OSFS, OSFD
Active Filters

Active harmonics filter in freestanding or wall-mounting cabinet, for three-phase low voltage networks with a neutral conductor for the compensation of harmonic currents up to the 50th harmonic, the correction of reactive power at the fundamental frequency and for balancing loads.

A host of problems...

The quality of a power supply is reduced considerably by loads that generate harmonics. These can cause electronically controlled devices to fail, break down or exhibit “inexplicable malfunction”.

- Sporadic upsets and defects in electronic control systems and devices
- Sporadic tripping of circuit breakers for no apparent reason
- Cables - especially transformers and induction motors - get too hot
- Motor power drops
- Power factor correction systems are overloaded
- The neutral conductor is overloaded
- Flicker in the supply network
- Disrupting effects on the medium voltage network

THE solution

If the operation of loads causing serious harmonics problems calls for an improvement of the network quality, FRAKO Active Filters should be installed.

The harmful effects of harmonics from single loads, load groups or a complete electrical system can be mitigated down to an acceptable degree, if not removed totally from the network.

OSFS and OSFD Active Filters combine numerous advantages. They are top-of-the-range instruments hallmarked by extremely short reaction times and selective control up to the 50th harmonic, without current error or phase displacement. The degree of compensation and the control dynamics can be optimized to suit local conditions.

In addition to harmonics compensation, these filters are also suitable for extremely fast control of fundamental-frequency reactive power and for balancing asymmetrical loads. This also reduces the amount of flicker in the network.

Active Filters

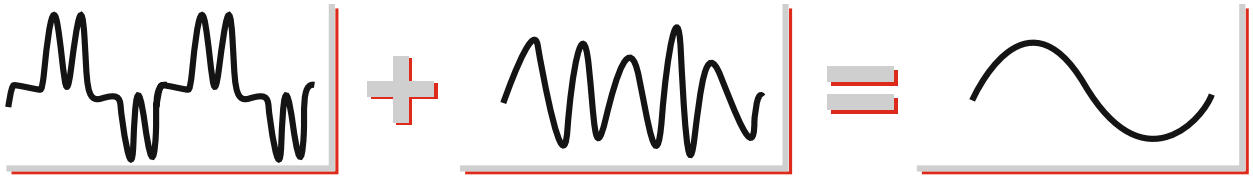
OSFS, OSFD

Essential operating principle of Active Filters

OSFS and OSFD Active Filters are operated in parallel with the loads that generate the harmonics.

The Active Filter analyses the harmonic current caused by nonlinear loads and supplies a compensating current in phase opposition, either over the entire spectrum or with only selected harmonics targeted. The harmonic currents are therefore completely neutralized at the point of connection.

The number, size and location in the circuit of Active Filters depend on the local harmonic spectrum and the specific duties.



Load current | **Active Filter compensating current** | **The result**

CNC machine tool

Active Filter

Transformator

	OSFS	OSFD
		
Web server	•	-
Remote control	•	-
Interfaces	Ethernet TCP/IP Ethernet (Modbus TCP)	Ethernet TCP/IP Modbus RTU RS-485
Resonance detection	•	•
3-wire units [A]	70, 100, 110, 120, 130, 150, 240, 300, 360, 450	30, 50, 100, 120, 200, 250, 300
4-wire units [A]	100	30, 60, 100, 120, 200, 250, 300
690 V (3-wire) units [A]	90, 140, 180, 270, 280, 420	-
UL certified (3-wire) units [A]	90, 110, 180, 220, 270, 330	200, 250, 300
Catalogue page	Page 179 ff.	Page 193 ff.

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OSFS
Active Filters

OSFS – The highly dynamic Active Filter
OSFS units encompass a broad range of state-of-the-art Active Filters with a web server function. The product range is characterized in particular by its variety of options for high-power applications plus a large selection of 690 V units and a special filter.

The OSFS range

–F **Fixed-rating unit:**
For wall mounting

–FS **Fixed-rating unit:**
In freestanding cabinet

–M **Modular unit:**
In freestanding cabinet with up to 3 modules per cabinet

–W **Water cooling:**
Modular unit in freestanding cabinet, water-cooled

–V **Voltage-controlled:**
Voltage-controlled Active Filter

–3 **3-wire:**
For compensating three phases without a neutral conductor

-4 **4-wire:**
For compensating three phases and the neutral conductor

–UL UL certificate

The OSFS-V voltage-controlled Active Filter

The OSFS-V is an Active Filter that compensates for harmonics in the range 50 Hz–5 kHz (up to the 100th harmonic). It is the fastest dynamic Active Filter worldwide, and also features resonance detection and suppression. It operates either with current transformers or it can be operated voltage-regulated without current transformers. This greatly simplifies its installation in existing networks.

Characteristics:

- High-speed Active Filter (Response time <20 µs)
- Reduction of interharmonics
- 50 Hz - 5 kHz bandwidth
- Voltage and current compensation
- Advanced digital control
- Easy installation
- Insensitive to network conditions
- Harmonics elimination
- Resonance elimination
- Can compensate for harmonics without current transformers
- Cannot be overloaded
- Available for 380 V – 480 V

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Technical Data

OSFS-F (3-wire fixed-rating unit), 400 V

Type	OSFS 70-400-3-F	OSFS 100-400-3-F	OSFS 130-400-3-F
Article-No.	39-22402	39-22400	39-22403
Power rating	59 kVA	84 kVA	109 kVA
Compensating current per phase at 50/60 Hz	70 A_{rms}	100 A_{rms}	130 A_{rms}
System voltage	400 V ± 10 %		
Nominal frequency	50/60 Hz ± 2 %		
Number of phases	3		
Phase connections	3 phases without neutral conductor (TN, TT, IT)		
Harmonics compensation	Individually up to the 49th harmonic		
Degree of compensation	> 98 %		
Correction of power factor cos φ	Up to 1.0		
Parallel operation	OSFS-F Active Filters can be operated in parallel		
Response time	< 1 ms		
Power loss	< 1200 W	< 1800 W	< 2400 W
Maximum air flow requirements	600 m^3/h		
Noise level	< 70 dB		
Ambient conditions	0 up to 95 % relative humidity, non-condensing, max. altitude: 1000 m above sea level		
Operating temperature	0 up to 40 °C, < 25 °C recommended		
Dimensions (W x H x D) [mm]	230 x 2 040 x 400		
Weight [kg]	120 kg		
Cabinet colour	RAL 7035, RAL 5017 (blue)		
Ingress protection	IP 20 according to IEC 529		
Environmental conditions	Class 3C3 (chemical), class 3S3 (mechanical)		
Electromagnetic compatibility (EMC)	EN 61000-6-2, EN 61000-6-4		
Certificates	CE		
Interfaces	Web server, Ethernet (Modbus TCP)		

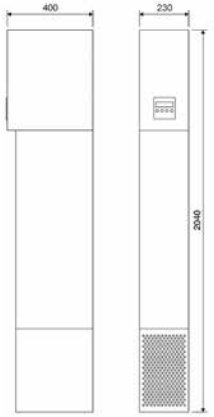
The units can be installed in parallel and are available as standard versions from 208 V to 480 V. Other voltages on request.

OSFS ordering example

Requirement: Active Harmonic Filter with a compensation current of I_h = 170 A.

- Parallel connection of the following OSFS Active Filters
  - OSFS 70-400-3-F
  - OSFS 100-400-3-F

Dimensions



All dimensions in mm

Technical Data

OSFS-F (4-wire fixed rating unit), 400 V

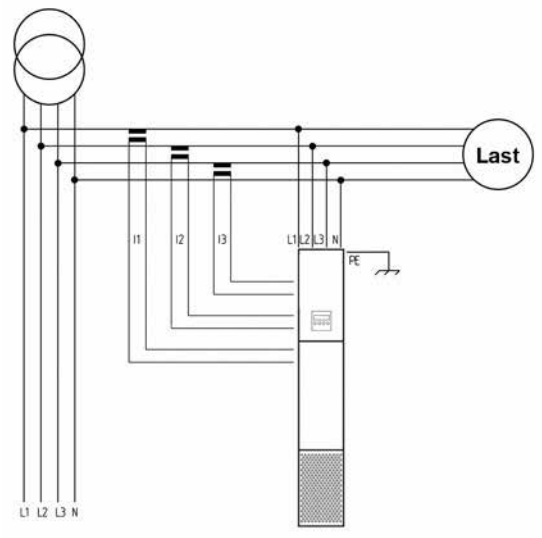
Type	OSFS 100-400-4-F
Article-No.	39-22429
Power Rating	70 kVA
Compensating current at 50/60 Hz	phase current 100 A_{rms} / neutral current 300 A_{rms}
System voltage*	400 V ± 10 %
Nominal frequency *	50/60 Hz ± 2 %
Number of phases	3
Phase connections	3 phases with neutral conductor (TN,TT,IT)
Harmonics compensation	individual compensation up to 49th order
Degree of compensation	> 98 %
Correction of power factor cos ϕ	Up to 1.0
Upgradeability	OSFS Active Filters can be operated in parallel
Response time	< 1 msec
Power loss	< 2235 W
Maximum air flow requirements	600 m³/h
Noise level	< 70 dB(A)
Ambient conditions	0 up to 95 % relative humidity, non-condensing, max. altitude: 1000 m above sea level
Operating temperature	0 bis 50 °C, up to 40 °C without performance reduction
Dimensions (W x H x D) [mm]	230 x 2 040 x 470
Weight [kg]	160
Cabinet colour	Cabinet: RAL 7035 (grey), Base: RAL 5017 (blue)
Ingress protection	IP20 nach IEC 529
Environmental conditions	Class 3C2 (chemical), class 3S2 (mechanical)
Electromagnetic compatibility (EMV)	EN 61000-6-2, EN 61000-6-4
Certificates	CE
Interfaces	Web server, Ethernet (Modbus TCP)**

The units can be installed in parallel and are available as standard versions from 208 - 480 V. Other voltages on request.

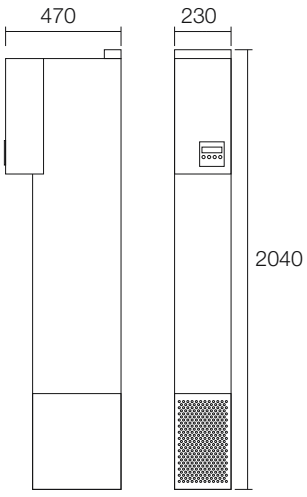
* When ordering, please indicate the mains voltage and the mains frequency.

** further interfaces on request.

Connection diagram (example)



Dimensions



All dimensions in mm

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Technical Data

OSFS-FS (4-wire fixed rating unit), 400 V

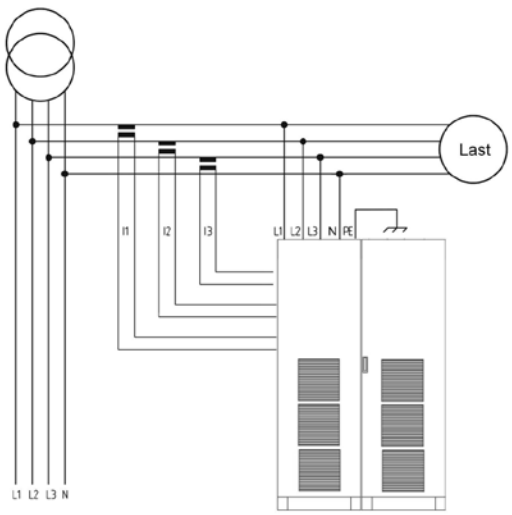
Type	OSFS 100-400-4-FS	OSFS 200-400-4-FS	OSFS 300-400-4-FS
Article-No.	39-22430	39-22431	39-22432
Power Rating	70 kVA	139 kVA	208 kVA
Compensating current at 50/60 Hz	phase current 100 A_{rms} / neutral current 300 A_{rms}	phase current 200 A_{rms} / neutral current 600 A_{rms}	phase current 300 A_{rms} / netural current 900 A_{rms}
System voltage*	400 V + 10 %		
Nominal frequency *	50/60 Hz + 2 %		
Number of phases	3		
Phase connections	3 phases with neutral conductor (TN,TT,IT)		
Harmonics compensation	individual compensation up to 49th order		
Degree of compensation	> 98 %		
Correction of power factor cos ϕ	Up to 1.0		
Upgradeability	OSFS Active Filters can be operated in parallel		
Response time	< 1 msec		
Power loss	< 2235 W	< 4470 W	< 6800 W
Maximum air flow requirements	600 m³/h	1200 m³/h	1800 m³/h
Noise level	< 70 dB		
Ambient conditions	0 up to 95 % relative humidity, non-condensing, max. altitude: 1000 m above sea level		
Operating temperature	0 up to 50 °C, up to 40 °C without performance reduction	0 up to 40 °C, < 25 °C recommended	0 up to 40 °C, < 25 °C recommended
Dimensions (W x H x D) [mm]	1200 x 2000 x 610		
Weight [kg]	360	525	690
Cabinet colour	Cabinet: RAL 7035 (grey), Base: RAL 7022 (dark grey)		
Ingress protection	IP20 according to IEC 529		
Environmental conditions	Class 3C3 (chemical), class 3S3 (mechanical)		
Electromagnetic compatibility (EMV)	EN 61000-6-2, EN 61000-6-4		
Certificates	CE		
Interfaces	Web server, Ethernet (Modbus TCP)**		

The units can be installed in parallel and are available as standard versions from 208 - 480 V. Other voltages on request.

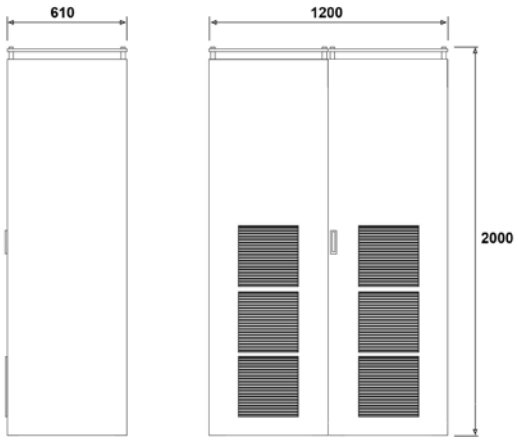
* When ordering, please indicate the mains voltage and the mains frequency.

** further interfaces on request.

Connection diagram (example)



Dimensions



All dimensions in mm

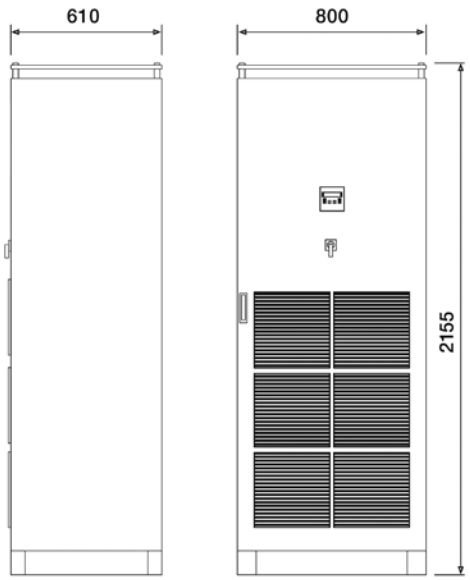
Technical Data

OSFS-M (3-wire modular unit), 400 V

Type	OSFS 120-400-3-M	OSFS 240-400-3-M	OSFS 360-400-3-M
Article-No.	39-22405	39-22401	39-22406
Power rating	83 kVA	166 kVA	249 kVA
Compensating current per phase at 50/60 Hz	120 A_{rms}	240 A_{rms}	360 A_{rms}
System voltage	400 V ± 10 %		
Nominal frequency	50/60 Hz ± 2 %		
Number of phases	3		
Phase connections	3 phases without neutral conductor (TN, TT, IT)		
Harmonics compensation	Individually up to the 49th harmonic		
Degree of compensation	> 98 %		
Correction of power factor cos φ	Up to 1.0		
Parallel operation	OSFS-M Active Filters can be operated in parallel		
Response time	< 1 ms		
Power loss	< 2725 W	< 5325 W	< 7925 W
Maximum air flow requirements	600 m^3/h	1200 m^3/h	1800 m^3/h
Noise level	< 70 dB		
Ambient conditions	0 up to 95 % relative humidity, non-condensing, max. altitude: 1000 m above sea level		
Operating temperature	0 up to 40 °C, < 25 °C recommended		
Dimensions (W x H x D) [mm]	800 x 2155 x 610		
Weight [kg]	335 kg	472 kg	609 kg
Cabinet colour	Cabinet: RAL 7035 (grey), Base: RAL 7022 (dark grey)		
Ingress protection	IP 20 according to IEC 529		
Environmental conditions	Class 3C3 (chemical), class 3S3 (mechanical)		
Electromagnetic compatibility (EMC)	EN 61000-6-2, EN 61000-6-4		
Certificates	CE		
Interfaces	Web server, Ethernet (Modbus TCP)		

The units can be installed in parallel and are available as standard versions from 208 V to 480 V. Other voltages on request.

Dimensions



All dimensions in mm

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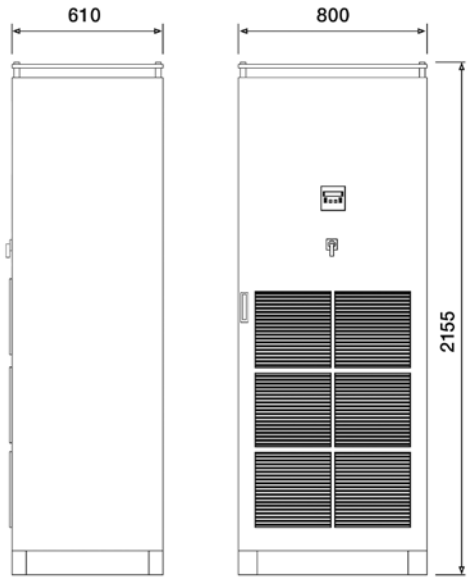
Technical Data

OSFS-M (3-wire modular unit), 690 V

Type	OSFS 90-690-3-M	OSFS 180-690-3-M	OSFS 270-690-3-M
Article-No.	39-22410	39-22411	39-22412
Power rating	108 kVA	215 kVA	323 kVA
Compensating current per phase at 50/60 Hz	90 A_{rms}	180 A_{rms}	270 A_{rms}
System voltage	690 V ± 10 %		
Nominal frequency	50/60 Hz ± 2 %		
Number of phases	3		
Phase connections	3 phases without neutral conductor (TN, TT, IT)		
Harmonics compensation	Individually up to the 49th harmonic		
Degree of compensation	> 98 %		
Correction of power factor cos φ	Up to 1.0		
Parallel operation	OSFS-M Active Filters can be operated in parallel		
Response time	< 1 ms		
Power loss	< 2969 W	< 5813 W	< 8657 W
Maximum air flow requirements	600 m^3/h	1200 m^3/h	1800 m^3/h
Noise level	< 70 dB		
Ambient conditions	0 up to 95 % relative humidity, non-condensing, max. altitude: 1000 m above sea level		
Operating temperature	0 up to 40 °C, < 25 °C recommended		
Dimensions (W x H x D) [mm]	800 x 2155 x 610		
Weight [kg]	351 kg	495 kg	639 kg
Cabinet colour	Cabinet: RAL 7035 (grey), Base: RAL 7022 (dark grey)		
Ingress protection	IP 20 according to IEC 529		
Environmental conditions	Class 3C3 (chemical), class 3S3 (mechanical)		
Electromagnetic compatibility (EMC)	EN 61000-6-2, EN 61000-6-4		
Certificates	CE		
Interfaces	Web server, Ethernet (Modbus TCP)		

The units can be installed in parallel and are available as standard versions from 480 V to 690 V. Other voltages on request.

Dimensions



All dimensions in mm

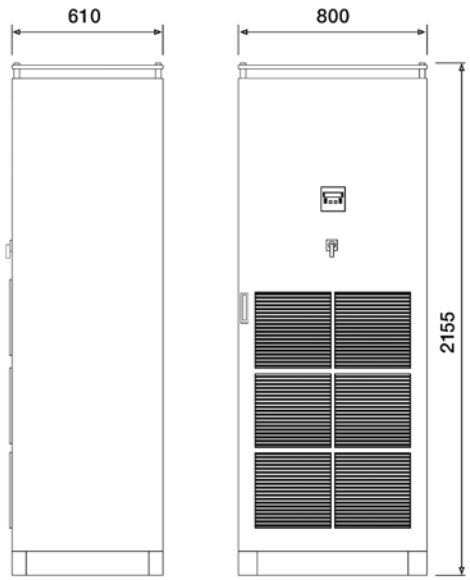
Technical Data

OSFS-4-M (4-wire modular unit), 400 V

Type	OSFS 100-400-4-M
Article-No.	39-22416
Power rating	70 kVA
Compensating current per phase at 50/60 Hz	100 A_{rms}
Compensating current in neutral at 50/60 Hz	300 A_{rms}
System voltage	400 V ± 10 %
Nominal frequency	50/60 Hz ± 2 %
Number of phases	3
Phase connections	3 phases with neutral conductor (TN, TT, IT)
Harmonics compensation	Individually up to the 49th harmonic, 19th order in the neutral conductor
Degree of compensation	> 98 %
Correction of power factor cos φ	Up to 1.0
Parallel operation	OSFS-4-M Active Filters can be operated in parallel
Response time	< 1 ms
Power loss	< 3800 W
Maximum air flow requirements	1200 m^3/h
Noise level	< 60 dB
Ambient conditions	0 up to 95 % relative humidity, non-condensing, max. altitude: 1000 m above sea level
Operating temperature	0 up to 40 °C, < 25 °C recommended
Dimensions (W x H x D) [mm]	800 x 2155 x 610
Weight [kg]	430 kg
Cabinet colour	Cabinet: RAL 7035 (grey), Base: RAL 7022 (dark grey)
Ingress protection	IP 20 according to IEC 529
Environmental conditions	Class 3C3 (chemical), class 3S3 (mechanical)
Electromagnetic compatibility (EMC)	EN 61000-6-2, EN 61000-6-4
Certificates	CE
Interfaces	Web server, Ethernet (Modbus TCP)

The units can be installed in parallel and are available as standard versions from 208 V to 480 V. Other voltages on request.

Dimensions



All dimensions in mm

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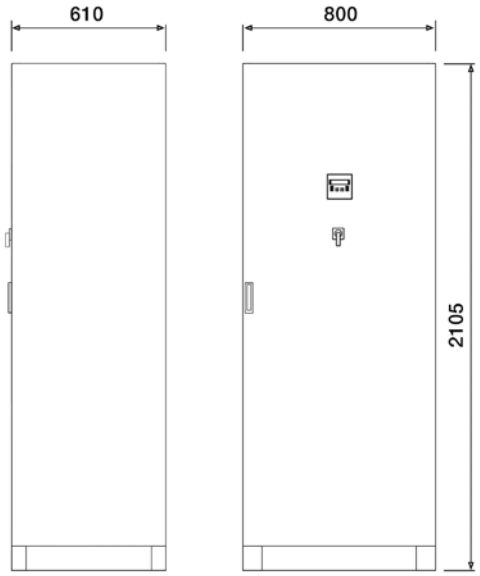
Technical Data

OSFS-W (3-wire modular unit, water-cooled), 400 V

Type	OSFS 150-400-3-W	OSFS 300-400-3-W	OSFS 450-400-3-W
Article-No.	39-22407	39-22408	39-22409
Power rating	104 kVA	208 kVA	312 kVA
Compensating current per phase at 50/60 Hz	150 A_{rms}	300 A_{rms}	450 A_{rms}
System voltage	400 V ± 10 %		
Nominal frequency	50/60 Hz ± 2 %		
Number of phases	3		
Phase connections	3 phases without neutral conductor (TN, TT, IT)		
Harmonics compensation	Individually up to the 49th harmonic		
Degree of compensation	> 98 %		
Correction of power factor cos φ	Up to 1.0		
Parallel operation	OSFS-W Active Filters can be operated in parallel		
Response time	< 1 ms		
Power loss	< 2550 W	< 5100 W	< 7650 W
Required cooling water supply	ΔP = 66 kPa at 21 l/min		
Noise level	< 60 dB		
Ambient conditions	0 up to 95 % relative humidity, non-condensing		
Operating temperature	0 up to 50 °C ambient and max. 38°C water temperature		
Dimensions (W x H x D) [mm]	800 x 2105 x 610		
Weight [kg]	367 kg	500 kg	633 kg
Cabinet colour	Cabinet: RAL 7035 (grey), Base: RAL 7022 (dark grey)		
Ingress protection	IP 54 according to IEC 529		
Environmental conditions	Class 3C3 (chemical), class 3S3 (mechanical)		
Electromagnetic compatibility (EMC)	EN 61000-6-2, EN 61000-6-4		
Certificates	CE		
Interfaces	Web server, Ethernet (Modbus TCP)		

The units can be installed in parallel and are available as standard versions from 208 V to 480 V. Other voltages on request.

Dimensions



All dimensions in mm

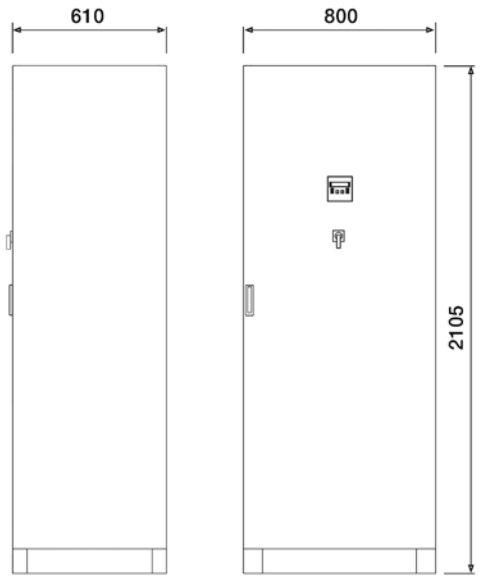
Technical Data

OSFS-W (3-wire modular unit, water-cooled), 690 V

Type	OSFS 140-690-3-W	OSFS 280-690-3-W	OSFS 420-690-3-W
Article-No.	39-22413	39-22414	39-22415
Power rating	168 kVA	335 kVA	312 kVA
Compensating current per phase at 50/60 Hz	140 A_{rms}	280 A_{rms}	450 A_{rms}
System voltage	690 V ± 10 %		
Nominal frequency	50/60 Hz ± 2 %		
Number of phases	3		
Phase connections	3 phases without neutral conductor (TN, TT, IT)		
Harmonics compensation	Individually up to the 49th harmonic		
Degree of compensation	> 98 %		
Correction of power factor cos φ	Up to 1.0		
Parallel operation	OSFS-W Active Filters can be operated in parallel		
Response time	< 1 ms		
Power loss	< 3600 W	< 7200 W	< 10800 W
Required cooling water supply	ΔP = 66 kPa at 21 l/min		
Noise level	< 60 dB		
Ambient conditions	0 up to 95 % relative humidity, non-condensing		
Operating temperature	0 up to 50 °C ambient and max. 38°C water temperature		
Dimensions (W x H x D) [mm]	800 x 2105 x 610		
Weight [kg]	372 kg	510 kg	648 kg
Cabinet colour	Cabinet: RAL 7035 (grey), Base: RAL 7022 (dark grey)		
Ingress protection	IP 54 according to IEC 529		
Environmental conditions	Class 3C3 (chemical), class 3S3 (mechanical)		
Electromagnetic compatibility (EMC)	EN 61000-6-2, EN 61000-6-4		
Certificates	CE		
Interfaces	Web server, Ethernet (Modbus TCP)		

The units can be installed in parallel and are available as standard versions from 480 V to 690 V. Other voltages on request.

Dimensions



All dimensions in mm

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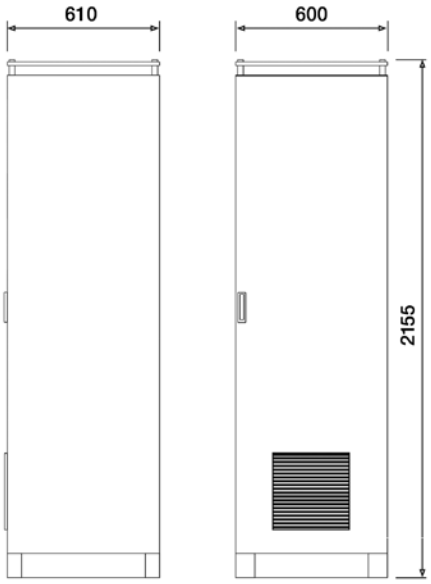
Technical Data

OSFS-V (3-wire unit, voltage-controlled), 400 V

Type	OSFS 100-400-3-V
Article-No.	39-22404
Power rating	70 kVA
Compensating current per phase at 50/60 Hz	100 A_{rms}
System voltage	400 V ± 10 %
Nominal frequency	50/60 Hz ± 2 %
Number of phases	3
Phase connections	3 phases without neutral conductor (TN, TT, IT)
Harmonics compensation	Compensation curve for harmonics and interharmonics up to 5 kHz (100th order)
Degree of compensation	> 97 %
Correction of power factor cos φ	Up to 1.0
Parallel operation	OSFS-V Active Filters can be operated in parallel
Response time	< 20 µs
Power loss	< 1200 W
Maximum air flow requirements	600 m^3/h
Noise level	< 60 dB
Ambient conditions	0 up to 95 % relative humidity, non-condensing, max. altitude: 1000 m above sea level
Operating temperature	0 up to 40 °C, < 25 °C recommended
Dimensions (W x H x D) [mm]	800 x 2155 x 610
Weight [kg]	232 kg
Cabinet colour	Cabinet: RAL 7035 (grey), Base: RAL 7022 (dark grey)
Ingress protection	IP 20 according to IEC 529
Environmental conditions	Class 3C3 (chemical), class 3S3 (mechanical)
Electromagnetic compatibility (EMC)	EN 61000-6-2, EN 61000-6-4
Certificates	CE
Interfaces	Web server, Ethernet (Modbus TCP)

The units can be installed in parallel and are available as standard versions from 380 V to 480 V. Other voltages on request.

Dimensions



All dimensions in mm

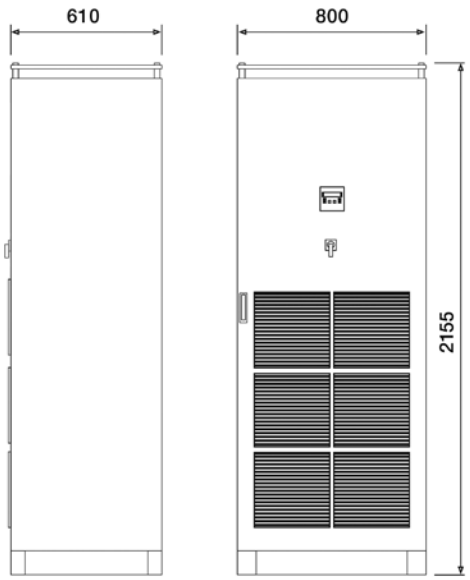
Technical Data

OSFS-UL (3-wire modular device, UL), 480 V

Type	OSFS 110-480-3-UL	OSFS 220-480-3-UL	OSFS 330-480-3-UL
Article-No.	39-22423	39-22424	39-22425
Power rating	76 kVA	152 kVA	229 kVA
Compensating current per phase at 50/60 Hz	110 A_{rms}	220 A_{rms}	330 A_{rms}
System voltage	400 V ± 10 %		
Nominal frequency	50/60 Hz ± 2 %		
Number of phases	3		
Phase connections	3 phases without neutral conductor (TN, TT, IT)		
Harmonics compensation	Individually up to the 49th harmonic		
Degree of compensation	> 98 %		
Correction of power factor cos φ	Up to 1.0		
Parallel operation	OSFS-UL Active Filters can be operated in parallel		
Response time	< 1 ms		
Power loss	< 2480 W	< 4835 W	< 7190 W
Maximum air flow requirements	600 m^3/h	1200 m^3/h	1800 m^3/h
Noise level	< 70 dB		
Ambient conditions	0 up to 95 % relative humidity, non-condensing, max. altitude: 1000 m above sea level		
Operating temperature	0 up to 40 °C, < 25 °C recommended		
Dimensions (W x H x D) [mm]	800 x 2155 x 610		
Weight [kg]	335 kg	472 kg	609 kg
Cabinet colour	Cabinet: RAL 7035 (grey), Base: RAL 7022 (dark grey)		
Ingress protection	IP 20 according to IEC 529		
Environmental conditions	Class 3C3 (chemical), class 3S3 (mechanical)		
Electromagnetic compatibility (EMC)	EN 61000-6-2, EN 61000-6-4		
Certificates	UL, cUL		
Interfaces	Web server, Ethernet (Modbus TCP)		

The units can be installed in parallel and are available as standard versions from 208 V to 480 V. Other voltages on request.

Dimensions



All dimensions in mm

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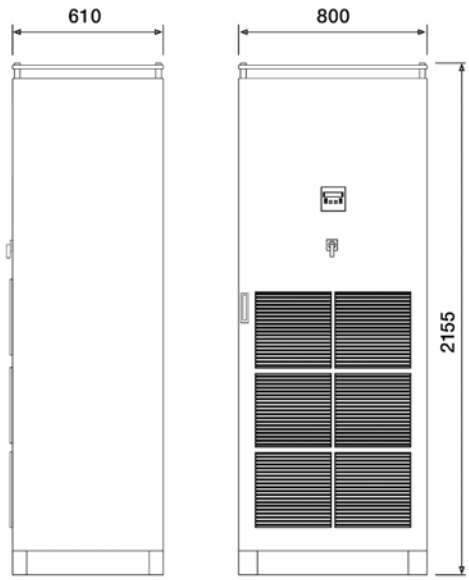
Technical Data

OSFS-UL (3-wire modular device, UL), 600 V

Type	OSFS 90-600-3-UL	OSFS 180-600-3-UL	OSFS 270-600-3-UL
Article-No.	39-22426	39-22427	39-22428
Power rating	94 kVA	187 kVA	281 kVA
Compensating current per phase at 50/60 Hz	90 A_{rms}	180 A_{rms}	270 A_{rms}
System voltage	600 V ± 10 %		
Nominal frequency	50/60 Hz ± 2 %		
Number of phases	3		
Phase connections	3 phases without neutral conductor (TN, TT, IT)		
Harmonics compensation	Individually up to the 49th harmonic		
Degree of compensation	> 98 %		
Correction of power factor cos φ	Up to 1.0		
Parallel operation	OSFS-UL Active Filters can be operated in parallel		
Response time	< 1 ms		
Power loss	< 2836 W	< 5547 W	< 8258 W
Maximum air flow requirements	600 m³/h	1200 m³/h	1800 m³/h
Noise level	< 70 dB		
Ambient conditions	0 up to 95 % relative humidity, non-condensing, max. altitude: 1000 m above sea level		
Operating temperature	0 up to 40 °C, < 25 °C recommended		
Dimensions (W x H x D) [mm]	800 x 2155 x 610		
Weight [kg]	351 kg	495 kg	639 kg
Cabinet colour	Cabinet: RAL 7035 (grey), Base: RAL 7022 (dark grey)		
Ingress protection	IP 20 according to IEC 529		
Environmental conditions	Class 3C3 (chemical), class 3S3 (mechanical)		
Electromagnetic compatibility (EMC)	EN 61000-6-2, EN 61000-6-4		
Certificates	UL, cUL		
Interfaces	Web server, Ethernet (Modbus TCP)		

The units can be installed in parallel and are available as standard versions from 480 V to 600 V. Other voltages on request.

Dimensions



All dimensions in mm

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OSFD
Active Filters

OSFD – The compact Active Filter, particularly suitable for low-power applications, with a variety of options and a large selection of 4-wire units.

Technical Data

OSFD (3-wire compact unit), 400 V

Type	OSFD 30-480-3	OSFD 50-480-3	OSFD 100-480-3	OSFD 120-480-3
Article-No.	39-22205	39-22200	39-22201	39-22215
Power rating	25 kVA	35 kVA	70 kVA	83 kVA
Compensating current per phase at 50/60 Hz	30 A_{rms}	50 A_{rms}	100 A_{rms}	120 A_{rms}
Rated voltage	380 V (AC) ± 15 % … 480 V (AC) ± 10 %			
Supply frequency	50/60 Hz ± 3 %			
Number of phases	3-wire and PE			
Phase connections	3 phases without neutral conductor (TN, TT, IT)			
Harmonics compensation	Individually up to the 50th order			
Switching frequency	16 kHz			
Max. current	Limited to nominal current			
Current transformer	50 : 5 up to 50.000 : 5			
Parallel operation	Up to 5 OSFD Active Filters			
Response time	300 µs			
Controller topology	Digital with FFT analysis			
Power loss	< 900 W	< 1300 W	< 2200 W	< 2500 W
Cooling air required	< 350 m^3/h	< 550 m^3/h	< 1400 m^3/h	< 1400 m^3/h
Noise level (1 m)	65 dB(A)		68 dB(A)	
Ambient conditions as per EN 50178	Pollution degree: 2; Relative humidity < 95 %; Climatic conditions in operation class 3K3; non-condensing, Temperature: Storage -25 °C up to +55 °C, 1K3, 1K4 – Transportation -25 °C up to +70 °C, 2K3			
Operating temperature	0 up to 40 °C[1]			0 up to 30 °C[2]
Dimensions (W x H x D) [mm]	358 x 615 x 288	358 x 615 x 288	469 x 972 x 412	469 x 972 x 412
Weight [kg]	47 kg	47 kg	105 kg	105 kg
Ingress protection	Standard IP 20, optional IP 54			
Electromagnetic compatibility (EMC)	EN 61000-6-2, EN 61000-6-4, EN 61800-3 (C2)			
Certificates	CE			
Interfaces	Modbus RTU (RS-485), Modbus TCP/IP (Ethernet), digital input for remote switching, digital alarm output, digital ON/OFF signal, digital derated capacity signal			

[1] from 40 °C to 55 °C derated by 2 % / K, no derating from 30 °C to 40 °C

[2] from 30 °C derated by 1.2 % / K

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Technical Data

OSFD (3-wire industrial unit, water-cooled), 400 V

Type	OSFD 200-415-3	OSFD 250-415-3	OSFD 300-415-3	OSFD 200-415-3-UL	OSFD 250-415-3-UL	OSFD 300-415-3-UL
Article-No.	39-22206	39-22208	39-22203	39-22212	39-22213	39-22214
Power rating	139 kVA	173 kVA	208 kVA	139 kVA	173 kVA	208 kVA
Compensating current per phase at 50/60 Hz	200 A_{rms}	250 A_{rms}	300 A_{rms}	200 A_{rms}	250 A_{rms}	300 A_{rms}
Rated voltage	50Hz: 380 V (AC) ± 15 % … 415 V (AC) ± 10 %, 60Hz: 480 V (AC) ± 10 %					
Supply frequency	50/60 Hz ± 3 %					
Number of phases	3-wire and PE					
Phase connections	3 phases without neutral conductor (TN, TT, IT)					
Harmonics compensation	Individually up to the 50th order					
Switching frequency	16 kHz					
Max. current	Limited to nominal current					
Current transformer	50 : 5 up to 50.000 : 5					
Parallel operation	Up to 5 OSFD Active Filters					
Response time	300 µs					
Controller topology	Digital with FFT analysis					
Power loss	< 5000 W	< 6000 W	< 7500 W	< 5000 W	< 6000 W	< 7500 W
Cooling air required	< 2600 m^3/h	< 3100 m^3/h	< 3400 m^3/h	< 2600 m^3/h	< 3100 m^3/h	< 3400 m^3/h
Noise level (1 m)	70 dB(A)					
Ambient conditions as per EN 50178	Pollution degree: 2; Relative humidity < 95 %; Climatic conditions in operation class 3K3; non-condensing, Temperature: Storage -25 °C up to +55 °C, 1K3, 1K4 – Transportation -25 °C up to +70 °C, 2K3					
Operating temperature	0 up to 40 °C[1)]					
Dimensions (W x H x D) [mm]	808 x 2105 x 760					
Weight [kg]	440 kg					
Ingress protection	IP 54					
Electromagnetic compatibility (EMC)	EN 61000-6-2, EN 61000-6-4, EN 61800-3 (C2)					
Certificates	CE			UL		
Interfaces	Modbus RTU (RS-485), Modbus TCP/IP (Ethernet), digital input for remote switching, digital alarm output, digital ON/OFF signal, digital derated capacity signal					

[1)] from 40 °C to 55 °C derated by 2 % / K, no derating from 30 °C to 40 °C

Technical Data

OSFD (4-wire compact unit), 400 V

Type	OSFD 30-415-4	OSFD 60-415-4	OSFD 100-415-4	OSFD 120-415-4
Article-No.	39-22210	39-22211	39-22202	39-22216
Power rating	25 kVA	42 kVA	70 kVA	83 kVA
Compensating current per phase at 50/60 Hz	30 A_{rms}	60 A_{rms}	100 A_{rms}	120 A_{rms}
Compensating current in neutral conductor	90 A	180 A	300 A	300 A
Rated voltage	380 V (AC) ± 15 % … 480 V (AC) ± 10 %			
Supply frequency	50/60 Hz ± 3 %			
Number of phases	3-wire, neutral conductor and PE			
Phase connections	3 phases with neutral conductor (TN, TT, IT)			
Harmonics compensation	Individually up to the 50th order			
Switching frequency	16 kHz			
Max. current	Limited to nominal current			
Current transformer	50 : 5 up to 50.000 : 5			
Parallel operation	Up to 5 OSFD Active Filters			
Response time	300 µs			
Controller topology	Digital with FFT analysis			
Power loss	< 950 W	< 1800 W	< 3000 W	
Cooling air required	< 400 m^3/h	< 600 m^3/h	< 1700 m^3/h	
Noise level (1 m)	63 dB(A)		69 dB(A)	
Ambient conditions as per EN 50178	Pollution degree: 2; Relative humidity < 95 %; Climatic conditions in operation class 3K3; non-condensing, Temperature: Storage -25 °C up to +55 °C, 1K3, 1K4 – Transportation -25 °C up to +70°C, 2K3			
Operating temperature	0 up to 40 °C[1]	0 up to 30 °C[2]	0 up to 40 °C[1]	0 up to 30 °C[2]
Dimensions (W x H x D) [mm]	415 x 842 x 296		469 x 1460 x 412	
Weight [kg]	70 kg		145 kg	
Ingress protection	Standard IP 20, optional IP 54			
Electromagnetic compatibility (EMC)	EN 61000-6-2, EN 61000-6-4, EN 61800-3 (C2)			
Certificates	CE			
Interfaces	Modbus RTU (RS-485), Modbus TCP/IP (Ethernet), digital input for remote switching, digital alarm output, digital ON/OFF signal, digital derated capacity signal			

[1] from 40 °C to 55 °C derated by 2 % / K, no derating from 30 °C to 40 °C

[2] from 30 °C derated by 1.2 % / K

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Technical Data

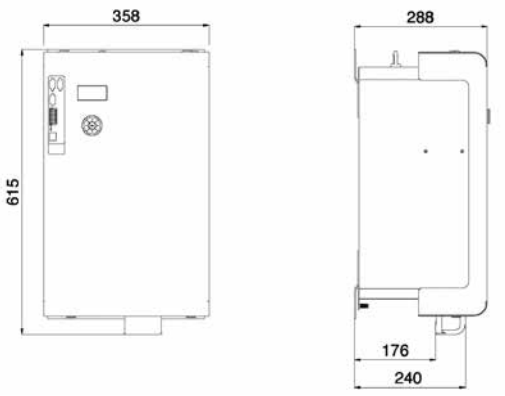
OSFD (4-wire industrial unit, water-cooled), 400 V

Type	OSFD 200-415-4	OSFD 250-415-4	OSFD 300-415-4
Article-No.	39-22207	39-22209	39-22204
Power rating	139 kVA	173 kVA	208 kVA
Compensating current per phase at 50/60 Hz	200 A_{rms}	250 A_{rms}	300 A_{rms}
Compensating current in neutral conductor	600 A	750 A	
Rated voltage	50Hz: 380 V (AC) ± 15 % … 415 V (AC) ± 10 %, 60 Hz: 480 V (AC) ± 10 %		
Supply frequency	50/60 Hz ± 3 %		
Number of phases	3-wire, neutral conductor and PE		
Phase connections	3 phases with neutral conductor (TN, TT, IT)		
Harmonics compensation	Individually up to the 50th order		
Switching frequency	16 kHz		
Max. current	Limited to nominal current		
Current transformer	50 : 5 up to 50.000 : 5		
Parallel operation	Up to 5 OSFD Active Filters		
Response time	300 µs		
Controller topology	Digital with FFT analysis		
Power loss	< 5500 W	< 6300 W	< 8500 W
Cooling air required	< 2800 m^3/h	< 3300 m^3/h	< 3600 m^3/h
Noise level (1 m)	70 dB(A)		
Ambient conditions as per EN 50178	Pollution degree: 2, Relative humidity < 95 %; Climatic conditions in operation class 3K3; non-condensing, Temperature: Storage -25 °C up to +55 °C, 1K3, 1K4 – Transportation -25 °C up to +70 °C, 2K3		
Operating temperature	0 up to 40 °C[1)]		
Dimensions (W x H x D) [mm]	808 x 2105 x 760	808 x 2105 x 760	808 x 2105 x 760
Weight [kg]	525 kg		
Ingress protection	IP 54		
Electromagnetic compatibility (EMC)	EN 61000-6-2, EN 61000-6-4, EN 61800-3 (C2)		
Certificates	CE		
Interfaces	Modbus RTU (RS-485), Modbus TCP/IP (Ethernet), digital input for remote switching, digital alarm output, digital ON/OFF signal, digital derated capacity signal		

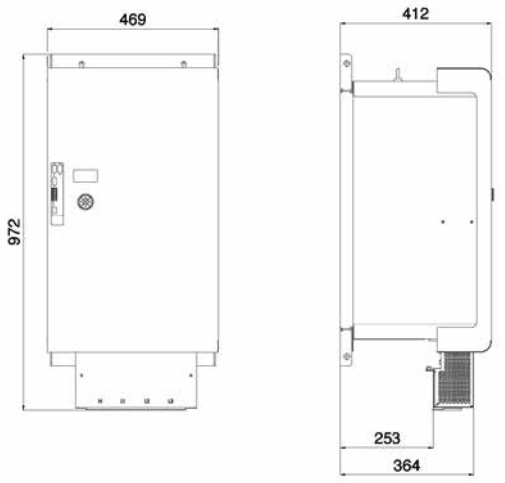
[1)] from 40 °C to 55 °C derated by 2 % / K

3

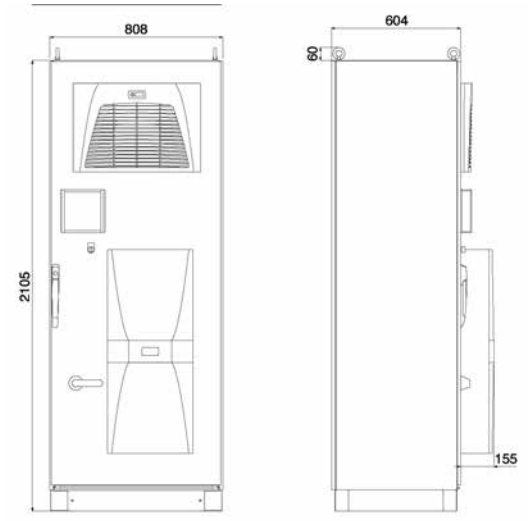
Dimensions



Dimensional drawing OSFD 30-480-3, OSFD 50-480-3



Dimensional drawing OSFD 100-480-3, OSFD 120-480-3



Dimensional drawing:
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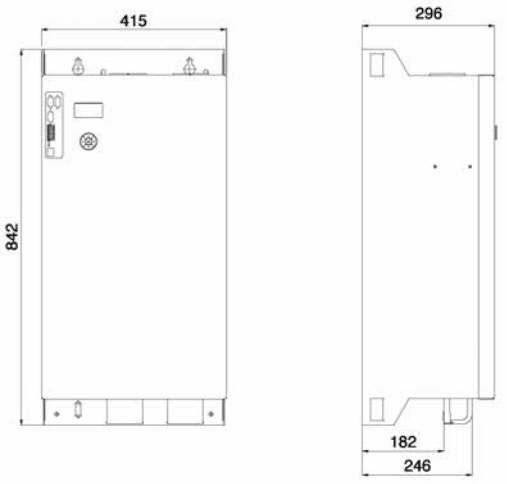
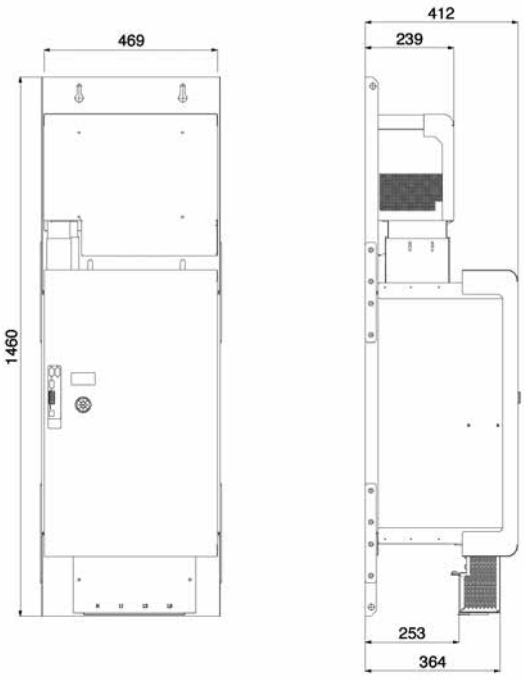
OSFD 200-415-3-UL, OSFD 250-415-3-UL, OSFD 300-415-3-UL,
OSFD 200-415-4, OSFD 250-415-4, OSFD 300-415-4



Dimensional drawing OSFD 30-415-4, OSFD 60-415-4



Dimensional drawing OSFD 100-415-4, OSFD 120-415-4

All dimensions in mm

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