

## **ANNEX II: TECHNICAL SPECIFICATIONS & ANNEX III: TECHNICAL OFFER**

### **SECTION 3: TECHNICAL DATA SCHEDULE**

#### **LOT 3: Development of remote supervision and control systems for the medium voltage distribution grid in the area of Elektrosrbija Kraljevo**

##### **RECLOSER (20 kV) WITH A CONTROL & PROTECTION CABINET**

**RECLOSER (20 kV)**

Item	Description	Unit	Required	Guaranteed
<b>1</b>	<b>GENERAL</b>			
1.1	Manufacturer			
1.2	Type			
1.3	Model			
1.4	Country of Origin			
1.5	Standards (optional)		IEC 62271-100 IEEE C37.60-2003	
1.6	QMS		ISO 9001	
1.7	Mount Location		Outdoor	
<b>2</b>	<b>BASIC OPERATING PARAMETERS</b>			
2.1	Current measurements		3 x Rogowski current sensors or CTs	
2.2	Voltage measurements		3 x capacitive voltage divider	
<b>3</b>	<b>RATED VALUES</b>			
3.1	Rated voltage	kV	24	
3.2	Continuous rated current	A	630	
3.3	Rated frequency	Hz	50	
3.4	Circuit breaking power	kA	12.5	
3.5	Short circuit making capacity (effective value)	kA	12.5	
3.6	Short circuit making capacity (maximum value)	kA	40	
3.7	Number of mechanical operations		10000	
3.8	Number of operations at Rated current		10000	
3.9	Number of operations at short circuit		116	
3.10	Contact closing time	ms	< 100	
3.11	Contact opening time	ms	< 50	
3.12	Withstand impulse voltage, phase-to-earth, phase-to-phase and along open contacts	kV	125	

Item	Description	Unit	Required	Guaranteed
3.13	Industrial frequency withstand voltage, phase-to-earth and along open contacts	kV	50	
3.14	Standing regulations			
4	<b>ENVIRONMENT CONDITIONS</b>			
4.1	Temperature range	°C	-25°C to +50°C	
4.2	Humidity	%	0-90%	
4.3	Altitude	m	<2000	
5	<b>DOCUMENTATION</b>			
5.1	The device shall be delivered with complete documentation for mounting and maintenance. The documentation shall be on Serbian		yes	
6	<b>CERTIFICATE OF COMPLIANCE AND TESTING DOCUMENTATION</b>			
6.1	The device shall be delivered with complete certificate of compliance documentation: factory test sheets in accordance with IEC standards		yes	
OVERALL COMPLIANCE WITH THE REQUIREMENTS (YES/NO)				

**RECLOSER CABINET WITH A MICROPROCESSOR PROTECTION CONTROL UNIT (MPCU)**

Item	Description	Unit	Required	Guaranteed
7	<b>GENERAL</b>			
7.1	Manufacturer			
7.2	Type			
7.3	Model			
7.4	Country of Origin			
7.5	Standards		ANSI / IEEE C37.60 ANSI / IEEE C37.61 IEC 60694	
7.6	QMS		ISO 9001	
7.7	Mount Location		Outdoor	

Item	Description	Unit	Required	Guaranteed
<b>8</b>	<b>RATED VALUES</b>			
<b>8.1</b>	Rated frequency	Hz	50	
<b>8.2</b>	Rated auxiliary AC cabinet voltage	V	110/220 +/- 25%	
<b>8.3</b>	Standard operations sequence		O-0.5s-CO-2s-CO-2s-CO	
<b>8.4</b>	Degree of protection		IP 65	
<b>8.5</b>	Power module			
8.5.1	Input alternating current	VAC	110/220 +/- 25%	
8.5.2	Output direct current	VDC	10 – 16	
8.5.3	Power module consumption			
8.5.3.1	at environment temperature above -15 °C	W	6	
8.5.3.2	at environment temperature below -15 °C	W	15	
8.5.3.3	within 60s from switching on or after the standard operations sequence	W	60	
<b>8.6</b>	Rechargeable Battery			
8.6.1	Type		sealed, led	
8.6.2	Capacity	Ah	12	
8.6.3	Rated Voltage	VDC	10 – 16	
<b>8.7</b>	Protection Functions			
8.7.1	Overcurrent I>	In	0.05 – 2	
8.7.2	Time Delay t>	s	0.00 – 10000	
8.7.3	Short Circuit I>>	In	1 – 30	
8.7.4	Time Delay t>>	s	0.00 – 10000	
8.7.5	Sensitive targeted earth ground Io>	In	0.005 – 0.03	
8.7.6	Time delay to>	s	0.00 – 10000	
8.7.7	RU			
8.7.7.1	First cycle	s	0.1 – 180	
8.7.7.2	Second cycle	s	1 – 180	
<b>9</b>	<b>CONNECTION</b>			

Item	Description	Unit	Required	Guaranteed
9.1	Ethernet - RJ45, 10/100 Mbps		yes	
9.2	RS-232 COM 1 - DB9 female		yes	
9.3	USB		yes	
10	<b>PROTOCOLS</b>			
10.1	Supported DNP 3.0 slave protocol		yes	
10.2	Supported IEC 60870-5-103 protocol (optional)			
10.3	Supported IEC 61850 protocol (optional)			
11	<b>POWER</b>			
11.1	Main power 90-240 V 50Hz		yes	
11.2	Overvoltage protection – by surge arresters mounted on a DIN rail		yes	
11.3	Secondary power - 12V DC (modem)		yes	
11.4	Battery protection against deep discharge and discharge under the level guaranteeing reliable equipment operation		yes	
12	<b>BATTERY CAPACITY</b>			
12.1	Minimum 10 device operations after interruption of the main power supply of the open/close switchgear		yes	
12.2	Be 12Ah minimum		yes Ah	
13	<b>DIGITAL RADIO COMMUNICATIONS MODULE</b>			
13.1	Reserved space for montage of Radio module (as per S3_L3_03 TDS_DCRM 1 and S3_L3_04 TDS_DCRM 2))		yes	
14	<b>SOFTWARE PACKAGES SHALL BE DELIVERED</b>			
14.1	For control and parametrization of MPCU on site via PC (license)		yes	
15	<b>DOCUMENTATION IN THE SERBIAN LANGUAGE SHALL BE DELIVERED WITH DEVICES</b>			
15.1	Software and operation manual(s)		yes	

Item	Description	Unit	Required	Guaranteed
15.2	Complete certificate of compliance paperwork and factory test sheets in accordance with IEC standards		yes	
15.3	The device shall be delivered with complete documentation for mounting and maintenance.		yes	
16	<b>ENVIRONMENT CONDITIONS</b>			
16.1	Temperature range	°C	-25°C to +50°C	
16.2	Humidity	%	0-90%	
16.3	Altitude	m	<2000	
17	<b>CERTIFICATE OF COMPLIANCE AND TESTING DOCUMENTATION</b>			
17.1	The device shall be delivered with complete certificate of compliance paperwork: factory test sheets in accordance with IEC standards		yes	
18	<b>INFORMATION TABLE</b>			
	<b>Digital Input Name</b>	Required status, indication		
18.1	Digital radio modem - communication			
18.2	Digital radio modem - device status			
18.3	Switch	Off		
18.4	Switch	On		
18.5	AR cycle	normal	yes	
18.6	AR block	normal	yes	
18.7	Io> pickup	normal	yes	
18.8	I> pickup	normal	yes	
18.9	I SEN pickup (max 2A)	normal	yes	
18.10	Manual switch operation	Off		
18.11	Manual switch operation	On		
18.12	I> trip	normal	yes	
18.13	I>> trip	normal	yes	
18.14	Io> trip	normal	yes	
18.15	I SEN trip	normal	yes	

Item	Description	Unit	Required	Guaranteed
18.16	AR switch on command	normal	on	
18.17	Settings group 1	off	on	
18.18	Settings group 2	off	on	
18.19	Settings group 3	off	on	
18.20	Settings group 4	off	on	
18.21	Protection	off	on	
18.22	I protection	off	on	
18.23	I SEN protection	off	on	
18.24	LL protection	off	on	
18.25	CLP protection	off	on	
18.26	AR	off	on	
18.27	Remote command	off	on	
18.28	RC Status	normal	malfunction	
18.29	OSM coil broken	normal	malfunction	
18.30	Short circuit in the plant circuit	normal	malfunction	
18.31	Battery T sensor	normal	malfunction	
18.32	OSM coil short circuit	normal	malfunction	
18.33	CPU module	normal	malfunction	
18.34	Internal communication	normal	malfunction	
18.35	Measurement module status	normal	malfunction	
18.36	Time synchronization	normal	malfunction	
18.37	UPS status	normal	malfunction	
18.38	ACCU battery charge	normal	disappearance	
18.39	AC charge	normal	disappearance	
18.40	Memory status	normal	malfunction	
19	<b>COMMANDS TABLE</b>			
	<b>Command Name</b>		yes	
19.1	Command off		yes	
19.2	Command on		yes	
19.3	Protection off		yes	
19.4	Protection on			

Item	Description	Unit	Required	Guaranteed
<b>20</b>	<b>MEASUREMENT TABLE</b>			
	<b>Measurements - Required</b>			
<b>20.1</b>	Single phase current I		yes	
<b>20.2</b>	Uab interphase voltage		yes	
<b>20.3</b>	Active power		yes	
<b>20.4</b>	Reactive power		yes	
<b>20.5</b>	Fault current Ia		yes	
<b>20.6</b>	Fault current Ib		yes	
<b>20.7</b>	Fault current Ic		yes	
<b>20.8</b>	Battery capacity		yes	
<b>21</b>	<b>FUNCTIONS</b>			
<b>21.1</b>	The command & communication modules need to have implemented communication link quality (comm test) and data transmission quality testing (Bit Error Rate test) functions;			
<b>21.2</b>	Every remote terminal unit with a radio-communication module shall have the option to measure the RSSI factor in real time (measuring signal reception quality in real time);			
<b>21.3</b>	Presence of Debounce filtering function, i.e. the option to define the digital input filtering time to eliminate possible digital signal peaks;			
<b>21.4</b>	Adjusting a different time allotted to each individual digital input point should be possible;			
<b>21.5</b>	Option of software adjustment of output power within the range of 10 mW to 5,0 W;			
<b>21.6</b>	Option of software setting local and remote dead band values in analogue inputs;			



Item	Description	Unit	Required	Guaranteed
21.7	Option of remote frequency adjustment on the remote unit with a communication radio module from the dispatcher centre within the range of 430 – 470 MHz;			
21.8	Option to support up to 8 digital input points			
OVERALL COMPLIANCE WITH THE REQUIREMENTS (YES/NO)				

**Recloser technical description :**

- outdoor mount;
- three-pole;
- highly reliable operation, i.e. no need for regular maintenance;
- - resistant to external influence;

The offered equipment shall comply with SRPS, i.e. IEC standards relevant to this field

**Recloser cabinet with MPCU technical description:**

- outdoor mount;
- microprocessor protection unit shall have an input line for the zero component of the earth ground current from the comprehensive current transformer with a ratio 50/1.
- provided for remote supervision and control, i.e. to facilitate easy connection to the remote unit with no additional adjustments;
- highly reliable operation, i.e. no need for regular maintenance;

The offered equipment shall comply with SRPS, i.e. IEC standards relevant to this field.