



SFA-200™

Stray Flux Analyser Unit

User's Manual



Safety Information

The following manual contains information and warnings. They must be followed in order to keep the instrument in a working condition and ensure safe operation.

Safety Symbols

	Warning - Danger - Identifies conditions or practices that could cause physical harm or death.
	Caution - Identifies conditions or practices that could result in a permanent loss of data or damage the measuring chain and/or other equipment to which it is connected.
	Important Information - Identifies important information, hints, and tips that must be read and applied.
	GND or earth ground

Safety Precautions

Warning - Danger Caution	
<ul style="list-style-type: none"> • To use the described product correctly and safely, read and follow all safety instructions or warnings that appear throughout this manual. • This product is intended to be used by qualified operators and maintenance personnel who recognize shock hazards and are familiar with the safety precautions required to avoid possible injury. Read and follow all installation, operation, and maintenance information before using this product. • Install and use this product only as specified in this manual or the protection provided by this product might be impaired. • When in doubt that safety protection has been impaired, make this product inoperative and secure it against any unintended operation. • Exercise caution when working with voltage levels above 30 VAC RMS or 42 VDC. These voltage levels are potential shock hazards. • Follow all generally accepted safety practices and procedures when working with or around electricity. • Do not use this product in wet environments. 	

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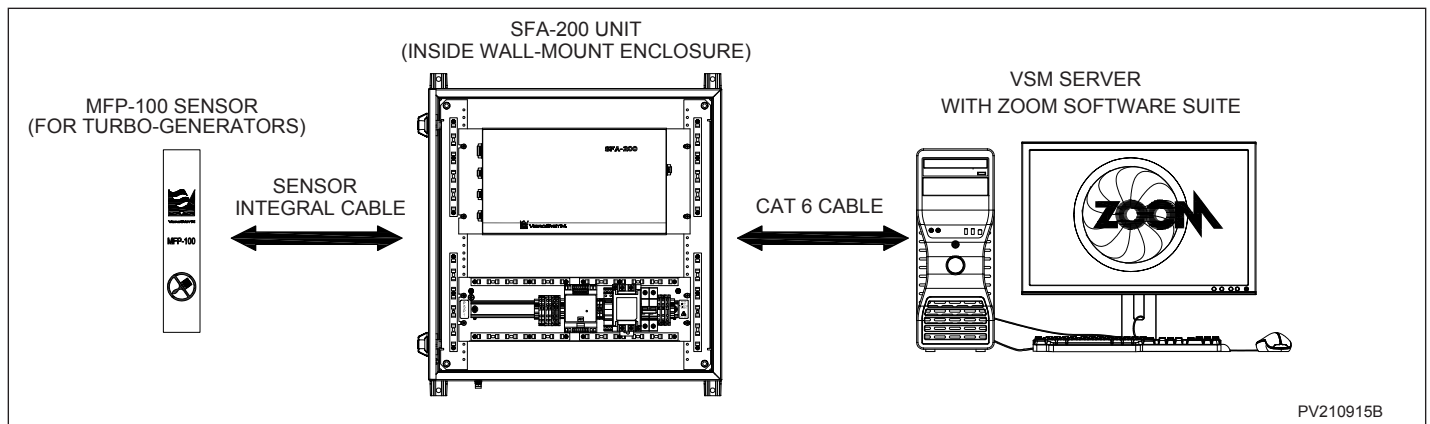




1. SFA-200 STRAY FLUX ANALYSER OVERVIEW

1.1 Description

The SFA-200 Stray Flux Analyser unit is an acquisition and processing instrument that accepts either a single signal from an MFP-100 sensor, or up to two stray flux signal inputs from other stray flux sensors (radial or tangential) at a sampling rate of 50,000 samples/s per channel, and a one per revolution signal from a synchronization sensor. From data collected by the SFA-200 unit, the ZOOM[®] software suite can display, analyze, and trigger alarms on inter-turn short-circuits for turbo-electric generators. The SFA-200 accepts commands from a remote VSM Server with ZOOM Software Suite, and transfers data to the VSM Server for storage. ZOOM Application is then used for viewing the received stray flux data, and for analysis of stored data.



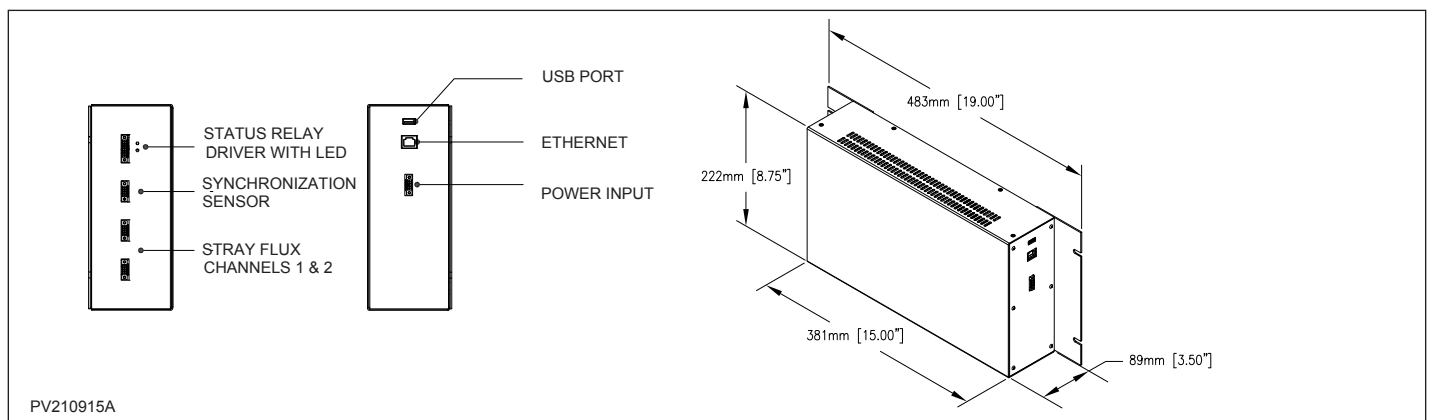
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1.2 Main Unit Interventions

- Stray flux sensors must be installed at appropriate locations;
- A penetration flange and inner flange are required for hydrogen-cooled generators;
- The wall-mount enclosure or 19-inch rack-mount cabinet housing the SFA-200 unit must be installed within 100 m [328 ft] of the sensor;
- Cables must be routed and protected between the stray flux sensors and the enclosure or cabinet;
- The Ethernet cable must be routed and protected between the enclosure or cabinet and the VSM Server;
- A main AC power cable is required for a wall-mount enclosure equipped with a VibroSystM power panel.

1.3 Overview of the SFA-200 Unit Main Components

The SFA-200 is enclosed in a steel, zinc-plated 19-inch rack-mount case, 5U form factor, designed to be installed in a wall-mount enclosure or a 19-inch cabinet (with a 17.5- or 17.75-inch opening).



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2. INSTALLATION OVERVIEW

SFA-200 Analyser Units can be installed in a 19-inch rack-mount cabinet (with a 17.5- or 17.75-inch opening) or a wall-mount enclosure.

2.1 Preliminary Considerations Before Installing the SFA-200

The following guidelines will help you plan your equipment installation in a 19-inch rack-mount cabinet or wall-mount enclosure:

- Allow sufficient clearance around the enclosure for maintenance.
- Make sure the internal temperature inside the enclosure does not exceed 60°C [140°F].
- Cabling must be kept away from sources of electrical noise, power lines and fluorescent lighting fixtures.
- Keep signal cables apart from power cables.
- The unit must be kept away from electrically conductive dust, as well as water or moisture.
- Do not install on a structure which is subjected to vibrations. If vibrations cannot be avoided, anti-vibration mounts are mandatory.

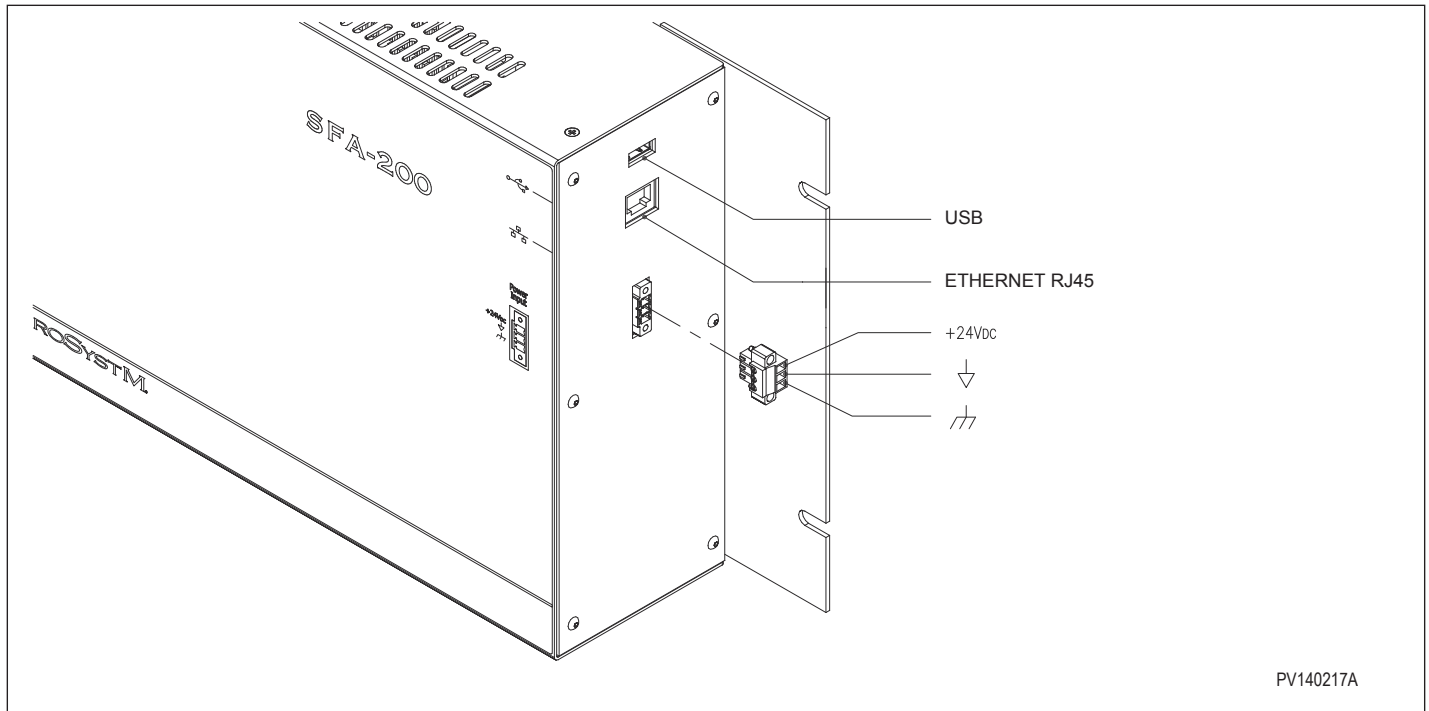
2.1.1 Preparing Cabling and Network Connections

The required power, signal, and communication cables must be already routed on the installation site. Those cables include:

Port	Description
Power input	from +24 V _{DC} source
SFA High Speed Inputs (Channel 1/ Channel 2)	from stray flux sensors
Synchronization Sensor	from reference (1/rev) sensor
Ethernet Port	to a switch connected on the dedicated VSM network
Status Relay Drivers	to remote annunciation devices



2.2 Cabling the SFA-200 Stray Flux Analyser Unit



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2.2.1 Power Input

The SFA-200 requires power from a 24 Vdc source with the following specifications:

Mechanical characteristics

Panel header with threaded flange	Phoenix Contact MCV 1.5/5-GF-3.81 (male)
Mating plug with screw flange	Phoenix Contact MC 1.5/3-STF-3.81 (female)
Recommended wire size	1.5 - 0.5 mm ² [16 - 20 AWG]

Electrical characteristics

Input voltage range	24 Vdc ± 15%
Power consumption	20 W

2.2.2 Ethernet Port

The Ethernet port is provided for communication with the VSM Server.

Install a standard patch cable terminated by RJ45 connectors at both ends, from the Ethernet port to a switch connected on the dedicated VSM network.

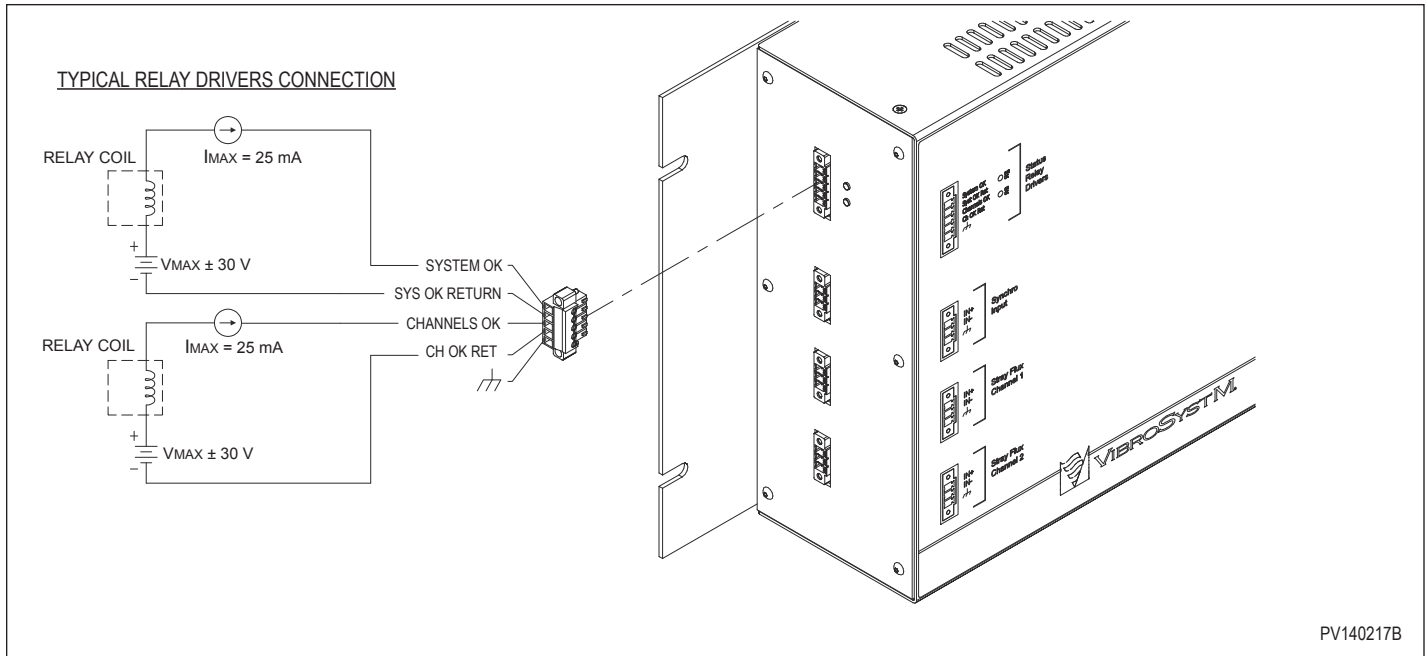
Mechanical characteristics

Receptacle	RJ45
Cable type	Cat 6

Electrical characteristics

Transfer rate	1000 Mbps (100/1000 BaseT Standard)*
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* A 100 Mbps network connection is sufficient for the SFA-200 transfer rate.



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2.2.3 Status Relay Drivers

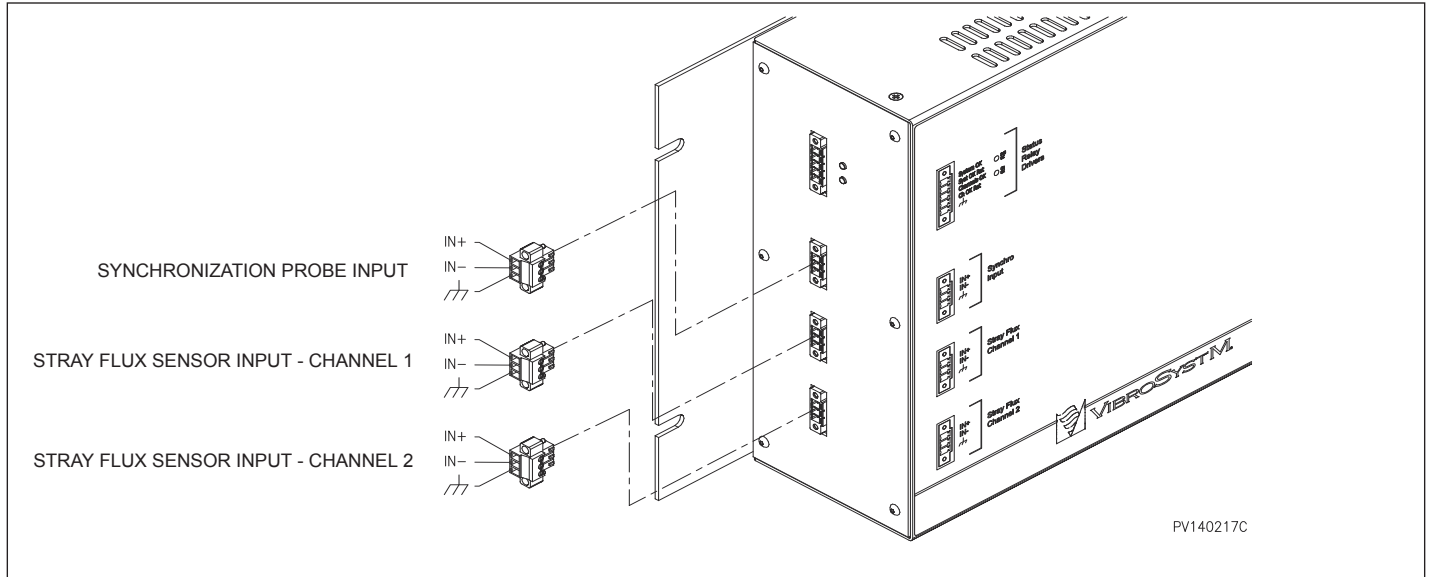
Two relay driver outputs, labelled SYSTEM OK and CHANNELS OK, serve for remote notification of the status of the SFA-200 unit.

Mechanical characteristics

- Vertical header with threaded flange Phoenix Contact MCV 1.5/5-GF-3.81 (male)
- Mating plug with screw flange Phoenix Contact MC 1.5/5-STF-3.81 (female)
- Recommended wire size 0.5 - 0.35 mm² [20-22 AWG]

Electrical characteristics

- Input Voltage $\leq \pm 30\text{ V}$
- Input Current $\leq 25\text{ mA}$
- System OK Driver is closed when the system is operating properly.
Driver is opened when a malfunction occurs.
- Channels OK Driver is opened when all channels are functional.
Driver is closed when at least one channel is found defective.



2.2.4 Synchronization Sensor

The synchronization input receives one electric pulse per rotation, generated each time a target on the shaft passes in front of a probe. The SFA-200 unit needs this pulse to start acquisition, and the ZOOM system needs this reference to correlate all measurements. Parameters of the synchronization signal can be configured through ZOOM Configuration: pulse detection level, polarity (falling edge or rising edge), and angular position.

Mechanical characteristics

Vertical header with threaded flange	Phoenix Contact MCV 1.5/3-GF-3.81 (male)
Mating plug with screw flange	Phoenix Contact MC 1.5/3-STF-3.81 (female)
Recommended wire size	0.5 - 0.35 mm ² [20-22 AWG]

Electrical characteristics

Input Voltage Range	± 24 V
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2.2.5 SFA High Speed Inputs (Channel 1 / Channel 2)

The SFA-200 unit can receive data from two input channels at a sampling rate of 50 KS/s per channel. Each channel can support a sensor designed to detect either the radial or the tangential leakage flux component. The MFP-100 sensor is suitable for use in turbo-generators, but as a radial leakage flux input only.

Mechanical characteristics

Vertical header with threaded flange	Phoenix Contact MCV 1.5/3-GF-3.81 (male)
Mating plug with screw flange	Phoenix Contact MC 1.5/3-STF-3.81 (female)
Recommended wire size	0.5 - 0.35 mm ² [20-22 AWG]

Electrical characteristics

Input Voltage Range	± 20 V
Bandwidth	10 kHz



3. USING THE SFA-200 UNIT

3.1 Status LED Indicators

The **System OK** LED confirms the integrity of the system operation.

The **Channels OK** LED confirms the integrity of the measuring chains (sensors and cables).

Upon each startup, LED indicators light up in the following colors:

- SYSTEM OK **Yellow**
- CHANNELS OK **Yellow**

After the startup sequence, the LED indicators change color as follow:

- SYSTEM OK Turns **Green** after firmware has completed booting and the system is powered up and operating properly.
Turns **Orange** when a system component malfunction occurs, such as a firmware malfunction or a network connection error.
Flashes **Yellow** when files are copied from a USB key, and turns **Yellow** once the operation is completed, until the unit reboots.
- CHANNELS OK Turns **Green** after firmware has completed booting and all measuring chains are confirmed as functional. Remains **Green** as long as all measuring chains are functional.
Turns **Orange** when at least one measuring chain loses the carrying signal.

3.2 Changing Firmware and Settings

The USB port allows connection of a portable storage Flash drive to update the firmware, or change network settings (Acquisition Unit Address, DHCP configuration, and IP Addresses). It is also possible to remotely update the firmware and change the network settings, directly from the VSM Server, by using ZOOM Server commands. These operations can be performed while the equipment is in operation, but the system must be rebooted to apply the changes. Refer to the ZOOM Installation Guide for details on the update procedure.

Important Information

- U3 USB smart drives are not compatible with the SFA-200 operating system.
- Apart from this restriction, any portable USB flash drive formatted to FAT32 may be used.

3.3 Cleaning

Clean the exterior of the SFA-200 only. Do not apply cleaner directly on the unit or allow liquids to spill or enter the unit.