

# **ACS600, ACS800**

## **Installation Guide**

### **du/dt Filters**

**AOCH0260-70**

**AOCH0400-70**

**NOCH0016-6x**

**NOCH0030-6x**

**NOCH0070-6x**

**NOCH0120-6x**

**NOCH0260-60**

**NOCH0400-60**

**NOCH0760-60**

3AFE 58933368 REV D  
EN  
EFFECTIVE: 20.10.2003

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# du/dt Filters Installation Guide

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## Contents

This document contains the following information:

- General notes and restrictions
- Technical data (including allowable ambient conditions)
- Internal circuit diagrams
- Power connection diagrams
- Filter selection tables
- Dimensional drawings (including terminal sizes and tightening torques).

## General notes and restrictions

Observe the following before you start to install the du/dt filters:



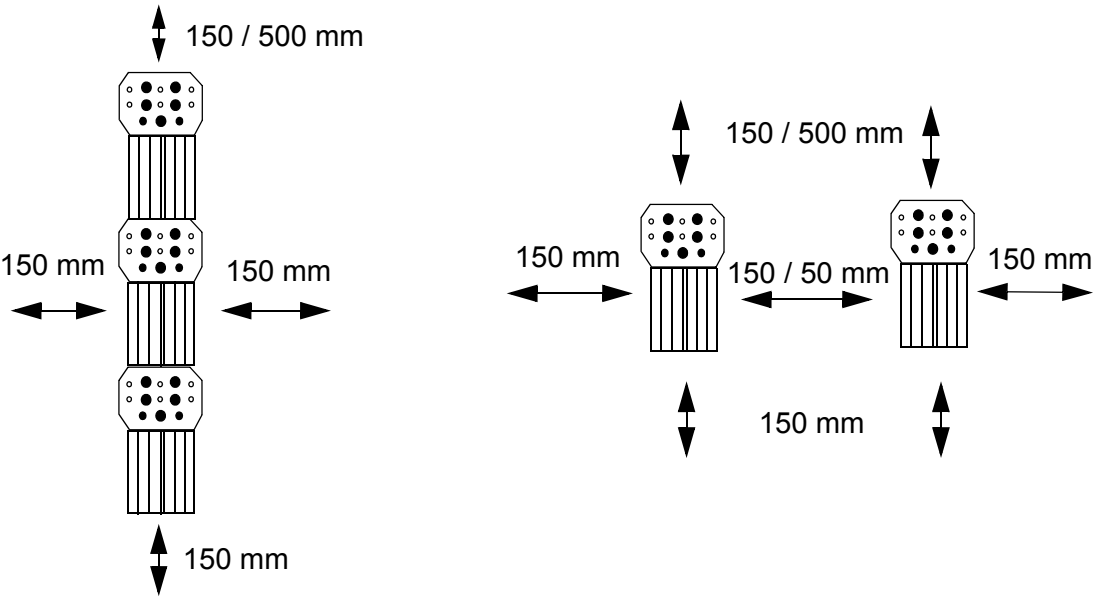
**WARNING!** Do not attempt any work on a powered drive. After switching off the mains, always allow the intermediate circuit capacitors 5 minutes to discharge before working on the frequency converter, the motor or the motor cable. It is good practice to check (with a voltage indicating instrument) that the drive is in fact discharged before beginning work.

- Unprotected (IP00) filters must be encased to meet the local safety requirements.
- The surface of the IP22/IP54 filter housing can reach a temperature up to 40 °C higher than the ambient temperature.
- Shielded cable must be used between enclosures.
- Filters must be grounded to the protective earth (PE) by using the fixing holes in the mounting legs.
- **Maximum drive output frequency:** 120 Hz
- **Maximum average switching frequency:**  
3 kHz (converter units with supply voltage  $\leq$  500 V) or  
2 kHz (converter units with supply voltage  $>$  500 V)
- **Maximum cable length between the drive output and the filter:** 3 m
- **Maximum motor cable length for AOCH0xxx-70 filters:** 300 m (cumulative for several parallel-connected motors)

- **Maximum motor cable length for NOCH0xxx-6x filters** (cumulative for several parallel-connected motors):

NOCH0016-60/62 NOCH0030-60/62 NOCH0070-60/62 NOCH0120-62	150 m (can be increased to 300 m by connecting two filters in series)
NOCH0016-65 NOCH0030-65 NOCH0070-65 NOCH0120-65	50 m (can be increased to 100 m by connecting two filters in series)
NOCH0120-60 NOCH0260-60 NOCH0400-60 NOCH0760-60	300 m

- The following free space requirements apply for the **AOCH0xxx-70** filters:  
 150 mm free space on each free side. *Exception:* 500 mm above the filter if installed below the drive. *Exception:* 50 mm between single phase filters on the same transmission line.  
 If filters are mounted on top of each other with SingleDrive types 0320-5, 0610-5 and 0610-7, the filters need a minimum of 700 m<sup>3</sup>/h of forced cooling. Maximum of three filters can be mounted on top of each other.



AOCH filters on top of each other

AOCH filters side by side

- **NOCH0xxx-6x** filters are designed to cool by natural convection, thus the following free space requirements apply:

Wall-mounted filter units:

300 mm on each free side. *Exception:* 500 mm above the filter if installed below the drive.

Floor-mounted filter units:

300 mm on each free side. *Exception:* 50 mm between single-phase filters on the same transmission line. *Exception:* 500 mm above the filter if installed below the drive.

## Technical data

**Nominal voltage:** 380 ... 690 V  $\pm$  10%.

**Rated short-time withstand current:** 50 kA 1 s.

**Applicable standards and markings:** EN 60204-1, EN 60529, EN 61800-3, EN 50178, CE marking, UL approval.

## Ambient conditions, operation

Ambient operating conditions refer to the conditions du/dt filters are subjected to when installed for stationary use.

**Air temperature:** -15 to +50 °C. At temperatures from +40 °C to +50 °C, the rated output current is decreased by 1% for every additional 1 °C. The output current is calculated by multiplying the current given in the rating table by the derating factor.

**Relative humidity:** 5% to 95%, no condensation allowed. Maximum allowed relative humidity is 60% in the presence of corrosive gases.

**Installation site altitude:** 0 to 4000 m. At altitudes from 1000 to 4000 m above the sea level, the rated output current is decreased by 1% for every 100 m.

### Vibration:

AOCH0xxx-70: Max 1 mm (5 to 13.2 Hz), max 7 m/s<sup>2</sup> (13.2 to 100 Hz) sinusoidal (IEC 60068-2)

NOCH0xxx-6x: Max 0.3 mm (2 to 9 Hz), max 1 m/s<sup>2</sup> (9 to 200 Hz) sinusoidal (IEC60068-2)

**Shock:** Max 70 m/s<sup>2</sup>, 22 ms (IEC 60068-2-27)

**Ambient conditions, storage**

Ambient storage conditions refer to the conditions du/dt filters are subjected to during storage in the protective package.

**Temperature:** -40 to +70 °C.

**Relative humidity:** Less than 95%, no condensation allowed

**Atmospheric pressure:** 70 to 106 kPa

**Vibration:**

AOCH0xxx-70: Max 1 mm (5 to 13.2 Hz), max 7 m/s<sup>2</sup> (13.2 to 100 Hz) sinusoidal (IEC 60068-2)

NOCH0xxx-6x: Max 0.3 mm (2 to 9 Hz), max 1 m/s<sup>2</sup> (9 to 200 Hz) sinusoidal (IEC 60068-2)

**Shock:** Max 100 m/s<sup>2</sup>, 11 ms (IEC 60068-2-27)

**Ambient conditions, transportation**

Ambient transportation conditions refer to the conditions du/dt filters are subjected to during transportation in the protective package.

**Temperature:** -40 to +70 °C

**Relative humidity:** Less than 95%, no condensation allowed.

**Atmospheric pressure:** 60 to 106 kPa

**Vibration:** Max 3.5 mm (2 to 9 Hz), max 15 m/s<sup>2</sup> (9 to 200 Hz) sinusoidal (IEC 60068-2)

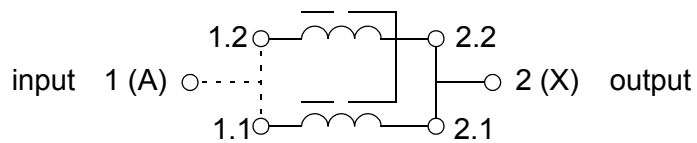
**Shock:** Max 100 m/s<sup>2</sup>, 11 ms (IEC 60068-2-27)

**Bump:** Max 300 m/s<sup>2</sup>, 6 ms (IEC 60068-2-29)

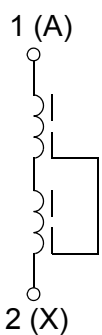
**Free fall:** 250 mm



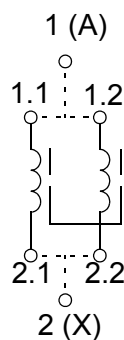
## Internal circuit diagrams



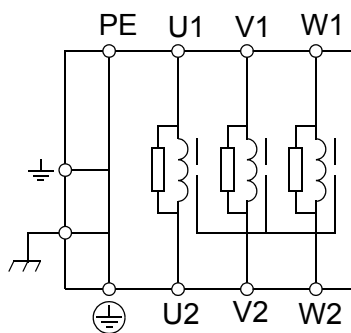
AOCH0xxx-70: Connect the input terminals together.



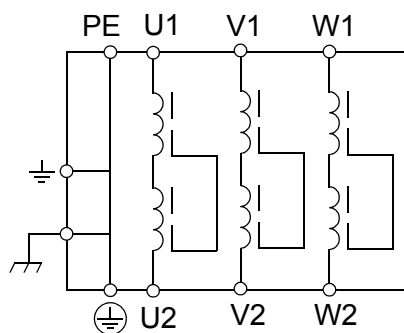
NOCH0120-60



NOCH0260-60  
NOCH0400-60  
NOCH0760-60

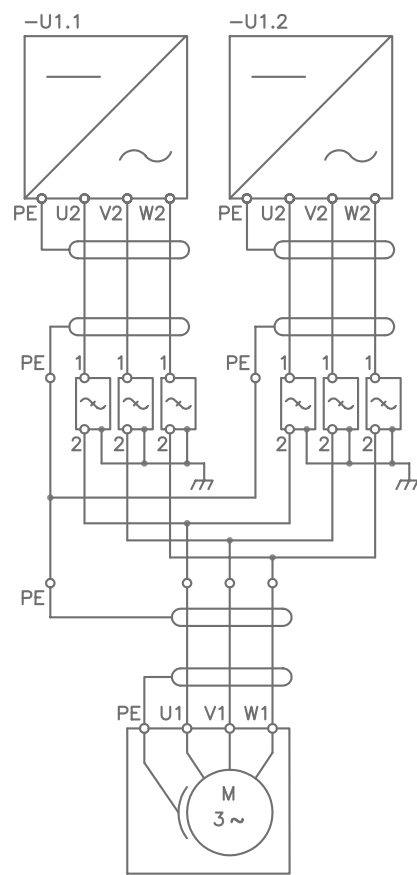


NOCH0016-6x  
NOCH0030-6x  
NOCH0070-6x

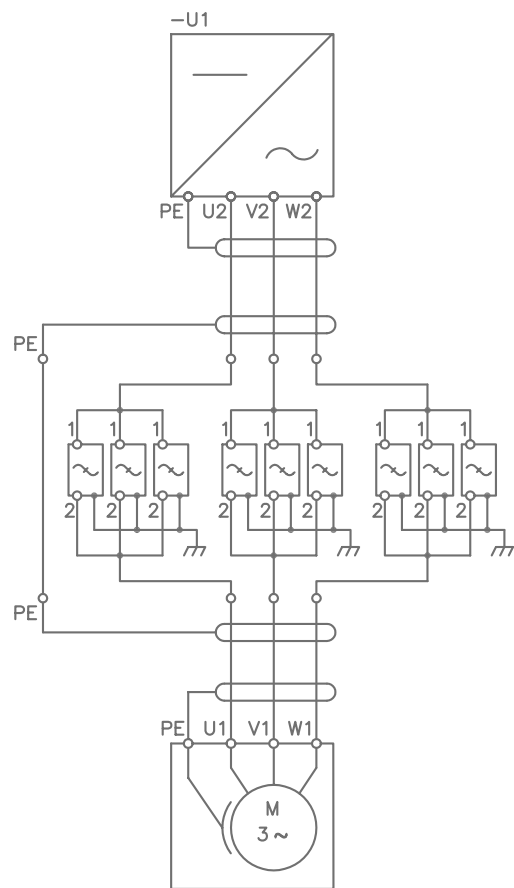


NOCH0120-6x

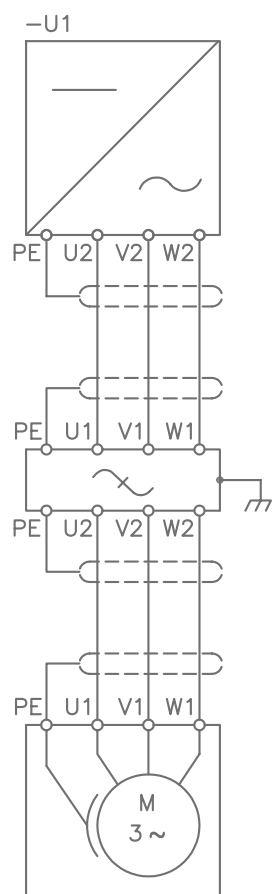
Power connections



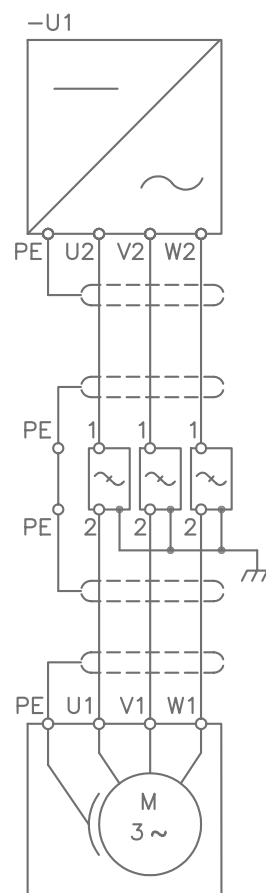
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NOCH0400-60  
NOCH0760-60



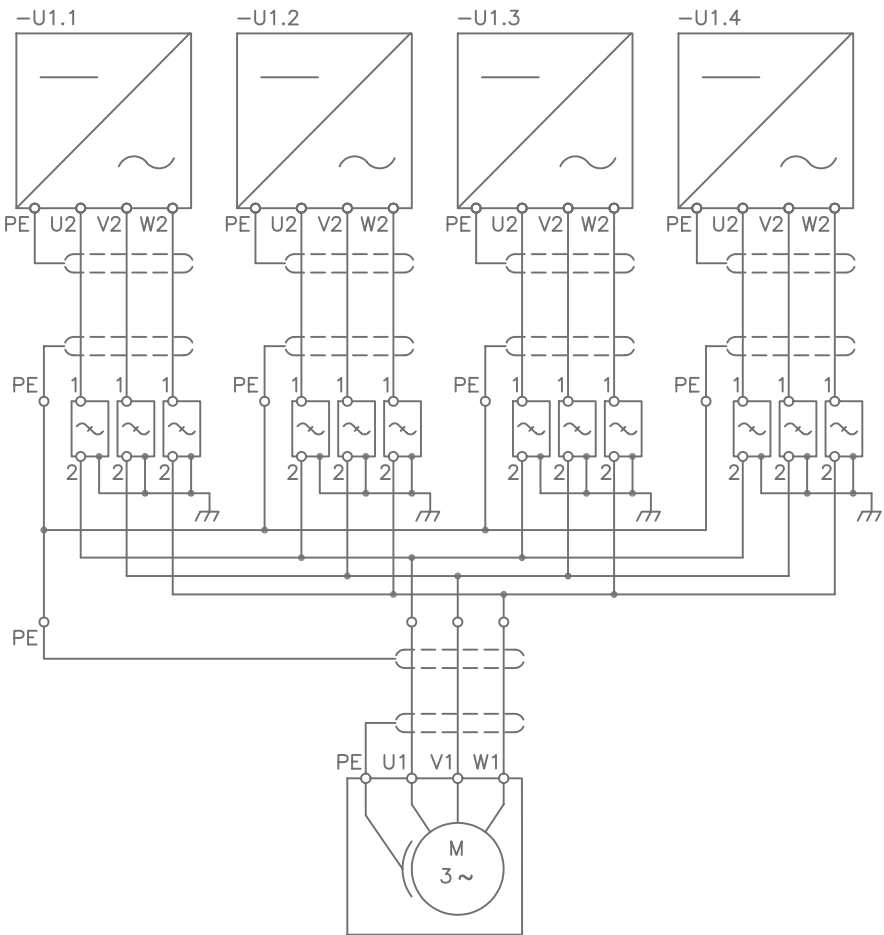
NOCH0400-60



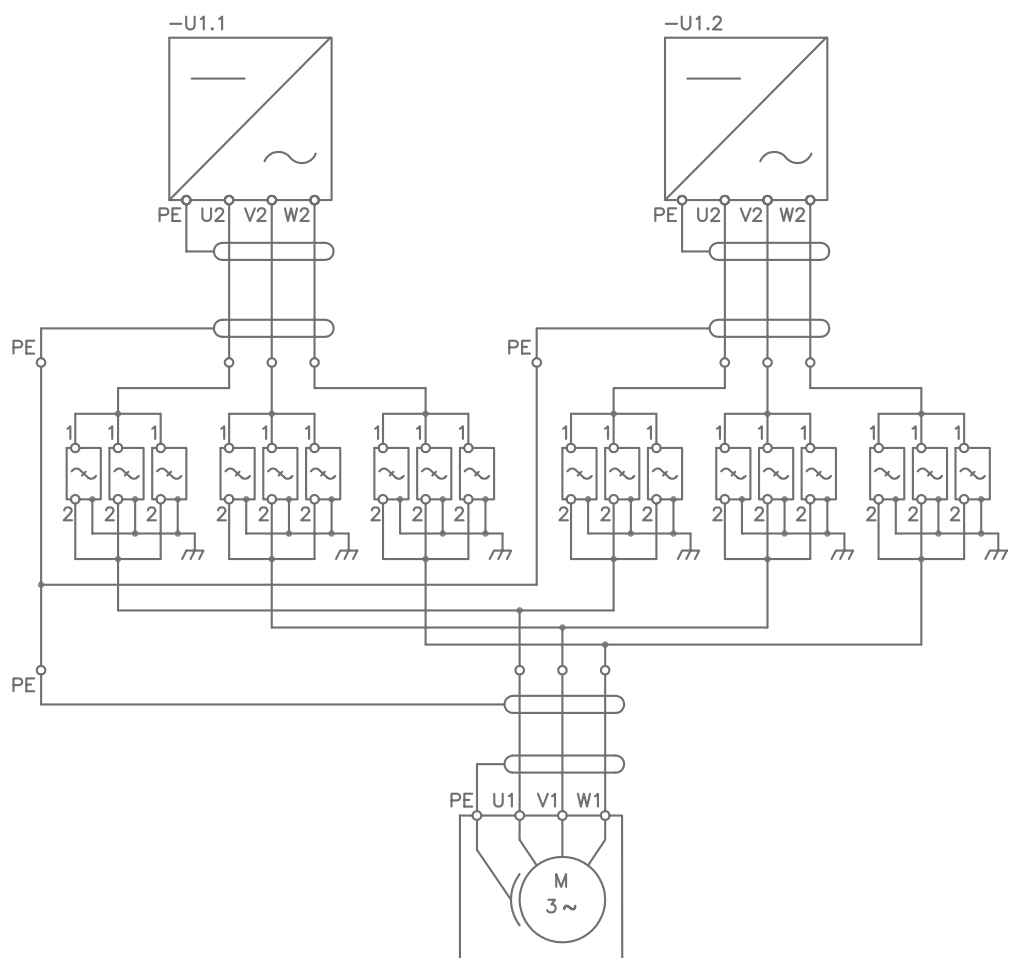
NOCH0016-6x  
 NOCH0030-6x  
 NOCH0070-6x



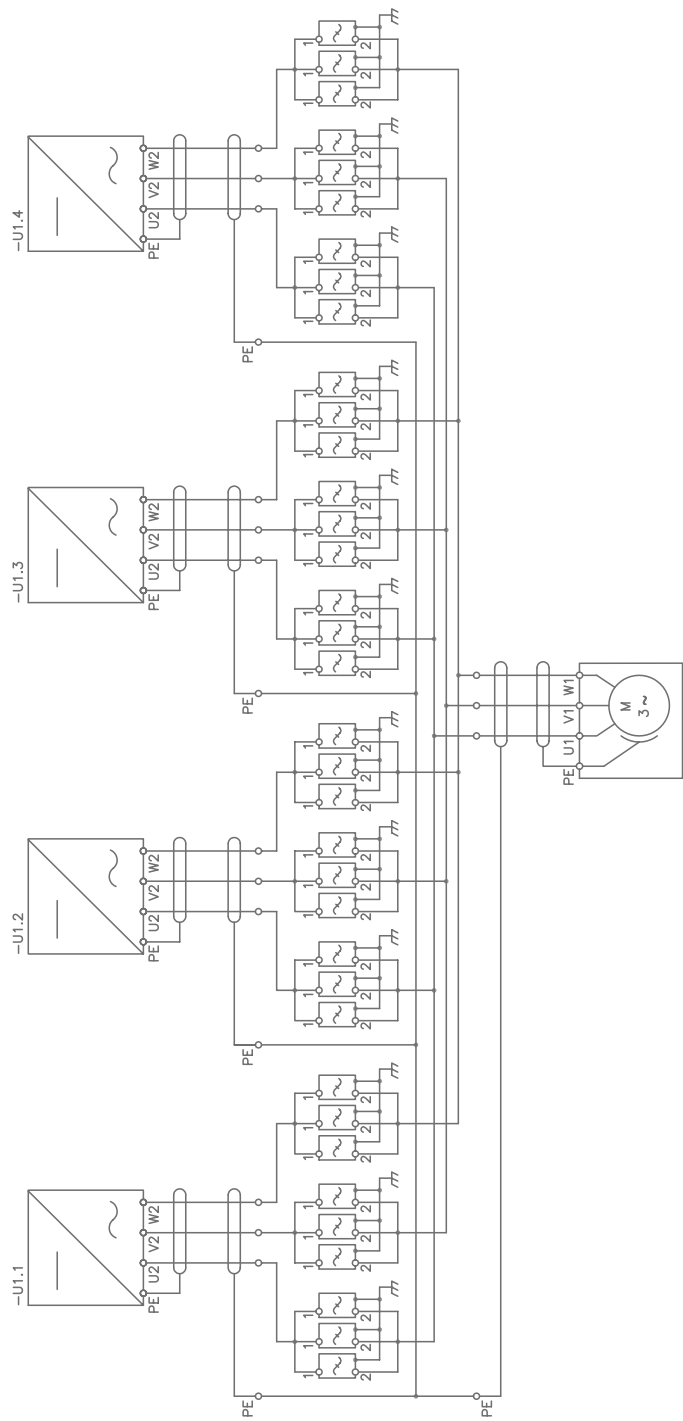
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 NOCH0260-60  
 NOCH0400-60  
 NOCH0760-60  
 AOCH0260-70  
 AOCH0400-70



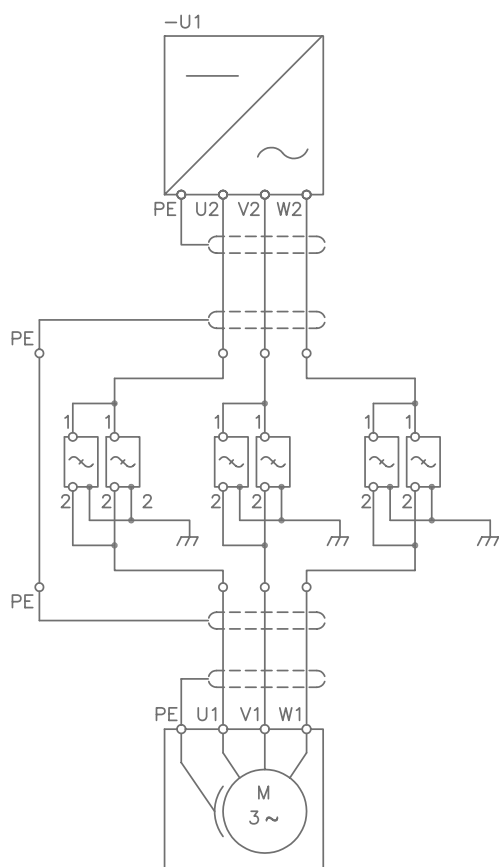
NOCH0760-60



NOCH0400-60

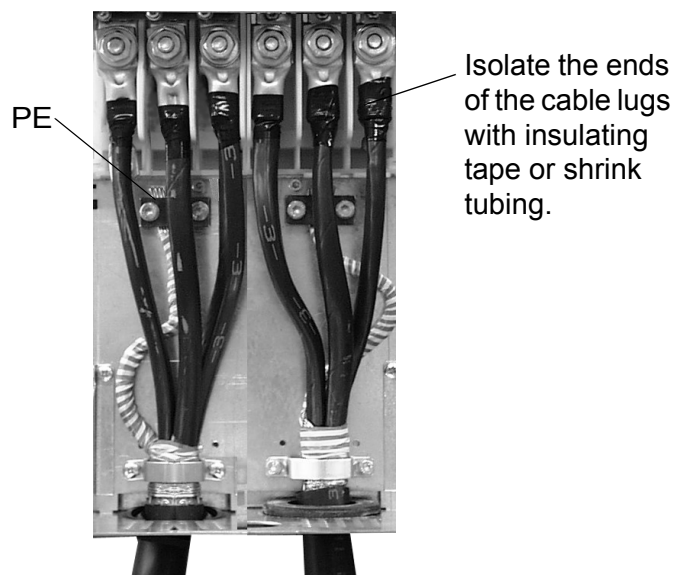


NOCH0400-60

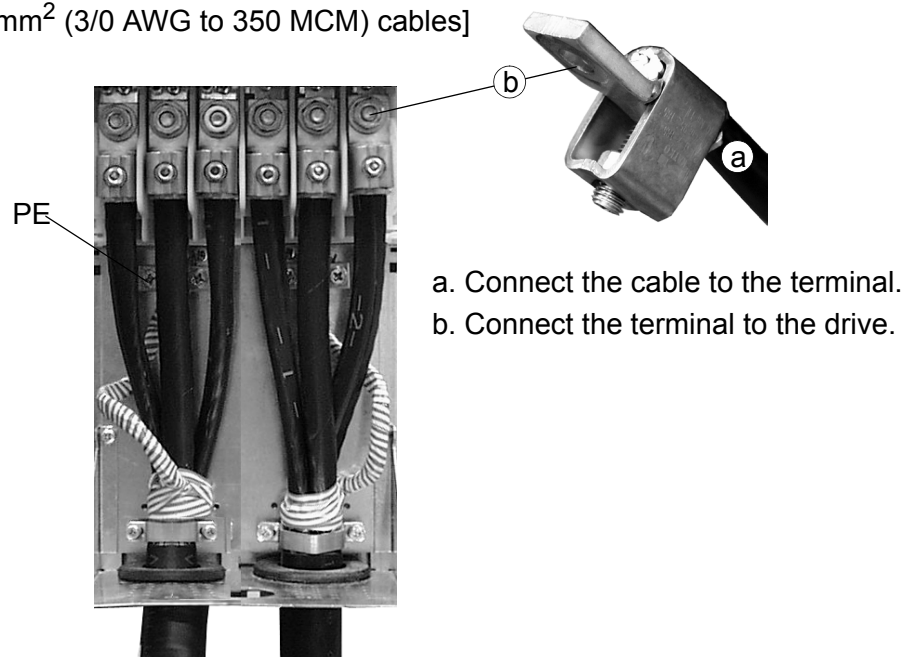


AOCH0400-70  
AOCH0260-70

NOCH0120-6x: Cable lug installation  
[16 to 70 mm<sup>2</sup> (6 to 2/0 AWG) cables]



NOCH0120-6x: Cable terminal installation  
[95 to 185 mm<sup>2</sup> (3/0 AWG to 350 MCM) cables]





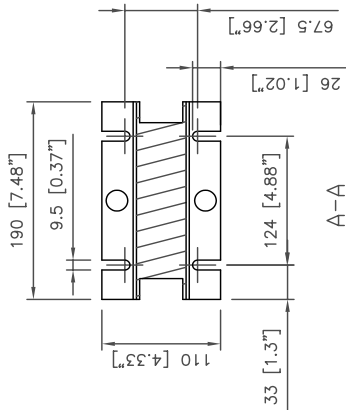
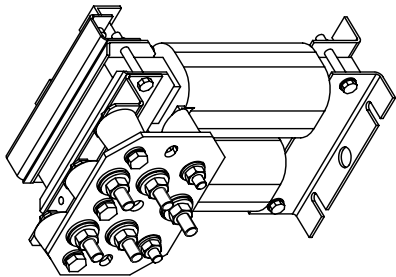
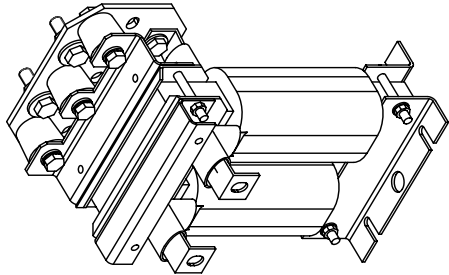
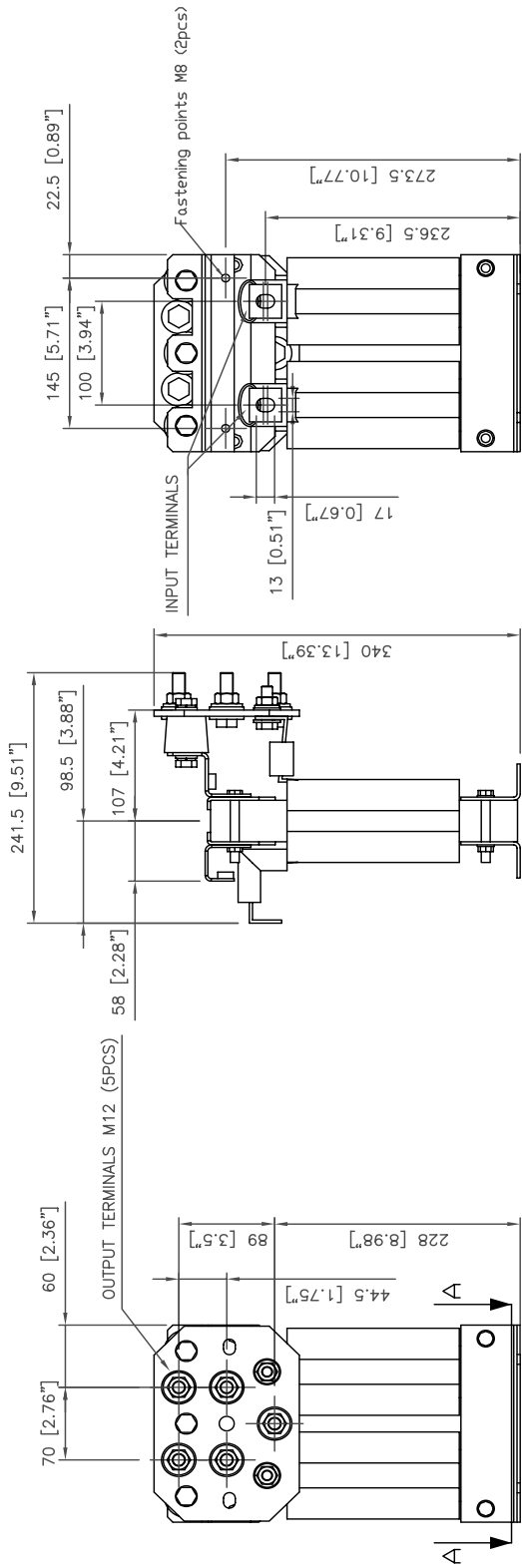
## Filter selection tables

SingleDrive				du/dt filter type (* 3 filters included in kits marked with *)								
				x=0 ≙ IP 00, x=2 ≙ IP22, x=5 ≙ IP 54								
				*AOCH0260-70	*AOCH0400-70	NOCH0016-6X	NOCH0030-6X	NOCH0070-6X	*NOCH0120-6X	*NOCH0260-60	*NOCH0400-60	*NOCH0760-60
	400 V	500 V	690 V									
60x-	0005-3, 0006-3 0009-3, 0011-3	0006-5, 0009-5 0011-6, 0016-6	0009-6, 0011-6 0016-6			1						
	0016-3, 0020-3	0020-5, 0025-5	0020-6, 0025-6 0030-6				1					
	0025-3, 0030-3 0040-3, 0050-3 0060-3	0030-5, 0040-5 0050-5, 0060-5 0070-5	0040-6, 0050-6 0060-6, 0070-6					1				
	0070-3, 0100-3 0120-3	0100-5, 0120-5 0140-5	0100-6, 0120-6						1			
	0140-3, 0170-3 0210-3	0170-5, 0210-5 0260-5	0140-6, 0170-6 0210-6, 0260-6							1		
	0260-3, 0320-3	0320-5, 0400-5	0320-6, 0400-6								1	
	0400-3	0490-5	0490-6							2		
	0490-3, 0610-3	0610-5, 0760-5	0610-6, 0760-6								2	
			0900-6									1
	0760-3, 0930-3	0930-5, 1090-5	1040-6, 1380-6								3	
	1120-3	1380-5	1710-6									2
	1440-3, 1770-3	1760-5, 2160-5	2120-6, 2540-6								6	
	2140-3, 2340-3	2620-5, 2850-5	2800-6, 3350-6									4
	2820-3	3450-5	3880-6, 5140-6								12	
800-01- 800-04-	0003-3, 0004-3 0005-3, 0006-3 0009-3, 0011-3	0004-5, 0005-5 0006-5, 0009-5 0011-5, 0016-5	0011-7			1						
	0016-3, 0020-3	0020-5	0016-7, 0020-7 0025-7				1					
	0025-3, 0030-3 0040-3, 0050-3	0025-5, 0030-5 0040-5, 0050-5 0060-5	0030-7, 0040-7 0050-7, 0060-7					1				
	0060-3, 0070-3 0100-3	0070-5, 0100-5 0120-5	0070-7, 0100-7 0120-7						1			
	0120-3	0140-5								1		
	0140-3, 0170-3	0170-5, 0210-5	0140-7, 0170-7	1								
	0210-3, 0260-3	0260-5, 0320-5	0210-7, 0260-7		1							
	0320-3	0400-5	0320-7, 0400-7	2								
	0400-3, 0440-3 0490-3	0440-5, 0490-5 0550-5, 0610-5	0440-7, 0490-7 0550-7, 0610-7		2							

MultiDrive				du/dt filter type (3 filters included in kits marked with *)								
				x=0 ▲ IP 00, x=2 ▲ IP22, x=5 ▲ IP 54								
				*AOCH0260-70	*AOCH0400-70	NOCH0016-6X	NOCH0030-6X	NOCH0070-6X	*NOCH0120-6X	*NOCH0260-60	*NOCH0400-60	*NOCH0760-60
	400 V	500 V	690 V									
6xx-	0005-3, 0006-3 0009-3, 0011-3	0006-5, 0009-5 0011-6, 0016-6	0009-6, 0011-6 0016-6			1						
	0016-3, 0020-3	0020-5, 0025-5	0020-6, 0025-6 0030-6				1					
	0025-3, 0030-3 0040-3, 0050-3 0060-3	0030-5, 0040-5 0050-5, 0060-5 0070-5	0040-6, 0050-6 0060-6, 0070-6					1				
	0070-3, 0100-3 0120-3	0100-5, 0120-5 0140-5	0100-6, 0120-6						1			
	0185-3, 0225-3	0215-5, 0255-5	0185-6, 0205-6 0255-6, 0315-6							1		
	0265-3, 0335-3	0325-5, 0395-5	0375-6, 0485-6								1	
	0405-3, 0500-3, 0630-3	0495-5, 0610-5, 0770-5	0600-6, 0750-6 0900-6									1
	0765-3, 0935-3	0935-5, 1095-5	1045-6, 1385-6								3	
	1125-3	1385-5	1715-6									2
	1440-3, 1775-3	1760-5, 2165-5	2125-6, 2545-6								6	
	2145-3, 2340-3	2625-5, 2850-5	2800-6, 3350-6									4
	2820-3	3450-5	3880-6, 5140-6								12	
800-104-	0003-3, 0004-3 0005-3, 0006-3 0009-3	0004-5, 0005-5 0006-5, 0009-5 0011-5	0011-7, 0016-7			1						
	0011-3, 0016-3	0016-5, 0020-5	0020-7, 0025-7 0030-7				1					
	0020-3, 0025-3 0030-3	0025-5, 0030-5 0040-5, 0050-5	0040-7, 0050-7 0060-7					1				
	0040-3, 0050-3 0060-3	0060-5, 0070-5							1			

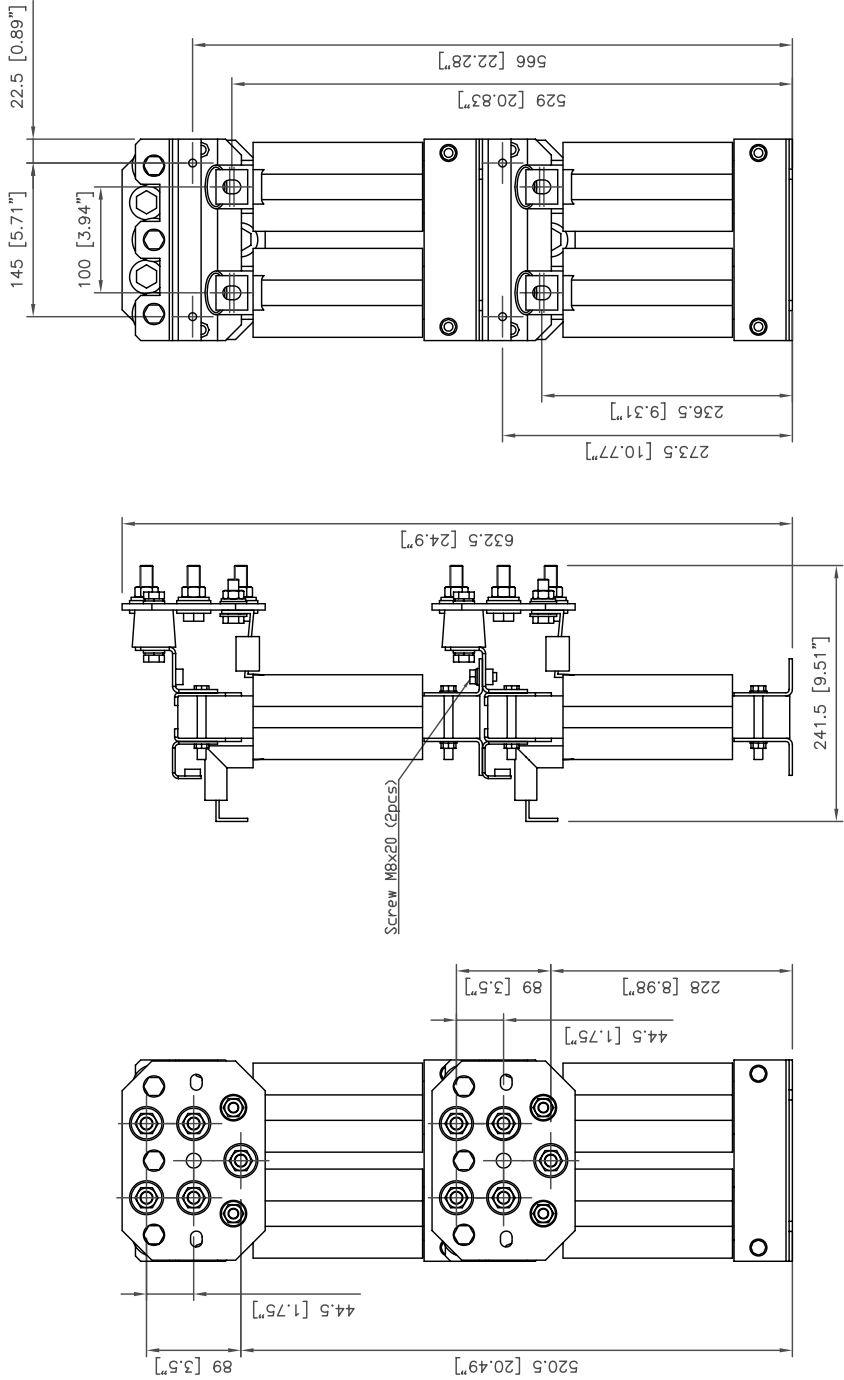
Dimensional drawings

AOCH0260-70, single phase filter  
du/dt filter kit includes 3 pieces of single phase filters.



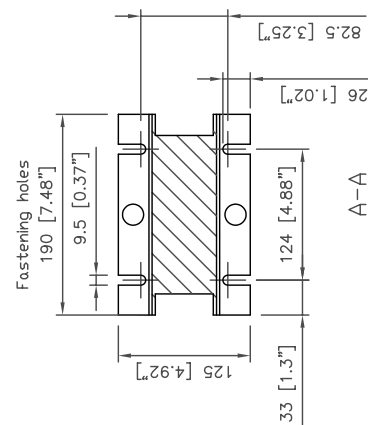
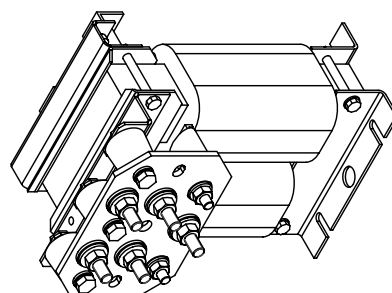
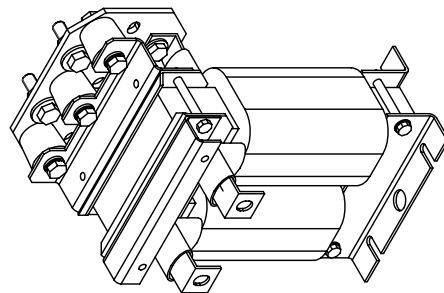
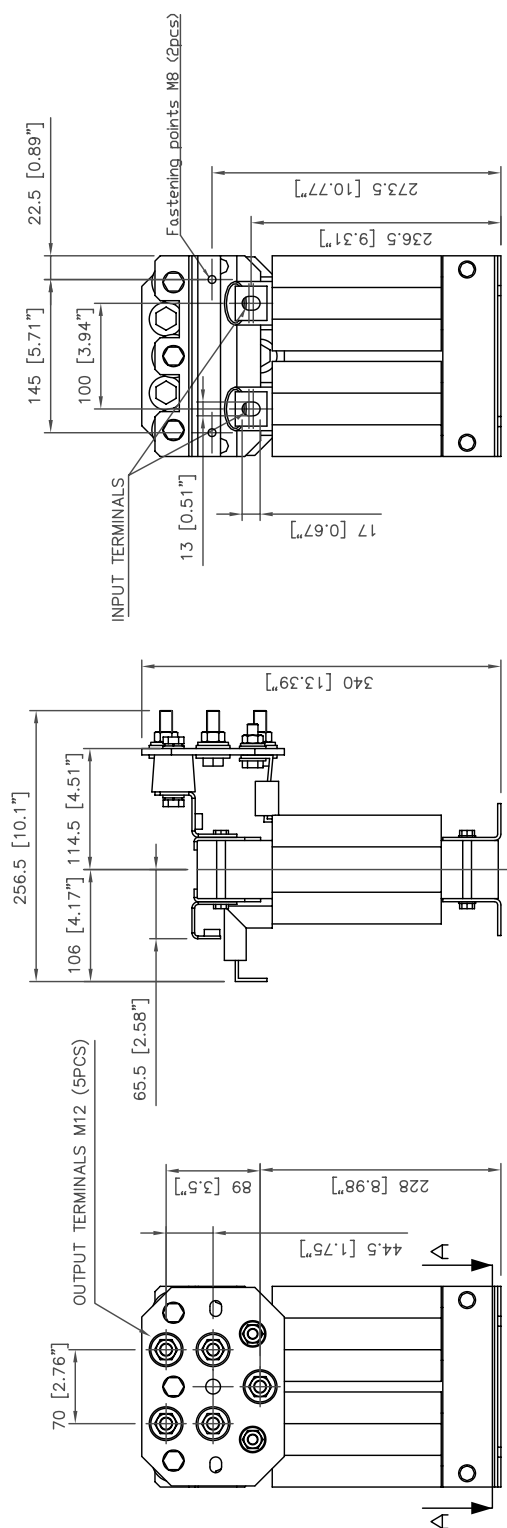
AOCH0260-70

Cable size:	3x(3x185)	Weight:	15.9 kg (35.1 lbs)
Screw size:	M12	$I_{TH}$	227 A <sub>rms</sub>
Power loss:	147 W	L	74 µH



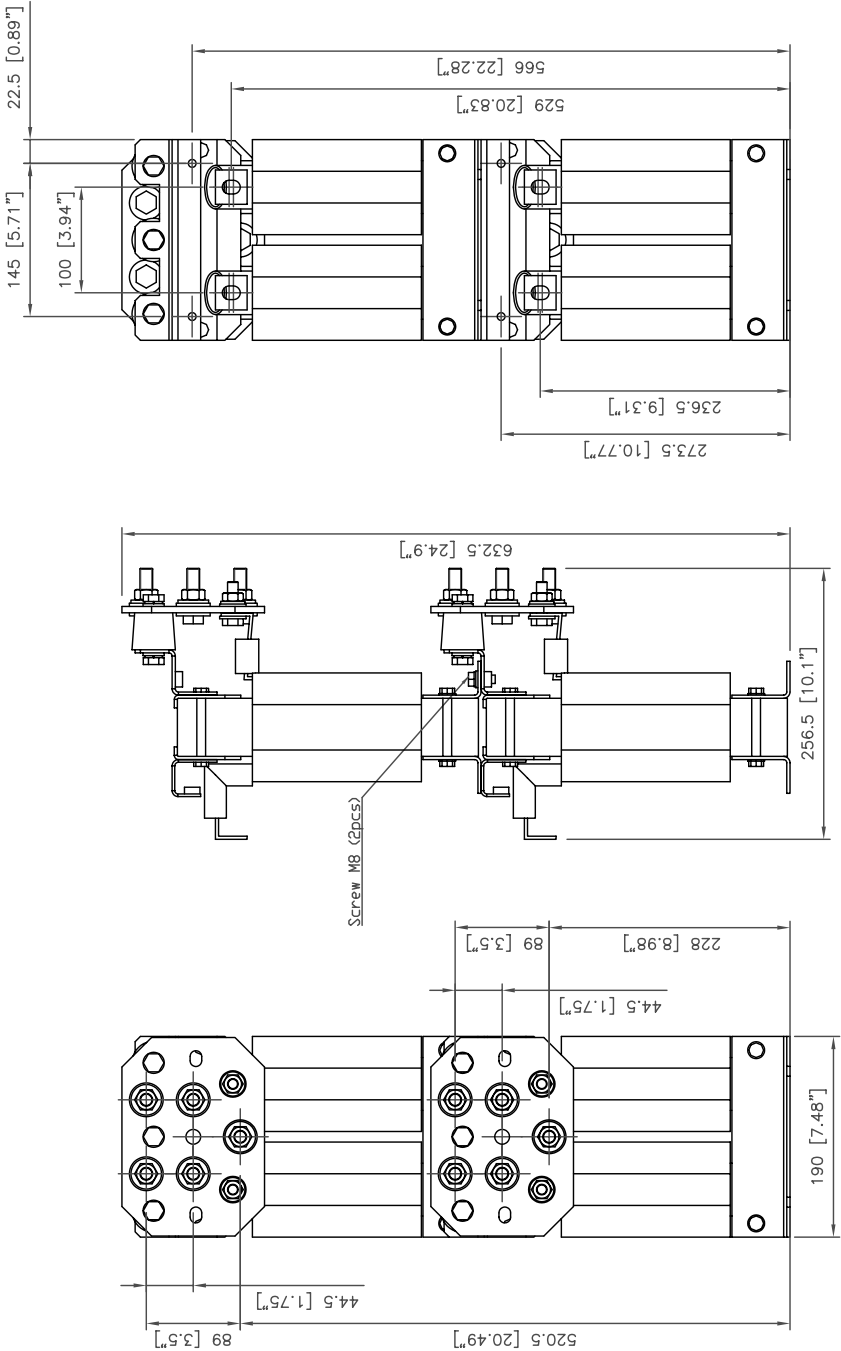
Alternative assembly

AOCH0400-70, single phase filter  
du/dt kit includes 3 pieces of single phase filters.




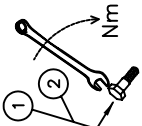
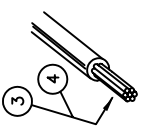
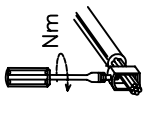


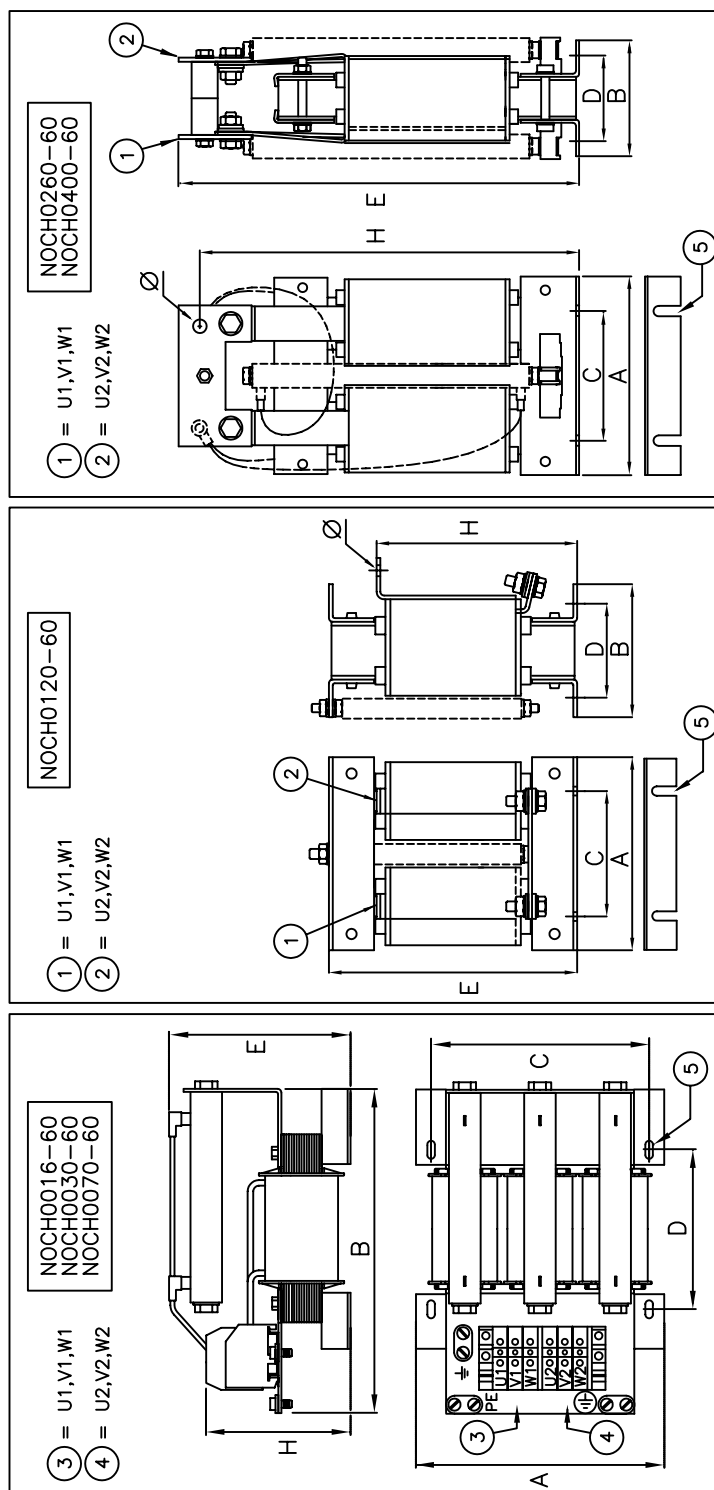
AOCH0400-70

Cable size:	3x(3x185)	Weight:	20.7 kg (45.6 lbs)
Screw size:	M12	$I_{TH}$	355 A <sub>rms</sub>
Power loss:	250 W	L	52 µH



Alternative assembly

L2								<div>① ② Ø</div>		<div> Nm</div>	<div> Nm</div>	<div> mm<sup>2</sup></div>	<div> Nm</div>
	A	B	C	D	E	H	mm						
NOCH0016-60	140	195	120	85	115	83	—	—	2.4	M5	4	0.2...10	1.5
NOCH0030-60	165	215	145	108	130	95	—	—	4.7	M5	4	0.5...16	1.5
NOCH0070-60	180	261	170	125	150	120	—	—	9.5	M6	6	10...35	2.5
NOCH0120-60	154	106	100	75	200	160	9	9	7	M8	20	—	—
NOCH0260-60	185	111	124	82	383	368	13	13	12	M10	30	—	—
NOCH0400-60	185	126	124	97	383	368	13	13	17	M10	30	—	—



Technical drawings of the 1000V 100A circuit breaker assembly, showing dimensions and component labels.

**Front View (Left):**

- Overall height:  $500 \pm 3$
- Top width:  $125 \pm 3$
- Top offset:  $33$
- Top hole diameter:  $\phi 11 \times 18$
- Top hole offset:  $15$
- Top hole diameter:  $61$
- Top hole offset:  $61$
- Top hole diameter:  $234 \pm 5$
- Top hole offset:  $435$  approx
- Top hole diameter:  $250$
- Top hole offset:  $176$

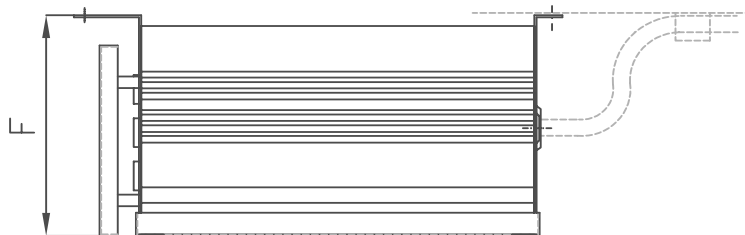
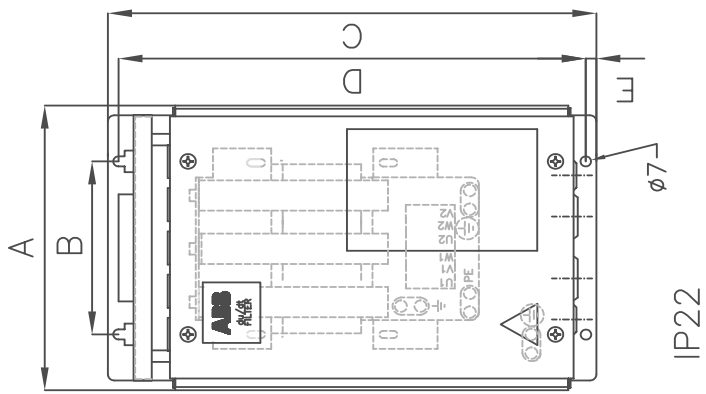
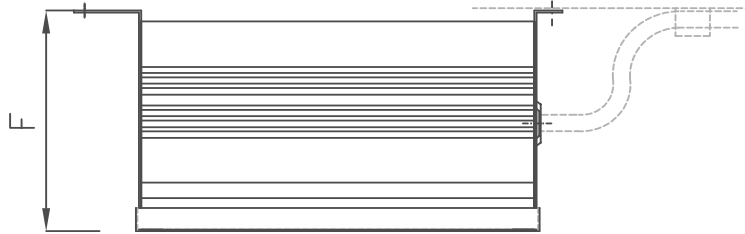
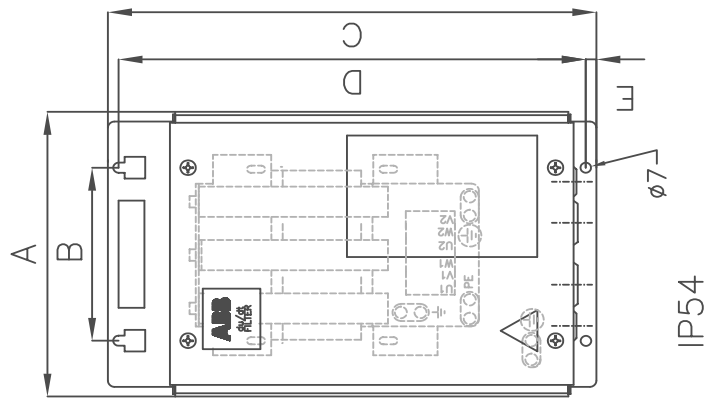
**Side View (Right):**


- Overall height:  $122 \pm 2$
- Top offset:  $6$
- Top hole diameter:  $61 \pm 2$
- Top hole offset:  $124 \pm 5$
- Top hole diameter:  $155$  approx
- Top hole offset:  $176$
- Top hole diameter:  $144$
- Top hole offset:  $\phi 12 \times 18$

**Detail View (Bottom):**

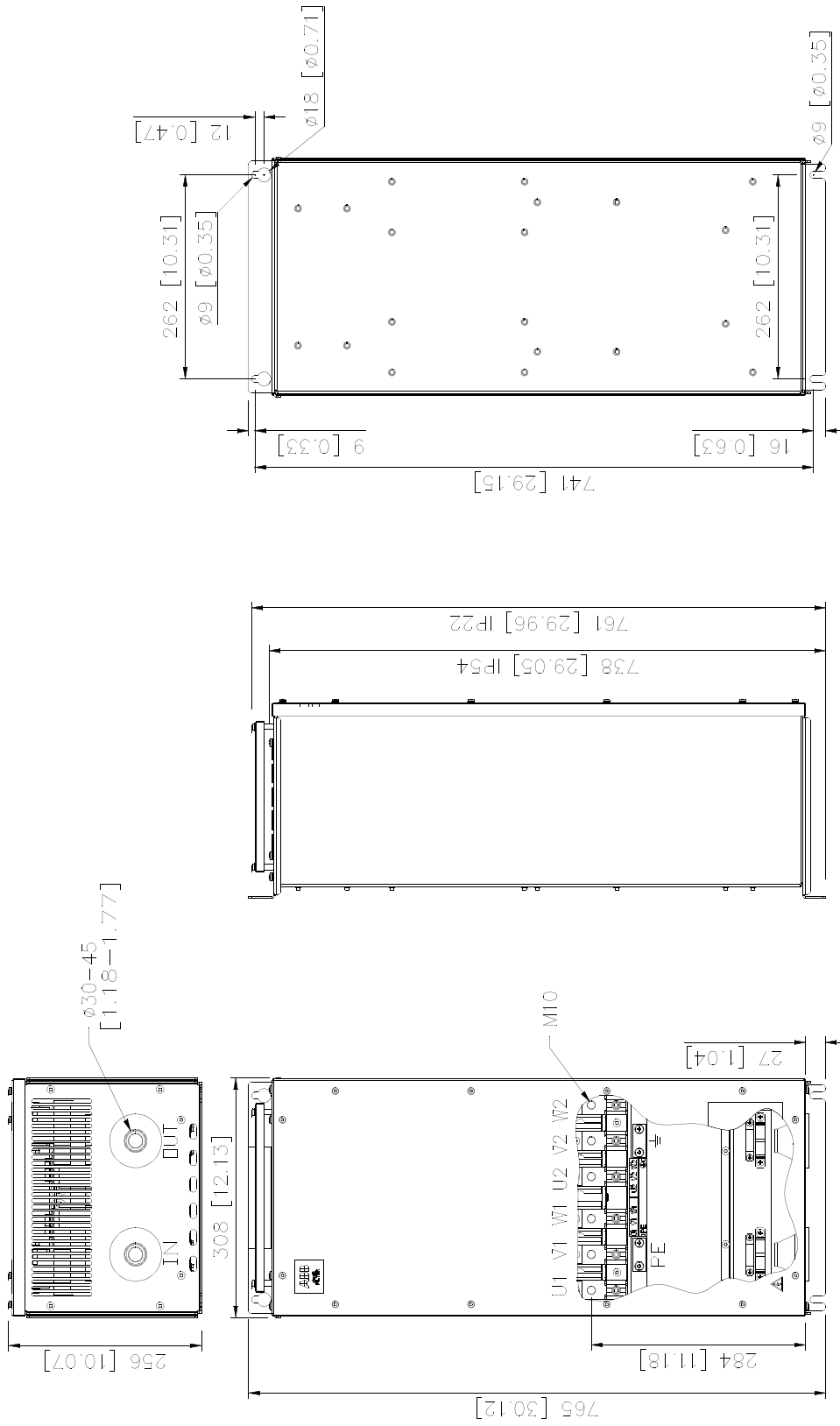
- Component labels: 1.1, 1.2, 2.1, 2.2





	A	B	C	D	E	F	 / 1
IP22	NOCH0016-62	199	120	323	309	7	154
	NOCH0030-62	249	160	348	334	7	172
	NOCH0070-62	279	180	433	419	7	202
IP54	NOCH0016-65	199	120	323	309	7	154
	NOCH0030-65	249	160	348	334	7	172
	NOCH0070-65	279	180	433	419	7	202

NOCH0120-62, NOCH0120-65 Weight 45 kg (99 lbs)



64787845-A





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**ABB Oy**  
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