8EF0160H300.1-1

1 General information

Passive line filter 8EF0160H300.1-1 is characterized by very low leakage currents. This makes it possible to implement compact ACOPOS P3 topologies with ACOPOS P3 8EI servo drives with a nominal current of up to 8.8 A per axis and fuse protection with a 30 mA RCD[1]. The leakage current is only 11.5 mA even when the system is switched on/off. [2]

Danger!

Where a residual current protective device (RCD) is used for protection in case of direct or indirect contact, only a type B RCD (AC/DC-sensitive per IEC 60755) is permitted for the mains connection of the ACOPOS P3 servo drive.

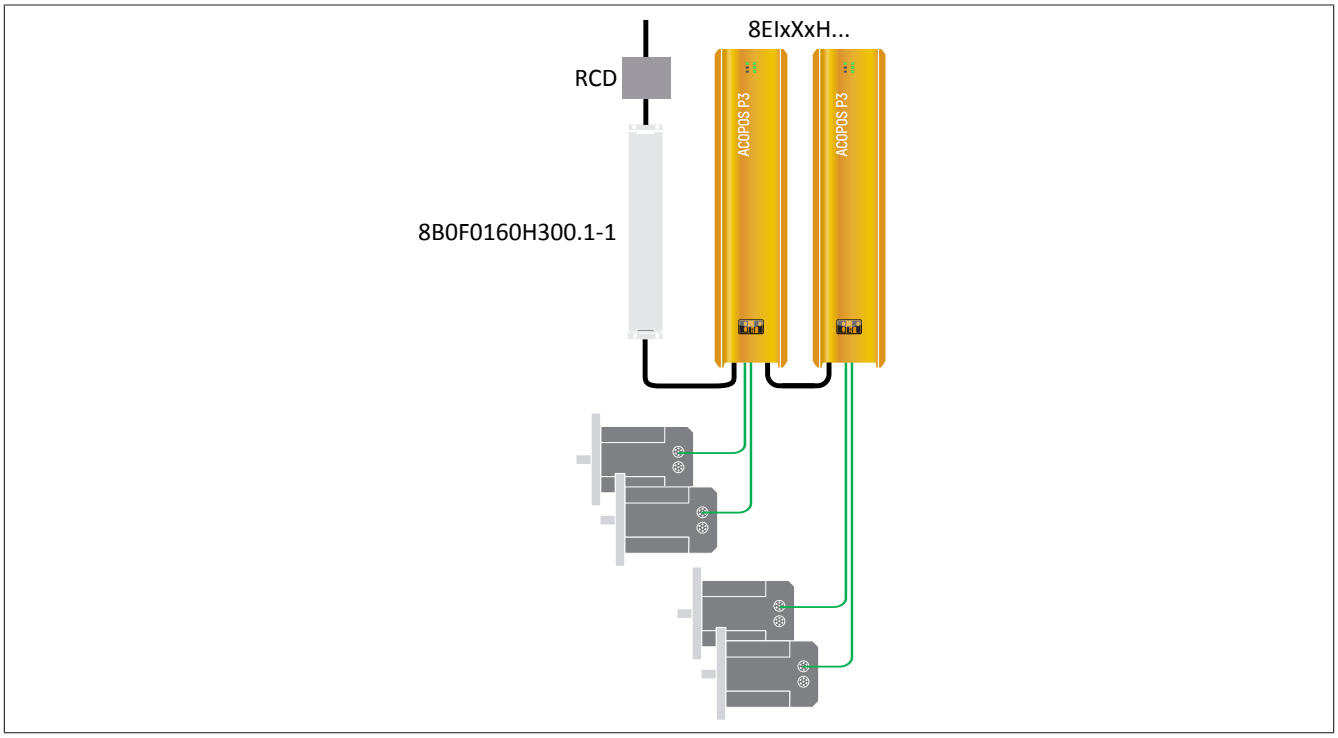


Figure 1: Example topology with line filter 8EF0160H300.1-1

Mains connection - Wiring
Motor cable 8ECM/8CCM

Requirements

- IT jumper X10 must be removed from all ACOPOS P3 8EI servo drives. This reduces the leakage current of the 8EI servo drive to 0 mA; the leakage current is then determined by the line filter.
- All ACOPOS P3 8EI servo drives must be operated with the same switching frequency.
- The wiring between the ACOPOS P3 and line filter must be twisted and as short as possible. The total length of the wiring between the line filter and ACOPOS P3 is not permitted to exceed 3 m.

[1] All-current sensitive, 4-pin residual-current circuit breaker F 204 from ABB can be used, for example.
[2] 3x480 VAC, 50 Hz, 2 isolated phases.

Caution!

The total permissible length of all B&R motor / hybrid motor cables per 8EF0160H300.1-1 line filter is limited to the following values, depending on the switching frequency of the ACOPOS P3 8EI servo drives:

- **Switching frequency 5 kHz: 12 m[3)].**
- **Switching frequency 10 kHz: 8 m**
- **Switching frequency 20 kHz: 4 m**

Exceeding the permissible values can result in irreparable damage to line filter 8EF0160H300.1-1!

2 Order data

Order number	Short description	Figure
8EF0160H300.1-1	Passive line filter, 16 A, 3x 480 VAC, 50/60 Hz, IP20, low leakage	

Table 1: 8EF0160H300.1-1 - Order data

3 Technical data

Order number	8EF0160H300.1-1
General information	
Cooling and mounting type	Wall mounting
Certification	CE UL E493879
Certifications	
CE	Yes
UKCA	Yes
UL	UR E493879
Mains connection	
Permissible network configurations	TT, TN [1)]
Mains input voltage [2)]	1x 110 - 230 VAC ±10% 3x 200 - 480 VAC ±10%
Frequency	50/60 Hz ±5%
SCCR	5 kA
Mains fuse protection	Max. 45 A (gG per IEC 60269-1 or class J non-delayed per UL 248-8) Max. 36 A (class J time-delayed per UL 248-8) Max. 32 A (LS per IEC 60947-2 characteristic C or UL 489)
Continuous current	16 A_{eff} [3)]
Peak current	24 A_{eff}
Reduction of continuous current at ambient temperatures starting at 40°C	0.32 A_{eff} / K starting at 50°C
Reduction of continuous current depending on installation elevation	
Starting at 1000 m above sea level	0.8 A_{eff} per 1000 m
Power dissipation [4)]	Typ. 10.8 W
Line filter per EN 61800-3, category C3	Yes
Variant	
L1, L2, L3 and L1´, L2´, L3´	Terminals
PE	M5 threaded bolt
Shield connection	
On mains	No
On device	No

Table 2: 8EF0160H300.1-1 - Technical data

[3)] For mains voltages of 1x / 3x 230 VAC, the total permissible length is 20 m

Order number	8EF0160H300.1-1
Terminal connection cross section	
Flexible and fine-stranded wires	
With wire end sleeves	0.5 to 6 mm² 20 - 8 AWG
Electrical properties	
Discharge capacitance	0.1 µF
Leakage current [5]	1.95 mA
Operating conditions	
Permissible mounting orientations	
Hanging vertically	Yes
Horizontal, face up	Yes
Standing horizontally	No
Installation elevation above sea level	
Nominal	0 to 1000 m
Maximum [6]	4000 m
Pollution degree per IEC 60664-1	2
Overvoltage category per IEC 60939-3	II
Degree of protection per EN 60529	IP20
Ambient conditions	
Temperature	
Operation	
Nominal	-25 to 40°C
Maximum [7]	55°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Relative humidity [8]	
Operation	Max. 93%, non-condensing
Storage	Max. 93%, non-condensing
Transport	Max. 93%, non-condensing
Mechanical properties	
Dimensions	
Width	55 mm
Height	230 mm
Depth	160 mm
Weight	1.5 kg

Table 2: 8EF0160H300.1-1 - Technical data

1) TT and TN power systems are commonly referred to as "Delta/Wye with grounded wye neutral" in the USA.
2) For wiring for single-phase power supply, see section "Wiring".
3) Valid under the following conditions: 3x 480 VAC mains input voltage, 50°C ambient temperature, cos phi = 0.8.
The exact value depends on the application.
4) Valid under the following conditions: 25°C ambient temperature, frequency 50 Hz.
5) Valid under the following conditions: 3x 400 VAC mains input voltage, 50 Hz frequency.
NOTE: Increased leakage currents may occur when switching on the mains (short-term single-phase or two-phase operation resulting from contact bounce in the line contactor) due to higher-frequency leakage currents occurring during operation with long motor cables or strong imbalances of the three-phase system. Observe the information in section "Dimensioning" in the drive system user's manual!
6) Continuous operation at an installation elevation of 1000 m to 4,000 m above sea level is possible taking the specified reduction of continuous current into account.
7) Continuous operation at an ambient temperature of 40°C to max. 55°C is possible taking the specified reduction of continuous torque into account, but this results in premature aging of components.
8) Specifications per IEC 60068-1.

4 Dimension diagram and installation dimensions

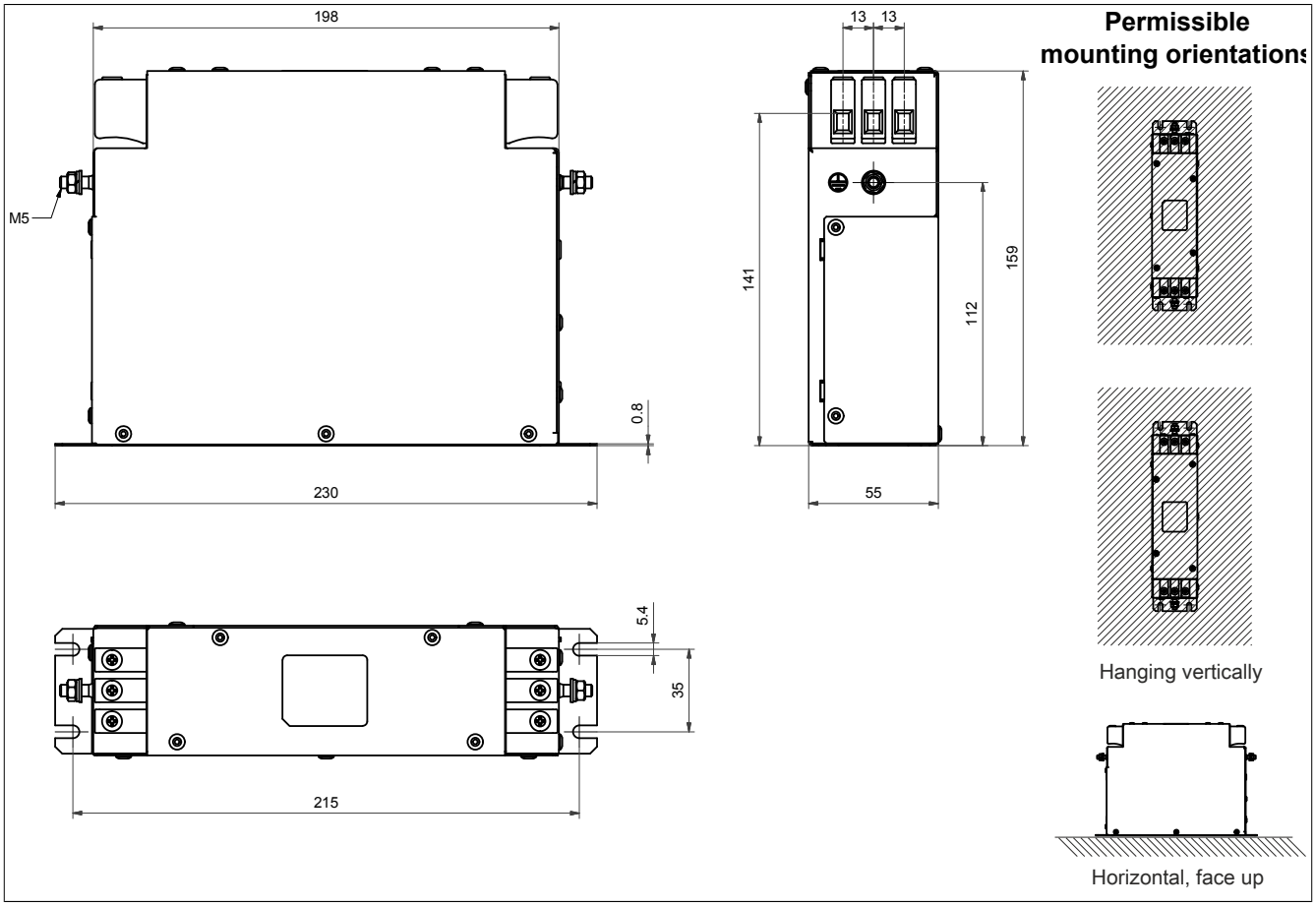


Figure 2: 8EF0160H300.1-1 - Dimension diagram and installation dimensions

5 Wiring

5.1 Pinout overview

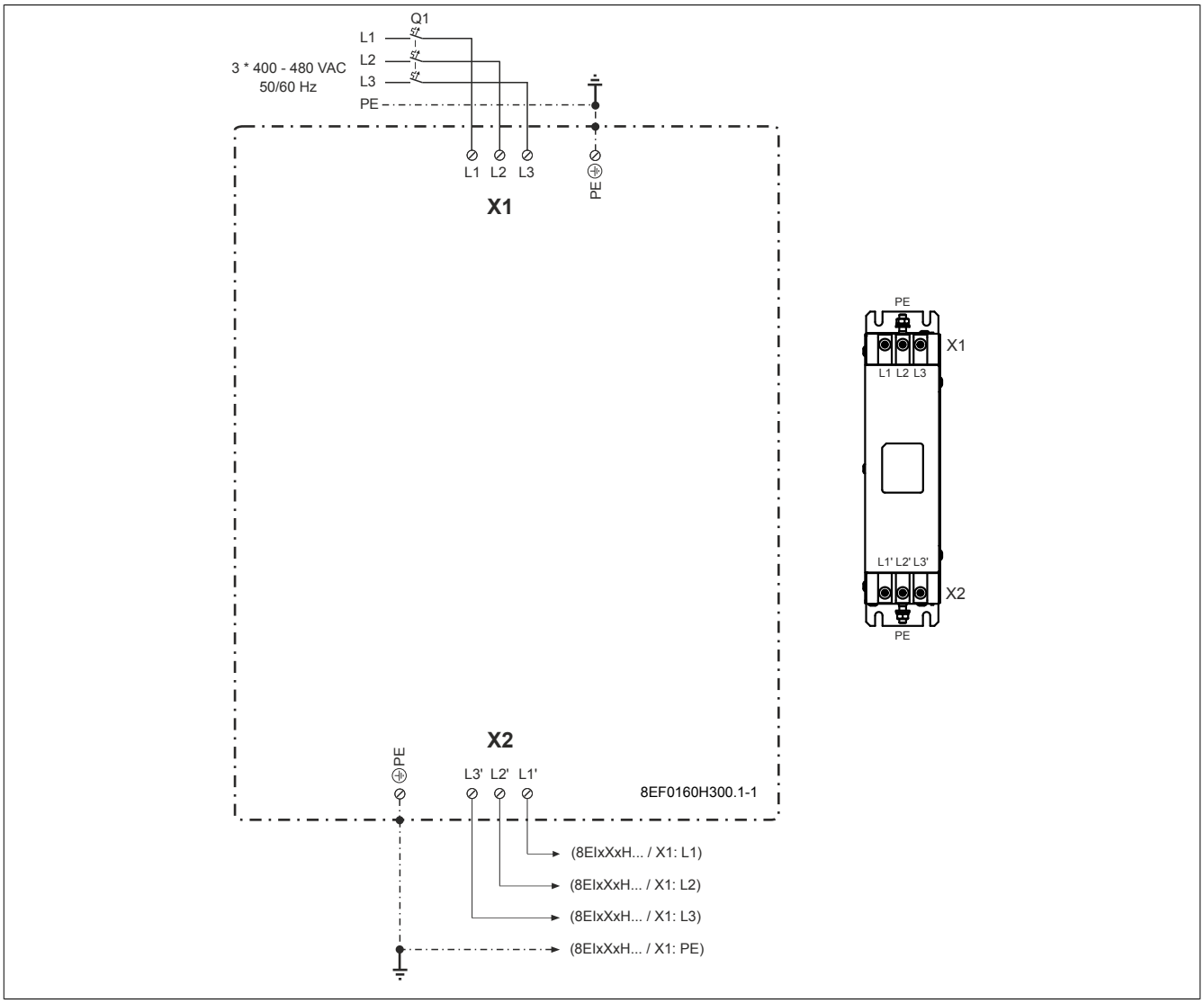


Figure 3: 8EF0160H300.1-1 - Pinout overview

5.2 X1 - Pinout

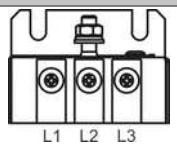
X1	Name	Function
	L1	Mains connection L1 (mains side)
	L2	Mains connection L2 (mains side)
	L3	Mains connection L3 (mains side)
Terminal connection cross section		
Flexible and fine stranded conductors with wire end sleeves	0.5 to 6 mm² 20 - 8 AWG	
Tightening torque of the terminal screws	1 to 1.2 Nm	

Table 3: X1 terminals - Pinout

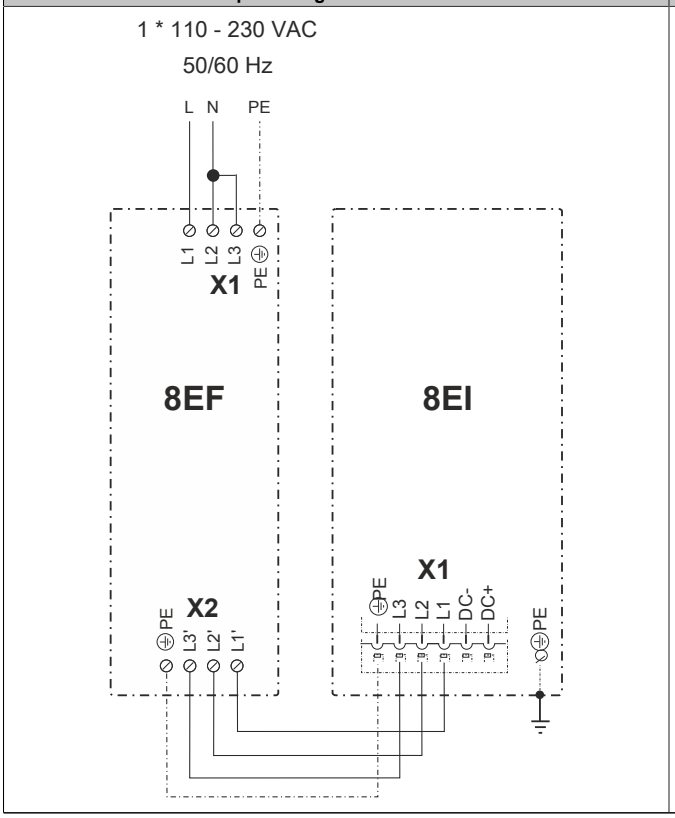
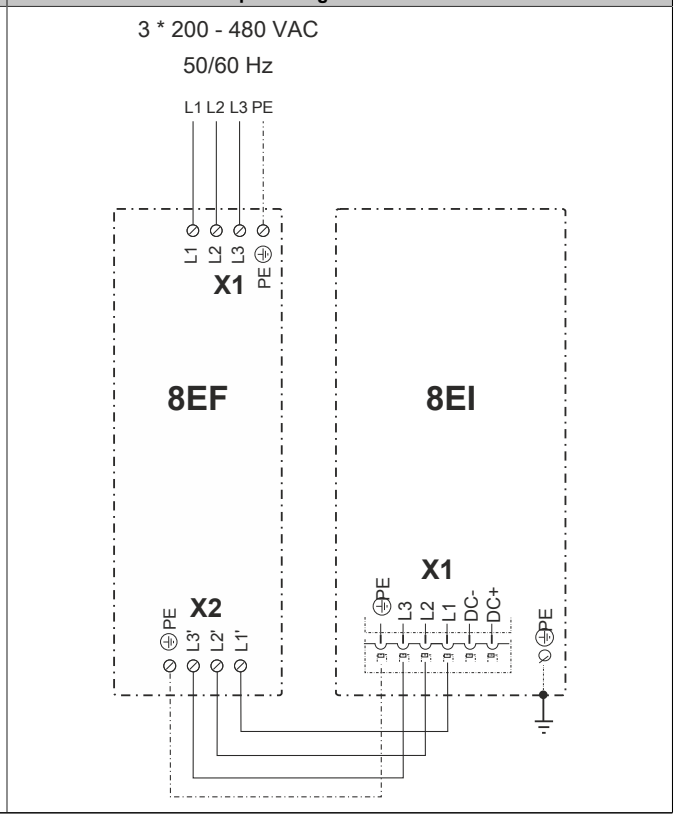
Mains input voltage - 1x 110 to 230 VAC	Mains input voltage - 3x 200 to 480 VAC
	

Table 4: Mains connection design

5.3 X2 - Pinout

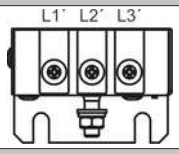
X2	Name	Function
	L1'	Mains connection L1 (load side)
	L2'	Mains connection L2 (load side)
	L3'	Mains connection L3 (load side)
Terminal connection cross section		
Flexible and fine stranded conductors with wire end sleeves	0.5 to 6 mm² 20 - 8 AWG	
Tightening torque of the terminal screws	1 to 1.2 Nm	

Table 5: X2 terminals - Pinout

5.4 Protective ground connection (PE) (mains and load sides)

The protective ground conductor is secured to the threaded bolt provided for this purpose using a cable lug.

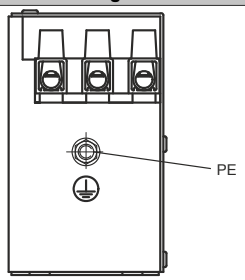
Figure	Pin	Name	Function
	---	PE	Protective ground conductor
Terminal cross section	**[mm²]**		**AWG**
Cable lug for threaded bolt	0.25 - 16		23 - 5
Tightening torque	2 to 2.2 Nm		

Table 6: Protective ground connection (PE) 8EF0160H300.1-1

Danger!

Before switching on the power supply, it must be ensured that the housing of the line filter is properly connected to ground potential (PE rail). Ground connections must also be made if the line filter is only connected for testing purposes or only operated for a short time!

5.5 Input/Output circuit diagram

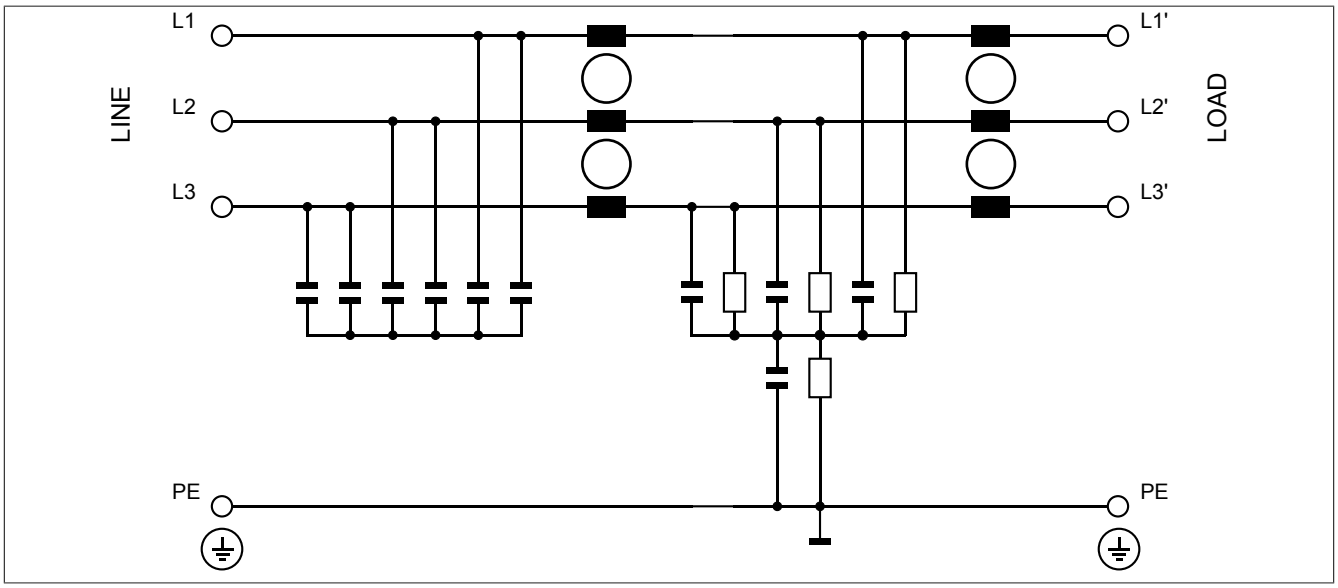


Figure 4: 8EF0160H300.1-1 - Input/Output circuit diagram