

# S390 High Voltage Phase Sequence Tester



- Intelligent voice feedback
- 1V-550kV Phase Sequence Comparator
- GPS Timing, can be used in environments with no signal
- Phase comparison distance up to 500km, virtually not restricted by distance
- Can be used both outdoor & indoor

## DESCRIPTION

S390 High Voltage Phase Sequence Tester is a battery-operated instrument designed to determine the phase relationship between 2 energized electrical conductors. Unlike other regular phase sequence detectors, the GPS function of the instrument makes it virtually not limited by distance, the distance between the X and Y transmitter and its respective receiver can be more than 500km apart and yet still obtain an accurate result. The time variation between the two receivers will be less than 30 nanoseconds. The receivers use a 3.5-inch true color LCD screen, supports a variety of satellite systems such as China's BDS (Beidou Satellite Navigation System), the United States' GPS, Russia's GLONASS, the European Union's GALILEO, and Japan's QZSS and satellite augmentation system SBAS (WAAS, EGNOS, GAGAN, MSAS), includes 32 tracking channels, is able to receive GNSS signals from six satellite timing systems at the same time, and it will synchronize the timing with the instrument to ensure accuracy of phase detection. Another feature of the instrument is that it does not require an ongoing connection with the satellites to obtain an

accurate result. Once the satellites connection has been established, it can be in sync with the satellites' time for at least 30 minutes, making it convenient for comparing phases in environments with no signal. In addition, it can use both the contact testing method or the non-contact method for phase detection of high voltage cables, which can be a much safer option for users.


## APPLICATION

S390 is designed to detect the rotary field of three-phase systems and determine phase relationship for high voltage cables. Its satellite function not only makes it not restricted by distance but also makes it convenient for environments without signals, for example, basements and mines.

## SPECIFICATIONS

<b>Functions</b>	Designed for ultra-long distance phase sequence detection/indication and comparison between 2 cables using GPS time, can also be used to measure frequency, phase angle, and voltage test.
<b>Power</b>	Receiver: DC 7.4V, 3000mAh rechargeable Li-battery Detector: DC 3.7V, 1000mAh rechargeable Li-battery USB charging port
<b>Test Modes</b>	GPS Mode, Synced Mode & Local Mode
<b>Transmission Method</b>	315MHz- 433MHz wireless transfer
<b>Distance</b>	GPS Mode distance is not limited, can X & Y set can be more than 500km Local Mode distance X & Y set can be up to 160m apart
<b>Display</b>	3.5-inch true color LCD display
<b>Measurement Range</b>	The Voltage of Conductor: AC 1V ~ 550kV Phase Angle: 0° ~ 360° Frequency: 45Hz ~ 75Hz
<b>Resolution</b>	1°; 0.1Hz
<b>Accuracy</b> (23°C ± 5°C, below 80%RH)	GPS & Synced Mode: ≤ ± 5° Local Mode: ≤ ± 10° Frequency: ≤ ± 2Hz

<b>Phase Difference</b>	In-phase: X & Y angle difference at $0^{\circ} \sim 30^{\circ}$ ; Out of phase: X & Y angle difference at $90^{\circ} \sim 120^{\circ}$ or $210^{\circ} \sim 270^{\circ}$
<b>Voice Feedback</b>	Voice notification: In phase, Out of phase, X signal normal , Y signal normal
<b>Time Sync Duration</b>	Using Synced Mode, once the instrument has established connections with the satellites, the instrument is able to stay in sync with the satellites for more than 30 minutes, this meets the needs for underground and mines or environments without signal
<b>Insulation Rod Length</b>	Fully extended length approx. 5m; retracted length approx. 1m
<b>Phase Detection Method</b>	Contact Method: Bare wire of 35kV or below and 110kV or below for cables with insulating sheath, (please conduct testing with insulation rod)lation rod) Non-contact Method: Bare wire of 35kV and above or 110kV and above for cables with insulating sheath. (please conduct testing with insulation rod)
<b>Voltage Test Indication</b>	A positive voltage test will be indicated by a "beeping" sound from the transmitter
<b>Measurement Range</b>	The measurement range will be automatically adjusted based on the voltage of the conductor
<b>Sampling Rate</b>	2 times/sec
<b>Satellite-Connecting Time</b>	The first time it takes about 3 minutes to search for satellites, then the second time takes about 30sec. If it is a warm start, it should take about 1 second. The transmitter should be put placed level facing upward while searching for satellites
<b>Time Variations</b>	Less than 30nS
<b>Instrument Dimensions</b>	Transmitter: LWT 147mm×60mm×50mm Receiver: LWT 207mm×101mm×45mm
<b>Backlight Brightness</b>	Press $\uparrow \downarrow$ to adjust the backlight brightness
<b>Power Amplifier</b>	Transmitter automatically amplifies the signal based on strength of the electric field, facilitating the phase-detection in a tightly packed environment
<b>Data Hold</b>	Press the HOLD button while in testing mode to hold the data, then press the HOLD button again to cancel the function
<b>Exit</b>	Press the ESC button to exit from the current interface and return to the upper directory
<b>View Data</b>	Press the ENTER button to enter this mode, then press arrow button to view the saved data
<b>Satellite Searching Indication</b>	The "----" symbol will be displayed when the instrument is searching for satellites
<b>Automatic Shutdown</b>	30 mins after startup, the instrument will automatically shut down to reduce battery consumption
<b>Rated Current</b>	Transmitter: 35mA max; receiver: 300mA max
<b>Battery Voltage</b>	When the battery voltage is low: Transmitter: The LED will flash slowly to remind the user to charge the battery Receiver: the low battery voltage symbol will be displayed to remind the users to charge it when possible
<b>Weight</b>	Transmitter: approx. 344g ( including battery) Receiver: approx. 909g (including battery) Insulation rod: approx. 1.45kg Total: approx. 7.188kg (including instrument box)
<b>Ideal Working Conditions</b>	$-10^{\circ}\text{C} \sim 40^{\circ}\text{C}$ ; below 80%RH
<b>Ideal Storage Conditions</b>	$-10^{\circ}\text{C} \sim 60^{\circ}\text{C}$ ; below 70%RH
<b>Interference</b>	This instrument will not produce a strong electromagnetic field or cause any interference to 433MHz or 315MHz signals
<b>Dielectric Strength</b>	Insulation rod: AC 110kV/RMS (between the two ends, fully extended) Transmitter: 2000V/RMS (between insulation rod attachment point to the top of the transmitter) Receiver: 2000V/RMS (between the two ends of the housing)
<b>Safety Standards</b>	GB13398 92, GB311.1 - 311.6 - 8, 3DL408 91 standard and national new electric power industry-standard "DL/T971-2005 for universal technical conditions for portable 1kV to 35kV portable phase transmitter apparatus for live work" Ideal for IEC61481 — A2:2004; IEC 61243 — 1 ed.2:2003 standard

ACCESSORIES & ORDER DATA			
Description	Order Code	Description	Order Code
S390 Phase Sequence Detector / kV GPS, 1 pc	S390	<b>Included accessories for S390</b>	
Receiver (host), 2 pcs		Antenna, 4 pcs	
Transmitter, 2 pcs (X and Y 1 each)		Extendable insulation rod, 2 pcs	
		Aluminum case, 1 pc	
		Hook, probe, 4 pcs (each 2)	
		USB charger and cable, 1 set	
		Li-battery, 4 pcs (within the instrument)	
		Self-calibration wire, 1 pc	
		Auxiliary test leads, 2 pcs	
		User manual, Warranty card, Certificate of Conformity, 1 copy of each	

**SALES OFFICE**

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**S390**

Phase Sequence Detector / kV GPS  
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