



Microelettrica Scientifica

MG30

Doc. N° MO-0084-ING

Rev. 1

Date 28.04.2003

Variable	Description	Setting Range	Default Setting	Actual Setting	Test Result	
					Pick-up	Reset
1Uo <i>110</i>	Pick-up level of the 1 st 64S element	5 - 99 - Dis %On	10	<i>0.18</i>		
t1O	Trip time delay of the element 1Uo	ist -0.05-9.99 s	2	<i>2</i>		
2Uo <i>210</i>	Pick-up level of the 2 nd 64S element	5 - 99 - Dis %On	20	<i>0.18</i>		
t2O	Trip time delay of the element 2Uo	ist -0.05-9.99 s	3	<i>3</i>		
Uo3	Pick-up level of the 100% 64S element	1 - 30 - Dis %On	10	<i>0.18</i>		
tO3	Trip time delay of the Uo3 element 2Uo	ist -0.05-9.99 s	9.99	<i>9.99</i>		
60FL	PTs' Fuse Failure element	ON - OFF -	ON	<i>OH</i>		
IC	Inadvertent generator energization element	ON - OFF -	ON	<i>OFF</i>		
tBF	Max. reset time delay of the instantaneous elements	0.05 - 0.5 s	0.05	<i>0.05</i>	<i>0.05</i>	

CONFIGURATION OF OUTPUT RELAYS

Default Setting				Description	Actual Setting			
Protect. Element	Output Relays				Protect. Element	Output Relays		
I>	-	-	-	Instantaneous element of low-set overcurrent operates relays	I>	-	-	-
tI>	1	-	-	As above, time delayed element	tI>	-	-	<i>3</i>
I>>	-	-	-	Instantaneous element of high-set overcurrent operates relay	I>>	-	-	-
tI>>	1	-	-	As above, time delayed element	tI>>	-	-	<i>3</i>
1Is	-	2	-	First unbalance element (time delayed) operates relay	1Is	-	-	<i>4</i>
2Is	-	-	4	As above, second unbalance element	2Is	-	-	-
tIr>	-	2	3	Reverse power time delayed element operates relay	tIr>	-	-	<i>3</i>
FL	-	2	-	Underimpedance time delayed element operates relay	FL	-	-	<i>4</i>
tW<	-	-	4	Underpower time delayed element operates relay	tW<	-	-	-
1U	-	-	4	Time delayed element 1U operates relay	1U	-	-	-
2U	-	2	3	Time delayed element 2U operates relay	2U	-	-	-
1f	-	-	4	Time delayed element 1f operates relay	1f	-	-	-
2f	-	-	4	Time delayed element 2f operates relay	2f	-	-	-
T>	-	2	-	Overtemperature element operates relay	T>	-	-	-
Ta/n	-	-	4	Thermal prealarm operates relay	Ta/n	-	-	-
1Z	-	-	-	Instantaneous element 1Z operates relay	1Z	-	-	-
t1Z	1	-	-	Delayed element t1Z operates relay	t1Z	-	-	<i>4</i>
2Z	-	-	-	Instantaneous element 2Z operates relay	2Z	-	-	-
t2Z	1	-	-	Delayed element t2Z operates relay	t2Z	-	-	-
1φ	-	-	-	Instantaneous element 1φ operates relay	1φ	-	-	-
t1φ	1	-	-	Delayed element t1φ operates relay	t1φ	-	-	-
2φ	-	-	-	Instantaneous element 2φ operates relay	2φ	-	-	-
t2φ	1	-	-	Delayed element t2φ operates relay	t2φ	-	-	-
1Uo	-	-	-	Instantaneous element 1Uo operates relay	1Uo	-	-	-
t1O	1	-	-	Delayed element t1O operates relay	t1O	-	-	-
2Uo	-	-	-	Instantaneous element 2Uo operates relay	2Uo	-	-	-
t2O	1	-	-	Delayed element t2O operates relay	t2O	-	-	-
Uo3	-	-	-	Instantaneous element Uo3 operates relay	Uo3	-	-	-
tO3	1	-	-	Delayed element tO3 operates relay	tO3	-	-	-
IC	1	-	-	Function IC operates relay	IC	-	-	-
60FL	-	-	4	Function 60FL operates relay	60FL	-	-	<i>4</i>
tBF	-	-	-	Breaker Failure function operates relay	tBF	-	-	-
tFRes:	A			Relay reset mode A= Automatic , M = Manual	tFRes:			
2A=	I>>			The input (2) for blocking the time delayed elements relevant to phase and ground faults operate on (I>) or (I>>) or (I>+I>>)	2A=			
t2=	OFF			The operation of the blocking input (2)	t2=			
3A=	Ir			The blocking input (3) operate on function (FL) or (Ir>) or (FL+Ir>)	3A=			
4A=	-			The blocking input (4) blocks the operation of the delayed elements of functions (1f) or (2f) or (1f+2f).	4A=			
2B=	-			The blocking input (2) blocks the operation of the delayed elements of functions (1Z) or (2Z) or (1Z+2Z)	2B=			
3B=	-			The blocking input (3) blocks the operation of the delayed elements of functions (1Uo) or (2Uo) or (Uo3) in any possible combination	3B=			
4B=	-			The blocking input (2) blocks the operation of the delayed elements of functions (1u) or (2u) or (1u+2u)	4B=			

Commissioning Engineer : _____

Date : _____

Customer Witness : _____

Date : _____

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27. PROGRAMMING'S FORM

Relay Type	MG30	Station :	Circuit :
Date :	/ /	Relay Serial Number :	
Power Supply	<input type="checkbox"/> 24V(-20%) / 110V(+15%) a.c. 24V(-20%) / 125V(+20%) d.c. <input type="checkbox"/> 80V(-20%) / 220V(+15%) a.c. 90V(-20%) / 250V(+20%) d.c.	Rated Current In :	<input type="checkbox"/> 1A <input type="checkbox"/> 5A Rated Voltage :

RELAY PROGRAMMING

Variable	Description	Setting Range	Default Setting	Actual Setting	Test Result	
					Pick-up	Reset
xxxxxxx	Current date	DDMMYY -	random			
xx:xx:xx	Current time	HH:MM:SS -	random			
Tsyn	Synchronisation Time	5 - 60 - Dis m	Dis	0.13		
NodAd	Identification number for serial communication	1 - 250 -	1	1		
Fn	System frequency	50 - 60 Hz	50	50		
In	Rated primary current of the phase C.Ts.	1 - 9999 Ap	500	200		
Kv	Ratio of system PTs	2.0 - 655 -	3.8	1.0		
UnS	P.Ts. rated secondary phase-to-phase voltage	50 - 125 V	100	100		
En	Rated secondary voltage of neutral-to-ground PT	50 - 125 V	100	100		
Ib	Generator's rated current as p.u. of C.Ts rated current	0.5 - 1.1 In	0.5	0.8	0.8	
F(I>)	Operation characteristic of the low-set overcurrent element	D - SI -	D	D		
U/I>	Voltage control on level I>	ON - OFF -	ON	ON		
I>	Trip level of low-set overcurrent element (p.u. of Ib)	1 - 2.5 - Dis lb	1.0	1.0	1.06	
tI>	Trip time delay of the low-set overcurrent element	0.05 - 30 s	0.05	0.05		
U/I>>	Voltage control on level I>>	ON - OFF -	ON	ON		
I>>	Trip level of high-set overcurrent element (p.u. of Ib)	1 - 9.9 - Dis lb	3	3		
tI>>	Trip time delay of the high-set overcurrent element	0.05 - 3 s	0.05	0.05		
1Is	Generator's max. continuous negative sequence current rating (p.u. of Ib)	0.05 - 0.5 - Dis lb	0.05	0.1		
Ks	Time multiplier of the I ₂ ² t time-current curve	5 - 80 s	5	5		
tcs	Cooling time from trip level to the state corresp. to I ₂ =1Is	10 - 1800 s	10	10		
2Is	Negative sequence current alarm level	0.03 - 0.5 - Dis lb	0.03	0.03		
t2Is	Independent trip time delay of alarm element	1 - 100 s	1	1		
Ir>	Trip level of the reverse power element	0.02 - 0.2 - Dis lb	0.02	0.02		
tIr>	Independent trip time delay of reverse power element	0.1 - 60 s	0.1	0.1		
K1	Diameter of the circle including the underimpedance tripping zone	50 - 300 - Dis %Zb	300	300		
K2	Offset of the circle	5 - 50 %Zb	50	50		
tz	Trip time delay of the underimpedance element	0.2 - 60 s	0.2	0.2		
ti	Integration time of underimpedance element.	0 - 10 s	0	0		
Un	Operation mode of first voltage element	- + +/- Dis 1u	+/-	-		
1u	Pick-up level of the first voltage element	1 - 50 %En	15	15		
t1u	Trip time delay of the first voltage element	0.10 - 60 s	1.00	1.0		
Un	Operation mode of second voltage element	- + +/- Dis 2u	+	+		
2u	Pick-up level of the second voltage element	1 - 50 %En	10	15		
t2u	Trip time delay of the second voltage element	0.10 - 60 s	3	5		
Fn	Operation mode of first frequency element	- + +/- Dis 1f	+/-	+		
1f	Pick-up level of the first frequency element	0.05 - 9.99 Hz	0.5	0.5		
t1f	Trip time delay of the first frequency element	0.1 - 60 s	3	10		
Fn	Operation mode of second frequency element	- + +/- Dis 2f	+	+		
2f	Pick-up level of the second frequency element	0.05 - 9.99 Hz	1	0.5		
t2f	Trip time delay of the second frequency element	0.1 - 60 s	0.5	0.5		
Tc	Thermal time constant of the alternator	1 - 400 m	60	60		
Ta/n	Prealarm level of the thermal image	50 - 110 %	100	100		
W<	Pick-up level of the active underpower element	0.05 - 1 - Dis Wb	0.05	0.05		
tW<	Trip time delay	0.1 - 60 s	0.1	0.1		
1Z	Pick-up level of the 1 st underimpedance element	0.1 - 1 - Dis Zn	0.5	0.1		
t1Z	Trip time delay of 1Z element	ist - 0.05 - 9.99 s	1	1		
2Z	Pick-up level of the 2 nd underimpedance element	0.1 - 1 - Dis Zn	1	0.1		
t2Z	Trip time delay of 2Z element	ist - 0.05 - 9.99 s	2	2		
1Φ>	Pick-up level of the V/Hz inverse time element	1 - 2 - Dis pU	1.2	0.1		
K	Time multiplier of the V/Hz T.C.C.	0.5 - 5 -	0.5	0.5		
2Φ>	Pick-up level of the V/Hz definite time element	1 - 2 - Dis pU	1.2	0.1		
t2Φ	Trip time delay of the 2Φ element	0.1 - 60 s	5.0	5.0		

24. Setting's Form

Relay Type	IM30-B00	Station :	Circuit :
Date :	/ /	FW Version:	Relay Serial Number :
Power Supply	<input type="checkbox"/> 24V(-20%) / 110V(+15%) a.c. 24V(-20%) / 125V(+20%) d.c. <input type="checkbox"/> 80V(-20%) / 220V(+15%) a.c. 90V(-20%) / 250V(+20%) d.c.	Rated Current :	<input type="checkbox"/> 1A <input type="checkbox"/> 5A

RELAY PROGRAMMING

Variable	Description	Setting Range	Default Setting	Actual Setting	Test Result	
					Pick-up	Reset
xxxxxxx	Current date	DDMMYY -	Random			
xx:xx:xx	Current time	HH:MM:SS -	Random			
Fn	Mains frequency	50 - 60 Hz	50	50		
HI	Rated primary current of the C.T. supplying terminals 29-28(30)	1 - 9999 Ap	500	200		
LI	Rated primary current of the C.T. supplying terminals 32-31(33)	1 - 9999 Ap	500	200		
F(1)	Operation characteristic of the first earth fault element	D A B C MI SI VI EI -	D	D		
1I	Trip level of first earth fault element	0.01 - 2 - Dis LI	1.0	0.4		
t1I	Trip time delay of first earth fault element.	0.05 - 30 s	0.05	0.1		
2I	Trip level of second earth fault element	0.01 - 2 - Dis LI	1.0	0.18		
t2I	Trip time delay of the second earth fault element	0.05 - 3 s	0.05	0.05		
3I	Trip level of third earth fault element	0.5 - 10 - Dis HI	0.1	0.18		
t3I	Trip time delay of the third earth fault element	0.02 - 3 s	0.02	0.02		
tBF	Time delay for Breaker Failure alarm	0.05 - 0.75 s	0.05	0.05		
Tsyn	Synchronisation Time Expected time interval between sync. pulses.	5 - 60 - Dis m	Dis	0.18		
NodAd	Identification number for connection on serial communication bus	1 - 250 -	1	1		

CONFIGURATION OF OUTPUT RELAYS

Default Setting		Description	Actual Setting	
Protect. Element	Output Relays		Protect. Element	Output Relays
1I	1 - - -	Instantaneous element of first earth fault element	1I	- - -
t1I	- - - -	As above, time delayed element.	t1I	1 - - -
2I	1 - - -	Instantaneous element of second earth fault element	2I	- - -
t2I	- - - -	As above, time delayed element.	t2I	- - -
3I	- - - -	Instantaneous of the third earth fault element	3I	- - -
t3I	- 2 - -	As above, time delayed element.	t3I	- - -
tBF	- - - 4	Breaker failure alarm	tBF	- - -
tFRes:	A	The reset after tripping of the relays associated to the time delayed elements can take place: (A) automatically (M) manually	tFRes:	A
B2	1I, 2I	The input (B2) for blocking the operation of the time delayed elements relevant to input terminals LI	B2	2I
B3	3I	The input (B3) for blocking the operation of the time delayed elements relevant to input terminals HI	B3	3I
tB2	2tBF	The blocking of the elements 1I, 2I	tB2	2tBF
tB3	2tBF	As above, for the earth fault elements	tB3	2tBF

Commissioning Engineer : _____

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