

Technical Evaluation Criteria for - Portable Three Phase Test System for Auto reclose Controllers

Evaluation Methodology

The evaluation will be performed by the Eskom evaluating representatives. It begins at Level 1 followed by Level 2 and then proceeds to Level 3.

Level 1 will include the desktop evaluation of the mandatory criteria. Submissions failing to meet the requirements at Level 1 will be deemed non-responsive and will be immediately disqualified and removed from further evaluation. Submissions meeting the requirements will proceed to Level 2.

Level 2 will include a desktop evaluation of the functional criteria. The submissions will be evaluated and scored. Submissions failing to meet the stipulated threshold at Level 2 will be deemed non-compliant and will be immediately disqualified and removed from further evaluation.

The Level 2 threshold is set at 80%.

Evidence required for Level 1 and Level 2 evaluations must be submitted by the tender closing date.

Submissions meeting the requirements will proceed to Level 3.

Level 3 is the sample evaluation. The Level 3 threshold is 100%. Failure to meet the threshold of 100% will be deemed non-compliant.

Deviations or deficiencies identified during functional evaluation and/or sample evaluation must be addressed prior to contract award.

Level 1 - Mandatory Criteria and Returnable

No	Criterion	Returnable
1	The product offered performs tests on all types of pole Mounted reclosers.	A product brochure confirming this requirement or letter from the OEM if the required information is not contained on existing brochures. Note the letter must be on the OEM's letterhead and must be signed by the relevant OEM representative.
2	The product offered must be light weight and portable to transport	A product brochure confirming this requirement or letter from the OEM if the required information is not contained on existing brochures. Note the letter must be on the OEM's letterhead and must be signed by the relevant OEM representative.
3	The product is a stand-alone device and is not an add on component to another testing system.	A product brochure confirming this requirement or letter from the OEM if the required information is not contained on existing brochures.

		Note the letter must be on the OEM's letterhead and must be signed by the relevant OEM representative.
4	The product must perform Manual tests as well as automated software test	<p>A product brochure confirming this requirement or letter from the OEM if the required information is not contained on existing brochures.</p> <p>Note the letter must be on the OEM's letterhead and must be signed by the relevant OEM representative.</p>
5	The product must have guided test software that can be operated by a PC or Tablet	<p>A product brochure confirming this requirement or letter from the OEM if the required information is not contained on existing brochures.</p> <p>Note the letter must be on the OEM's letterhead and must be signed by the relevant OEM representative.</p>

Level 2 - Functional Criteria and Returnable

The functional threshold is set at 80%. Submissions failing meet the threshold will not proceed further.

Part marks will be allowed as indicated in the scoring column of the criteria table.

The total available points = 100%.

Criterion	Returnable	Scoring Model
Technical Testing Specification		
Power Supply Nominal Voltage 100 V - 240 V Permissible Voltage Range 85 V - 264 V Nominal Frequency 50 Hz / 60 Hz Permissible Frequency Range 45 Hz - 65 Hz Power Consumption 1000W at 230V Rated Current 8A at 230V Connection Standard AC sockets (IEC 60320)	<p>A product brochure confirming this requirement or letter from the OEM if the required information is not contained on existing brochures.</p> <p>Note the letter must be on the OEM's letterhead and must be signed by the relevant OEM representative.</p>	5%
Weight Max 10kg		10%
Environment Operating Temperature -10°C ... +50 °C Storage Temperature -25 °C ... 70 °C Humidity 5 % ... 95 % r.h. (non-condensing) Operating Altitude up to 4000m Ingress Protection Rating IP31 (IP32 with front cover)		5%
Certification		5%

<p>EMC IEC 61326-1; CISPR22; FCC Subpart B of part 15 Class A</p> <p>Shock IEC60068-2-7 (30g) IEC60068-2-64 (5g,</p> <p>Vibration 10Hz..2000Hz)</p> <p>Drop test IEC60068-2-31 (2 drops, 0.5m)</p> <p>Independent Test Laboratory</p> <p>Copies of test certificates from independent test laboratories proving compliance with the above standards are to be supplied together with the tender</p>		
Hardware		
<p>General</p> <p>All functions should be combined in one hardware unit The unit shall be of a robust and sturdy construction PC card design: Wire jumpers on a single printed circuit board are not permissible Electronic components: No potentiometers are allowed No moving elements or elements that are susceptible to damage, i.e. controls elements or displays on the face plate are permissible</p>	<p>A product brochure confirming this requirement or letter from the OEM if the required information is not contained on existing brochures.</p>	5%
<p>Output Amplifiers</p> <p>The amplifier stages are to be fully electronic, i.e. not via transformer All current amplifiers to be fully protected and proof against any open-circuit-, overload-, overburden- and over-temperature- condition. Any such condition is to be immediately displayed in all active software modules. Except for an over-temperature condition an automatic shut down of the amplifiers is NOT permissible All voltage amplifiers to be fully protected and proof against any short-circuit-, overload-, overburden- and over-temperature- condition. Any such condition is to be immediately displayed in all active software modules. Except for an over-temperature condition an automatic shut down of the amplifiers is NOT permissible All amplifiers to use linear amplification elements and to be dc-coupled Ability to generate dc and ac signals The amplifiers, low-level outputs, the measurement inputs and the main power supply to be galvanically isolated from each other and earth (2kV insulation voltage)</p>	<p>Note the letter must be on the OEM's letterhead and must be signed by the relevant OEM representative.</p>	5%
<p>Voltage Amplifiers</p> <p>Setting range 6x 0..8V, Option: 6x 0..150V_{rms} (L-N)</p> <p>Output power 6x 42W at 150V</p> <p>Load current 6x 280mA</p> <p>Accuracy error < 0.05% typically, <0.1% guaranteed</p> <p>THD+N < 0.1% at full scale</p>		5%
<p>Current Amplifiers</p>		5%

<p>Setting range 3x 0..12.5A_{rms} Output power 3x 95W Compliance voltage 3x 12V_{rms}, 3x 18V_{pk} Accuracy error < 0.05% typically, <0.1% guaranteed THD+N < 0.1% at full scale Independent amplifiers The three current amplifiers are to be independent from the six voltage amplifiers</p>		
<p>Low-level signal Generators</p> <p>6 analogue low level signals to test controllers with low-level input, e.g. from Rogowski coils, linear voltage or linear current sensors must be provided Full simulation of Rogowski coil signal (i.e. first order differential of signal) to be performed in hardware.</p>		5%
<p>Signal Generation</p> <p>All outputs to be continuously and independently adjustable in amplitude, phase (0 to +/- 360°) and frequency. Able to generate continuous sine waves with a frequency between dc and 599Hz. Frequency error to be less than 0.5 ppm. Phase error to be less than 0.005°</p>		5%
Components		
<p>Binary Inputs</p> <p>Number of inputs 6 fully isolated galvanic inputs (2kV insulation voltage) Mode/Trigger criteria Pick-up and drop-out of potential-free contacts or dc voltages of up to 250Vdc. Trigger levels to be adjustable Max. Input Voltage 250V Max. error < 100 µs</p> <p>Binary output contacts</p> <p>Number 9 in three potential groups Breaking capacity 250V / 0.5A Type Dry contacts that can be used to switch ac or dc</p>	<p>A product brochure confirming this requirement or letter from the OEM if the required information is not contained on existing brochures.</p> <p>Note the letter must be on the OEM's letterhead and must be signed by the relevant OEM representative.</p>	5%
<p>Time Synchronization</p> <p>Test set needs to be synchronise to the IEEE 1588 Precision Time Protocol (PTP) via Ethernet. Timing accuracy for PTP: 100ns.</p>	<p>A product brochure confirming this requirement or letter from the OEM if the required information is not contained on existing brochures.</p>	5%

<p>Maximum distance between GPS receiver and test equipment for PTP: 2000m.</p> <p>IEEE 1588 / PTP clock to be powered over Ethernet (PoE), i.e. no separate power supply should be necessary.</p>	<p>Note the letter must be on the OEM's letterhead and must be signed by the relevant OEM representative.</p>	
<p>Interface to PC</p> <p>Interface to the IBM compatible PC via Ethernet interface OR USB</p> <p>10/100Mbit/s copper (autosensing, autocross over) via RJ45 connector</p> <p>Note: Centronics parallel port (Lpt) and/or serial RS232 ports are not permissible as modern laptops do not provide such ports.</p> <p>Communications card to support IEEE 1588 / Precision Time Protocol (PTP) to synchronize the test set to a PTP enabled Grandmaster clock in the substation for Distributed tests of Distribution Automation Schemes.</p>	<p>A product brochure confirming this requirement or letter from the OEM if the required information is not contained on existing brochures.</p> <p>Note the letter must be on the OEM's letterhead and must be signed by the relevant OEM representative.</p>	5%
<p>General</p> <p>Windows 10 (32bit and 64bit) software. Long filenames, tool tip help, context sensitive menu function (right mouse click) and an integrated help browser must be provided.</p> <p>No programming to be necessary to test an application - entry of setting parameters to be all that is required to set up and perform a test</p> <p>Future expansions in functionality by means of software updates. Firmware updating to be handled by the software, i.e. exchange of any hardware components is not permissible.</p> <p>Generation of reports on paper or file. All graphics and text to be printable.</p> <p>Test report must be configurable to include custom information (tester, date of test, substation, reminders)</p> <p>It must be possible to test the whole recloser controller with one test routine.</p> <p>Test sequence to be pausable at pre-defined points in the test sequence, by popping up a custom instruction dialogue, instructing the user to switch certain functions ON or OFF, change a setting on the controller, ...</p> <p>On Line Pass/ Fail assessment for ALL tests. This is particular important for automatic testing.</p> <p>Test software to be future proof to allow the complete testing of any new recloser controller, both in form of</p>	<p>A product brochure confirming this requirement or letter from the OEM if the required information is not contained on existing brochures.</p> <p>Note the letter must be on the OEM's letterhead and must be signed by the relevant OEM representative.</p>	5%

<p>new smart adapters as well as in terms of the capability of the hardware of the test equipment.</p> <p>Full breaker simulation of the binary outputs in terms of auxiliary contacts (52a and/or 52b) as well as when to switch off the current must be possible in each test module</p> <p>Full control of the breaker in terms of closing or tripping the breaker from inside the software or from the front panel of the test equipment hardware must be possible.</p>		
<p>Software</p> <p>Windows 10 (32bit and 64bit) software. Long filenames, tool tip help, context sensitive menu function (right mouse click) and an integrated help browser must be provided.</p> <p>No programming to be necessary to test an application - entry of setting parameters to be all that is required to set up and perform a test</p> <p>Future expansions in functionality by means of software updates. Firmware updating to be handled by the software, i.e. exchange of any hardware components is not permissible.</p> <p>Generation of reports on paper or file. All graphics and text to be printable.</p> <p>Test report must be configurable to include custom information (tester, date of test, substation, reminders)</p> <p>It must be possible to test the whole recloser controller with one test routine.</p> <p>Test sequence to be pausable at pre-defined points in the test sequence, by popping up a custom instruction dialogue, instructing the user to switch certain functions ON or OFF, change a setting on the controller, ...</p> <p>On Line Pass/ Fail assessment for ALL tests. This is particular important for automatic testing.</p> <p>Test software to be future proof to allow the complete testing of any new recloser controller, both in form of new smart adapters as well as in terms of the capability of the hardware of the test equipment.</p> <p>Full breaker simulation of the binary outputs in terms of auxiliary contacts (52a and/or 52b) as well as when to switch off the current must be possible in each test module</p> <p>Full control of the breaker in terms of closing or tripping the breaker from inside the software or from the front panel of the test equipment hardware must be possible.</p>	<p>A product brochure confirming this requirement or letter from the OEM if the required information is not contained on existing brochures.</p> <p>Note the letter must be on the OEM's letterhead and must be signed by the relevant OEM representative.</p>	<p>5%</p>

<p>Manual Test Functions</p> <p><u>Analogue Output Check:</u> Enter six phase voltages and three phase currents (in terms of unsymmetrical amplitudes, phase angle and frequency), displaying the voltage, currents and power either numerically or vectorially - and compare these voltages, currents and power to the values displayed on the controller. Quantities to be displayed either in primary or in secondary quantities.</p> <p><u>Pick-up Test:</u> Manually ramp any voltage or current in terms of amplitude or frequency to determine the pick-up level of any such function. Automatic recording of results should be possible when a pick-up contact is available. Else manual stepping up/down must be possible.</p> <p><u>Tripping Sequence:</u> Determine the sequence of tripping and reclosing for all possible fault scenarios, i.e. successful and un-successful reclosing. All deadtimes and trip times are to be measured. Dettimes are to be assessed automatically against nominal deadtimes entered</p> <p><u>Trip Time Characteristic Test:</u> The trip times are to be assessed against the theoretical tripping curve for all typical tripping curves available (Definite Time, Normally inverse, Very inverse, extremely inverse, Long-time inverse, TCC101, etc....) for all kinds of fault (A-N, B-N, C-N, A-B, B-C, C-A, A-B-C)</p> <p><u>Direct Test Mode:</u> Similar to the automatic output check - but with the option to switch instantaneously between pre-fault and fault states. Each of the six voltages and three currents are to be adjustable in amplitude, phase angle and frequency. Any binary input changes are to be recorded and timed in relation to the state switches.</p> <p><u>Restoration Test Mode:</u> This is a test mode to synchronize multiple hardware units via GPS and to ensure a time synchronized injection of all test quantities into multiple recloser controllers forming part of a Distribution Automation Scheme.</p> <p><u>Sequencer Test Mode:</u> The Sequencer tool allows creation and execution of custom test sequences.</p> <p><u>Harmonic:</u> The Harmonics tool tests harmonic blocking or restraint functions by applying harmonics of the 2nd and/or 5th order to currents and voltages.</p>	<p>A product brochure confirming this requirement or letter from the OEM if the required information is not contained on existing brochures.</p> <p>Note the letter must be on the OEM's letterhead and must be signed by the relevant OEM representative.</p>	<p>5%</p>
<p>Test Templates</p> <p>It must be possible to prepare test templates offline (i.e. without the test hardware connected) and ahead of the time.</p>	<p>A product brochure confirming this requirement or letter from the OEM if the required information is not</p>	<p>5%</p>

<p>The person in the field then simply needs to execute each of the pre-prepared tests. Hence it should be possible for a lower-skilled person to conduct and execute the test template - with adequate training as well as guided by user instructions, which are part of the test template.</p> <p>Automatic assessment of the test results must be provided - where possible.</p> <p>Th test template software should have a similar look and feel with the same setting possibilities as the manual test software.</p> <p>Test report with both numeric and graphical test results must be printable from the test results file.</p>	<p>contained on existing brochures.</p> <p>Note the letter must be on the OEM's letterhead and must be signed by the relevant OEM representative.</p>	
<p>Accessories</p> <p>Smart Adapters</p> <p>Connection to all kinds of recloser controllers via Smart Adapters Safe to Touch, Plug & Play technology, i.e. by plugging the relevant test lead in, the test set should configure itself for that specific recloser controller whilst all electrical outputs are insulated from the user's touch. One connector to support ALL types of recloser controllers</p> <p>Smart Adapters: for Nulec PTCC, Schneider ADVC, Tavrda RC05, Cooper Form 4C, Entecc ETR300-R, Noja RC15 Measurement leads: 2m and 7m lead to be provided Other accessories: South African power cord</p> <p>Connection lead from test set to PC Hardcover carrying cases for test hardware with retractable handle and wheels</p> <p>Soft Bag for test set and accessories</p> <p>Instruction Manual</p> <p>Software for report downloading and configuration as well as offline test sequence generation.</p>	<p>A product brochure confirming this requirement or letter from the OEM if the required information is not contained on existing brochures.</p> <p>Note the letter must be on the OEM's letterhead and must be signed by the relevant OEM representative.</p>	5%
<p>Local Support</p> <p>Local on-site presentation and demonstration LOCALLY based engineers required (i.e. from the Southern African region) They are to be present and demonstrate the equipment to our engineers at our companies substation on our own test application to prove its suitability to operate in local environmental conditions as well as to be able to test our test objects adequately.</p> <p>Hotline support hours Local telephonic support to be offered in the hours of 07h00 - 20h00 South African time.</p>	<p>A product brochure confirming this requirement or letter from the OEM if the required information is not contained on existing brochures.</p> <p>Note the letter must be on the OEM's letterhead and must be signed by the relevant OEM representative.</p>	5%

Email support Email support to be offered with a guaranteed turnaround time of 1 business day. Back-up units available in South Africa Calibration facility to be available in South Africa Guaranteed turnaround time for repairs and calibration < 5 working days Product training offered in South Africa In-house / On-site training to be offered on request Warranty on Hardware Minimum FIVE years from date of delivery		
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Level 3 - Sample Criteria and Returnable

The functional threshold is set at 100%. Submissions failing meet the threshold will not proceed further.

No part marks are allowed.

Eskom reserves the right to allow concessions related to deviations at this stage.

Note – due to the high cost of the item, Eskom reserves the right to perform the sample evaluation over MS Teams or in person, in a manner that effectively demonstrates the compliance of the product offered. The supplier will be allowed to be present to perform the required demonstrations.

Criterion	Returnable	Scoring Model
All components and parts stated in the evidence at stage 2 are supplied with the sample.	As required to complete Pole Mounted Recloser Testing 1. All required leads and cables. 2. All required accessories, Leads, Smart adaptors etc 3. Interface to PC 4. All required safety accessories. 5. Transport case.	25%
Demonstration of tester capability wrt Pole Mounted Recloser Testing	Demonstration	50%
Demonstration of software wrt Pole Mounted Recloser Testing	Demonstration	25%