

Centrix



Benefits

- ▶ EasyGo operating concept 
- ▶ Automatic data storage and logging
- ▶ Central control of all test van functions
- ▶ Integrates the most innovative pre-location methods
- ▶ Highest safety standard

► The Centrix

The experiences and feedback from daily use and the suggestions from many users have contributed to the unique operating concept and will continue influencing the functionality of the Centrix system. In this way, a test van system has been developed that continuously sets new standards:

- User friendly
- Fast and efficient
- Arc reflection pre-location methods up to 80 kV
- Arc burning with burn take over
- Automatic analysis of the test data
- User-specific reports in PDF format
- Online documentation and help

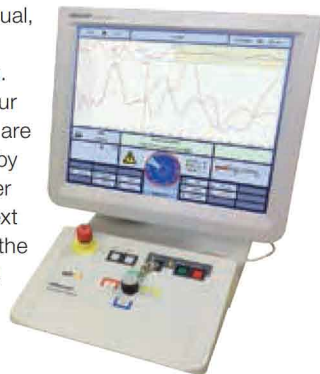
All standard processes run automatically with the help of single button jog dial operation. The user can fully concentrate on his actual task – the fault location.

► The operating concept

The control of the Centrix fault location system consists of a large monitor and a free positionable control panel, the control unit. This unit contains the central control element of the system – the Jogdial. The Linux® based operating system is very stable.

The Centrix system stores all test and measurement data automatically. Data evaluation and transmission can be done easily. The Jogdial serves as control of all system functions.

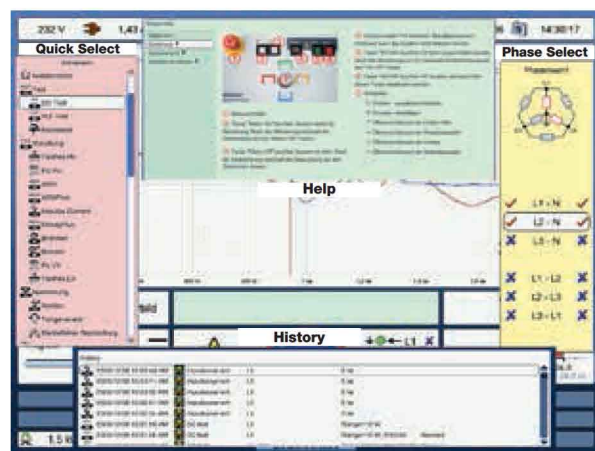
Via the Jogdial permit a direct access the online user manual, the test history, the phase selection and a quick menu. Operatinal steps which occur frequently during operation are automatically pre-selected by the Centrix system. The user then simply confirms the next operating step by pressing the Jogdial – simple and direct!



Control Panel

► Automated procedures

When using reflection methods, automatic functions determine the end of the cable and set the ideal parameters for the measurement range and method. The end as well as the fault location are automatically determined. For all pre-location methods, the end is immediately indicated by a marker. Due to the consistent ongoing development of the proven high voltage pre-location methods and due to the high performance of the software systems, excellent results are produced, even on faults which were previously hard to locate. The History function stores all measurement results automatically. No measurement will be lost. After seven days, the measurements are compressed and stored in daily files.



Examples of menus

In addition to its normal operation, the Jogdial is also used to select the side menus. These side menus provide easy access to the "Phase Selection", "History", the "Quick Select" as drop down menu and the "Help" function with online manual. Individually definable printed records permit these to be directly adapted for company-specific forms.

► Test

The integrated test, using DC, 0.1 Hz Cosine Rectangular Wave voltage or a Sinusoidal Wave form (54 kV 0.1 Hz VLF), permits tests to be carried out throughout the entire medium voltage range. The DC tests are possible up to a maximum voltage of 40 or 80 kV. Test currents with a maximum 600 mA enable direct burning with the Centrix system, even without the use of external power burn units.

A fully integrated insulation tester up to 1 kV, capacitance measurement and sheath tests offer additional applications for all necessary maintenance work on cables and accessories.

► Pre-location

In addition to the proven Decay travelling wave method and the impulse current methods (ICE), all other proven arc reflection methods can be integrated into the Centrix. The Centrix also offers the ARM* process in a new version which has been optimised for shorter distances. Alternatively, for greater distances, ARM* Plus (up to 32 kV) and Decay Plus (up to 80 kV) are available. The new ARMSlide technology provides a choice of displaying up to 15 reflectograms out of one ARM shot.



ARM*- and ARM* Plus Reflectograms

As a further feature, the Centrix includes the ARM burning Technology, which permits the monitoring of the fault location with a reflection measurement, during the burn process. The burning process can thus be controlled and automatically provides a pre-location result. For a cable preserving operation, the ARM burning allows the burn duration to be as short as possible. Accordingly, the most effective pre-location methods are available to the Centrix.

One of the most progressive methods of fault location is the ARM* Plus or Decay Plus double surge method, especially for higher voltage levels and long cables. The first step is a discharge from a surge generator or with DC voltage, to be able to cause a breakdown at the fault location. In a second step, the duration of the arc resulting from the breakdown is automatically extended by a second discharge from the 4 kV surge module and is then measured with the ARM* Plus or Decay Plus method. This results in perfect fault traces.

► IFL-Modus

For intermittent faults, the Centrix has an IFL mode available. This IFL Mode can save a lot of time, particularly in the area of branched low voltage distribution. Changes caused by short circuits that would only be visible as short reflections are clearly recognised by their envelope.

Therefore it is not necessary to know the exact time at which the change occurs as this is immediately and permanently visible. This technology allows the simple verification of the exact fault positions and their Tee's in a branched low voltage network.



Typical IFL-Reflectograms

*ARM=ARC Reflection Method

► Pinpointing

With a comparably low weight, due to powerful surge modules with 1280, 1750 or 2560 Joules, the Centrix can produce a high surge energy at voltage levels from 2 to 32 kV. Together with the new digiPHONE+, acoustic pinpointing thus becomes a simple, fast and reliable process.

Four voltage levels from 5 to 20 kV enable sheath testing and, via the step voltage method, sheath fault pinpointing with a pulsed output. The pinpointing technologies are rounded off by a powerful, integrated 200 W audio frequency transmitter. This supports the patented SignalSelect technology as well as the direct and capacitive step voltage method with AC voltage. These system options are supplemented by custom-made solutions, which we adapt as required to our customer requirements for the Centrix test van system.



Centrix 1- Phased

Method	Basic Module	Options
Insulation Testing		
up to 500 / 1000 V	Connection sockets for external insulation tester (max. 1000 V)	Integrated automatic or manual insulation, resistance and capacitance measurement, trend measurement (DAR and PI) of resistance up to 10 min, automatic memory, comparison of measurements ph-ph and ph-N, measurement for cable capacitance R_{iso} : 1 Ω ... 2 G Ω , R_{iso} : 1 k Ω ... 2 G Ω C : 0.0 μ F ... 19.9 μ F R: 0.1 Ω ... 1 k Ω
Resistance low voltage < 24 V		
HV Testing		
DC Testing	0 ... 8 kV, I_N 195 mA, I_{max} 580 \pm 20 mA >8 ... 40 kV, I_N 20 mA, I_{max} 300 \pm 20 mA Automatic shut off at breakdown	>8 ... 80 kV, I_N 13,5 mA, I_{max} 180 \pm 20 mA
VLF Testing		VLF 0 ... 40 or 54 kV 0.1 Hz Cosine Rectangular Wave, max. cable capacity 5 μ F@54 kV, 8 μ F@36 kV, 21 μ F@18 kV VLF sin 36 kV _{rms} , max. cable capacity 5 μ F @ 36 kV/0.01 Hz, 1 μ F @ 36 kV/ 0.1 Hz
Diagnostic measurements		Diagnostic measurement of Partial Discharge with OWTS @ power frequency tan δ diagnostic measurement @ VLF sine
Sheath Testing	0 ... 5 kV / 0 ... 10 kV / 0 ... 15 kV 0 ... 20 kV, I_{max} 580 \pm 20 mA	
Prelocation		
Impulse Reflection Measurement modes	Direct, Difference, Comparison, Average, Intermittent Fault location IFL, Simultaneous display of six phases or memory contents in selectable colours. Automatic adjustment of gain, range and pulse width. ARM-Slide technology	
Range:	20 m ... 1280 km @ v/2 = 80 m/ μ s	
Pulse width:	20 ns ... 10 μ s	
Pulse amplitude:	30 ... 160 V	
Resolution:	0,1 m @ 80m/ μ s, 1,0 cm @ V/2 < 40 m/ μ s	
Sample Rate:	400 MHz	
Gain	-37 ... +37 db + 0 ... 22dB for ProRange	
Propagation Velocity V/2:	10 ... 149,9 m/ μ s, ft/ μ s oder nvp	
Dynamic range:	> 80 dB	
Output impedance:	50 Ω	
Display:	17" Colour SXGA, CCFL-Backlight, 300cd/m ²	
Data Storage:	2 GB each for Program, Data and recovery	
Connections:	USB for Printer and Data, Ethernet, RS 232	
Storage and Protocolling	Automatic storage of all measurements, protocol printout, also as PDF file or for transfer to the incl. Winkis PC software.	
HV prelocation Methods		
ARM		0 ... 4 / 8 / 16 / 32 kV
ARM Plus		0 ... 4 / 8 / 16 / 32 kV
Decay		0 ... 40 / 80 kV (max. DC test voltage)
Decay Plus		0 ... 40 / 80 kV (max. DC test voltage)
ICE 1 ph		0 ... 4 / 8 / 16 / 32 kV
LV ARM Burning		0 ... 4 / 8 kV, I_{max} 580 \pm 20 mA
ARM Burning		DC ignition up to 20 kV
Burning		
DC	0 ... 8 kV, I_{max} 580 \pm 20 mA	>8 ... 40 kV, I_N 20 mA, I_{max} 300 \pm 20 mA >8 ... 80 kV, I_N 13,5 mA, I_{max} 180 \pm 20 mA 0 ... 20 kV, with automatic burn take-over to 600 V, 40A DC.
LV ARM-Burning		0 ... 4 / 8 kV, I_{max} 580 \pm 20 mA
AC		AC Burning 0 ... 600V, max. 70 A _{rms}

Method	Basic Module	Options
Pinpointing		
Acoustic Method with Surge Modules	3 ... 30 s	0 ... 4 / 0 ... 8 kV, 1200 J
Surge rate		0 ... 4 / 0 ... 8 kV, 1750 J
		0 ... 4 / 0 ... 8 kV, 2400 J
		0 ... 16 / 0 ... 32 kV, 1280 J
		0 ... 16 / 0 ... 32 kV, 1750 J
		0 ... 16 / 0 ... 32 kV, 2560 J
0 ... 2 kV, 1200 J		
Surge pulse receiver		digiPHONE+
Sheath fault pinpointing with DC step voltage	0 ... 5 / 10 / 15 / 20 kV I_{\max} 580 mA \pm 20 mA	ESG step voltage receiver for sheath fault pinpointing
Duty cycle	1:3 / 1:6 / 1:12	
Audio Frequency		
Output power		200 W
Frequencies		491 Hz, 982 Hz, 8.44 kHz also with SignalSelect, Supermaximum
Impedance		0.5 Ω ... 1 k Ω / automatic impedance matching
Sheath fault pinpointing with AC audio frequency		Step voltage probe, direct or capacitive
HV Connections		
Single phase		ECONOMY: 50 m (manual cable drum) COMFORT: 50 m (motorised cable drum) PRO: 50 m (motorised slip-ring cable drum)
Connections Power Supply		
	Earth potential monitoring, 10 m (manual cable drum) Integrated safety system with FU/EP. Separation transformer Monitoring of: Voltage difference to protective earth Rise time of potential to protective earth Loop of protective earth to aux. earth Loop of cable shield to aux. earth	ECONOMY: Mains cable 50 m (manual slip-ring cable drum), Protective earth cable 50 m (manual cable drum) COMFORT: Mains cable 50 m (recoiling belt slip-ring cable drum), protective earth 50 m (recoiling belt cable drum) PRO: Mains cable 50 m (motorised slip-ring cable drum), Protective earth 50 m (motorised cable drum)
Teleflex Connection		3-phase coax cable, 50 m (manual, recoiling band or motorised drum)
Safety cable drum		Safety cable drum 50 m (manual, recoiling band or motorised) with emergency-OFF, key interlock and status indicating lights
Operating conditions		
Operating temperature	HV Unit: -25 °C ... +55 °C	
	Control Unit: -5 °C ... +55 °C	
Storage temperature	-25 °C ... +70 °C	
Weight		
	depending on options 900 ... 1300 kg	
Mains supply		
Mains voltage	230 V, 50 Hz (16 A connection)	120 V, 60 Hz
		Generator operation from vehicle engine
		Battery operation up to 4 hours
Power consumption	Separation transformer max. 3.6 kVA	Separation transformer 5 kVA with CEE connector for extended requirements such as ARM Burning, air condition etc.

Centrix 3 phased

Method	Basic Module	Options
Insulation Testing		
500 and 1000 V	Integrated automatic or manual insulation, resistance and capacitance measurement, trend measurement (DAR and PI) of resistance up to 10 min., automatic memory, comparison of measurements ph-ph and ph-N, 6 measurements for resistance ph-ph, 3 measurements for cable capacitance R _{iso} : 1 Ω ... 2 GΩ, R _{iso} : 1 kΩ ... 2 GΩ C: 0.0 μF...19.9 μF	
< 24 V	R: 0.1 Ω ... 1 kΩ	
HV Testing		
DC Testing	0 ... 8 kV, I _N 195 mA, I _{max} 580 ±20 mA >8 ... 40 kV, I _N 20 mA, I _{max} 300 ±20 mA Automatic shut off at breakdown	>8 ... 80 kV, I _N 13.5 mA, I _{max} 180 ±20 mA
VLF Testing		VLF 0 ... 40 or 54 kV 0.1 Hz Cosine Rectangular Wave, max. cable capacity 5 μF@54 kV, 8 μF@36 kV, 21 μF@18 kV VLF sin 36 kV _{rms} , max. cable capacity 5 μF @ 36 kV/0.01 Hz, 1 μF @ 36 kV/ 0.1 Hz
Diagnostic measurements		Diagnostic measurement of Partial Discharge with OWTS oscillating wave @ power frequency Tan δ diagnostic measurement @ VLF sin
Sheath Testing	0 ... 5 kV / 0 ... 10 kV / 0 ... 15 kV 0 ... 20 kV, I _{max} 580 ±20 mA	
Prelocation		
Impulse Reflection Measurement modes	Direct, Difference, Comparison, Average, Intermittent Fault location IFL, Simultaneous display of six phases or memory contents in selectable colours. Automatic adjustment of gain, range and pulse width. ARMslide technology	
Range:	20 m ... 1280 km @ v/2 = 80 m/μs	
Pulse width:	20 ns ... 10 μs	
Pulse amplitude:	30 ... 160 V	
Resolution:	0.1 m @ 80m/μs, 1.0 cm @ V/2 < 40 m/μs	
Sample Rate:	400 MHz	
Gain	-37 ... +37 db + 0 ... 22dB for ProRange	
Propagation Velocity V/2:	10 ... 149.9 m/μs, ft/μs oder nvp	
Dynamic range:	> 80 dB	
Output impedance:	50 Ω	
Display:	17" Colour SXGA, CCFL-Backlight, 300cd/m²	
Data Storage:	2 GB each for Program, Data and recovery	
Connections:	USB for Printer and Data, Ethernet, RS 232	
Storage and Protocolling	Automatic storage of all measurements. protocol printout, also as PDF file or for transfer to the incl. Winkis PC software.	
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Decay Plus		0 ... 40 / 80 kV (max. DC test voltage)
ICE 1 ph		0 ... 4 / 8 / 16 / 32 kV
ICE 3 ph		0 ... 4 / 8 / 16 / 32 kV
LV ARM Burning		0 ... 4 / 8 kV, I _{max} 580 ±20 mA
ARM Burning		DC ignition and take over up to 20 kV
Burning		
DC	0 ... 8 kV, I _{max} 580 ±20 mA	>8 ... 40 kV, I _N 20 mA, I _{max} 300 ±20 mA >8 ... 80 kV, I _N 13.5 mA, I _{max} 180 ±20 mA 0 ... 20 kV, with automatic take-over burning to 600 V, 40A DC.
LV ARM-Burning		0 ... 4 / 8 kV, I _{max} 580 ±20 mA
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Surge pulse receiver		digiPHONE+
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Duty cycle	1:3 / 1:6 / 1:12	
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Impedance		0.5 Ω ... 1 kΩ / automatic impedance matching
Sheath fault pinpointing with AC audio frequency		Step voltage probe, direct or capacitive
HV Connections		
3 x 1 Phase		ECONOMY: 50 m (manual cable drum)
		COMFORT: 50 m (motorised cable drum)
		PRO: 50 m (motorised slip-ring cable drum)
1 x 3 Phase		Multi: 50 m (motorised cable drum 3phase)
Connections Power Supply		
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