



External EMC Filters User Guide

Using EMC Filters

Most electronic equipment will generate electrical noise, small unwanted disturbances which may be conducted back onto the mains power supply. All Invertek products are designed to minimise this noise transfer, and offer high levels of Electro Magnetic Compatibility. Where required, additional EMC Filters may be added to further reduce the level of noise transferred back to the mains power supply, reducing the risk of other equipment being affected.

In general, most modern electronic devices have a high level of immunity to electro-magnetic noise, and thereby in many cases additional filters are not required, however where highly sensitive equipment is used, or a reduction in the electrical noise is required, these EMC filters can be fitted in line with the Optidrive to reduce the conducted noise emission.

Important Safety Information

This option is specifically designed to be used with the Optidrive variable speed drive product range and is intended for professional incorporation into complete equipment or systems. If installed incorrectly it may present a safety hazard. The Optidrive uses high voltages and currents, carries a high level of stored electrical energy, and is used to control mechanical plant that may cause injury. Close attention is required to system design and electrical installation to avoid hazards in either normal operation or in the event of equipment malfunction. Optidrives and the Options should be installed only by qualified electrical persons and in accordance with local and national regulations and codes of practice.

Electric shock hazard! Disconnect and **ISOLATE** the Optidrive before attempting any work on it. High voltages are present at the terminals and within the drive for up to 10 minutes after disconnection of the electrical supply.

Where the electrical supply to the drive is through a plug and socket connector, do not disconnect until 10 minutes have elapsed after turning off the supply.

It is the responsibility of the installer to ensure that the equipment or system into which the product is incorporated complies with the EMC legislation of the country of use. Within the European Union, equipment into which this product is incorporated must comply with 2004/108/EC, Electromagnetic Compatibility.

Within the European Union, all machinery in which this product is used must comply with the Directive 98/37/EC, Safety of Machinery. In particular, the equipment should comply with EN60204-1.

The manufacturer accepts no liability for any consequences resulting from inappropriate, negligent or incorrect installation.

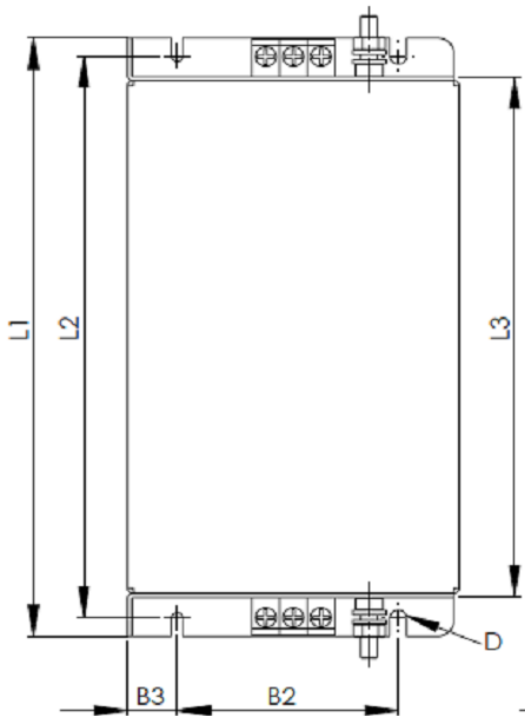
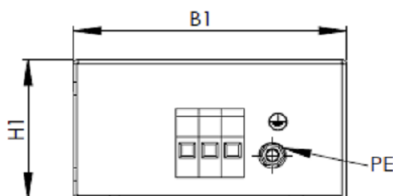
The contents of this User Guide are believed to be correct at the time of printing. In the interests of a commitment to a policy of continuous improvement, the manufacturer reserves the right to change the specification of the product or its performance or the contents of the User Guide without notice.

Dimensions – Panel Mount – Single Phase

Part Number	Optidrive Size	PE Connection	L1 (mm)	L2 (mm)	L3 (mm)	B1 (mm)	B2 (mm)	B3 (mm)	H1 (mm)	H2 (mm)	H3 (mm)	D (mm)	Rated Amps	Weight (kg)
OPT-2-E1010-20	1	2 x M6	180	166	150	70	45	12.5	65	40	12.5	6.2	10	1.5
OPT-2-E1025-20	2	2 x M6	250	236	220	70	45	12.5	65	40	12.5	6.2	25	2.8

Dimensions – Panel Mount – Three Phase – Frame Sizes 1 - 3

Part Number	Optidrive Size	PE Connection	L1 (mm)	L2 (mm)	L3 (mm)	B1 (mm)	B2 (mm)	B3 (mm)	H1 (mm)	H2 (mm)	H3 (mm)	D (mm)	Rated Amps	Weight (kg)
OPT-2-E3006-20	1	2.5	210	196	180	85	55	15	60	40	10	6.2	6	2.7
OPT-2-E3016-20	2	2.5	230	216	200	120	80	20	65	40	12.5	6.2	16	2.7
OPT-2-E3025-20	3	2.5	230	216	200	120	80	20	65	40	12.5	6.2	25	2.7

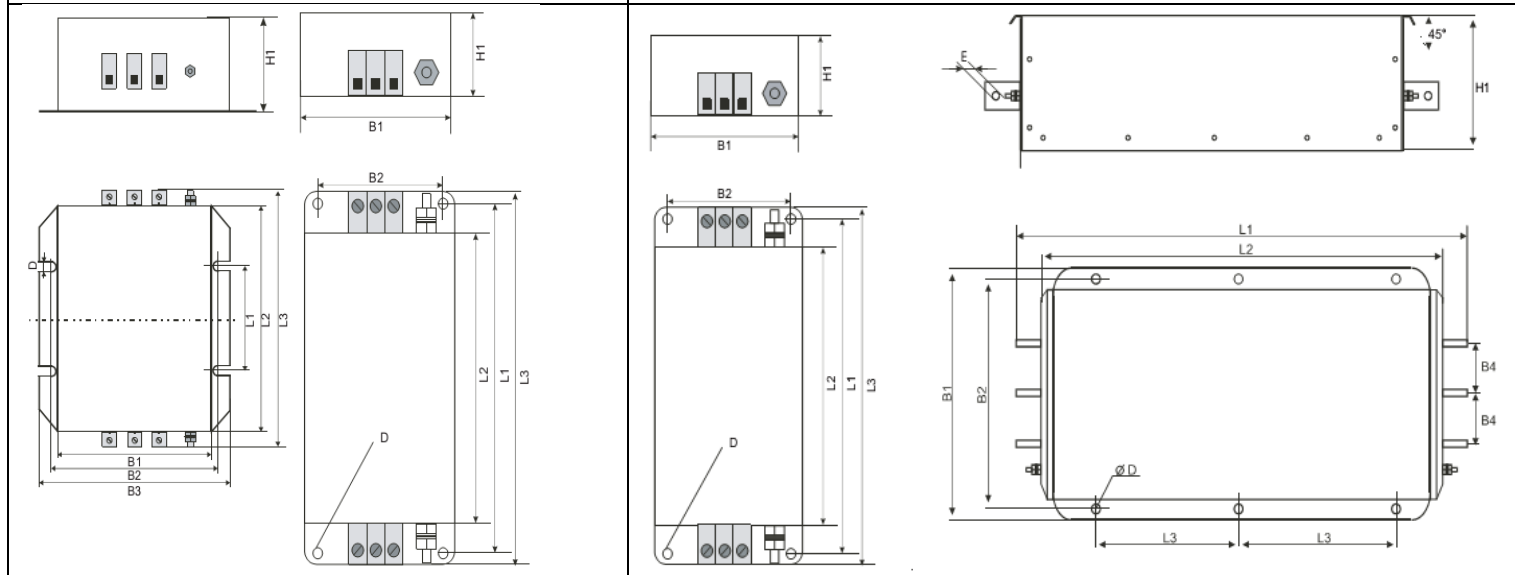


Dimensions – Panel Mount – Three Phase – Frame Sizes 4 - 7

Part Number	Optidrive Size	PE Connection	L1 (mm)	L2 (mm)	L3 (mm)	B1 (mm)	B2 (mm)	B3 (mm)	H1 (mm)	D (mm)	Rated Amps
OPT-2-E3050-20	4	2 x M6	115	200	240	120	136	150	65	6.5	50
OPT-2-E3080-20	5	2 x M10	373	350	400	170	130	-	65	6.5	80
OPT-2-E3180-20	6	2 x M10	470	360	510	180	156	-	115	9	180
OPT-2-E3300-00	7	2 x M10	660	530	700	260	220	-	130	9	300
OPT-2-E3500-00	8	2 x M12	390	306	-	260	235	-	135	11	500

Size 4 - 6

Size 7 - 8

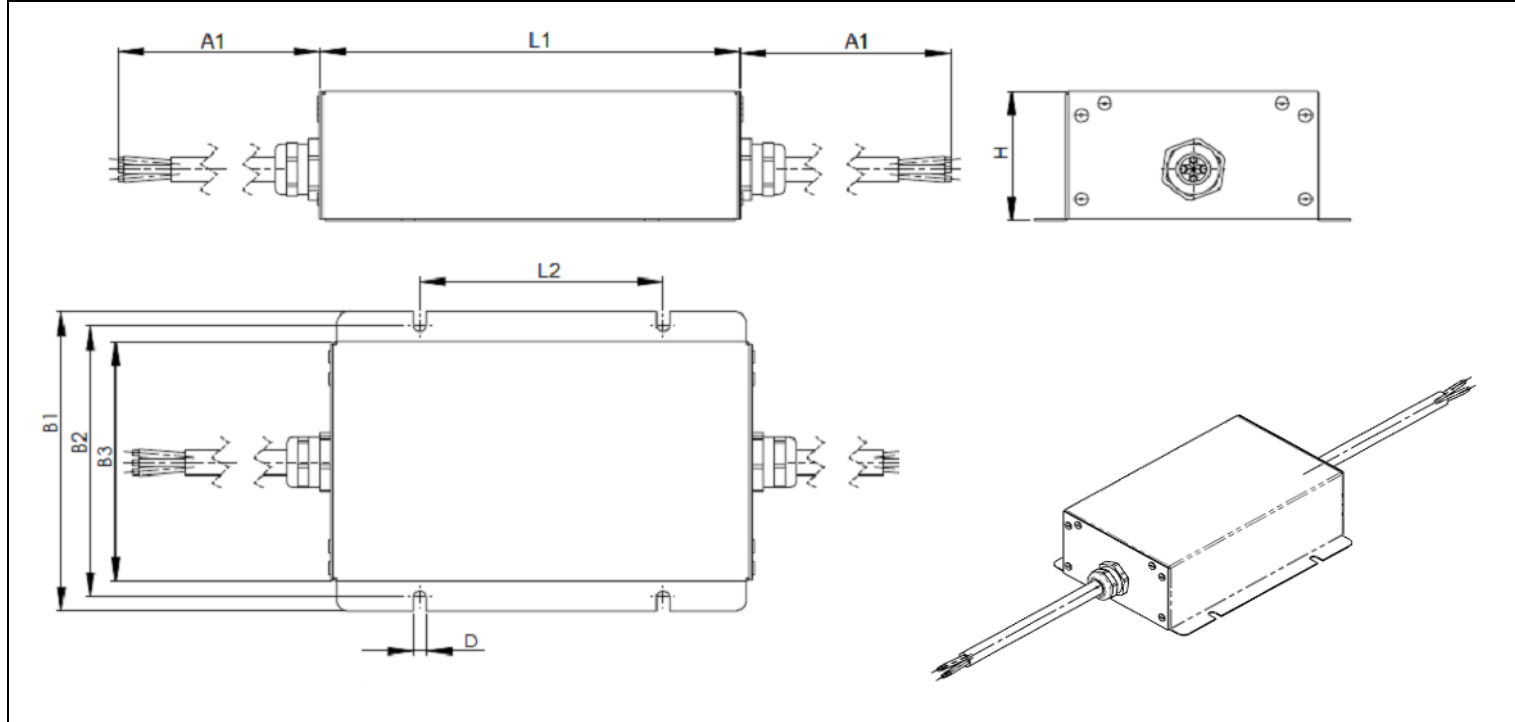


Dimensions – Enclosed – Single Phase

Part Number	Optidrive Size	PE Connection	L1 (mm)	L2 (mm)	L3 (mm)	B1 (mm)	B2 (mm)	B3 (mm)	H (mm)	D (mm)	A1 (mm)	Rated Amps	Weight (kg)
OPT-2-E1010-66	1	2 x M6	180	166	150	70	45	12.5	65	6.2	500	10	1.5
OPT-2-E1025-66	2	2 x M6	250	236	220	70	45	12.5	65	6.2	500	25	2.8

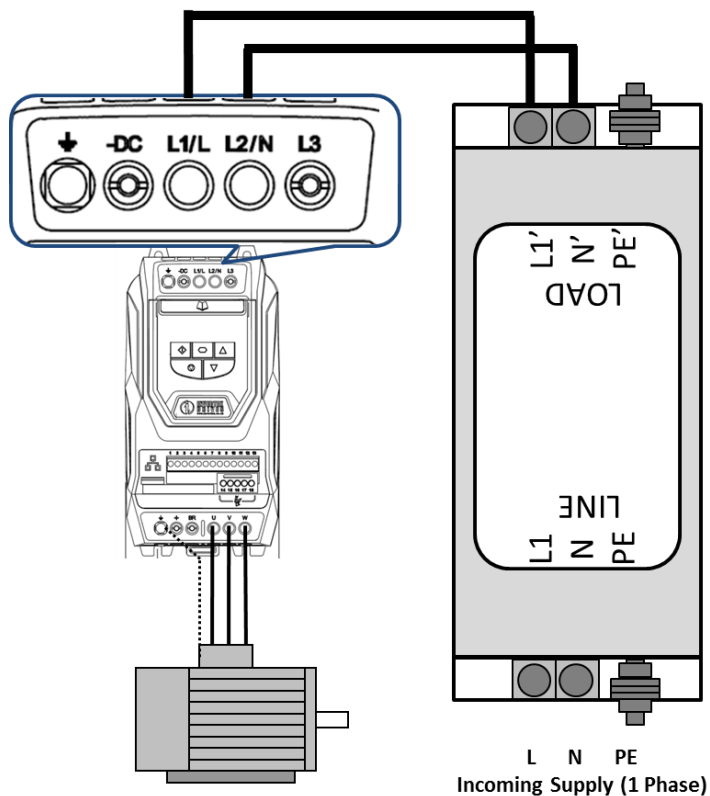
Dimensions – Enclosed – Three Phase

Part Number	Optidrive Size	PE Connection	L1 (mm)	L2 (mm)	L3 (mm)	B1 (mm)	B2 (mm)	B3 (mm)	H (mm)	D (mm)	A1 (mm)	Rated Amps	Weight (kg)
OPT-2-E3006-66	1	2.5	210	196	180	85	55	15	60	6.2	500	6	2.7
OPT-2-E3016-66	2	2.5	230	216	200	120	80	20	65	6.2	500	16	2.7
OPT-2-E3025-66	3	2.5	200	115	-	150	136	120	65	6.2	500	25	2.7

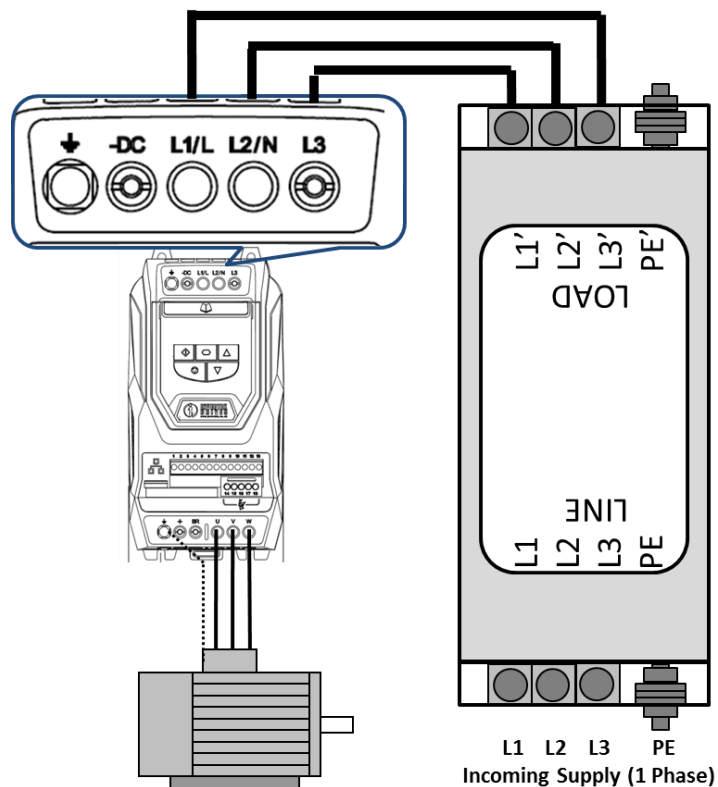


Installation Schematic Diagram

Single Phase Supply Installation



3 Phase Supply Installation



Installation

To ensure best possible EMC performance, correct installation and connection of the Optidrive, EMC Filter and motor is essential. The following points highlight some of the requirements where particular attention should be paid.

- The EMC Filter **MUST** be Grounded. Connection to ground through the largest surface area possible is recommended for best performance, which can be achieved by mounting the EMC filter directly to an unpainted control panel backplate. Where this is not possible, use the ground studs provided to ensure a good connection, preferably using a flat earth braid to ensure good operation at high frequency.
- Connect the LINE side of the EMC Filter to the incoming AC supply
- Observe the correct connection orientation
 - For Single Phase Filters
 - L1 = Live Connection
 - N = Neutral Connection
 - PE = Ground / Earth connection
 - For Three Phase Filters
 - L1, L2, L3 = Incoming Live connection, the phase sequence is unimportant
 - PE = Ground / Earth connection
- Connect the LOAD side of the filter to the drive incoming power connection terminals
- A shielded type motor cable must be used, with the shield connected to ground at both ends
- 360° EMC Cable glands should be used where the cable exists the control cabinet, and where the cable enters the motor

Electrical Specification – Single Phase			Electrical Specification – Three Phase		
Voltage Range	200 – 250 VAC		Voltage Range	380 – 480 VAC	
Frequency Range	48 – 62Hz		Frequency Range	48 – 62Hz	
Leakage Current	OPT-2-E1010-00	< 5mA	Leakage Current	OPT-2-E3006-00	< 10mA
	OPT-2-E1025-00	< 5mA		OPT-2-E3016-00	< 35mA
				OPT-2-E3025-00	< 35mA
				OPT-2-E3050-20	< 180mA
				OPT-2-E3080-20	< 200mA
				OPT-2-E3180-20	< 220mA
				OPT-2-E3300-00	< 260mA
				OPT-2-E3500-00	< 100mA

Drive & Filter Compatibility

The following table shows the EMC filter to be used with each respective drive rating.

1 Phase Input, 230 Volt AC Supply, Drive fitted with internal EMC Filter

Frame Size	kW	HP	EMC Filter Model Code	Optidrive E2	Optidrive P2	Optidrive Eco	Optidrive Elevator
1	0.37	0.5	OPT-2-E1010-xx	✓	✓	✓	
	0.75	1	OPT-2-E1025-xx	✓	✓	✓	
	1.5	2	OPT-2-E1025-xx	✓	✓	✓	
2	1.5	2	OPT-2-E1025-xx	✓	✓	✓	
	2.2	3	OPT-2-E1025-xx	✓	✓	✓	

3 Phase Input, 400 Volt AC Supply, Drive fitted with internal EMC Filter

Frame Size	kW	HP	EMC Filter Model Code	Optidrive E2	Optidrive P2	Optidrive Eco	Optidrive Elevator
1	0.75	1	OPT-2-E3006-xx	✓			
	1.5	2	OPT-2-E3006-xx	✓			
2	1.5	2	OPT-2-E3006-xx	✓	✓	✓	✓
	2.2	3	OPT-2-E3016-xx	✓	✓	✓	✓
	4	5	OPT-2-E3016-xx	✓	✓	✓	✓
3	5.5	7.5	OPT-2-E3016-xx	✓	✓	✓	✓
	7.5	10	OPT-2-E3025-xx	✓	✓	✓	✓
	11	15	OPT-2-E3025-xx	✓	✓	✓	✓
4	11	15	OPT-2-E3025-xx		✓	✓	✓
	15	20	OPT-2-E3050-20		✓	✓	✓
	18.5	25	OPT-2-E3050-20		✓	✓	✓
	22	30	OPT-2-E3050-20		✓	✓	✓
5	30	40	OPT-2-E3080-20		✓	✓	✓
	37	50	OPT-2-E3080-20		✓	✓	✓
	45	60	OPT-2-E3180-20			✓	
6	45	60	OPT-2-E3180-20		✓		
	55	75	OPT-2-E3180-20		✓	✓	
	75	100	OPT-2-E3180-20		✓	✓	
	90	120	OPT-2-E3180-20		✓	✓	
7	110	150	OPT-2-E3300-00		✓	✓	
	132	175	OPT-2-E3300-00		✓	✓	
	160	250	OPT-2-E3300-00		✓	✓	
8	200	300	OPT-2-E3500-00		✓	✓	
	250	350	OPT-2-E3500-00		✓	✓	



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