



SOUTHERN POWER DISTRIBUTION COMPANY OF TELANGANA LIMITED
TGSPDCL (erstwhile TSSPDCL)

Specification No.STN-1459/2025

Amendment – III

Sl. No.	As per Specification	Amendments proposed																																																				
1	Cl. No.2, Page No. 33 Standards Impulse withstand : 5kV Peak : IEC 60255-27 (Optional)	Cl. No.2, Page No. 33 Standards To be deleted																																																				
2	Cl. No.3, Page No. 33 System Details The portable relay testing kit shall be suitable for outdoor and indoor installation with 3Phase, 50Hz 33KV & 11KV System in which the neutral is effectively earthed and the same shall be suitable for service under fluctuations in supply voltage up to 12% permissible under Indian Electricity Rules and the frequency variation of -5% and +5%.	Cl. No.3, Page No. 33 System Details The portable relay testing kit shall be suitable for outdoor and indoor installation with 3Phase, 50Hz 33KV & 11KV System in which the neutral is effectively earthed and the same shall be suitable for service under fluctuations in supply voltage up to 10% permissible under Indian Electricity Rules and the frequency variation of -5% and +5%.																																																				
3	Cl. No.4, Page No. 33 Ratings : The Portable relay test kit shall be powered by single phase auxiliary supply of 240 V and control unit range shall be designed to accommodate the tolerance of voltage +20% to -20%.	Cl. No.4, Page No. 33 Ratings : The Portable relay test kit shall be powered by single phase auxiliary supply of 240 V and control unit range shall be designed to accommodate the tolerance of voltage +10% to -10% .																																																				
4	Cl. No.5.2, Page No. 34 Impulse withstand : 5kV Peak : IEC 60255-27 (Optional)	Cl. No.5.2, Page No. 34 To be Deleted																																																				
5	Cl. No.6.6, Page No. 35 The Portable relay test kit shall be supplied along with PC/Laptop/Tablet for operating the relay test kit	Cl. No.6.6, Page No. 35 6.6 (a) The Portable relay test kit shall be supplied along with Laptop for operating the relay test kit, however the usage of relay software shall not be limited to supplied laptop of make Dell/HP/Lenovo with 14" screen, Core i5 Intel latest generation processor, SSD of 512GB (expandable), RAM of 16GB (expandable), Latest Windows licensed Operating System, minimum 2 USB port and 1 Ethernet port and with laptop bag. The Operating Software of relay test kit shall be provided in separate pen drive for each test kit and shall be supplied with full license. Also Hard Copy of Operating manual shall be provided along with each test kit. 6.6 (b) In addition to the laptop the relay test kit shall have inbuilt display/detachable display for operating the relay test kit.																																																				
6	Cl. No.6.8, Page No. 35 Voltage Generators <table><tr><td>Channels</td><td colspan="3">At least 4 No independent Voltage Generators</td></tr><tr><td>Range</td><td colspan="3">(0 - 300) V</td></tr><tr><td>Inaccuracy</td><td colspan="3">0.1 % or better</td></tr><tr><td>Resolution</td><td colspan="3">< 10 mV &< 0.1 Degree</td></tr><tr><td>Frequency</td><td colspan="3">(0 - 1) KHz</td></tr><tr><td rowspan="4">Configuration</td><td>Range</td><td>Output Power</td><td rowspan="4">Burden ≥ 2K ohms</td></tr><tr><td>4 x (0 - 300) V (AC/DC), 4th Channel (0-300V) (AC/DC)</td><td>≥ 4 x (0-75) VA/W</td></tr><tr><td>3 x (0 - 300) V (AC) - 3 Phase Symmetrical</td><td>≥ 3 x (0-100) VA/W</td></tr><tr><td>1 x (0-300) V (AC/DC) - Parallel</td><td>≥ 1 x (0-300) VA/W</td></tr></table>	Channels	At least 4 No independent Voltage Generators			Range	(0 - 300) V			Inaccuracy	0.1 % or better			Resolution	< 10 mV &< 0.1 Degree			Frequency	(0 - 1) KHz			Configuration	Range	Output Power	Burden ≥ 2K ohms	4 x (0 - 300) V (AC/DC), 4th Channel (0-300V) (AC/DC)	≥ 4 x (0-75) VA/W	3 x (0 - 300) V (AC) - 3 Phase Symmetrical	≥ 3 x (0-100) VA/W	1 x (0-300) V (AC/DC) - Parallel	≥ 1 x (0-300) VA/W	Cl. No.6.8, Page No. 35 Voltage Generators <table><tr><td>Channels</td><td colspan="2">At least 4 No independent Voltage Generators</td></tr><tr><td>Range</td><td colspan="2">(0 - 300) V</td></tr><tr><td>Inaccuracy</td><td colspan="2">0.1 % or better</td></tr><tr><td>Resolution</td><td colspan="2">< 10 mV &< 0.1 Degree</td></tr><tr><td>Frequency</td><td colspan="2">(0 - 1) KHz</td></tr><tr><td rowspan="3">Configuration</td><td>Range</td><td>Output Power</td></tr><tr><td>4 x (0 - 300) V (AC/DC)</td><td>≥ 4 x (0-75) VA/W, ≥ 75 VA/W @ 300V per Channel</td></tr><tr><td>3 x (0 - 300) V (AC) - 3 Phase Symmetrical</td><td>≥ 3 x (0-100) VA/W, ≥ 100 VA/W @ 300V per Channel</td></tr></table>	Channels	At least 4 No independent Voltage Generators		Range	(0 - 300) V		Inaccuracy	0.1 % or better		Resolution	< 10 mV &< 0.1 Degree		Frequency	(0 - 1) KHz		Configuration	Range	Output Power	4 x (0 - 300) V (AC/DC)	≥ 4 x (0-75) VA/W, ≥ 75 VA/W @ 300V per Channel	3 x (0 - 300) V (AC) - 3 Phase Symmetrical	≥ 3 x (0-100) VA/W, ≥ 100 VA/W @ 300V per Channel
Channels	At least 4 No independent Voltage Generators																																																					
Range	(0 - 300) V																																																					
Inaccuracy	0.1 % or better																																																					
Resolution	< 10 mV &< 0.1 Degree																																																					
Frequency	(0 - 1) KHz																																																					
Configuration	Range	Output Power	Burden ≥ 2K ohms																																																			
	4 x (0 - 300) V (AC/DC), 4th Channel (0-300V) (AC/DC)	≥ 4 x (0-75) VA/W																																																				
	3 x (0 - 300) V (AC) - 3 Phase Symmetrical	≥ 3 x (0-100) VA/W																																																				
	1 x (0-300) V (AC/DC) - Parallel	≥ 1 x (0-300) VA/W																																																				
Channels	At least 4 No independent Voltage Generators																																																					
Range	(0 - 300) V																																																					
Inaccuracy	0.1 % or better																																																					
Resolution	< 10 mV &< 0.1 Degree																																																					
Frequency	(0 - 1) KHz																																																					
Configuration	Range	Output Power																																																				
	4 x (0 - 300) V (AC/DC)	≥ 4 x (0-75) VA/W, ≥ 75 VA/W @ 300V per Channel																																																				
	3 x (0 - 300) V (AC) - 3 Phase Symmetrical	≥ 3 x (0-100) VA/W, ≥ 100 VA/W @ 300V per Channel																																																				

	<table><tr><td></td><td>1 x (0-600) V (AC/DC) - Series</td><td>≥ 1 x (0-200) VA/W</td><td></td></tr><tr><td>Phase Accuracy</td><td colspan="3">< 0.05 Degree</td></tr><tr><td>THD</td><td colspan="3">< 0.25 %</td></tr><tr><td>Duty Cycle</td><td colspan="3">< 300 V Continuous ≥ 300 V Intermittent</td></tr><tr><td>Protection</td><td colspan="3">Shall be protected against short circuit, overload, over temperature</td></tr></table>		1 x (0-600) V (AC/DC) - Series	≥ 1 x (0-200) VA/W		Phase Accuracy	< 0.05 Degree			THD	< 0.25 %			Duty Cycle	< 300 V Continuous ≥ 300 V Intermittent			Protection	Shall be protected against short circuit, overload, over temperature			<table><tr><td></td><td>1 x (0-300) V (AC/DC)</td><td>≥ 1 x (0-200) VA/W, ≥ 200 VA/W @ 300V</td></tr><tr><td>Phase Accuracy</td><td colspan="2">< 0.05 Degree</td></tr><tr><td>THD</td><td colspan="2">< 0.25 %</td></tr><tr><td>Duty Cycle</td><td colspan="2">≤ 300 V Continuous > 300 V Intermittent</td></tr><tr><td>Protection</td><td colspan="2">Shall be protected against short circuit, overload, over temperature</td></tr></table>		1 x (0-300) V (AC/DC)	≥ 1 x (0-200) VA/W, ≥ 200 VA/W @ 300V	Phase Accuracy	< 0.05 Degree		THD	< 0.25 %		Duty Cycle	≤ 300 V Continuous > 300 V Intermittent		Protection	Shall be protected against short circuit, overload, over temperature																																															
	1 x (0-600) V (AC/DC) - Series	≥ 1 x (0-200) VA/W																																																																																	
Phase Accuracy	< 0.05 Degree																																																																																		
THD	< 0.25 %																																																																																		
Duty Cycle	< 300 V Continuous ≥ 300 V Intermittent																																																																																		
Protection	Shall be protected against short circuit, overload, over temperature																																																																																		
	1 x (0-300) V (AC/DC)	≥ 1 x (0-200) VA/W, ≥ 200 VA/W @ 300V																																																																																	
Phase Accuracy	< 0.05 Degree																																																																																		
THD	< 0.25 %																																																																																		
Duty Cycle	≤ 300 V Continuous > 300 V Intermittent																																																																																		
Protection	Shall be protected against short circuit, overload, over temperature																																																																																		
7	Cl. No.6.9, Page No. 36 Current Generators <table><tr><td>Channels</td><td colspan="3">Atleast 6 No. independent current generators</td></tr><tr><td>Range</td><td colspan="3">≥ (0 - 60) A</td></tr><tr><td>Inaccuracy</td><td colspan="3">0.1 % or better</td></tr><tr><td>Resolution</td><td colspan="3">< 10 mA &< 0.1 Degree</td></tr><tr><td>Frequency</td><td colspan="3">(0 - 1) KHz</td></tr><tr><td rowspan="4">Configuration</td><td>Range</td><td>Output Power</td><td>Burden</td></tr><tr><td>3 x (0-60) A (AC) - 3 Phase Symmetrical & 3 x (0-30) A (AC) - 3 Phase Symmetrical</td><td>≥ 3 x (0-200) VA ≥ 3 x (0-100) VA</td><td rowspan="3">< 0.3 ohms</td></tr><tr><td>1 x (0-180) A (AC/DC) - Parallel</td><td>≥ 1 x (0-900) VA/W</td></tr><tr><td>1 x (0-60) A (AC/DC) - Series</td><td>≥ 1 x (0-600) VA/W</td></tr><tr><td>Phase Accuracy</td><td colspan="3">< 0.05 Degree</td></tr><tr><td>THD</td><td colspan="3">< 0.25 %</td></tr><tr><td>Duty Cycle</td><td colspan="3">< 30 A, Continuous ≥ 30 A, Intermittent</td></tr><tr><td>Protection</td><td colspan="3">Shall be protected against overload, over temperature</td></tr></table>	Channels	Atleast 6 No. independent current generators			Range	≥ (0 - 60) A			Inaccuracy	0.1 % or better			Resolution	< 10 mA &< 0.1 Degree			Frequency	(0 - 1) KHz			Configuration	Range	Output Power	Burden	3 x (0-60) A (AC) - 3 Phase Symmetrical & 3 x (0-30) A (AC) - 3 Phase Symmetrical	≥ 3 x (0-200) VA ≥ 3 x (0-100) VA	< 0.3 ohms	1 x (0-180) A (AC/DC) - Parallel	≥ 1 x (0-900) VA/W	1 x (0-60) A (AC/DC) - Series	≥ 1 x (0-600) VA/W	Phase Accuracy	< 0.05 Degree			THD	< 0.25 %			Duty Cycle	< 30 A, Continuous ≥ 30 A, Intermittent			Protection	Shall be protected against overload, over temperature			Cl. No.6.9, Page No. 36 Current Generators <table><tr><td>Channels</td><td colspan="2">At least 6 No. independent current generators</td></tr><tr><td>Range</td><td colspan="2">≥ 6 x (0-30) A</td></tr><tr><td>Inaccuracy</td><td colspan="2">0.1 % or better</td></tr><tr><td>Resolution</td><td colspan="2">≤ 1mA & ≤ 0.1 Degree</td></tr><tr><td>Frequency</td><td colspan="2">(0 - 1) KHz</td></tr><tr><td rowspan="3">Configuration</td><td>Range</td><td>Output Power</td></tr><tr><td>6 x (0-30)A (AC)- 3 Phase Symmetrical</td><td>≥ 6 x (0-250)VA, ≥ 250 VA @ 25A per Channel</td></tr><tr><td>1 x (0-100)A (AC/DC)</td><td>≥ 1 x (0-900) VA/W, ≥ 900 VA @ 100A</td></tr><tr><td>Phase Accuracy</td><td colspan="2">< 0.05 Degree</td></tr><tr><td>THD</td><td colspan="2">< 0.25 %</td></tr><tr><td>Duty Cycle</td><td colspan="2">≤ 6 x 25 A, Continuous > 6 x 25 A, Intermittent</td></tr><tr><td>Protection</td><td colspan="2">Shall be protected against overload, over temperature</td></tr></table>	Channels	At least 6 No. independent current generators		Range	≥ 6 x (0-30) A		Inaccuracy	0.1 % or better		Resolution	≤ 1mA & ≤ 0.1 Degree		Frequency	(0 - 1) KHz		Configuration	Range	Output Power	6 x (0-30)A (AC)- 3 Phase Symmetrical	≥ 6 x (0-250)VA, ≥ 250 VA @ 25A per Channel	1 x (0-100)A (AC/DC)	≥ 1 x (0-900) VA/W, ≥ 900 VA @ 100A	Phase Accuracy	< 0.05 Degree		THD	< 0.25 %		Duty Cycle	≤ 6 x 25 A, Continuous > 6 x 25 A, Intermittent		Protection	Shall be protected against overload, over temperature	
Channels	Atleast 6 No. independent current generators																																																																																		
Range	≥ (0 - 60) A																																																																																		
Inaccuracy	0.1 % or better																																																																																		
Resolution	< 10 mA &< 0.1 Degree																																																																																		
Frequency	(0 - 1) KHz																																																																																		
Configuration	Range	Output Power	Burden																																																																																
	3 x (0-60) A (AC) - 3 Phase Symmetrical & 3 x (0-30) A (AC) - 3 Phase Symmetrical	≥ 3 x (0-200) VA ≥ 3 x (0-100) VA	< 0.3 ohms																																																																																
	1 x (0-180) A (AC/DC) - Parallel	≥ 1 x (0-900) VA/W																																																																																	
	1 x (0-60) A (AC/DC) - Series	≥ 1 x (0-600) VA/W																																																																																	
Phase Accuracy	< 0.05 Degree																																																																																		
THD	< 0.25 %																																																																																		
Duty Cycle	< 30 A, Continuous ≥ 30 A, Intermittent																																																																																		
Protection	Shall be protected against overload, over temperature																																																																																		
Channels	At least 6 No. independent current generators																																																																																		
Range	≥ 6 x (0-30) A																																																																																		
Inaccuracy	0.1 % or better																																																																																		
Resolution	≤ 1mA & ≤ 0.1 Degree																																																																																		
Frequency	(0 - 1) KHz																																																																																		
Configuration	Range	Output Power																																																																																	
	6 x (0-30)A (AC)- 3 Phase Symmetrical	≥ 6 x (0-250)VA, ≥ 250 VA @ 25A per Channel																																																																																	
	1 x (0-100)A (AC/DC)	≥ 1 x (0-900) VA/W, ≥ 900 VA @ 100A																																																																																	
Phase Accuracy	< 0.05 Degree																																																																																		
THD	< 0.25 %																																																																																		
Duty Cycle	≤ 6 x 25 A, Continuous > 6 x 25 A, Intermittent																																																																																		
Protection	Shall be protected against overload, over temperature																																																																																		
8	Cl. No.6.10, Page No. 36 Auxiliary DC Outputs : Voltage Range : (0 - 250) V DC	Cl. No.6.10, Page No. 36 Auxiliary DC Outputs : Voltage Range : (12 - 250) V DC																																																																																	
9	Cl. No.6.11, Page No. 36 Binary Inputs : <table><tr><td>No of Inputs</td><td>≥ 8</td></tr><tr><td>Time Resolution</td><td>< 100 μsec</td></tr><tr><td>Trigger Criterion</td><td>1. Potential Free 2. V threshold with user selectable voltage (DC & AC)</td></tr><tr><td>Debounce time</td><td>0 - 500 m sec</td></tr></table>	No of Inputs	≥ 8	Time Resolution	< 100 μsec	Trigger Criterion	1. Potential Free 2. V threshold with user selectable voltage (DC & AC)	Debounce time	0 - 500 m sec	Cl. No.6.11, Page No. 36 Binary Inputs : Trigger Criterion: 1.Potential Free 2. V threshold with user selectable voltage (DC)																																																																									
No of Inputs	≥ 8																																																																																		
Time Resolution	< 100 μsec																																																																																		
Trigger Criterion	1. Potential Free 2. V threshold with user selectable voltage (DC & AC)																																																																																		
Debounce time	0 - 500 m sec																																																																																		
10	Cl. No.6.17, Page No. 37 Connectivity The Kit shall support connectivity through Wireless, Bluetooth, USB, Ethernet port. The Ethernet port shall be suitable for control through external computer. GOOSE configuration software should be provided with the test kit for effective checking of protective IED relays based on IEC 61850 protocols. It shall read, write, poll & check data models/values details. It shall be subscribe & publish GOOSE data. It will be the bidder's responsibility to demonstrate all above IEC 61850 complied features	Cl. No.6.17, Page No. 37 The Kit shall support connectivity through USB, Ethernet port, Wireless (Optional). The Ethernet port shall be suitable for control through external computer. The kit should be capable of subscribing to and publishing GOOSE messages by importing the respective SCL file. It should also support testing of protection functions by subscribing to GOOSE signals and measuring the corresponding trip times of IED relays based on IEC 61850.																																																																																	
11	Cl. No.6.18, Page No. 37 Software Specification : a) Software shall be provided with basic licensed software along with licensed software containing advance options utilized to test all relays make in various distribution 33/11KV substations	Cl. No.6.18, Page No. 37 Software Specification : a) a) The Software of Relay test kit shall support manual, semi-automatic and automatic test modes It should include modules for Over Current Protection templates specific to each manufacturer (Specified in 6.18(g) to simplify automatic testing and avoid configuration complexities. The test software must provide comprehensive functionality for testing Over Current																																																																																	

		Protection, Auto reclose Protection, including Ground Fault, Phase Fault, and Positive, Negative, and Zero Sequence fault models. A library containing all standard definite and inverse characteristics (IEC, ANSI, IAC) must be available, along with the flexibility to easily create non-standard characteristics point by point. Additionally, the software must be capable of testing both IDMT characteristics and directional features simultaneously, while displaying the characteristics of both during the test. The Templates for specified make relays mentioned in 6.18(g) shall be provided by the time of dispatch. i. The relay test kit should support test plan automation through predefined templates, enabling the creation and execution of automatic test procedures. The software must allow users to design, modify, and save test plans based on relay type and protection function, ensuring repeatable and efficient testing. It should facilitate automatic parameter import, test sequencing, result evaluation, and report generation, minimize manual intervention and ensure consistency across multiple test cases. ii. Test Plans shall easily be built, maintained and distributed and reduce the test time drastically ii. The test plan automatically executes the test modules – one by one, results being stored in the included dynamic report. v. The modules Pause should capture the image of panel, relays and writing information's, Execute to synch with 3rd party software to see the measurements, and Text View make the test plan interactive and store the manual within the test plans. v. Test Plan should be one-time investment and later stages it should help to test the respective protection IEDS without feeding settings, creating different faults & etc.												
12	Cl. No.6.18, Page No. 37 Software Specification : g) Software shall have scope to import the relay settings template to the interfacing software for testing of the relays. The relay settings template of different manufactures should be provided by the manufacturer of the kit free of cost	Cl. No.6.18, Page No. 37 Software Specification : g) 6.18(g) The relay test kit should include templates for all major manufacturers (specified below) to enable automatic testing. The kit software must be capable of importing relay settings directly from the relay configuration software using the XRIO format. It should perform automatic slope characteristic tests for all fault types. The kit must be capable of injecting up to 6 x 25A during differential slope tests in an automated manner for relays both 1A & 5A secondary current rating. Additionally, the kit should support automatic harmonic testing. The software must also provide the capability to inject single-phase faults (Ph-N), two-phase faults (Ph-Ph), and three-phase faults on slope characteristics and verify the corresponding relay responses. The Templates for specified make relays mentioned in 6.18(g) shall be provided by the time of dispatch. <table><tr><th>S.No</th><th>Make</th><th>Model</th></tr><tr><td>1</td><td>ALSTOM</td><td>P141, P643</td></tr><tr><td>2</td><td>ABB</td><td>REF 615, RET 615, RET 620</td></tr><tr><td>3</td><td>SIEMENS</td><td>7SJ66, 7SR2203,</td></tr></table>	S.No	Make	Model	1	ALSTOM	P141, P643	2	ABB	REF 615, RET 615, RET 620	3	SIEMENS	7SJ66, 7SR2203,
S.No	Make	Model												
1	ALSTOM	P141, P643												
2	ABB	REF 615, RET 615, RET 620												
3	SIEMENS	7SJ66, 7SR2203,												

		<table> <tr> <td></td><td></td><td>7SR2205, 7SR5111, 7SR5421, 7UT6</td></tr> <tr> <td>4</td><td>SCHNEIDER</td><td>Vamp 255, Vamp 265, P3U30, P3T32, P3F30</td></tr> <tr> <td>5</td><td>CGL</td><td>Aegis Feeder, Aegis Transformer</td></tr> <tr> <td>6</td><td>ASHIDA</td><td>ADR 241 B, ADR 245 B</td></tr> </table> The supplier shall support to provide necessary templates for any new relays not limited to the above specified in future.			7SR2205, 7SR5111, 7SR5421, 7UT6	4	SCHNEIDER	Vamp 255, Vamp 265, P3U30, P3T32, P3F30	5	CGL	Aegis Feeder, Aegis Transformer	6	ASHIDA	ADR 241 B, ADR 245 B
		7SR2205, 7SR5111, 7SR5421, 7UT6												
4	SCHNEIDER	Vamp 255, Vamp 265, P3U30, P3T32, P3F30												
5	CGL	Aegis Feeder, Aegis Transformer												
6	ASHIDA	ADR 241 B, ADR 245 B												
13	Cl. No.6.19, Page No. 38 Accessories : c) The Relay test kit shall be supplied along with communicating laptop/tablet for operating the relay test kit, also its operation shall not be limited only to laptop/tablet supplied along with relay test kit	Cl. No.6.19, Page No. 38 Accessories : c) The Relay test kit shall be supplied along with communicating laptop for operating the relay test kit, also its operation shall not be limited only to laptop supplied along with relay test kit. In addition to the laptop the kit shall have inbuilt display/detachable display.												
14	Cl. No.6.20, Page No. 38 Software Specification : The main relay kit shall be portable, rugged and the weight shall be less than 20 kgs. The kit shall be supplied with transport case, compete test lead set and spare test lead set and other mandatory accessories for relay testing. The total weight of relay testing kit along with Hard transport case shall be less than 40 Kgs.	Cl. No.6.20, Page No. 38 Software Specification : The main relay kit shall be portable, rugged and the weight shall be less than 25 kgs. The kit shall be supplied with transport case, compete test lead set and spare test lead set and other mandatory accessories for relay testing. The total weight of relay testing kit along with Hard transport case shall be less than 40 Kgs.												

SD/-

CHIEF ENGINEER/P&MM