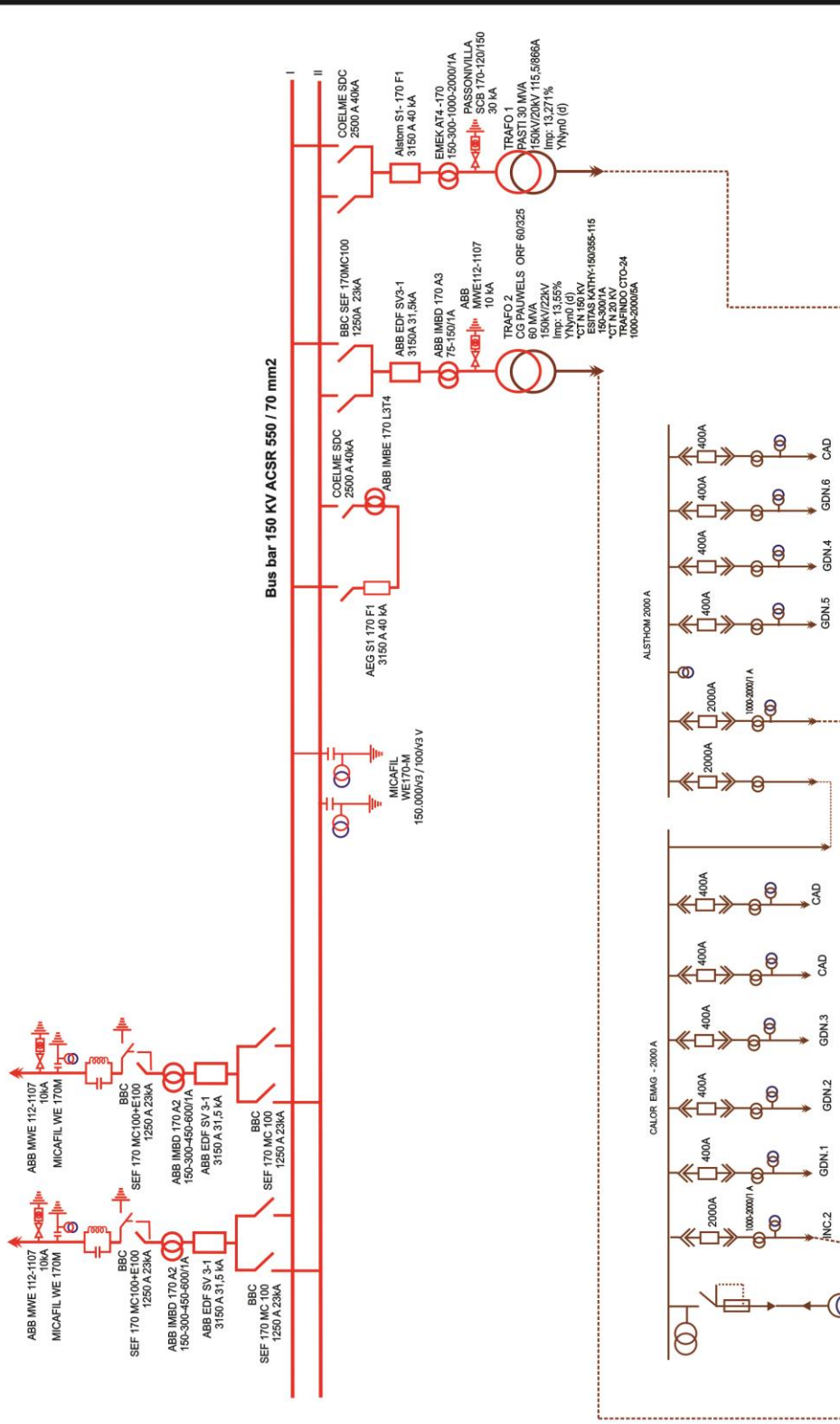


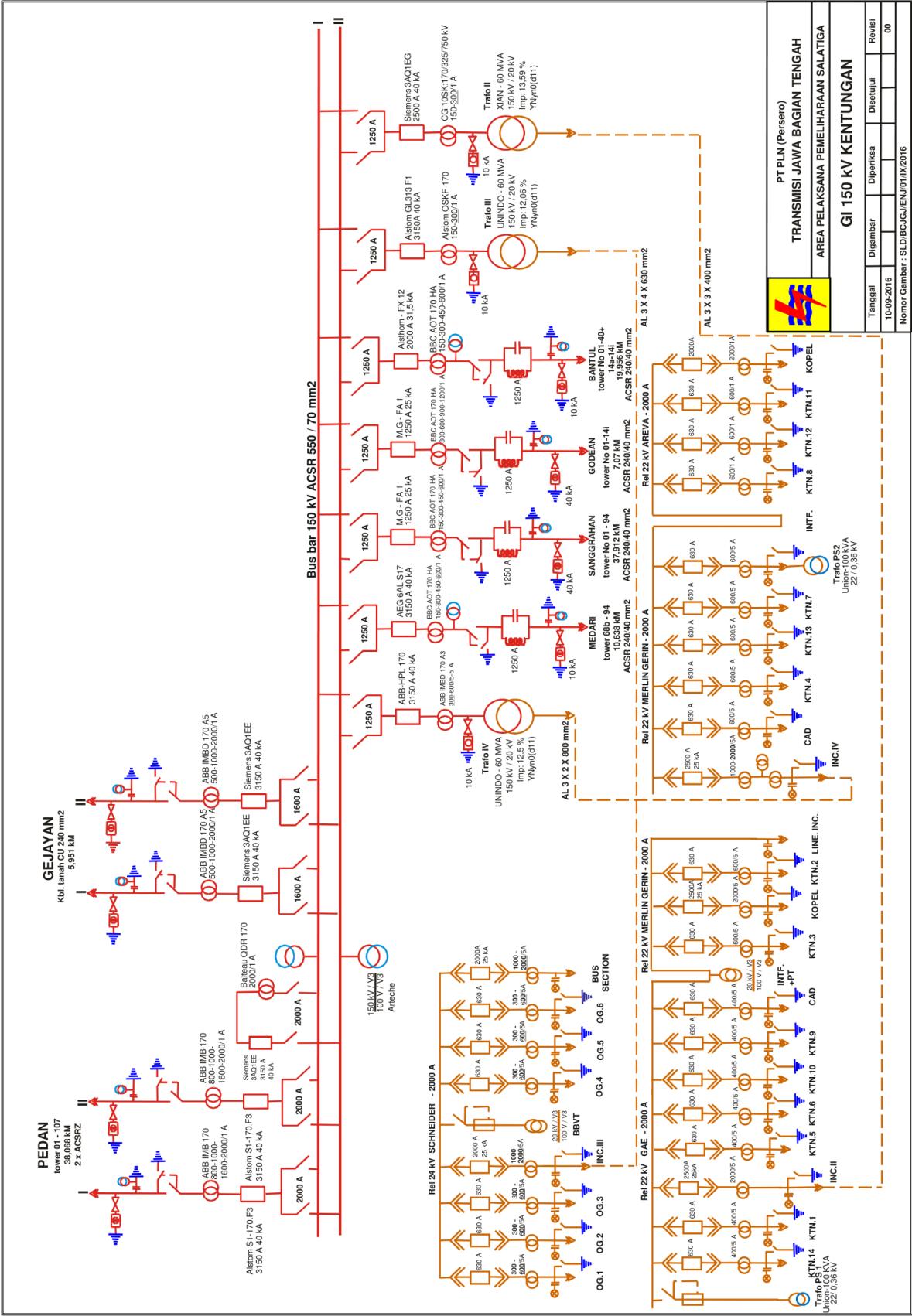
Tanggal	Digambar	Diperiksa	Disetujui	Revisi
04/01/2014	04/01/2014	04/01/2014	04/01/2014	04

**KENTUNGAN**      **BANTUL**



PT PLN (Persero)			
TRANSISI JAWA BAGIAN TENGAH			
AREA PELAKSANA PEMELIHARAAN SALAFIDA			
<b>GI 150 KV GODEAN</b>			
Tanggal	Dibuat	Direvisi	Revisi
02-08-2017	001/14	001/14	03





<b>PT PLN (Persero)</b>			
<b>TRANSMISI JAWA BAGIAN TENGAH</b>			
<b>AREA PELAKSANA PEMELIHARAAN SALATIGA</b>			
<b>GI 150 kV KENTUNGAN</b>			
Tanggal	Digambar	Diperiksa	Disetujui
10-09-2016			
			Revisi
			00

Nomor Gambar : SLD/BCJG/ENJ/01/IX/2016


	PT PLN (PERSERO) TRANSMISI JAWA BAGIAN TENGAH Komplek PLN Cigereleng - Bandung	Doc. No.	
		Valid.	13 MARET 2018
<b>DAFTAR SETELAN PROTEKSI GI 150 KV BANTUL</b>			

### 1. Proteksi: Penghantar 150 kV Purworejo Arah Bantul

Jenis relai	: DISTANCE		
Merek/Tipe relai	: SIFANG/CSC-101		
LOKASI	: BANTUL		
PROTEKSI	: GODEAN		
L1, L2	: 13,211	,	9,1771 Km
L3, L4	: 9,1771	,	10,663 Km
Z1	: 0,1370	,	0,3966 Ω/Km
Z11	: 0,1370	,	0,3966 Ω/Km
Z12	: 0,1370	,	0,3966 Ω/Km
Z0	: 0,287	+j,	1,19 Ω/Km
CT	: 1000	/	1 Ampere
PT	: 150	kV/	100 Volt
In	: 1	A	
Z1PP	: 3,138	Z1PE	: 7,068
Z2PP	: 4,842	Z2PE	: 13,117
Z3PP	: 7,7	Z3PE	: 14,804
Φ	: 70,943°		

No	Menu Text	value	No	Menu Text	Value
	<b>FUNC TEST</b>			<b>FUNC CT FAIL</b>	
1	Imp.oper.Zone	0 CW	1	Func_CT Fail	0 CW
2	Test Pos. Imp	0 CW	2	3I0_CT Fail	1 A
	<b>FUNC COMMON</b>			<b>FUNC BROKEN CONDUKTOR</b>	
1	VT Line	1 CW	1	Func_Broken Conduct	1 CW
2	AR Init By 2p	1 CW	2	Broken Conduct Trip	0 CW
3	AR Init By 3p	0 CW		<b>FUNC FAULT LOCATOR</b>	
4	Relay Trip 3pole	1 CW	1	Kx	0,667
5	CB Close state	1 CW Condition	2	Kr	0,365
6	I_ abrupt	0,15 A	3	Km	0,335
7	T Relay Reset	1 s	4	X_Line	5,239 Ω
8	U_Primary	150 kV	5	R_Line	1,81 Ω

1	Daftar Evaluasi Setelan Rele Proteksi GI 150 KV BANTUL-GODEAN	Dibuat: LKD	Diperiksa: ALI	Disetujui: DMT-MTN
REV. 00		Tgl :	Tgl :	Tgl :

	PT PLN (PERSERO) TRANSMISI JAWA BAGIAN TENGAH Komplek PLN Cigereleng - Bandung	Doc. No.	
		Valid.	13 MARET 2018
<b>DAFTAR SETELAN PROTEKSI GI 150 KV BANTUL</b>			

9	U_Secondary	100 V	6	Line lenght	13,211 km
10	CT_Primary	0,6 kV		<b>FUNC TELE DISTANCE</b>	
11	CT_Secondary	1 A	1	Weak Infeed	0 CW
	<b>FUNC VT FAIL</b>		2	Blocking Mode	0 CW
1	Func_VT Fail	1 CW	3	PUR Mode	1 CW
2	Solid Earth	0 CW	4	POR Mode	0 CW
3	I_VT Fail	0,1 A	5	Func_ Tele EF	0 CW
4	3I02_VT Fail	1 A	6	Tele_EF_Inrush Block	0 CW
5	Upe_VT Fail	8 A	7	Tele_EF_Init AR	0 CW
6	Upp_VT Fail	16 V	8	Parallel Line Mode	0 CW
7	Upe_VT Normal	40 V	9	T_Tele Reversal	100 ms
			10	3I0_Tele EF	0,2 A
			11	T0_Tele EF	0,1 A
	<b>FUNC DISTANCE</b>			<b>FUNC DISTANCE</b>	
1	Func Z1	1 CW	34	X1Ext PE	0,1 Ω
2	Func Z2	1 CW	35	T1 PE	0 s
3	Func Z3	1 CW	36	T2 PE	0,4 s
4	Func Z4	0 CW	37	T3 PE	1,6 s
5	Reverse Z4	0 CW	38	T4 PE	10 s
6	Func Z5	0 CW	39	T5 PE	10 s
7	Reverse Z5	0 CW	40	T1 Ext PE	10 s
8	Func Z1 ext	0 CW	41	R1 PP	1,168 Ω
9	Z1 PS Blocking	1 CW	42	X1 PP	2,913 Ω
10	Z2 PS Blocking	1 CW	43	R2 PP	1,704 Ω
11	Z3 PS Blocking	1 CW	44	X2 PP	4,532 Ω
12	Z4 PS Blocking	1 CW	45	R3 PP	2,113 Ω
13	Z5 PS Blocking	1 CW	46	X3 PP	7,405 Ω
14	Z1 ext PS Bloking	0 CW	47	R4 PP	0,1 Ω
15	Z2 Speedup	0 CW	48	X4 PP	0,1 Ω
16	Z3 Speedup	0 CW	49	R5 PP	0,1 Ω
17	Z23 Speedup Inrush Block	0 CW	50	X5 PP	0,1 Ω

2	Daftar Evaluasi Setelan Rele Proteksi GI 150 KV BANTUL-GODEAN	Dibuat: LKD	Diperiksa: ALI	Disetujui: DMT-MTN
REV.00		Tgl :	Tgl :	Tgl :



PT PLN (PERSERO)  
TRANSMISI JAWA BAGIAN TENGAH  
Komplek PLN Cigereleng - Bandung

Doc. No.

Valid.

13 MARET 2018

### DAFTAR SETELAN PROTEKSI GI 150 KV BANTUL

18	Mho Characteristic	0 CW	51	R1Ext PP	0,1 $\Omega$
19	Use PE LoadCutOut	0 CW	52	X1Ext PP	0,1 $\Omega$
20	Use PP LoadCutOut	0 CW	53	T1 PP	0 s
21	Fast Distance	0 CW	54	T1 PP	0,8 s
22	I PSB	0,9 A	55	T1 PP	1,2 s
23	R1 PE	6,44 $\Omega$	56	T1 PP	10 s
24	X1 PE	2,913 $\Omega$	57	T1 PP	10 s
25	R2 PE	12,31 $\Omega$	58	T1 Ext PP	10 s
26	X2 PE	4,532 $\Omega$	59	I SOFT Dist	1,2 A
27	R3 PE	12,82 $\Omega$	60	3I0 Dist PE	0,1 A
28	X3 PE	7,405 $\Omega$	61	3U0 Dist PE	1 V
29	R4 PE	0,1 $\Omega$	62	AngleLoadCutOut	41,87°
30	X4 PE	0,1 $\Omega$	63	R LoadCutOut PE	48,113 $\Omega$
31	R5 PE	0,1 $\Omega$	64	AngleLoadCutOut PP	41,87°
32	X5 PE	0,1 $\Omega$	65	R LoadCutOut PP	48,113 $\Omega$
33	R1Ext PE	0,1 $\Omega$	66	Xs OHM	0,01 $\Omega$
	<b>FUNC SOFT</b>			<b>FUNC SOFT</b>	
1	Func SOFT	1 CW	4	T OC SOFT	0 CW
2	SOTF Inrush Block	1 CW	5	3I0 SOFT	1,2 CW
3	I SOFT	1,2 CW	6	T EF SOFT	0 CW

3	Daftar Evaluasi Setelan Rele Proteksi GI 150 KV BANTUL-GODEAN	Dibuat: LKD	Diperiksa: ALI	Disetujui: DMT-MTN
REV.00		Tgl :	Tgl :	Tgl :



## EVALUASI SETELAN RELAI PROTEKSI GI 150 kV GODEAN

### 1. Proteksi : Penghantar 150 kV arah KENTUNGAN

Jenis relai	:	Distance relay			
Merek/Tipe relai	:	Alstom / Micom P442			
LOKASI	:	<b>GODEAN</b>			
PROTEKSI	:	Kentungan			
L1, L2	:	9,177	,	10,638	km
L3, L4	:	31,192	,	0,000	km
Z1	:	0,1370	+ j	0,3966	$\Omega$ /km
Z11	:	0,1370	+ j	0,3966	$\Omega$ /km
Z12	:	0,1370	+ j	0,3966	$\Omega$ /km
Z0	:	0,2870	+ j	1,1898	$\Omega$ /km
CT	:	600	/	1	Ampere
PT	:	150	KV /	100	Volt

COL	ROW	MENU TEXT	VALUES	COL	ROW	MENU TEXT	VALUES
0000		SYSTEM DATA		3000		GROUP 1 DISTANCE ELEMENT	
	0009	System Frequency	50 Hz		3001	Line Setting	-
					3002	Line Length	9,177 km
0700		CB CONTROL			3004	Line Impedance	1,54 $\Omega$
	0707	A/R Single Pole	Enabled		3005	Line Angle	70,9 °
	0708	A/R Three Pole	Disabled		3006	Zone Setting	-
					3007	Zone Status	11010
						Z2	Enabled
0900		CONFIGURATION				Z3	Enabled
	090D	Distance Protection	Enabled			Z4	Enabled
	0910	Power Swing	Enabled		3008	kZ1 Res Comp	0.641
	0918	Supervision	Enabled		3009	kZ1 Angle	8,3 °
	0924	Internal A/R	Enabled		300A	Z1	1.232 $\Omega$
	0928	CT & VT Ratios	Visible		300C	R1G	15.84 $\Omega$
	092A	Disturb. Recorder	Visible		300D	R1Ph	11.88 $\Omega$
	092B	Measure't Setup	Visible		300E	tZ1	0 s
	092E	Setting Values	Secondary		300F	kZ2 Res Comp	0.641
					3010	kZ2 Angle	8,3 °
0A00		VT AND CT RATIOS			3011	Z2	2.375 $\Omega$
	0A01	Main VT Primary	150 kV		3012	R2G	22.63 $\Omega$
	0A02	Main VT Secondary	100 V		3013	R2Ph	16.97 $\Omega$
	0A07	Phase CT Primary	600 A		3014	tZ2	0.4 s
	0A08	Phase CT Sec.	1 A		3015	kZ3/4 Res Comp	0.641
	0A10	Main VT Location	Line		3016	kZ3/4 Angle	8,3 °
					3017	Z3	6.088 $\Omega$
0D00		MEASUREMENT SETUP			3018	R3G - R4G	32.33 $\Omega$
	0D02	Local Values	Secondary		3019	R3Ph - R4Ph	24.25 $\Omega$
	0D07	Distance Unit	Kilometers		301A	tZ3	1.6 s
	0D08	Fault Location	Distance		301B	Z4	0.154 $\Omega$
					301C	tZ4	1.6 s

#### ENJINIRING PROTEKSI - RJTD

Hal.	Evaluasi Setelan Relai Proteksi	Dibuat : TRA	Diperiksa : UNT	Disetujui : MNY	18 November 2011
1/2	GI 150 kV GDEAN- KNTUG				



## EVALUASI SETELAN RELAI PROTEKSI GI 150 kV GODEAN

### 1. Proteksi : Penghantar 150 kV arah KENTUNGAN

COL	ROW	MENU TEXT	VALUES	COL	ROW	MENU TEXT	VALUES
	3024	Fault Locator	-	4600		GROUP 1 SUPERVISION	
	3025	kZm Mutual Comp	0,24		4601	VT SUPERVISION	-
	3026	kZm Angle	9.6 °		4602	VTS Time Delay	5 s
					4603	VTS I2> & I0> Inh.	50 mA
3100		GROUP 1 DISTANCE SCHEMES			4604	Detect 3P	Enabled
	3101	Program Mode	Open Sch.		4605	Threshold 3P	30 V
	3102	Standard Mode	PUP Z2		4606	Delta I>	100 mA
	3103	Fault Type	Both Enabled		4607	CT SUPERVISION	-
	3104	Trip Mode	1P, Z1, Z2 & CR		4608	CTS Status	Disabled
	3105	Sig. Send Zone	CsZ1				
	3106	Dist CR	Perm Z2	4900		GROUP 1 AUTORECLOSE	
	310A	TOR – SOTF Mode	0111000		4901	1P Trip Mode	1/3
		TOR All Zones	Enabled		4902	3P Trip Mode	3/3
		TOR Distance Sch.	Enabled		4904	1P Dead Time 1	1 s
		SOTF All Zones	Enabled		4905	3P Dead Time 1	3 s
	310C	Weak Infeed	-		4909	Reclaim Time	40 s
	310D	WI : Mode Status	Disabled		490A	Reclose Pulse Time	0.2 s
	3111	Loss Of Load	-		490D	AUTORECLOSE LOCKOUT	
	3112	LoL : Mode Status	Disabled		490E	Block A/R	011
						At tZ2	Enabled
3200		GROUP 1 POWER SWING				At tZ3	Enabled
	3201	Delta R	7.275 Ω				
	3202	Delta X	7.275 Ω				
	320A	Blocking Zones	00000111				
		Z1 Blocking	Enabled				
		Z2 Blocking	Enabled				
		Z3 Blocking	Enabled				

#### ENJINIRING PROTEKSI - RJTD

Hal.	Evaluasi Setelan Relai Proteksi	Dibuat : TRA	Diperiksa : UNT	Disetujui : MNY	18 November 2011
2/2	GI 150 kV GDEAN- KNTUG				



### DATA PENGHANTAR

NO	APP	DARI	KE	DATA PENGHANTAR					
				SKT	TEG	JARAK (Km )	JENIS KAWAT	PENAM.mm2	INOM
					(kV)				(Amp)
1	2	3	4	5	6	7	8	9	10
	<b>SALATIGA</b>								
23		BANTUL	KLATEN	1	150	34.77	ACSR	240/40	600
24		BANTUL	KLATEN	2	150	34.77	ACSR	240/40	600
25		BANTUL	WATES	1	150	31.72	ACSR	240/40	600
26		BANTUL	PURWOREJO	2	150	54.64	ACSR	240/40	600
27		BANTUL	WIROBRAJAN	1	150	6.40	CU	240	550
28		BANTUL	WIROBRAJAN	2	150	6.40	CU	240	550
29		SEMANU	BANTUL	1	150	39.04	HAWK	281.1	580
30		SEMANU	BANTUL	2	150	39.04	HAWK	281.1	580
31		GODEAN	BANTUL	1	150	13.21	ACSR	240/40	600
32		KENTUNGAN	BANTUL	1	150	22.39	ACSR	240/40	600

LAPISAN KAWAT	JUMLAH PILIN	FAKTOR GMR
	1 (Solid)	0,7788
1	7	0,7256
2	19	0,7577
3	37	0,7678
4	61	0,772
5	91	0,774
6	127	0,776
7	169	0,776



## LAPORAN GANGGUAN PENYALURAN 500/150/30/20 KV

### GARDU INDUK 150 kV BANTUL

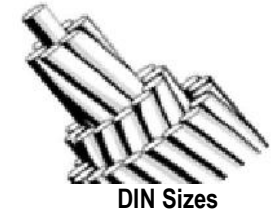
**BULAN : DESEMBER 2016**

**A. LAPORAN GANGGUAN SUET/SUTT/SKTT 500/150/30 KV**

NO	PADAM			GANGGUAN		NORMAL		RELE KERJA / ANNOUNCIATOR	BEBAN PADAM			PENYEBAB	CUACA	KETERANGAN
	ALAT	TEG	BAY	TGL	JAM	TGL	JAM		AMP	MW	MVAR			
1	PMT	150	KLATEN 1											
2	PMT	150	KLATEN 2											
2	PMT	150	KLATEN 2											
3	PMT	150	KENTUNGAN	28/12/16	8:52	28/12/16	8:52	distance rele trip , zone 1 , phasa t/ A.R in progres, A.R succes,	0	0	0	Belum Diketahui	cerah	Nihil
4	PMT	150	GODEAN									Nihil		Nihil
5	PMT	150	WATES									Nihil		Nihil
6	PMT	150	PURWOREJO									Nihil		Nihil
7	PMT	150	WIROBRAJAN 1									Nihil		Nihil
8	PMT	150	WIROBRAJAN 2									Nihil		Nihil
9	PMT	150	SEMANU 1									Nihil		Nihil
10	PMT	150	SEMANU 2											
11	PMT	150	Kopel									Nihil		Nihil



## CONDUCTOR DATA SHEET ALUMINUM CONDUCTORS STEEL REINFORCED ( ACSR )

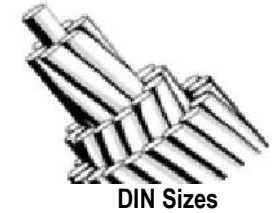


Area					Equivalent copper area mm <sup>2</sup>	Stranding and wire diameter		Overall Diameter mm	Weight			Calculated breaking load kN	Maximum DC resistance at 20 °C Ω / km
Nominal		Aluminium mm <sup>2</sup>	Steel mm <sup>2</sup>	Total mm <sup>2</sup>		Aluminium mm	Steel mm		Aluminium kg/km	Steel kg/km	Total kg/km		
Aluminium mm <sup>2</sup>	Steel mm <sup>2</sup>												
16	2.5	15.3	2.6	17.9	9.3	6/1.80	1/1.80	5.4	41.8	19.9	61.7	5.81	1.8793
25	4.0	23.8	4.0	27.8	14.5	6/2.25	1/2.25	6.8	65.4	31.0	96.4	9.02	1.2028
35	6.0	34.3	5.7	40.0	20.9	6/2.70	1/2.70	8.1	94.2	44.7	138.9	12.70	0.8353
44	32.0	44.0	31.7	75.7	26.8	14/2.00	7/2.40	11.2	121.4	248.2	369.6	45.46	0.6573
50	8.0	48.3	8.0	56.3	29.5	6/3.20	1/3.20	9.6	132.2	62.7	194.9	17.18	0.5946
50	30	51.2	29.8	81.0	31.2	12/2.33	7/2.33	11.7	141.1	233.9	375.0	44.28	0.5644
70	12	69.9	11.4	81.3	42.6	26/1.85	7/1.44	11.7	192.8	89.4	282.2	26.31	0.4130
95	15	94.4	15.3	109.7	57.6	26/2.15	7/1.67	13.6	260.3	120.1	380.4	35.17	0.3058
95	55	96.5	56.3	152.8	58.9	12/3.20	7/3.20	16.0	266.2	441.1	707.3	80.20	0.2992
105	75	105.7	75.5	181.5	64.5	14/3.10	19/2.25	17.5	291.8	594.0	885.8	106.69	0.2376
120	20	121.6	19.8	141.4	74.2	26/2.44	7/1.90	15.5	335.5	155.5	491.0	44.94	0.2374
120	70	122.0	71.3	193.3	74.4	12/3.60	7/3.60	18.0	337.0	558.0	895.0	98.16	0.2364
125	30	127.9	29.8	157.7	78.0	30/2.33	7/2.33	16.1	353.0	233.9	586.9	57.86	0.2259
150	25	148.9	24.2	173.1	90.8	26/2.70	7/2.10	17.1	410.6	190.0	600.6	54.37	0.1939
170	40	171.8	40.1	211.9	104.8	30/2.70	7/2.7	18.9	474.2	314.0	788.2	77.01	0.1682
185	30	183.8	29.8	213.6	112.1	26/3.00	7/2.33	19	507.0	233.9	740.9	66.28	0.1571

Note: All the data set out in this catalogue is for information purpose only and Midal Cables shall not be held responsible for its accuracy



## CONDUCTOR DATA SHEET ALUMINUM CONDUCTORS STEEL REINFORCED ( ACSR )



DIN Sizes

Area					Equivalent copper area mm <sup>2</sup>	Stranding and wire diameter		Overall Diameter mm	Weight			Calculated breaking load kN	Maximum DC resistance at 20 °C Ω / km
Nominal		Aluminium mm <sup>2</sup>	Steel mm <sup>2</sup>	Total mm <sup>2</sup>		Aluminium mm	Steel mm		Aluminium kg/km	Steel kg/km	Total kg/km		
Aluminium mm <sup>2</sup>	Steel mm <sup>2</sup>												
210	35	209.1	34.1	243.2	128	26/3.20	7/2.49	20.3	576.6	267.1	843.7	74.94	0.1380
210	50	212.1	49.5	261.6	129	30/3.00	7/3.00	21.0	585.5	387.7	973.2	92.23	0.1363
230	30	230.9	29.8	260.7	141	24/3.50	7/2.33	21.0	636.5	233.9	870.4	73.09	0.1249
240	40	243.0	39.5	282.5	148	26/3.45	7/2.68	21.8	670.4	309.4	979.8	86.46	0.1188
<hr/>													
265	35	263.7	34.1	297.8	161	24/3.74	7/2.49	22.4	726.9	267.1	994.0	82.94	0.1094
300	50	304.3	49.5	353.7	186	26/3.86	7/3.00	24.5	839.0	387.7	1226.7	105.09	0.0949
305	40	304.6	39.5	344.1	186	54/2.68	7/2.68	24.1	841.2	309.4	1150.6	99.30	0.0949
340	30	339.3	29.8	369.1	207	48/3.00	7/2.33	25.0	936.8	233.9	1170.7	92.56	0.0851
380	50	382.0	49.5	431.5	233	54/3.00	7/3.00	27.0	1054.3	387.7	1442.0	120.91	0.0757
385	35	386.0	34.1	420.1	235	48/3.20	7/2.49	26.7	1065.4	267.1	1332.5	194.31	0.0748
435	55	434.3	56.3	490.6	265	54/3.20	7/3.20	28.8	1199.0	441.1	1631.1	136.27	0.0666
450	40	448.7	39.5	488.2	274	48/3.45	7/2.68	28.7	1238.6	309.4	1548.0	120.19	0.0644
490	65	490.3	63.6	553.9	299	54/3.40	7/3.40	30.6	1353.7	498.0	1851.7	152.85	0.0590
550	70	550.0	71.3	621.3	336	54/3.60	7/3.60	32.4	1518.3	558.3	2076.6	167.42	0.0526
560	50	561.7	49.5	611.2	343	48/3.86	7/3.00	32.2	1550.2	387.7	1937.9	146.28	0.0514
680	85	678.6	86.0	764.6	414	54/4.00	19/2.40	36.0	1874.5	675.8	2550.3	209.99	0.0426

Note: All the data set out in this catalogue is for information purpose only and Midal Cables shall not be held responsible for its accuracy