



# EMC FILTERS FOR MAXIMUM SAFETY

- Meets EMC guidelines
- Increases interference protection
- Decreases interference emissions

## KEEP IT SAFE – EVEN IN THE CONTROL CABINETS

**Mains filters are used to reduce interference without affecting the supply.** Murrelektronik's filters decrease incoming interference, which can affect sensitive equipment, and also decrease outgoing interference from the equipment they are connected to, which could damage the mains supply. Typical sources of continuous interference are switch mode power supplies, motors and phase controllers.

These sources are made up of inductive and capacitive components and work the best when their impedance is matched to the source of the interference. In regards to grounding, it's important to have a low impedance. Ideally, the filter should be as close as possible to the point where the cable enters the cabinet. If that's not possible, then shielded cables should be used between the filter and the entry point. Ground straps should be as short as possible and connection surfaces should be free from paint, etc.

### Single-phase



#### MEF Emparro® 1/1 – one-stage

- Operating voltage: max. 265 V AC/DC
- Nominal current: 20 A

Page 1.7.1



#### MEF 1/2 SY and MEF 1/2 AS – two-stage

- Operating voltage: max. 250 V AC/DC, 0..60 Hz
- Nominal current: 10...16 A

Page 1.7.2

### Three-phase



#### MEF 3/1 N – one-stage

- Operating voltage: max. 3 x 440 V AC
- Nominal current: 3...20 A

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#### MEF 3/1 N HD – one-stage

- Operating voltage: max. 3 x 500 V AC
- Nominal current: 10...135 A

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#### MEF 3/1 and MEF 3/2 – one and two-stage

- Operating voltage: max. 3 x 500 V AC / 3 x 600 V AC
- Nominal current: 8...180 A

Page 1.7.7

# EMC FILTERS

1-phase, 1-stage

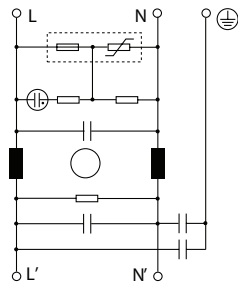
– DIN-rail mountable

**MEF Emparro® 1/1**  
wide attenuation spectrum



Approvals:  **UL** <sub>US</sub>

### Circuit diagram



### Order Data

20 A Art-No. 10701

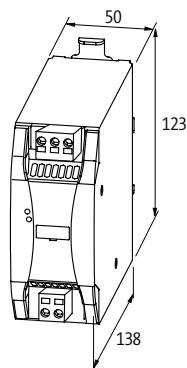
### Technical Data

Operating voltage	85...265 V AC/100...230 V DC
Operating frequency	50...60 Hz
Consumption	max. 1 mA (250 V AC)
Connection cross section	1.5...10 mm <sup>2</sup> single core (AWG 16...8); 1.5...6 mm <sup>2</sup> multiple core (AWG 16...10)

### General data

Climatic category	Environment class (EN 60721)
Connection	Push In terminals
Mounting method	DIN-rail mountable TH35 (EN 60715)

### Dimension drawing




### Notes

# EMC FILTERS

1-phase, 1-stage

– DIN-rail mountable

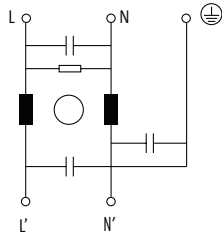
Approvals:  **us**

## MEF 1/1

for universal applications



### Circuit diagram



Order Data	Art-No.
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10 A	10415
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20 A	10416
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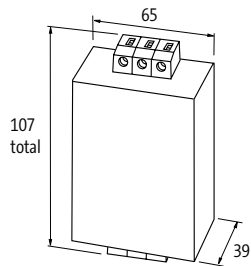
### Technical Data

Operating voltage	max. 250 V AC/300 V DC
Operating frequency	50...60 Hz
Consumption	max. 5 mA (250 V AC)
Overload current	18 × (IN t) max. 0.5 ms; 1.5 × (IN t) max. 1 min. (1 × per hour)
Connection cross section	0.2...6 mm <sup>2</sup> single core (AWG 24...9); 0.2...4 mm <sup>2</sup> multiple core (AWG 24...11)

### General data

Climatic category	25/085/21 (EN 60068-1)
Test isolation voltage	2.7 kV (L - N), 2 s; 2.1 kV (L - L), 2 s (EN 60939-2)
Connection	Screw connection, touch protected
Mounting method	DIN-rail mountable TH35 (EN 60715)

### Dimension drawing



### Notes

# EMC FILTERS



1-phase, 2-stage

– DIN-rail mountable

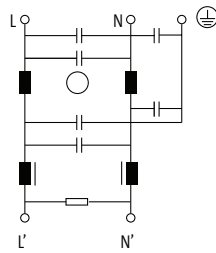
## MEF 1/2 SY

against symmetrical interferences



Approvals:  

### Circuit diagram



### Order Data

	Art-No.
1 A	10460
2 A	10461
3 A	10462
4 A	10463
6 A	10464
16 A	10466

### Technical Data

Operating voltage	max. 250 V AC/300 V DC
Operating frequency	50...60 Hz
Overload current	18 × (IN t) max. 0.5 ms; 1.5 × (IN t) max. 1 min. (1 × per hour)
Consumption	max. 5 mA (250 V AC)
Connection cross section	0.2...6 mm <sup>2</sup> single core (AWG 24...9); 0.2...4 mm <sup>2</sup> multiple core (AWG 24...11)

### General data

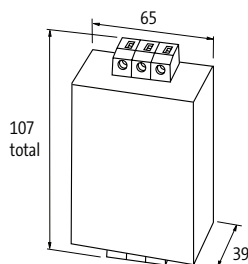
Climatic category	25/085/21 (EN 60068-1)
Test isolation voltage	2.7 kV (L - N), 2 s; 2.1 kV (L - L), 2 s (EN 60939-2)
Connection	Screw connection, touch protected
Mounting method	DIN-rail mountable TH35 (EN 60715)

### Description

Functional description: The single phase 2-stage EMC filters MEF 1/2 are used in the range 0.1...30 MHz to suppress cable carried interference on mains and control cables. The best filter performance is achieved by using short connection wires (suggestion: earth connection < 10 cm) and the largest possible diameter. The EMC filters work bi-directionally (in both directions). The filters are for demanding applications. The filters are designed for use with fixed modules. One step of the filter is always for the suppression of asymmetrical interferences (magnetically compensated suppression). The second step is, dependant on application for symmetrical or asymmetrical interferences.

Application: symmetrical interferences: units with high repetitions of the switching processes, - switch mode P.S.U.s, - phase angle controller, - supply of universal motors, - behind transformers

### Dimension drawing




### Notes

# EMC FILTERS

1-phase, 2-stage

- DIN-rail mountable

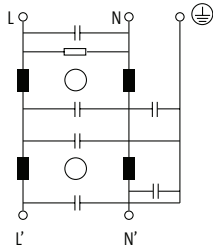
Approvals: 

## MEF 1/2 AS

against asymmetrical interferences



### Circuit diagram



Order Data	Art-No.
3 A	10470
6 A	10471
10 A	10472

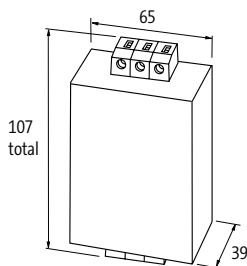
Technical Data	
Operating voltage	max. 250 V AC/300 V DC
Operating frequency	50...60 Hz
Consumption	max. 5 mA (250 V AC)
Overload current	18 × (IN t) max. 0.5 ms; 1.5 × (IN t) max. 1 min. (1 × per hour)
Connection cross section	0.2...6 mm <sup>2</sup> single core (AWG 24...9); 0.2...4 mm <sup>2</sup> multiple core (AWG 24...11)

General data	
Climatic category	25/085/21 (EN 60068-1)
Test isolation voltage	2.7 kV (L - N), 2 s; 2.1 kV (L - L), 2 s (EN 60939-2)
Connection	Screw connection, touch protected
Mounting method	DIN-rail mountable TH35 (EN 60715)

Description	
Functional description	The single phase 2-stage EMC filters MEF 1/2 are used in the range 0.1...30 MHz to suppress cable carried interference on mains and control cables. The best filter performance is achieved by using short connection wires (suggestion: earth connection < 10 cm) and the largest possible diameter. The EMC filters work bi-directionally (in both directions). The filters are for demanding applications. The filters are designed for use with fixed modules. One step of the filter is always for the suppression of asymmetrical interferences (magnetically compensated suppression). The second step is, dependant on application for symmetrical or asymmetrical interferences.

Application	asymmetrical interferences: - units with high switching frequency and repetition, - switch mode P.S.U.s, - in DC mains, - in front of transformers, - for frequency inverters
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### Dimension drawing



### Notes

# EMC FILTERS

3-phase, 1-stage

– DIN-rail mountable

– with neutral

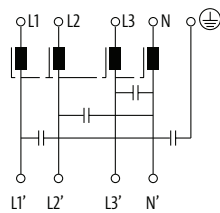
Approvals:  

## MEF 3/1 N

for universal applications



### Circuit diagram



### Order Data

	Art-No.
3 A	10510
6 A	10511
10 A	10512
20 A	10513

### Technical Data

Operating voltage	max. 4 × 440 V AC
Operating frequency	50...60 Hz
Consumption	max. 3 mA (250 V AC)
Overload current	18 × (IN t) max. 0.5 ms; 1.5 × (IN t) max. 1 min. (1 × per hour)
Connection cross section	0.2...6 mm <sup>2</sup> single core (AWG 24...9); 0.2...4 mm <sup>2</sup> multiple core (AWG 24...11)

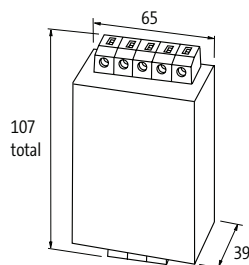
### General data

Climatic category	25/085/21 (EN 60068-1)
Test isolation voltage	2.7 kV (L - N), 2 s; 2.1 kV (L - L), 2 s (EN 60939-2)
Connection	Screw connection, touch protected
Mounting method	DIN-rail mountable TH35 (EN 60715)

### Description

Functional description  
The 3-phase and one-stage EMC filters MEF 3/1 are used in the range 0.1...30 MHz and dampen interferences found in cables from the mains, supply units and control systems. They are suitable for TN-S, TN-CS, and TT networks. The best results are obtained with short connection cables (suggestion: earth connection < 10 cm) of the largest possible cross-section. The EMC filters are bi-directional. They reduce symmetrical and asymmetrical interferences that regularly appear with electronically controlled three phase units through mains influences.

### Dimension drawing



### Notes

# EMC FILTERS

3-phase, 1-stage

– with neutral

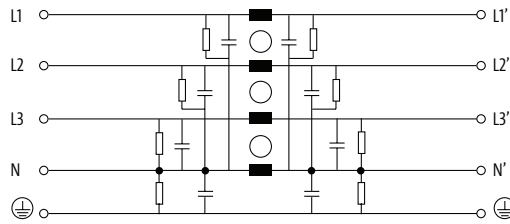
Approvals: 

## MEF 3/1 N HD

with increased damping



### Circuit diagram



Order Data	H×W×D/kg	Art-No.
10 A	153×130×100/1.0	10571
18 A	153×130×100/1.0	10572
36 A	153×130×100/1.1	10574
72 A	153×118×125/1.6	10575
100 A	170×180×140/3.4	10577
135 A	170×180×140/4.5	10578

### Technical Data

Connection cross section	0.2...10 mm <sup>2</sup> single core (AWG 24...7); 0.2...6 mm <sup>2</sup> multiple core (AWG 24...9)
Operating voltage	max. 3 × 500 V AC
Operating frequency	50...60 Hz
Consumption	max. 15 mA (250 V AC)
Overload current	18 × (I <sub>N</sub> t) max. 0.5 ms; 1.5 × (I <sub>N</sub> t) max. 1 min. (1 × per hour)

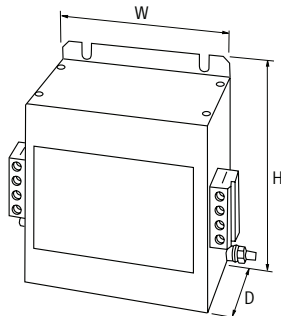
### General data

Mounting method	screw fixing, M6
Climatic category	25/085/21 (EN 60068-1)
Test isolation voltage	3.3 kV (L - N), 2 s; 3.1 kV (L - L), 2 s

### Description

Functional description  
The 3-phase and one-stage EMC filters MEF 3/1 are used in the range 0.1...30 MHz and dampen interferences found in cables from the mains, supply units and control systems. They are suitable for TN-S, TN-C-S, and TT networks. The best results are obtained with short connection cables (suggestion: earth connection < 10 cm) of the largest possible cross-section. The EMC filters are bi-directional. They reduce symmetrical and asymmetrical interferences that regularly appear with electronically controlled three phase units through mains influences.

### Dimension drawing



### Notes

3-phase, 1-stage

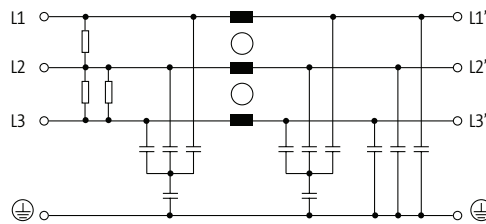
– Space saving book form

MEF 3/1



Approvals:

### Circuit diagram



Order Data	H×W×D/kg	Art-No.
8 A	250×90×100/1.3	10531
16 A	250×90×100/1.3	10532
25 A	250×90×100/1.3	10533
36 A	250×90×100/1.5	10534
50 A	250×90×100/1.7	10535
80 A	270×85×135/2.2	10537
110 A	270×90×150/3.2	10538
180 A	380×120×170/5.1	10539

### Technical Data

Operating voltage	max. 3 × 600 V AC
Operating frequency	50...60 Hz
Overload current	18 × (IN t) max. 0.5 ms; 1.5 × (IN t) max. 1 min. (1 × per hour)
Consumption	max. 10 mA (250 V AC)
Connection cross section	0.2...10 mm <sup>2</sup> single core (AWG 24...7); 0.2...6 mm <sup>2</sup> multiple core (AWG 24...9)

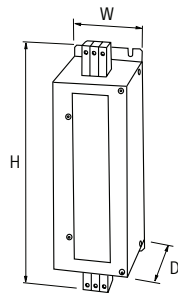
### General data

Climatic category	25/085/21 (EN 60068-1)
Test isolation voltage	3.3 kV (L - N), 2 s; 3.1 kV (L - L), 2 s
Connection	Screw connection, touch protected
Mounting method	screw fixing

### Description

Functional description  
The 3-phase and 1-/2-stage EMC filters MEF 3/1-3/2 are used in the range 0.1...30 MHz and dampen interferences found in cables from the mains, supply units and control systems. They are suitable for TN-C-mains. The best results are obtained with short connection cables (suggestion: earth connection < 10 cm) of the largest possible cross-section. The EMC filters are bi-directional. They reduce symmetrical and asymmetrical interferences that often occur with frequency converters and switch mode power supplies.

### Dimension drawing



### Notes



# EMC FILTERS

3-phase, 2-stage

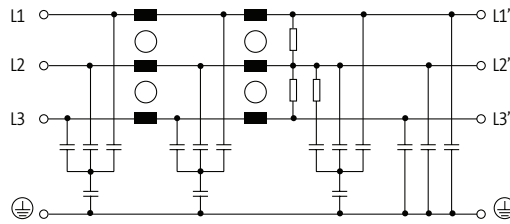
– Space saving book form

Approvals: 

MEF 3/2



## Circuit diagram



Order Data	HxWxD/kg	Art-No.
8 A	226x50x140/1.7	10550
12 A	226x50x140/1.7	10551
16 A	226x50x140/1.7	10552
25 A	226x50x140/1.7	10553
36 A	226x50x140/1.7	10554
50 A	295x70x177/3.7	10555
80 A	295x70x177/5.1	10556

## Technical Data

Operating voltage	max. 3 × 500 V AC
Operating frequency	50..60 Hz
Overload current	18 × (IN t) max. 0.5 ms; 1.5 × (IN t) max. 1 min. (1 × per hour)
Consumption	max. 15 mA (250 V AC)
Connection cross section	0.2...10 mm <sup>2</sup> single core (AWG 24...7); 0.2...6 mm <sup>2</sup> multiple core (AWG 24...9)

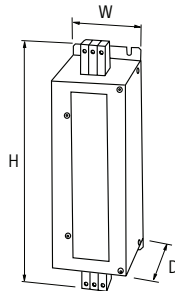
## General data

Climatic category	25/085/21 (EN 60068-1)
Test isolation voltage	3.3 kV (L - N), 2 s; 3.1 kV (L - L), 2 s
Connection	Screw connection, touch protected
Mounting method	screw fixing

## Description

Functional description  
The 3-phase and 1/2-stage EMC filters MEF 3/1-3/2 are used in the range 0.1...30 MHz and dampen interferences found in cables from the mains, supply units and control systems. They are suitable for TN-C-mains. The best results are obtained with short connection cables (suggestion: earth connection < 10 cm) of the largest possible cross-section. The EMC filters are bi-directional. They reduce symmetrical and asymmetrical interferences that often occur with frequency converters and switch mode power supplies.

## Dimension drawing



## Notes