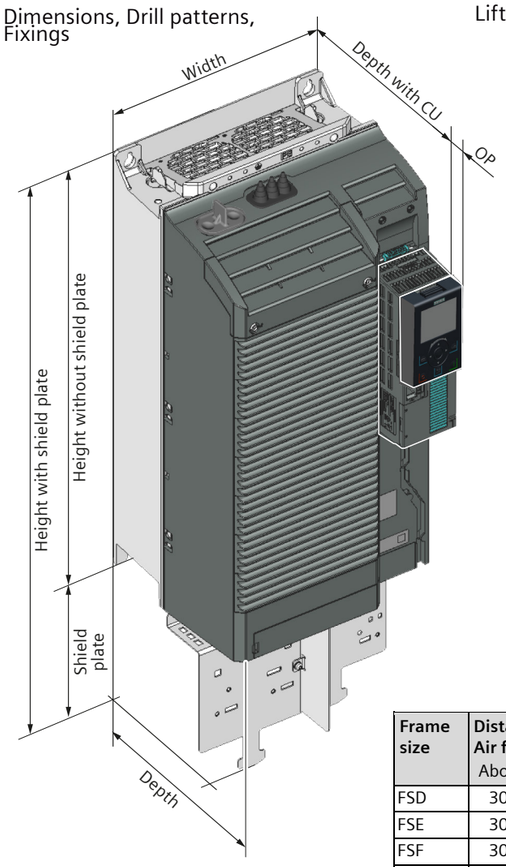
⚠ WARNING

Danger to life if the safety instructions and installation instructions are not observed

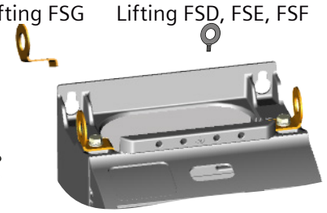
The compact installation instructions only contain the most important information for installing the Power Module. If the safety instructions and installation instructions in the associated documentation are not observed, accidents involving severe injuries or death can occur.

- Observe the safety instructions and installation instructions given in the associated documentation. See also http://support.automation.siemens.com/cs/ww/en/ps/13224/man

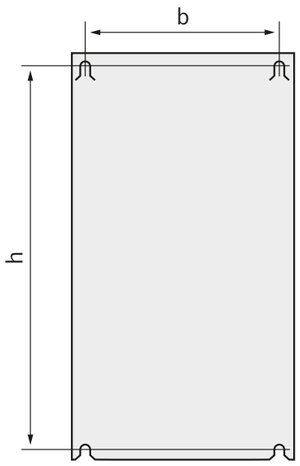
Dimensions, Drill patterns, Fixings



Lifting FSG

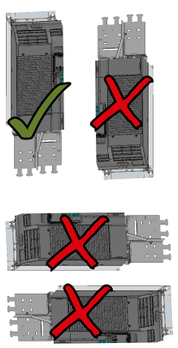


Lifting FSD, FSE, FSF



Frame size	Distances (mm) *) Air flow			Fixings		Drill pattern (mm)	
	Above	Below	Front	Screw	Torque (Nm)	b	h
FSD	300	350	100	M5	6	170	430
FSE	300	350	100	M6	10	230	509
FSF	300	350	100	M8	25	270	680
FSG	300	350	100	M10	50	265	970.5

*) Referred to the Power Module, except screening shields.
The Power Modules can be mounted side-by-side.
Due to tolerance reasons, we recommend a lateral distance of 1 mm.

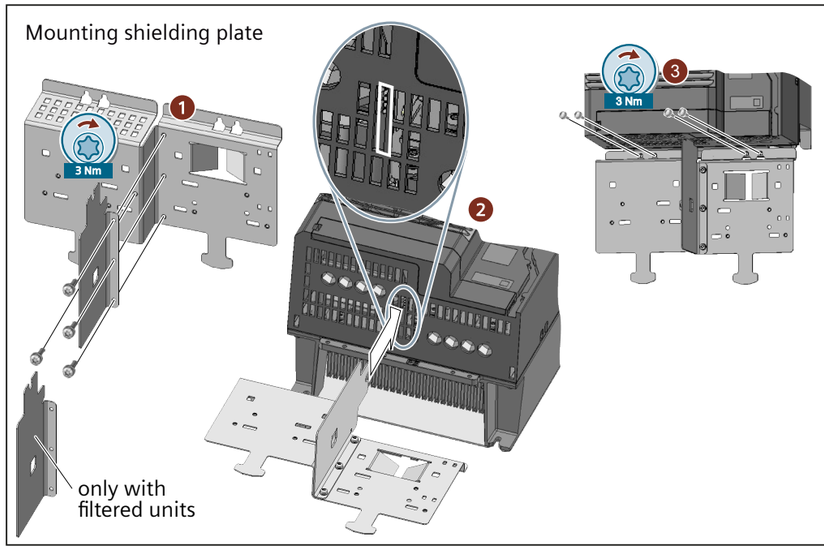


Frame size	Dimensions (mm)									
	Width	Height without shield plate	Height with shield plate	Depth	With control Unit CU230 P-2 1)	CUA / CU240 B/E -2 1)	CU250 S-2 1)	CU305 DP	CU305 PN	CU310 -2
FSD	200	472	624	237	253	237	256	248.5	264.5	268.5
FSE	275	551	728	237	253	237	256	248.5	264.5	268.5
FSF	305	709	965	357	373	357	376	368.5	384.5	388.5
FSG	305	1000	1255	357	373	357	376	368.5	384.5	388.5

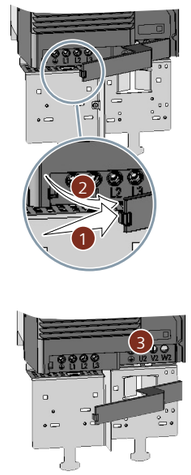
1) With an OP or a blanking cover, plus 11 mm; with SINAMICS G120 Smart Access, plus 9 mm.

FSD, FSE

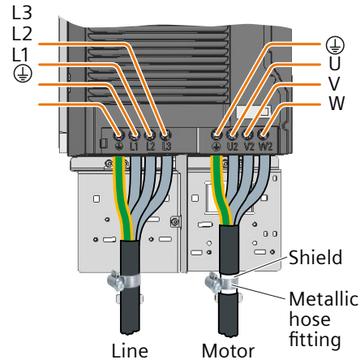
Mounting shielding plate



Removing covers

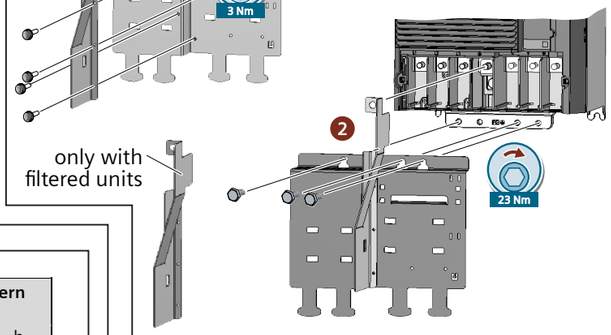


Connecting and shielding

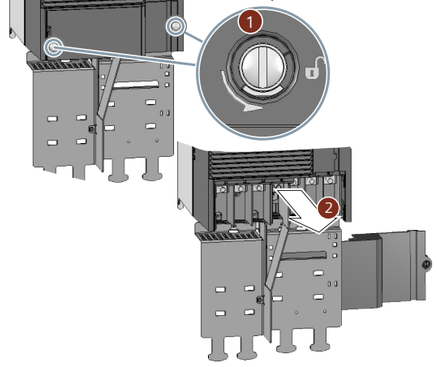


FSF, FSG

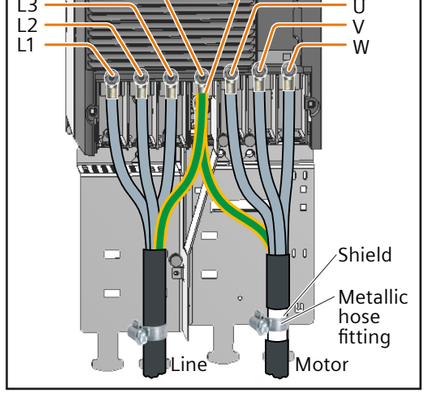
Mounting shielding plate, FSF



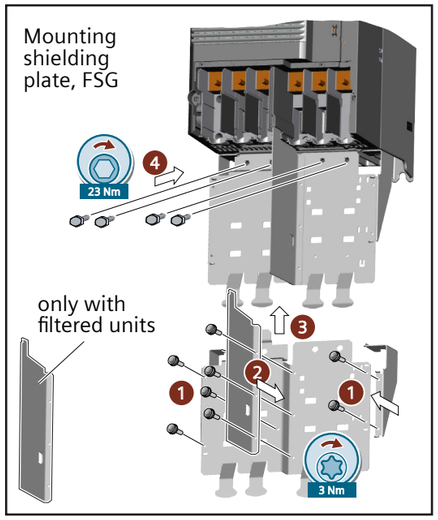
Removing covers FSF, FSG



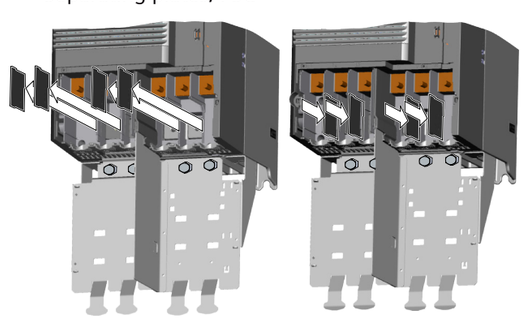
Connecting and shielding FSF



Mounting shielding plate, FSG



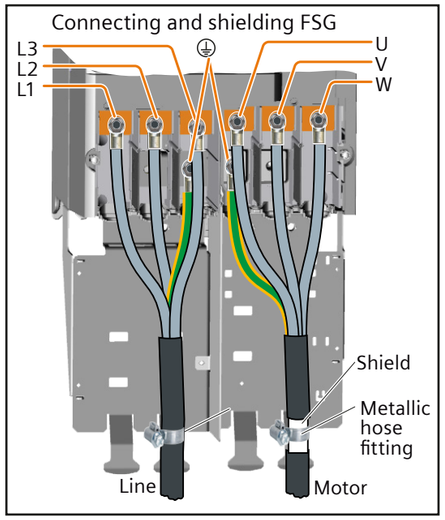
Separating plates, FSG



Remove separating plates for cabling.

Warning
For safe operation separating plates must be inserted after cabling.

Connecting and shielding FSG



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Input frequency:	50 Hz ... 60 Hz, ± 3 Hz			Power factor λ:	> 0.9
Output frequency:	0 Hz ... 550 Hz, depending on the control mode			Inrush current	Less than rated input current
Pulse frequency (Increasable in 2 kHz steps [1])	200 V Units, factory setting: 4 kHz			setting range:	2 kHz ... 16 kHz 11 kW ... 30 kW 2 kHz ... 8 kHz 37 kW ... 55 kW
	400 V Units, factory setting:	4 kHz	18.5 kW ... 90 kW	setting range:	2 kHz ... 16 kHz 18.5 kW ... 45 kW 2 kHz ... 8 kHz 55 kW ... 90 kW 2 kHz ... 4 kHz 110 kW ... 132 kW 2 kHz ... 8 kHz 160 kW ... 250 kW
		2 kHz	110 kW ... 250 kW		
	690 V Units, factory setting:	2 kHz		setting range:	2 kHz ... 4 kHz
Electromagnetic compatibility	Filtered devices comply with EN 61800-3: 2012 and are suitable for Category C2 / C3. For more details refer to the Hardware Installation Manual.				
Braking methods	DC braking, Compound braking, Resistor braking (Resistor braking only with PM240-2)				
Degree of protection	IP20 according to EN60529 (IEC) / open type (UL)				
Motor overload protection	This equipment is capable of providing internal motor overload protection according to UL61800-5-1. The protection level is 115 % of full load current of the equipment. This is adjusted via parameter p0640 and assumes the equipment has had basic motor commissioning for the motor used as described in the documentation.				
Applicable motors	Following motors can be used at full performance: Power Modules 200 V or 400 V: rated motor current: 25 % ... 150 % of the rated converter output current Power Modules 690 V: rated motor current: 50 % ... 150 % of the rated converter output current.				

[1] Increasing the pulse frequencies leads to an output current reduction. For more details, refer to the Hardware Installation Manual.

Environmental conditions	Long-term storage in transport packaging	Transport in transport packaging	Operation
Temperature	-25 °C ... 55 °C (-13 °F ... 131 °F)	-40 °C ... 70 °C (- 40 °F ... 158 °F)	-20 °C ... 40 °C (-4 °F ... 104 °F) [1]
Chemical substances	Class 1C2 according to EN 60721-3-1	Class 2C2 according to EN 60721-3-2	Class 3C2 according to EN 60721-3-3
Biological environmental conditions	Class 1B1 according to EN 60721-3-1	Class 2B1 according to EN 60721-3-2	Class 3B1 according to EN 60721-3-3
Shock and vibration	See Hardware Installation Manual		
Installation altitude	Up to 1000 m (3300 ft) above sea level without derating / Up to 4000 m (13000 ft) above sea level with derating		
Humidity	< 95 % RH - non-condensing		
Pollution	Protected against pollution according to pollution degree level 2. If protection against conductive pollution is required, the unit must be installed in an IP54 cabinet.		

[1] Operation according to LO with derating up to 60 °C (140 °F).
The maximum and minimum surrounding temperature is limited by the temperature limits of the used components (Power Module, Control Unit or Operator Panel).

WARNING - The opening of the branch-circuit protective device may be an indication that a fault current has been interrupted. To reduce the risk of fire or electrical shock, current-carrying parts and other components of the controller should be examined and replaced if damaged. If burnout of the current element of an overload relay occurs, the complete overload relay must be replaced.

For connecting the safety related function "Safe Torque Off" (STO) or Brake Relay use 600 V insulated wire only.

For United States/Canadian installations (UL/cUL): The products are cULus listed under E192450.

- **SCCR:** The **Short Circuit Current Rating** of the supply circuit shall not exceed 100 kA rms (Symetrical Amperes), 240/480/600 Vac maximum, when protected by listed Class J fuses or a divergent value, when protected by another protective device listed under https://support.industry.siemens.com/cs/ww/en/view/109782705
- Integral solid state short circuit protection does not provide branch circuit protection. Branch circuit protection must be provided in accordance with the NEC or CEC, Part I, respectively, and any additional local codes. You find fuses for branch circuit protection in the table on the right top of this page.
- Install power conductors sufficiently separated or isolated against any low voltage circuits or other power circuits.
- Use 60/75 °C copper conductors only. On the brake resistor terminal of FSE use 75 °C rated conductors only.
- FSF and FSG line and motor terminals shall be connected with UL-Listed (ZMVV) ring lugs with suitable voltage and current rating (min. 125% of input/output current).

Additional requirements for CSA compliance: Overvoltage Categroy OVC III must be ensured for all primary circuit connections of the equipment. This may require Transient Surge Supression (SPD) to be installed on the line side of the equipment. The voltage rating of the SPD shall not be smaller than the supply voltage. It shall provide protection for a rated impulse withstand voltage peak of not more than the VPR shown in the table below.

Supply voltage		Phase to ground Rated voltage	Phase to ground VPR	Phase to ground Rated voltage	Phase to ground VPR
3 AC 200 ... 240 V	Grounded neutral	139 V	2,5 kV	240 V	4 kV
	Corner grounded	240 V	4 kV	240 V	4 kV
3 AC 380 ... 480 V	Grounded neutral	277 V	4 kV	480 V	4 kV
	Corner grounded	480 V	6 kV	480 V	4 kV
3 AC 500 ... 600 V	Grounded neutral	347 V	6 kV	600 V	4 kV
	Corner grounded	600 V	6 kV	600 V	4 kV

Cable cross section and fixing torque					
Frame Size	Component	Cable mm²	Torque Nm	Cable AWG / MCM	Torque lbf in
FSD	Line, motor, DC link	10 ... 35	2.5 ... 4.5	8 AWG ... 2 AWG	22 ... 40
	Braking resistor	2.5 ... 16	1.2 ... 1.5	14 AWG ... 6 AWG	10.5 ... 13
FSE	Line, motor, DC link	25 ... 95	8 ... 10	4 AWG ... 3/0 AWG	71 ... 88.5
	Braking resistor	10 ... 35	2.5 ... 4.5	8 AWG ... 2 AWG	22 ... 40
FSF	Line, motor, DC link	35 ... 2x120	22 ... 25	2 AWG ... 2x4/0 AWG	195 ... 221
	Braking resistor	25 ... 95	8 ... 10	4 AWG ... 3/0 AWG	71 ... 88.5
FSG	Line, motor, DC link	35 ... 2x185	22 ... 25	2 AWG ... 2x350 kcmil	195 ... 221
	Braking resistor	25 ... 95	8 ... 10	4 AWG ... 3/0 AWG	71 ... 88.5

CAUTION
Cable cross-section for grounding: Observe local specifications

- In IEC areas, IEC 60264-5-54, Table 52.2.
- In the USA, the NFPA 70 NEC Specifications, Article 250, Table 250.122.
- In Canada, the CEC Canadian Electrical Code specifications.

Scan the QR code for information on our Online Support app.

... or follow the link:
https://support.industry.siemens.com/cs/de/en/sc/2067

Scan the QR code for Declaration of Conformity and Certificates.

... or follow the link:
http://support.automation.siemens.com/cs/ww/en/ps/13225/cert

Scan the QR code for further documentation for your converter.

... or follow the link:
http://support.automation.siemens.com/cs/ww/en/ps/13224/man

Data regarding the power loss in accordance with Ecodesign Regulation (EU) 2019/1781 and IEC 61800-9-2

You can find data regading power loss of our products on the Internet:

https://support.industry.siemens.com/cs/ww/en/view/94059311

Rated LO values Power (IEC) kW	Output current A	HO values Power (IEC) kW	Output current A	Rated (LO) input current A	Frame Size	Articel no. [1] [2] PM240-2	PM240P-2	Line fuses, fuese for branch circuit protection [3] acc. IEC/UL Siemens [4]		Listed class J acc. UL 600 V ac A
U_{in} 3 AC 200 ... 240 V ± 10 %, U_{out} 3 AC 0 V ... U_{in} *0.95, brake output volt. 410 V										
11	42	7.5	35	40	FSD	6SL3210-1PC24 -2UL0	---	3NA3822	63 A	60
15	54	11	42	51	FSD	6SL3210-1PC25 -4UL0	---	3NA3824	80 A	70
18.5	68	15	54	64	FSD	6SL321 x-1PC26 -8UL0	---	3NA3830	100 A	90
22	80	18.5	68	76	FSE	6SL3210-1PC28 -8UL0	---	3NA3830	100 A	100
30	104	22	80	98	FSE	6SL321 x-1PC31 -1UL0	---	3NA3836	160 A	150
37	130	30	104	126	FSF	6SL3210-1PC31 -3UL0	---	3NA3140	200 A	175
45	154	37	130	149	FSF	6SL3210-1PC31 -6UL0	---	3NA3140	200 A	200
55	178	45	154	172	FSF	6SL321 x-1PC31 -8UL0	---	3NA3142	224 A	225
U_{in} 3 AC 380 ... 480 V – 20 %, + 10 %, U_{out} 3 AC 0 V ... U_{in} *0.95, brake output volt. 820 V										
18.5	38	15	32	36	FSD	6SL3210-1PE23 -8_L0	---	3NA3822	63 A	60
22	45	18.5	38	42	FSD	6SL3210-1PE24 -5_L0	6SL3210-1RE24 -5_L0	3NA3824	80 A	70
30	60	22	45	57	FSD	6SL3210-1PE26 -0_L0	6SL3210-1RE26 -0_L0	3NA3830	100 A	90
37	75	30	60	70	FSD	6SL321 x-1PE27 -5_L0	6SL3210-1RE27 -5_L0	3NA3830	100 A	100
45	90	37	75	86	FSE	6SL3210-1PE28 -8_L0	6SL3210-1RE28 -8_L0	3NA3832	125 A	125
55	110	45	90	104	FSE	6SL321 x-1PE31 -1_L0	6SL3210-1RE31 -1_L0	3NA3836	160 A	150
75	145	55	110	140	FSF	6SL3210-1PE31 -5_L0	6SL3210-1RE31 -5_L0	3NA3140	200 A	200
90	178	75	145	172	FSF	6SL3210-1PE31 -8_L0	6SL3210-1RE31 -8_L0	3NA3142	224 A	250
110	205	90	178	198	FSF	6SL3210-1PE32 -1_L0	6SL3210-1RE32 -1_L0	3NA3250	300 A	300
132	250	110	205	242	FSF	6SL321 x-1PE32 -5_L0	6SL3210-1RE32 -5_L0	3NA3252	315 A	350
160	302	132	250	300	FSG	6SL3210-1PE33 -0_L0	---	3NA3254	355 A	400
200	370	160	302	365	FSG	6SL3210-1PE33 -7_L0	---	3NA3260	400 A	500
250	477	200	370	470	FSG	6SL3210-1PE34 -8_L0	---	3NA3372	630 A	600
U_{in} 3 AC 500 ... 690 V – 20 %, + 10 %, [5] U_{out} 3 AC 0 V ... U_{in} *0.95, brake output volt. 1210 V										
11	14	7.5	11	14	FSD	6SL3210-1PH21 -4_L0	6SL3210-1RH21 -4_L0	3NA3807-6	20 A	20
15	19	11	14	18	FSD	6SL3210-1PH22 -0_L0	6SL3210-1RH22 -0_L0	3NA3810-6	25 A	25
18.5	23	15	19	22	FSD	6SL3210-1PH22 -3_L0	6SL3210-1RH22 -3_L0	3NA3812-6	32 A	30
22	27	18.5	23	25	FSD	6SL3210-1PH22 -7_L0	6SL3210-1RH22 -7_L0	3NA3817-6KJ	40 A	35
30	35	22	27	33	FSD	6SL3210-1PH23 -5_L0	6SL3210-1RH23 -5_L0	3NA3820-6KJ	50 A	45
37	42	30	35	40	FSD	6SL321 x-1PH24 -2_L0	6SL3210-1RH24 -2_L0	33NA3822-6	63 A	60
45	52	37	42	50	FSE	6SL3210-1PH25 -2_L0	6SL3210-1RH25 -2_L0	3NA3824-6	80 A	80
55	62	45	52	59	FSE	6SL321 x-1PH26 -2_L0	6SL3210-1RH26 -2_L0	3NA3824-6	80 A	80
75	80	55	62	78	FSF	6SL3210-1PH28 -0_L0	6SL3210-1RH28 -0_L0	3NA3830-6	100 A	100
90	100	75	80	97	FSF	6SL3210-1PH31 -0_L0	6SL3210-1RH31 -0_L0	3NA3132-6	125 A	125
110	115	90	100	111	FSF	6SL3210-1PH31 -2_L0	6SL3210-1RH31 -2_L0	3NA3136-6	160 A	150
132	142	110	115	137	FSF	6SL321 x-1PH31 -4_L0	6SL3210-1RH31 -4_L0	3NA3140-6	200 A	200
160	171	132	144	170	FSG	6SL3210-1PH31 -7CL0	---	3NA3244-6	250 A	250
200	208	160	171	205	FSG	6SL3210-1PH32 -1CL0	---	3NA3252-6	315 A	300
250	250	200	208	250	FSG	6SL3210-1PH32 -5CL0	---	3NA3354-6	355 A	350

[1] _: A = with filter class C2
C = with filter class C3
U = unfiltered unit

[2] x: 0 = IP 20 unit, 1 = Push-through unit

[3] For further protective devices refer to: https://support.industry.siemens.com/cs/ww/en/view/109782705

[4] must be installed in the same overall assembly

[5] for UL applications 3 AC 500 V ... 600 V only

Voltage	Maximum motor cable length EMC C2 units with filter integrated	No EMC category units with or without filter without / with one output reactor		with two output reactors in series	
	Shielded	Shielded	Un-shielded	Shielded	Un-shielded
Frame size FSD/FSE					
200 V	150 m	200 m	300 m	350 m	525 m
400 V	150 m	200 m	300 m	350 m	525 m
690 V	100 m	200 m	300 m	350 m [2]	525 m [2]
Frame size FSF					
200 V	150 m	300 m	450 m	525 m	800 m
400 V	150 m	300 m	450 m	525 m	800 m
690 V	150 m [1]	300 m	450 m	525 m	800 m
Frame size FSG					
400 V	150 m 300 m [1]	300 m	450 m	525 m	800 m
690 V	150 m [1]	300 m	450 m	525 m	800 m

[1] EMC Category C3 only

[2] PM240P-2 only

FSD	FSE	FSF	FSG	Contents of delivery
1	1	1	1	Frequency Converter
1	1	1	1	Compact Operating Instructions
1	1	1	1	Warning labels
1	1	1	1	CSA Warning labels for Canadian plants
1	1	1	1	EMC connection lug (separating plate)
1	1	1	1	Shielding plate
1	1	1	1	Product liability notes
10	10	4	8	Torx screws M4 x 10
8	8	-	-	Torx screws M5 x 16
-	-	7	10	Torx screws M10 x 20
1	1	1	1	Cable gland 2 pole
4	4	4	5	Hose clamps
1	1	-	-	Contact protection for power connection – if power connection not used

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