R30 2.0
Cable fault location and cable testing system for low, medium and high voltage transmission cables

- **Modern software-based centralized control interface similar to well-established fully centrally controlled test vans of the MV world**
- **Single rotary knob operation for most functions**
- **Available versions: 110 kV or 150 kV; optionally with 400 kV expansions**
- **Unique Arc Reflection Method up to 50 kV with second-to-none TDR-based fault finding performance**
- **Transient prelocation; ICE up to 100 kV, DECAY 110 kV, 150 kV or 400 kV**
- **Surging/Thumping up to 100 kV / 4000 J**
- **Unique best-in-market discharge capability, suitable and necessary for long HV cables**
- **Powerful VLF up to 70 kV_{RMS}**
- **Options for PD diagnostics and tanDelta testing available**

DESCRIPTION

The System R30 2.0 is the largest most powerful test van system within the Megger product range. All functions and voltage ranges are full integrated and three phased. Single phase or two phase version are available on request. Recently extended and improved, this already powerful System's capabilities are increased.

DC test voltage levels, including the well known Decay travelling wave prelocation method are available up to 110 kV or even 150 kV option in the standard version (400 kV optional extension of the setup e.g assembled in a trailer), thus keeping and extending the world-wide standards set by system R30 2.0.

The widely approved and well-known Arc Reflection Method up to 50 kV gives this system the capacity to locate faults in cables above the 30 kV range. The standard high voltage supply provides DC test voltage levels up to 6 x U_0. The combination with Meggers VLF tester series makes the System R30 to a suitable solution for cable fault location and cable diagnoses for the cable networks up to 30 kV cable rating.

A digital central control unit monitors the safety and all vital functions of the system. The integrated safety system concept and the separation transformer for defined potentials, guarantees the high Megger safety standards for men and equipment.

Functions

The three phased standard connection offers a comfortable and safe switching of the phases by the internal high voltage switch.

The control unit is an integrated central operator interface which follows Meggers User Interface-Platform concept well known from the Teleflex and Centrix series. It enables an easy and quick operation of the system (many local languages available), prevents operational errors and reduces the fault location time considerably.

Equipped with the integrated highend Teleflex VX – our state-of-the-art reflectometer, with high dynamic range, sampling frequency up to 400 MHz and selectable pulse width – the System R30 2.0 provides excellent resolutions even at far distances. This is equally valid for reflectometer tests and in combination with the various high voltage applications.

The modular concept offers optimised solutions suited to individual requirements. With a wide range of different possibilities, this system leaves almost no wishes unfullfilled.

The high surge power of up to 3200 Joules is the base for an efficient and fast localisation of cable faults.

An effective and safe testing of PE, XLPE and paper oil insulated cables is provided for use of the patented Megger VLF 0.1 Hz cosine square wave method.

The very powerful high voltage source in high frequency converter technology provides the system with the required voltage level of 110 kV (optional 400 kV) for testing, and a high standard current of up to 300 mA to handle high loads.

The system provides all known and proven Megger high voltage prelocation methods as:

- ARM® Multishot
- Decay method
- Impulse current decoupling ICE

in combination with according high voltage and power features.

The extensive and approved safety concept of Megger fulfils the highest safety standards by extensive use of safety interlocks, indications at the digital control unit, detection of errors, as well as use of a separation transformer and thus generates the maximum protection for men and equipment.

In general:

System concept R 30 is also useful for special requirements in on- and offshore feeder networks. In combination with the internal HV DC source there are two different high energy discharge modules avaible:

Module 1: test van mounted module discharge capability 220 kJoule @150 kV DC (-)

Module 2: trailer mounted external module discharge capability 844 kJoule @150 kV DC (-)

TECHNICAL DATA

R 30	Standard	Options
Insulation Evaluation		
	Standalone insulation test set via external auxiliary connection	Integrated insulation resistance module 1 kV, 2 GOhm
Cable Testing		
DC testing	0-110 kV DC I_{max} 290 mA Automatic breakdown detection and safety shut-off	0-150 kV DC 0-400 kV DC (external source, controlled by system)
VLF testing	-	0.1 Hz Cosine Rectangular VLF Either 0-54 kV_{RMS} with 5.0 µF at 54 kV_{RMS} at 0.1 Hz Or 0-70 kV_{RMS} with 5.0 µF at 70 kV_{RMS} at 0.1 Hz Other options: VLF 80 kV_{RMS} VLF 62 kV peak sine wave
Prelocation		
ARM®	0-50 kV; true inductive double-surge ARM Multishot; Inductive filter; Active arc stabilization by double surge; Multishot: 15 fault traces per ARM shot	
ARM Burning (Burn Arc Reflection)	-	0-15 kV DC (option HDW T22/13B necessary)
ICE	0-50 kV impulse current decoupling	0-100 kV
Decay	0-110 kV voltage decoupling	0-150 kV 0-400 kV (external coupler, controlled by system)
TDR	Teleflex VX; No-User-Intervention auto mode; Distance-dependent de-attuation +22 dB; Phase comparison; Comparison to previously stored TDR fingerprint measurement	Overhead line system for fault location and phase identification on HV AC transmission lines
Burning; Fault conversion and conditioning		
	Conditioning via DC source	HDW T22/13B 0-15 kV DC Max burn-down current 25 A Resonance technology (no large reactive power draw like with 50 Hz transformer burners)

TECHNICAL DATA

R 30	Standard	Options
Surge Generator and Pinpointing		
Magnetic-acoustic pinpointing	0-3/0-6/0-12 kV 1000/1000/1000 J 0-25/0-50 kV 2500/2500 J Adjustable surge sequence 3-30 sec, single shot	0-3/0-6/0-12 kV 2000/2000/2000 J 0-80 kV 3200 J or 0-100 kV 2000 J or 0-100 kV 4000 J
Audio frequency	FLG 200 Output power: 200 W Frequencies: 480 Hz, 1.09 kHz, 9.8 kHz	Other frequencies upon request
DC sheath fault pinpointing		Step-voltage method / Voltage-gradient method via T22/13B, 300 mA, 1:2 or via MFM10
AC sheath fault pinpointing	Pearson method via FLG 200, 200 W, 480 Hz / 1.09 kHz / 9.8 kHz	
Connections		
HV connections	3 x 1 phase with 50 m 110 kV HV cable on manual cable drum	3 x 1 phase with 50 m 110 kV HV cable on motor driven cable drum 3 x 1 phase with 50 m 110 kV HV cable on motor driven HV-slipring cable drum
LV connection	50 m mains cable 2 x 4 mm^2 on cable drum 50 m earth cable 16 mm^2 cable drum 10 m FU cable	Other frequencies upon request
Teleflex-direct-connection		Teleflex cable drum 50 m, 3 phased coaxial cable 50 Ω
Operation temperature	-25°C ... +55°C (HV hardware) -10°C ... +50°C (Teleflex VX and operator room)	
Storage temperature	- 25 °C...+ 60 °C	
Weight	approx. 1000 kg, depending on selected options and outfitting	
Mains supply		
Mains voltage	230 V, 50 Hz (16 A connection)	120 V, 60 Hz (other voltages on request)
Power consumption	5 kVA maximum input via separation transformer	Battery powered operating time > 4 hours Generator 5.5 kVA Wireless remote control

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