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

– **M2** **Modular unit:**
In freestanding cabinet with up to 3 modules per cabinet

– **UL** UL certificate

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

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

– **V2** **Voltage Controlled:**
voltage controlled Active Filter

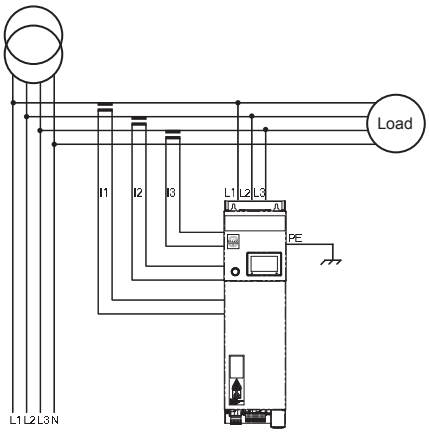
Technical Data

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

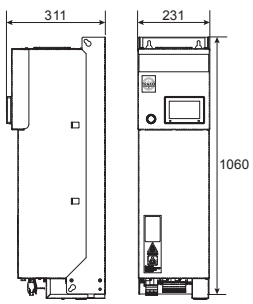
Type	OSFS 30-400-3-F
Article-No.	39-22441
Power rating	21 kVA
Compensating current per phase at 50/60 Hz	30 A_{rms}
System voltage	400 V ± 10 %
Nominal frequency	50/60 Hz ± 5 %
Number of phases	3
Phase connections	3 phases without neutral conductor (TN, TT)
Harmonics compensation	Individually up to the 49th order
Degree of compensation	> 98 %
Correction of power factor cos φ	Up to 1.0
Parallel operation	OSFS Filters can be operated in parallel
Response time	< 1 ms
Power loss	< 1 000 W
Maximum air flow requirements	400 m^3/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 to 50 °C, derating exceeding 40 °C
Dimensions (W x H x D) [mm]	231 x 1 060 x 311
Weight [kg]	50
Cabinet colour	RAL 7035 (light grey), RAL 5017 (traffic blue)
Type of protection	IP20, IP21 according to IEC 529, other ratings upon request
Environmental conditions	chemical 3C2, mechanical 3S2
Electromagnetic compatibility (EMC)	EN55011, Class B
Certificates	CE, UKCA
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, interfaces and IP-classes on request.

Connection diagram (example)



Dimensions



All dimensions in mm

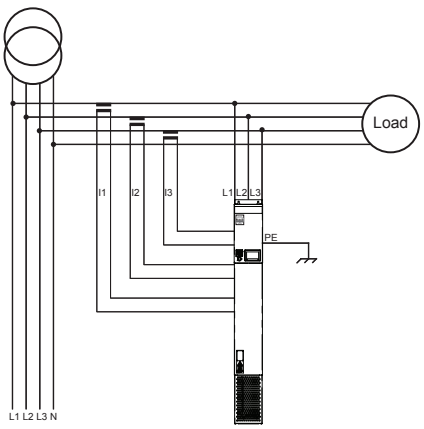
Technical Data

OSFS-F (3-wire fixed-rating unit), 400 V and 690 V

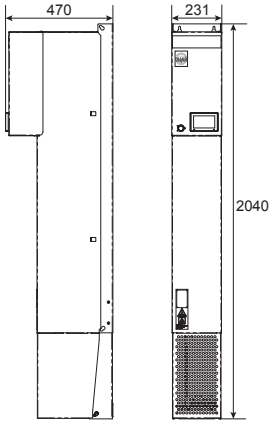
Type	OSFS 50-400-3-F	OSFS 75-400-3-F	OSFS 90-400-3-F	OSFS 120-400-3-F	OSFS 150-400-3-F	OSFS 90-690-3-F
Article-No.	39-22442	39-22402	39-22400	39-22403	39-22443	39-22444
Power rating	35 kVA	52 kVA	62 kVA	83 kVA	104 kVA	108 kVA
Compensating current per phase at 50/60 Hz	50 A_{rms}	75 A_{rms}	90 A_{rms}	120 A_{rms}	150 A_{rms}	90 A_{rms}
System voltage	400 V ± 10 %					690 V ± 10 %
Nominal frequency	50/60 Hz ± 5 %					
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 Filters can be operated in parallel					
Response time	< 1 ms					
Power loss	< 1 600 W	< 2 535 W	< 3 180 W	< 3 155 W	< 3 225 W	< 2 969 W
Maximum air flow requirements	600 m^3/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 to 50 °C, up to 40 °C without derating					
Dimensions (W x H x D) [mm]	231 x 2 040 x 470					
Weight [kg]	91	91	91	105	116	150
Cabinet colour	RAL 7035 (light grey), RAL 5017 (traffic blue)					
Type of protection	IP 20 according to IEC 529					
Environmental conditions	Class 3C3 (chemical), class 3S3 (mechanical)					
Electromagnetic compatibility (EMC)	EN 55011, class B					
Certificates	CE, ABS, DNV GL, UKCA					
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 resp. 480 V to 690 V.
Other voltages, interfaces and IP-classes on request.

Connection diagram (example)



Dimensions



All dimensions in mm

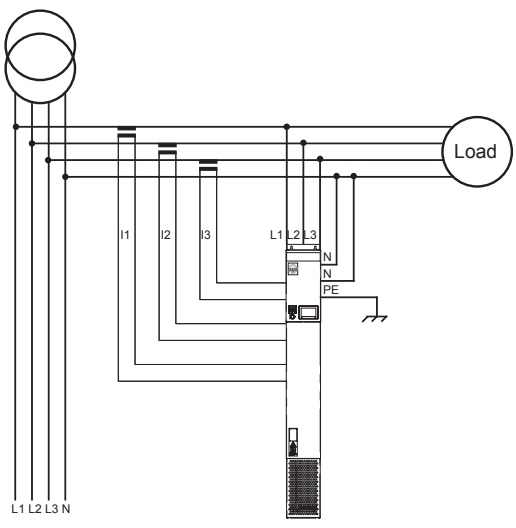
Technical Data

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

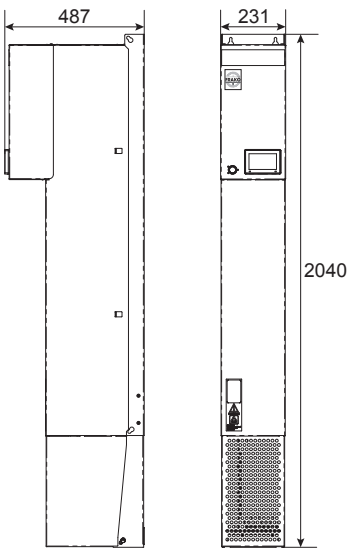
Type	OSFS 100-400-4-F
Article-No.	39-22429
Power Rating	70 kVA
Compensating current at 50/60 Hz	phase current 100 A_{rms} / neutral current 300 A_{rms}
System voltage	400 V ± 10 %
Nominal frequency	50/60 Hz ± 2 %
Number of phases	3
Phase connections	3 phases with neutral conductor (TN,TT,IT)
Harmonics 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 to 50 °C, derating exceeding 40 °C
Dimensions (W x H x D) [mm]	231 x 1 650 x 487
Weight [kg]	90
Cabinet colour	RAL 7035 (light grey), RAL 5017 (traffic blue)
Type of protection	IP20 nach IEC 529
Environmental conditions	Class 3C2 (chemical), class 3S2 (mechanical)
Electromagnetic compatibility (EMV)	EN 55011, class B
Certificates	CE, UKCA
Interfaces	Web server, Ethernet (Modbus TCP)

The units can be installed in parallel and are available as standard versions from 208 – 415 V. Other voltages, interfaces and IP-classes on request.

Connection diagram (example)



Dimensions



All dimensions in mm

The OSFS-V2 voltage-controlled active filter

The OSFS-V2 is an active filter for the compensation of harmonics in the range of 50 Hz - 5 kHz (up to the 100th harmonic). The world's fastest dynamic active filter offers resonance detection and suppression. It works either with current transformers or it can be operated voltage controlled without current transformers. This makes installation in existing networks considerably easier.

Features:

- High-speed active filter (response time < 20 µs).
- Reduces interharmonics
- 50 Hz – 5 kHz bandwidth
- Voltage and current compensation
- Advanced digital control
- Easy installation
- Insensitive to mains changes
- Harmonic compensation
- Resonance suppression
- Harmonic compensation possible without current transformer
- Not overloadable
- Available in 208 V – 480 V

All dimensions in mm

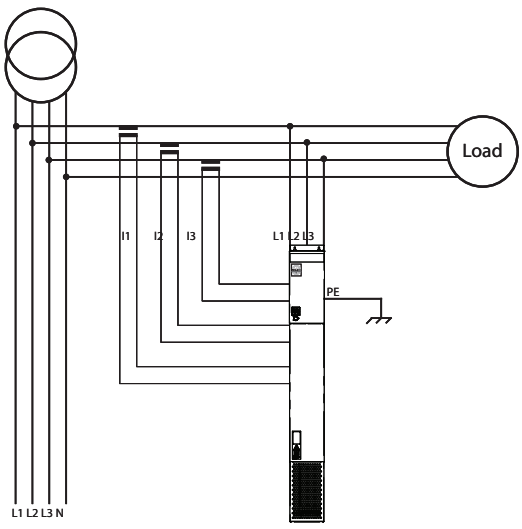
Technical Data

OSFS-V2 (3-wire fixed rating unit), 400 V

Type	OSFS 120-400-3-V2-F
Article-No.	39-22438
Power Rating	83 kVA
Compensating current at 50/60 Hz	120 A_{eff}
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
Upgradeability	OSFS Active Filters can be used in parallel
Response time	< 20 µs
Power loss	< 1 200 W
Maximum air flow requirements	600 m^3/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 up to 50 °C, up to 40 °C with derating
Dimensions (W x H x D) [mm]	231 x 1653 x 482
Weight [kg]	90
Cabinet colour	Cabinet: RAL 7035 (grey), Base: RAL 7022 (dark grey)
Type of protection	IP20 to IEC 529
Environmental conditions	Class 3C3 (chemical), class 3S3 (mechanical)
Electromagnetic compatibility (EMV)	EN 55011, Class B
Certificates	CE, UKCA
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, interfaces and IP-classes on request.

Connection diagram (example)



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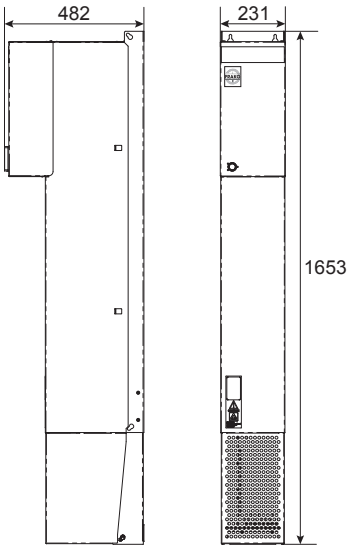


All dimensions in mm

Active Filter OSFS-M2 in freestanding cabinet

Modern medical equipment, the latest LED technology and present-day motor control systems make the most exacting demands on power supply quality. Certain loads, however, greatly distort the supply-side waveform by generating harmonics. This situation often calls for an improvement in power quality. With the FRAKO Modular Active Filter, the distortion caused by individual loads, groups of consumers or the entire electrical installation is reduced to a tolerable level or totally eliminated from the network.

Clear benefits:

- 8 versions enable optimum adaption to the compensation requirement: 90 A, 125 A, 150 A, 180 A, 250 A, 270 A, 300 A and 375 A
- Modular construction with only one control unit
- User-friendly touchscreen
- User-friendly remote service
- Current-controlled
- New: optionally also available voltage-controlled, if on site there is no space for current transformers
- Voltage range: 208 V – 480 V and 690 V

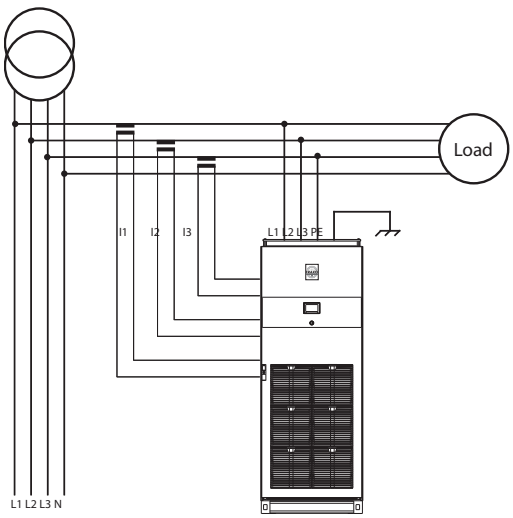
Technical Data

OSFS-M2 (3-wire modular unit), 400 V

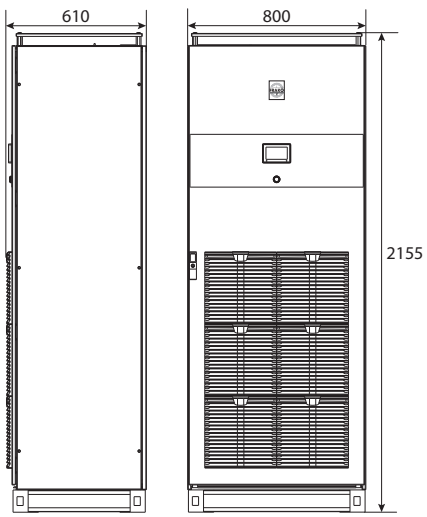
Type	OSFS 75-400-3-M2	OSFS 100-400-3-M2	OSFS 125-400-3-M2	OSFS 150-400-3-M2	OSFS 200-400-3-M2	OSFS 250-400-3-M2	OSFS 300-400-3-M2	OSFS 375-400-3-M2
Article-No.	39-22480	39-22481	39-22464	39-22472	39-22483	39-22465	39-22475	39-22466
Power rating	52 kVA	69 kVA	87 kVA	104 kVA	139 kVA	173 kVA	208 kVA	260 kVA
Compensating current per phase at 50/60 Hz	70 A_{eff}	100 A_{eff}	125 A_{eff}	150 A_{eff}	200 A_{eff}	250 A_{eff}	300 A_{eff}	375 A_{eff}
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-M2 Active Filters can be operated in parallel							
Response time	< 1 ms							
Power loss	< 2 760 W	< 2 810 W	< 2 825 W	< 3 225 W	< 5 425 W	< 5 650 W	< 6 250 W	< 7 925 W
Maximum air flow requirements	600 m^3/h	600 m^3/h	600 m^3/h	800 m^3/h	1 200 m^3/h	1 200 m^3/h	1 600 m^3/h	1 800 m^3/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 to 50 °C, up to 40 °C without derating							
Dimensions (W x H x D) [mm]	800 x 2155 x 610							
Weight [kg]	335	335	335	351	472	472	495	609
Cabinet colour	Cabinet: RAL 7035 (grey), Base*: RAL 7022 (dark grey)							
Type of protection	IP 21 according to IEC 529							
Environmental conditions	Class 3C3 (chemical), class 3S3 (mechanical)							
Electromagnetic compatibility (EMC)	EN55011, class A; EN55011, class B							
Certificates	CE, DNV GL, UKCA							
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, interfaces and IP-classes on request. *base can be ordered separately

Connection diagram (example)



Dimensions



All dimensions in mm

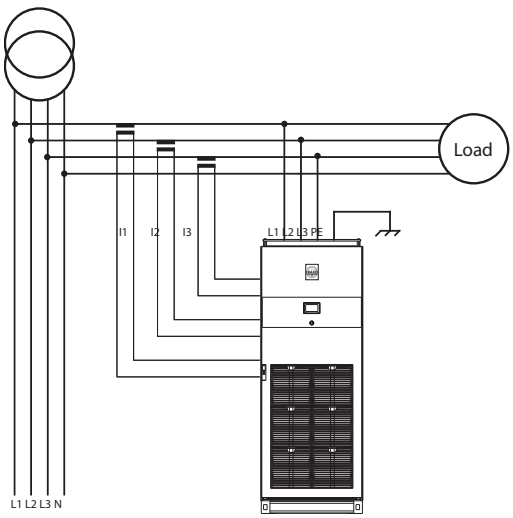
Technical Data

OSFS-M2 (3-wire modular unit), 690 V

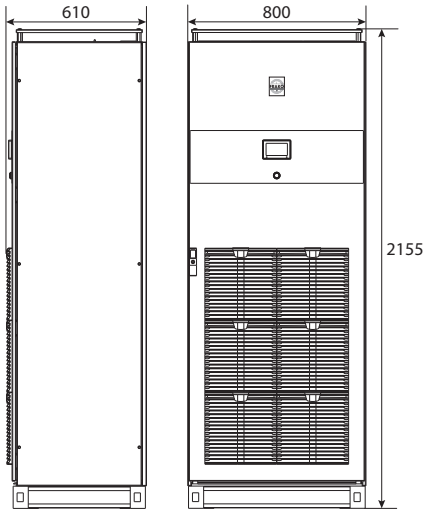
Type	OSFS 90-690-3-M2	OSFS 180-690-3-M2	OSFS 270-690-3-M2
Article-No.	39-22476	39-22477	39-22478
Power rating	108 kVA	215 kVA	323 kVA
Compensating current per phase at 50/60 Hz	90 A_{rms}	180 A_{rms}	270 A_{rms}
System voltage	690 V ± 10 %		
Nominal frequency	50/60 Hz ± 2 %		
Number of phases	3		
Phase 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 m³/h	1200 m³/h	1800 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 to 50 °C, up to 40 °C without derating		
Dimensions (W x H x D) [mm]	800 x 2155 x 610		
Weight [kg]	351	495	639
Cabinet colour	Cabinet: RAL 7035 (grey), Base*: RAL 7022 (dark grey)		
Type of protection	IP 21 according to IEC 529		
Environmental conditions	Class 3C3 (chemical), class 3S3 (mechanical)		
Electromagnetic compatibility (EMC)	EN 55011, class B / EN 55011, class A		
Certificates	CE, DNV GL, UKCA		
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, interfaces and IP-classes on request. *base can be ordered separately

Connection diagram (example)



Dimensions



All dimensions in mm

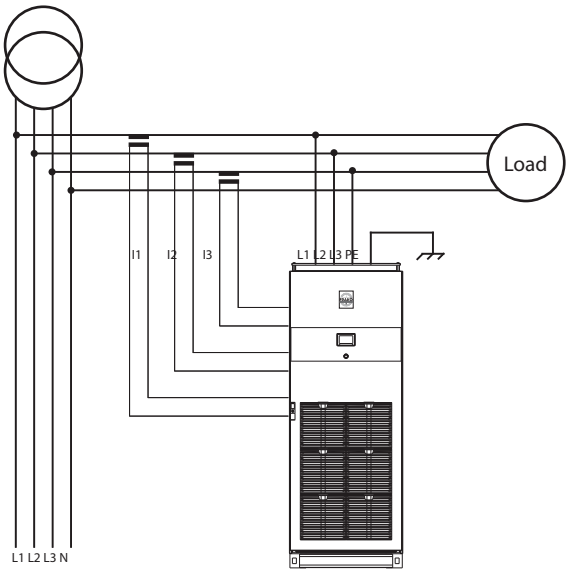
Technical Data

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 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 to 50 °C, up to 40 °C without derating		
Dimensions (W x H x D) [mm]	800 x 2155 x 610		
Weight [kg]	335	472	609
Cabinet colour	Cabinet: RAL 7035 (grey), Base*: RAL 7022 (dark grey)		
Type of protection	UL Type 1		
Environmental conditions	Class 3C3 (chemical), class 3S3 (mechanical)		
Electromagnetic compatibility (EMC)	EN 61000-6-2, EN 61000-6-4		
Certificates	UL, cUL, UKCA		
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, interfaces and IP-classes on request. *base can be ordered separately

Connection diagram (example)



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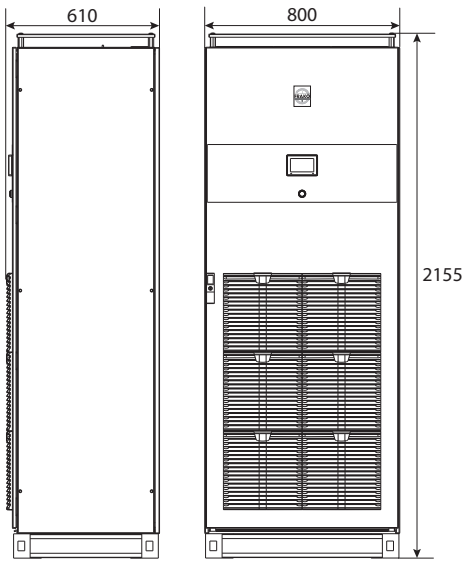


All dimensions in mm

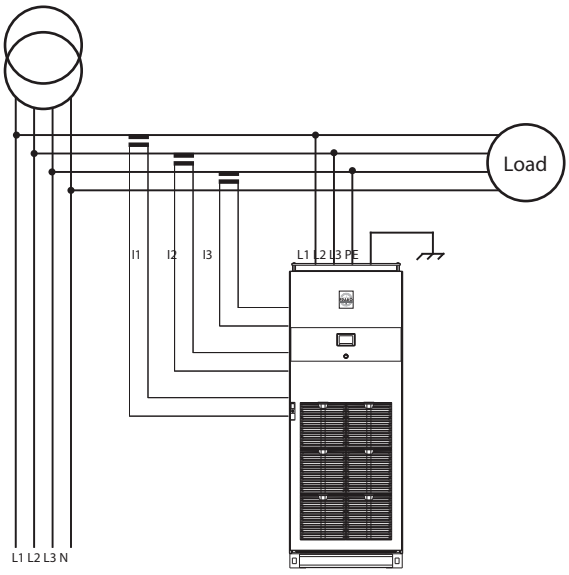
Technical Data

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

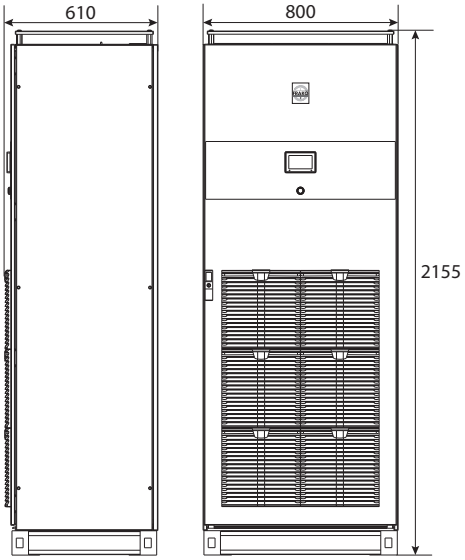
Type	OSFS 90-600-3-UL	OSFS 180-600-3-UL	OSFS 270-600-3-UL
Article-No.	39-22426	39-22427	39-22428
Power rating	94 kVA	187 kVA	281 kVA
Compensating current per phase at 50/60 Hz	90 A_{rms}	180 A_{rms}	270 A_{rms}
System voltage	600 V ± 10 %		
Nominal frequency	50/60 Hz ± 2 %		
Number of phases	3		
Phase 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 (A)		
Ambient conditions	0 up to 95 % relative humidity, non-condensing, max. altitude: 1000 m above sea level		
Operating temperature	0 to 50 °C, up to 40 °C without derating		
Dimensions (W x H x D) [mm]	800 x 2155 x 610		
Weight [kg]	351	495	639
Cabinet colour	Cabinet: RAL 7035 (grey), Base*: RAL 7022 (dark grey)		
Type of protection	UL Type 1		
Environmental conditions	Class 3C3 (chemical), class 3S3 (mechanical)		
Electromagnetic compatibility (EMC)	EN 61000-6-2, EN 61000-6-4		
Certificates	UL, cUL, UKCA		
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, interfaces and IP-classes on request. *base can be ordered separately

Connection diagram (example)



Dimensions



All dimensions in mm