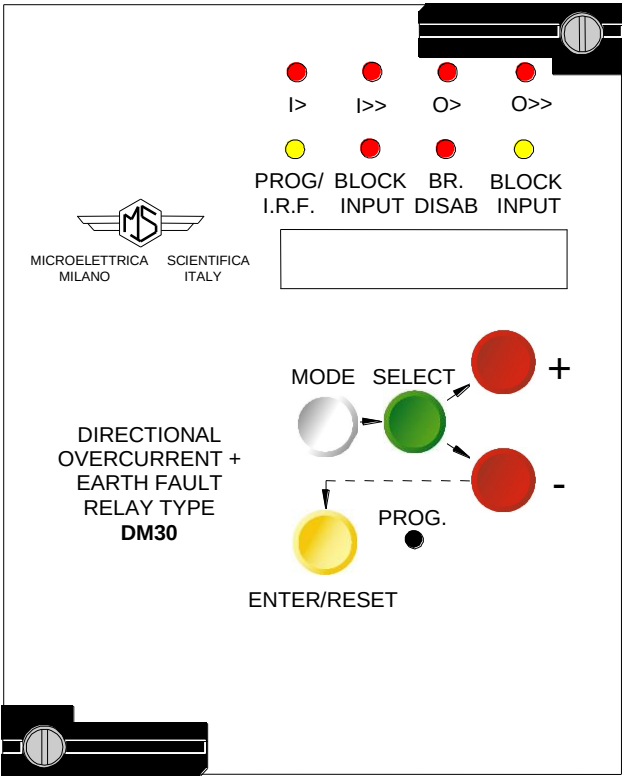


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MULTIFUNCTION MICROPROCESSOR
PROTECTION RELAY
DIRECTIONAL 3 PHASE OVERCURRENT
+ DIRECTIONAL EARTH FAULT
TYPE
DM30-EK

ADDENDUM
OPERATION MANUAL



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0	EMISSION	23/06/99	P. Brasca	D. Abad	
REV.	DESCRIPTION	DATE	PREP.	CONTR.	APPR.

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The Version K has been modified as hereunder listed

10. READING OF MEASUREMENTS AND RECORDED PARAMETERS

10.2 MAX VAL

Display	Description
loxxx%On	As above, zero sequence current
Soxxx%On	As above, zero sequence current.

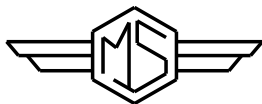
10.3 EVENT RECORDING (LASTTRIP)

Display	Description
loxxx%On	Earth fault current.

12. PROGRAMMING

12.1 PROGRAMMING OF FUNCTIONS SETTINGS

Display	Description	Setting Range	Step	Unit
O> 1%On	Trip level of low-set earth fault element (F67) in p.u. of the rated current of the earth fault detection C.T.	0.1-10-Dis	0.1	%On
O>>1%On	Trip level of high-set earth fault element in p.u. of the rated current of the C.Ts. for unbalance detection:	0.1 - 10 - Dis	0.1	%On



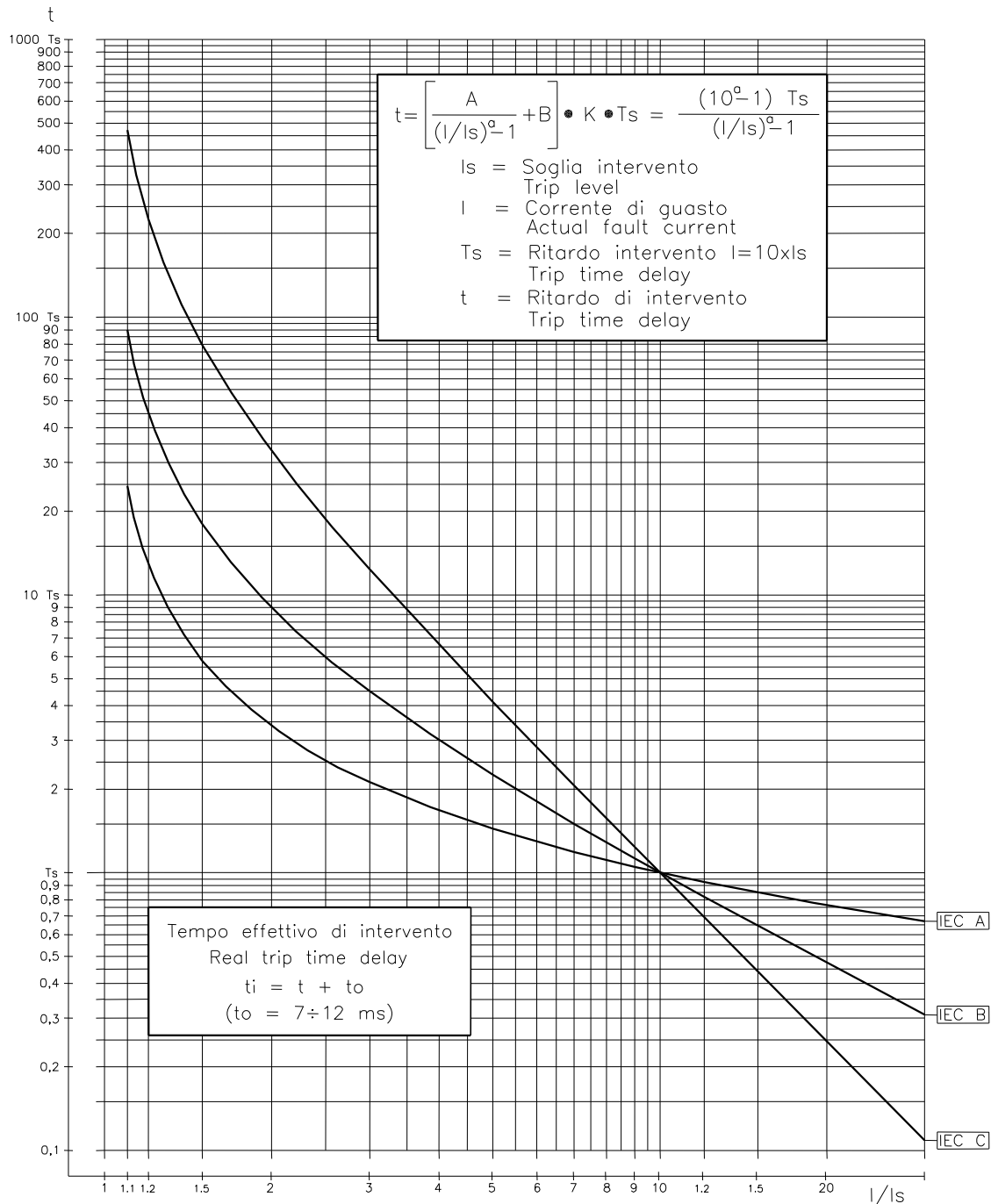
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20. TIME CURRENT CURVES (TU0353 Rev.0) 1/2

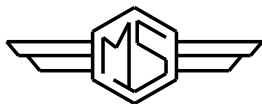


Curve Type	A	B	K	a
IEC A	0.14	0	0.336632	0.02
IEC B	13.5	0	0.666667	1
IEC C	80	0	1.2375	2

$$F51 \begin{cases} I_s = I > = (0.5-4)I_n \\ T_s = tI > = (0.05-30)s \end{cases}$$

$$F51N \begin{cases} I_s = 0 > = (0.02-0.4)0_n \\ T_s = t0 > = (0.05-30)s \end{cases}$$

For F51 saturation at $I > 50 I_n$
For F51N saturation at $I > 20 \% 0_n$



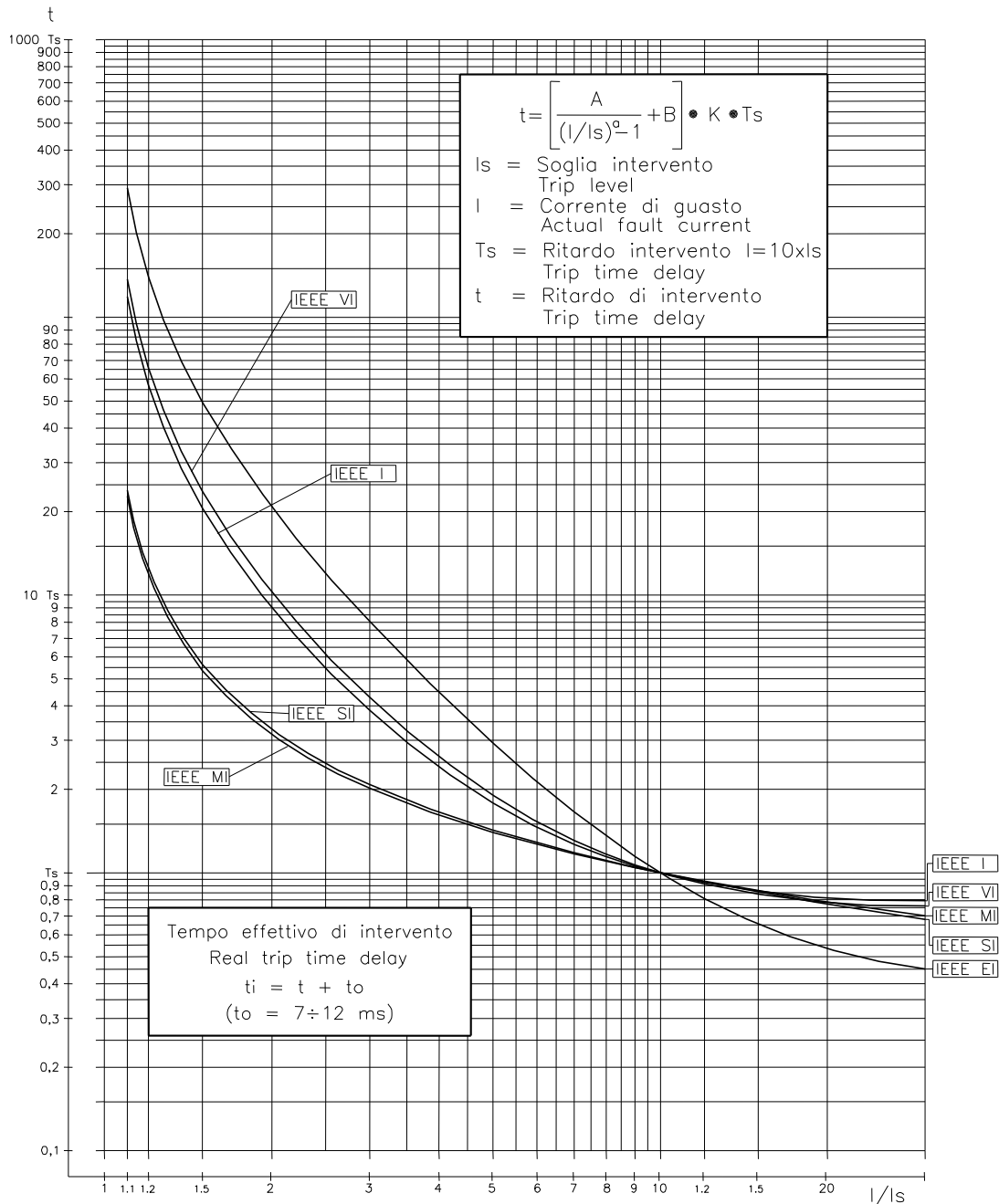
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21. TIME CURRENT CURVES (TU0353 Rev.0) 2/2



Curve Type	A	B	K	a
MI=IEEE Moderate Inv.	0.0104	0.0226	4.110608	0.02
SI=IEEE Short Inv.	0.00342	0.00262	13.30009	0.02
VI=IEEE Very Inv.	3.88	0.0963	7.380514	2
I=IEEE Inverse	5.95	0.18	4.164914	2
EI=IEEE Extremely Inv.	5.67	0.0352	10.814	2

$$\begin{aligned} \text{F51} \quad & \begin{cases} I_s = I > = (0.5-4)I_n \\ T_s = tI > = (0.05-30)s \end{cases} \\ \text{F51N} \quad & \begin{cases} I_s = 0 > = (0.02-0.4)0_n \\ T_s = t0 > = (0.05-30)s \end{cases} \end{aligned}$$

For F51 saturation at $I > 50 I_n$
For F51N saturation at $I > 20 \% 0_n$

24 SETTINGS' FORM

Date :			Number Relay:				
RELAY PROGRAMMING							
Default Setting				Actual Setting			
Variable	Value	Units	Description	Variable	Value	Units	
Fn	50	Hz	System Frequency	Fn		Hz	
In	500	Ap	Rated primary current of phase C.Ts.	In		Ap	
On	500	Ap	Neutral CT rated primary current	On		Ap	
F(I>)	D	-	Curve shape of low-set phase overcurrent	F(I>)		-	
Fα	Dir	-	Operation mode of the phase O/C elements	Fα		-	
α=	90	°	Reference direction of phase fault elements	α=		°	
I>	1.0	In	Tap of phase low-set overcurrent elements	I>		In	
tl>	2.0	s	Time dial of phase low-set overcurrent elements	tl>		s	
I>>	2	In	Tap of phase high-set element	I>>		In	
tl>>	1.0	s	Time delay of high-set phase overcurrent element	tl>>		s	
2I>>	ON	-	Automatic Cold Load pick-up	2I>>		-	
Uo	10	V	Enabling level of the zero-sequence polarizing input voltage	Uo		V	
Fαo	Dir	-	Operation mode of the earth fault element	Fαo		-	
α=	90	°	Reference direction of earth fault elements	α=		°	
F(O>)	D	-	Curve shape of low-set ground overcurrent	F(O>)		-	
O>	1	%On	Tap of low-set overcurrent ground element	O>		%On	
tO>	4.0	s	Time dial of ground low-set overcurrent element	tO>		s	
O>>	1	%On	Tap of high-set overcurrent ground element	O>>		%On	
tO>>	3.0	s	Time delay of high-set ground overcurrent element	tO>>		s	
tBO	0.1	s	Max. reset time delay of the instantaneous elements	tBO		s	
NodAd	1	-	Communication address	NodAd		-	
CONFIGURATION OF OUTPUT RELAYS							
Default Setting						Actual Setting	
Protective Element	Output Relays				Description	Protective Element	Output Relays
I>	-	-	3	-	Low-set phase overcurrent pick-up	I>	
tl>	1	-	-	-	Time delayed low-set phase overcurrent	tl>	
I>>	-	-	3	-	High-set phase overcurrent pick-up	I>>	
tl>>	1	-	-	-	Time delayed high-set phase overcurrent	tl>>	
O>	-	-	-	4	Low-set ground overcurrent pick-up	O>	
tO>	-	2	-	-	Time delayed low-set ground overcurrent	tO>	
O>>	-	-	-	4	High-set ground overcurrent pick-up	O>>	
tO>>	-	2	-	-	Time delayed high-set ground overcurrent	tO>>	
BT	-	-	-	-	Breaker Trip relay	BT	
tFRes:	A				Relay reset mode A=Automatic, M=Manual (*)	tFRes:	
Bf	I>>I>				The input for blocking	Bf	
Bo	O>>O>				The input for blocking	Bo	
tBf	2tBO				The blocking of the fase fault elements	tBf	
tBo	2tBO				The blocking of the earth fault elements	tBo	