of a complete system.

Advantages of Sinusfilter Plus<sup>++</sup><sup>®</sup>:

- longer cable runs can be used between the frequency inverter and motor
- higher switching frequencies < 8 kHz
- reduction of audible noise
- reduction of cable losses
- removes the need for additional filters on the input side of the inverter (which already has an integrated filter)
- reduction of radiated emissions from cables
- allows use of unshielded cables
- prevention of harmful leakage currents

Comparison between a conventional sinusoidal filter and Sinusfilter Plus<sup>++</sup><sup>®</sup>





#### Technical data

Sinusfilter Plus <sup>++</sup>	Rated voltage [V]	Rated current [A]	Total inductance [mH]	Capacitance [μF]	Copper [kg]	Weight [kg]
CNW 961 / 2	bis 3 x 500 (50 / 60 Hz)	2	33,4	0,22	1,4	5,2
CNW 961 / 4		4	16,7	0,68	1,65	5,3
CNW 961 / 6		6	11,0	0,75	3,0	8,0
CNW 961 / 10		10	6,60	0,75	4,5	10,0
CNW 961 / 16		16	4,20	1,10	5,0	15,0
CNW 961 / 24		24	2,36	1,50	6,5	17,0
CNW 961 / 30		30	2,0	2,20	12,0	37,0
CNW 961 / 37		37	1,64	2,20	12,5	38,0
CNW 961 / 48		48	0,85	3,30	16,2	42,0
CNW 961 / 60		60	0,89	4,7	17,0	44,5

As for all REO components the Sinusfilter Plus<sup>++</sup> can be constructed to fulfil customer's specific requirements.



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