Harmonic Filter
User Manual

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V.25.1

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PROPER USE AND SAFETY REQUIREMENTS

Cut all the power when connecting and disconnecting the device to a panel.

Do not clean the device with a solvent or similar material. Only use a dry cloth.

Please do not intervene to the device when a technical problem is encountered and get in contact with a technical service within the shortest time.

If the warnings are not taken into account, our company or the authorized dealer shall not be held responsible for the negative consequences.

Do not dispose in the trash, the device must be delivered to the collection centers (electronic device recycling centers). It should be recycled or disposed of without harming human health and environment.

The installation, assembly, activation and operation of the device should be done and used by only expert professionals and in accordance with safety regulations and instructions.

1. INTRODUCTION

1.1. General Features

Under normal conditions, it is required that the mains voltage is in sinusoidal form. However, for various reasons, the mains voltage moves away from the sinusoidal form and high-frequency components called harmonics are formed. When harmonics exceed certain limits, it can cause very dangerous consequences for businesses. For this reason, harmonic filter reactors should be used in compensation panels in enterprises with high harmonics. In this way, both resonance events that are dangerous for the system are prevented and capacitors are protected from the harmful effects of harmonics.

- High Permeability Iron Core, Air Gap Design
- Design in Accordance with EN 61000-2-2, EN 61558-2-1, EN 61558-2-20 Standards
- Thermal Protection Against Overheating in the Middle Leg
- Moisture Protection and Quiet Operation with Vacuum Varnish

1.2. Technical Features

- **Standard:** EN 60076-6, EN 61558-2-20
- **Nominal Voltage:** 230-690 V AC
- **Nominal Power:** 0,5-100 kVAr
- **Nominal Frequency:** 50 Hz
- **Reactor Factor:** %100
- **Inductivity Tolerance:** *%5*
- **Isolation Class:** Class F 155 ˚C
- **Humidity:** %95
- **Cooling:** Natural T40
- **Connection:** Terminal Block, Lug or Busbar
- **Winding Material:** Aluminum or Copper
- **Thermal Protection:** 120 ˚C (NC Contact)
- **Protection Class:** IP00
- **Core:** High Permeability Iron Core, Air Gap

1.3. Harmonic Filter Selection Consideration

Harmonic Filter Selection

According to the voltage harmonic values of the harmonic filters in our list, which are measured while the compensation is off;

- If THDv < 8% and 5th voltage harmonic < 6%; p= 5.67% normal filter or p= 7% normal filter,
- If THDv < 8% and 5th voltage harmonic > 6%; p= 5.67% reinforced filter or p= 7% reinforced filter,
- If THDv > 8% and harmonics are to be filtered, p=5.67% reinforced filter or p=7% reinforced filter,
- If THDv > 8% and only capacitors are to be protected from overcurrent, it is recommended to choose a filter with p=14%.

Considered Sectorally

- In small-scale enterprises with few harmonic generating devices; p=5.67% or p=7% normal filter,
- Where harmonic distortion is relatively high, such as textiles and automotive; p=5.67% or p=7% reinforced filter,

In places such as iron and steel industry, rolling mills, foundry furnaces, p=14% filter can be used.

Other Issues to Consider

- p=5.67% filters require continuous monitoring as they are very sensitive to the loss of value in capacitors or the increase of harmonics over time. For this reason, it will be safer to use a p=7% filter if the harmonic values measured while the compensation is off are at a level that will not pose a problem for the operation.
- The harmonic filters in our list are designed for the plants where the 5th voltage harmonic does not exceed 6% and the total voltage harmonic does not exceed 8% when the compensation is off. For higher harmonic distortion values, a reinforced filter should be used. Please contact our company for reinforced filters.

Note: For a correct application, it is recommended to make measurements with an analyzer and evaluate the measurement results with our technical team.

1.4. Harmonic Filter / Capacitor Selection Table

MONOPHASE HARMONIC FILTER - CAPACITOR	
(p=%5,67 - 210 Hz; p=%7 - 189 Hz; p=%14 - 134 Hz)	
Harmonic Filter Code	Capacitor Product Name
HRM 0.5/5.67 - HRM 0.5/7 - HRM 0.5/14	KND M0.5
HRM 1.0/5.67 - HRM 1.0/7 - HRM 1.0/14	KND M1.0
HRM 1.5/5.67 - HRM 1.5/7 - HRM 1.5/14	KND M1.5
HRM 2.5/5.67 - HRM 2.5/7 - HRM 2.5/14	KND M2.5
HRM 5.0/5.67 - HRM 5.0/7 - HRM 5.0/14	KND M5.0
HRM 7.5/5.67 - HRM 7.5/7 - HRM 7.5/14	KND M7.5
HRM 10.0/5.67 - HRM 10.0/7 - HRM 10.0/14	KND M10.0

THREE-PHASE HARMONIC FILTER - CAPACITOR	
(p=%14, 134 Hz) Harmonic Filter Code	Capacitor To Be Used For 525 V Product Name
HRT 3.1 / 14	KND B5.0
HRT 5.0 / 14	KND B7.5
HRT 6.25 / 14	KND B10.0
HRT 7.5 / 14	KND B12.5
HRT 10.0 / 14	KND B15.0
HRT 12.5 / 14	KND B20.0
HRT 15.0 / 14	KND B10.0 + KND B12.5
HRT 20.0 / 14	KND B30.0
HRT 25.0 / 14	KND B25.0 + KND B12.5
HRT 30.0 / 14	KND B25.0+ KND B20.0
HRT 40.0 / 14	2xKND B30.0
HRT 50.0 / 14	3xKND B25.0
HRT 60.0 / 14	3xKND B30.0
HRT 75.0 / 14	2xKND B40.0 + KND B30.0
HRT 100.0 / 14	3xKND B40.0 + KND B30.0

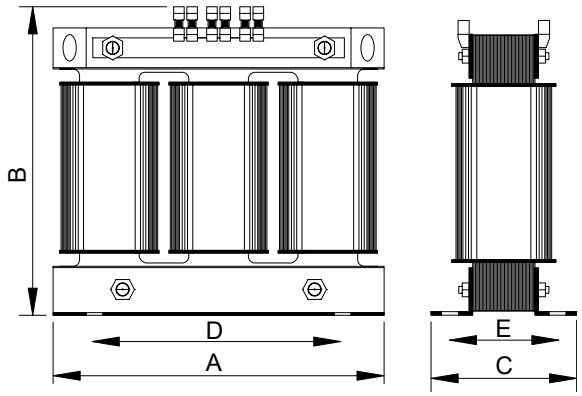
THREE-PHASE HARMONIC FILTER - CAPACITOR		
(p=%5.67, 210 Hz) Harmonic Filter Code	Capacitor To Be Used For 440 V Product Name	Capacitor To Be Used For 525 V Product Name
HRT 0.5/5.67	KND T0.5	-
HRT 1.0/5.67	KND T1.0	-
HRT 1.5/5.67	KND T1.5	-
HRT 2.5/5.67	KND T2.5	-
HRT 3.1/5.67	2xKND T1.5	KND B5.0
HRT 5.0/5.67	KND T5.0	KND B7.5
HRT 6.25/5.67	KDN T5.0+KND T1.0	KND B10.0
HRT 7.5/5.67	KND T7.5	KND B12.5
HRT 10.0/5.67	KND T10.0	KND B15.0
HRT 12.5/5.67	KND T12.5	KND B20.0
HRT 15.0/5.67	KND T15.0	KND B25.0
HRT 20.0/5.67	KND T18.6	KND B20.0 + KND B12.5
HRT 25.0/5.67	KND T23.2	KND B40.0
HRT 30.0/5.67	KND T15.0+KND T12.5	2xKND B25.0
HRT 40.0/5.67	2xKND T18.6	KND B40.0 + KND B25.0
HRT 50.0/5.67	2xKND T23.2	2xKND B40.0
HRT 60.0/5.67	KND T30.0+KND T25.0	2xKND B40.0 +KND B15.0
HRT 75.0/5.67	3xKND T23.2	3xKND B40.0
HRT 100.0/5.67	4xKND T23.2	4xKND B40.0

THREE-PHASE HARMONIC FILTER - CAPACITOR		
(p=%7, 189 Hz) Harmonic Filter Code	Capacitor To Be Used For 440 V Product Name	Capacitor To Be Used For 525 V Product Name
HRT 0.5/7	KND T0.5	-
HRT 1.0/7	KND T1.0	-
HRT 1.5/7	KND T1.5	-
HRT 2.5/7	KND T2.5	-
HRT 3.1/7	2xKND T1.5	KND B5.0
HRT 5.0/7	KND T5.0	KND B7.5
HRT 6.25/7	KDN T5.0+KND T1.0	KND B10.0
HRT 7.5/7	KND T7.5	KND B12.5
HRT 10.0/7	KND T10.0	KND B15.0
HRT 12.5/7	KND T12.5	KND B20.0
HRT 15.0/7	KND T15.0	KND B25.0
HRT 20.0/7	KND T18.6	KND B20.0 + KND B12.5
HRT 25.0/7	KND T23.2	KND B40.0
HRT 30.0/7	KND T15.0+KND T12.5	2xKND B25.0
HRT 40.0/7	2xKND-T18.6	KND B40.0 + KND B25.0
HRT 50.0/7	2xKND-T23.2	2xKND B40.0
HRT 60.0/7	KND T30.0+KND T25	2xKND B40.0 + KND B20.0
HRT 75.0/7	3xKND T23.2	3xKND B40.0
HRT 100.0/7	4xKND T23.2	4xKND B40.0

• The capacitor recommended to be used for the selected harmonic filter is indicated by the product name in our price list, not the power value.

1.5. Technical Drawing

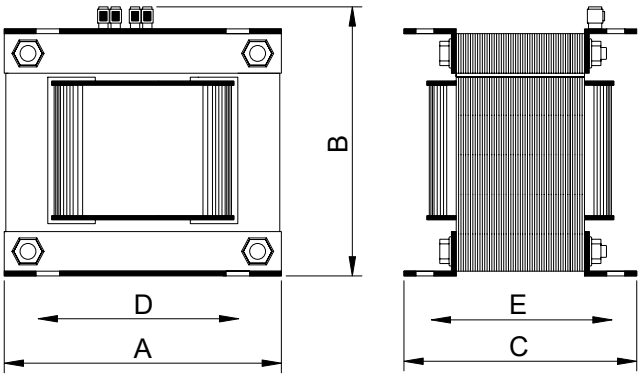
1.5.1. Three-Phase Harmonic Filter (P=%7, THDv<%7 - 189 Hz)



• Product sizes indicated in the table may vary. You can contact for detailed information.

Product Name	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
HRT 10/7-7	180	175	105	125	80
HRT 12.5/7-7	180	175	105	125	80
HRT 15/7-7	180	175	115	125	90
HRT 20/7-7	240	210	105	175	80
HRT 25/7-7	240	210	105	175	80
HRT 30/7-7	240	210	125	175	100
HRT 40/7-7	240	210	135	175	115
HRT 50/7-7	270	240	135	200	125
HRT 60/7-7	270	240	150	200	125
HRT 75/7-7	295	255	175	200	135
HRT 100/7-7	350	310	180	250	145

1.5.2. Monophase Harmonic Filter (P=%5.67, %7, %14)



• Product sizes indicated in the table may vary. You can contact for detailed information.

Monophase Harmonic Filter (P=%5.67)

Product Name	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
HRM 0.5/5.67	84	70	60	70	45
HRM 1.0/5.67	84	70	80	70	65
HRM 1.5/5.67	84	70	80	70	65
HRM 2.5/5.67	96	80	96	80	80
HRM 5.0/5.67	120	100	98	100	80
HRM 7.5/5.67	120	100	120	100	100
HRM 10.0/5.67	150	125	128	125	100

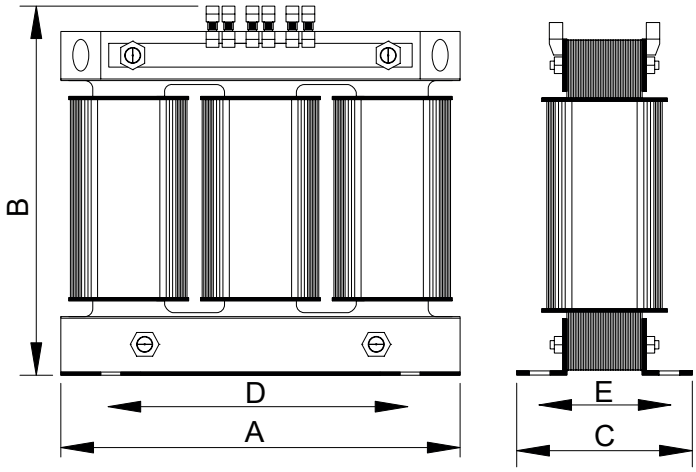
Monophase Harmonic Filter (P=%7)

Product Name	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
HRM 0.5/7	84	70	60	70	45
HRM 1.0/7	84	70	80	70	65
HRM 1.5/7	84	70	80	70	65
HRM 2.5/7	96	80	96	8	80
HRM 5.0/7	120	100	98	100	80
HRM 7.5/7	120	100	120	100	100
HRM 10.0/7	150	125	110	120	80

Monophase Harmonic Filter (P=%14)

Product Name	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
HRM 0.5/14	84	70	60	70	45
HRM 1.0/14	84	70	80	70	65
HRM 1.5/14	84	70	100	70	95
HRM 2.5/14	96	80	96	80	80
HRM 5.0/14	120	100	100	100	80
HRM 7.5/14	120	100	120	100	100
HRM 10.0/14	150	125	150	120	120

1.5.3. Three-Phase Harmonic Filter (P=%5.67, %7, %14)



• Product sizes indicated in the table may vary. You can contact for detailed information.

Three-Phase Harmonic Filter (P=% 5.67 - 210 Hz)

Product Name	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
HRT 0.5/5.67	150	148	72	100	52
HRT 1.0/5.67	150	148	72	100	52
HRT 1.5/5.67	150	148	72	100	52
HRT 2.5/5.67	150	148	72	100	52
HRT 3.12/5.67	150	148	72	100	52
HRT 5.0/5.67	150	148	89	100	70
HRT 6.25/5.67	180	170	97	125	72
HRT 7.5/5.67	180	170	97	125	72
HRT 10.0/5.67	180	180	105	125	80
HRT 12.5/5.67	180	180	105	125	80
HRT 15.0/5.67	235	230	100	175	80
HRT 20.0/5.67	235	230	100	175	80
HRT 25.0/5.67	240	235	120	175	100
HRT 30.0/5.67	270	240	135	200	110
HRT 40.0/5.67	270	240	150	200	125
HRT 50.0/5.67	295	255	165	200	130
HRT 60.0/5.67	295	255	170	200	135
HRT 75.0/5.67	355	310	170	250	135
HRT 100.0/5.67	355	310	190	250	155

Three-Phase Harmonic Filter (P=% 7, THDv<%8 - 189 Hz)

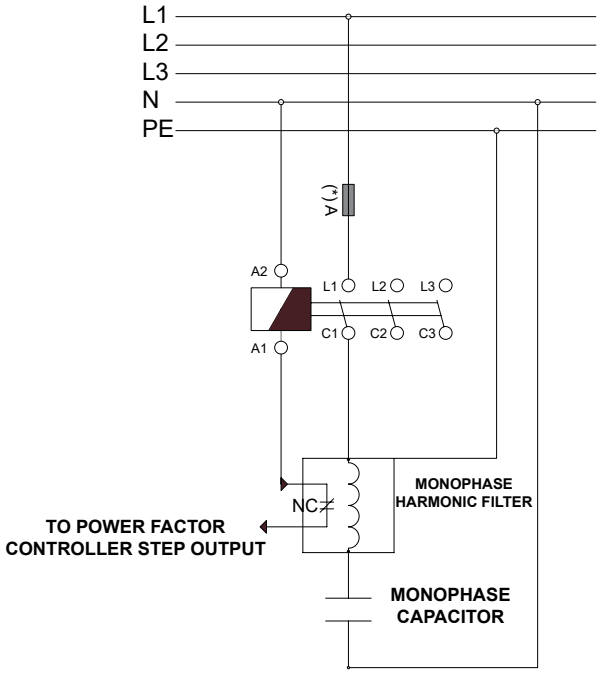
Product Name	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
HRT 0.5/7-8	150	148	72	100	52
HRT 1.0/7-8	150	148	72	100	52
HRT 1.5/7-8	150	148	72	100	52
HRT 2.5/7-8	150	148	72	100	52
HRT 3.12/7-8	150	148	72	100	52
HRT 5.0/7-8	180	175	85	125	60
HRT 6.25/7-8	180	175	85	125	60
HRT 7.5/7-8	180	175	105	125	80
HRT 10.0/7-8	180	175	115	125	90
HRT 12.5/7-8	180	175	115	125	90
HRT 15.0/7-8	180	175	115	125	90
HRT 20.0/7-8	240	210	105	175	80
HRT 25.0/7-8	240	210	125	175	80
HRT 30.0/7-8	240	210	135	175	110
HRT 40.0/7-8	300	255	145	200	105
HRT 50.0/7-8	270	240	150	200	125
HRT 60.0/7-8	295	255	175	200	135
HRT 75.0/7-8	295	255	205	200	165
HRT 100.0/7-8	355	310	195	250	155

Three-Phase Harmonic Filter (P=% 14 - 134 Hz)

Product Name	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
HRT 0.5/14	150	150	72	100	55
HRT 1.0/14	150	150	72	100	55
HRT 1.5/14	150	150	72	100	55
HRT 2.5/14	180	175	85	125	60
HRT 3.12/14	180	175	85	125	60
HRT 5.0/14	180	175	115	125	90
HRT 6.25/14	180	175	115	125	90
HRT 7.5/14	240	225	100	175	75
HRT 10.0/14	240	225	100	175	75
HRT 12.5/14	240	225	100	175	75
HRT 15.0/14	240	225	110	175	85
HRT 20.0/14	270	240	135	200	110
HRT 25.0/14	270	240	150	200	125
HRT 30.0/14	295	255	165	200	130
HRT 40.0/14	295	255	170	200	135
HRT 50.0/14	300	255	180	200	145
HRT 60.0/14	355	310	190	250	155
HRT 75.0/14	355	310	210	250	175
HRT 100.0/14	400	360	210	250	175

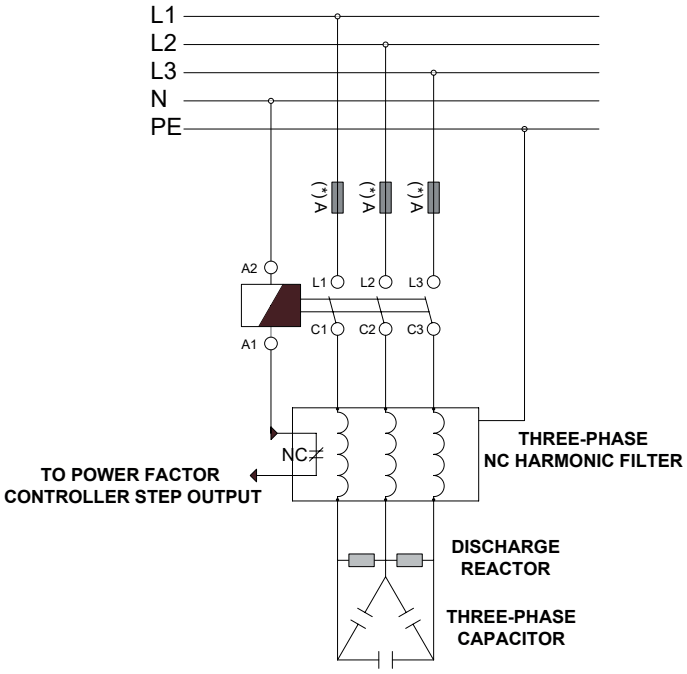
1.6. Connection Diagram

1.6.1. Monophase Harmonic Filter (P=%5.67, %7, %14)



(*)For the recommended fuse current and cable cross-section, please refer to the rated operating current table in the section related to the product of your choice.

1.6.2. Three-Phase Harmonic Filter (P=%5.67, %7, %14)



(*)For the recommended fuse current and cable cross-section, please refer to the rated operating current table in the section related to the product of your choice.