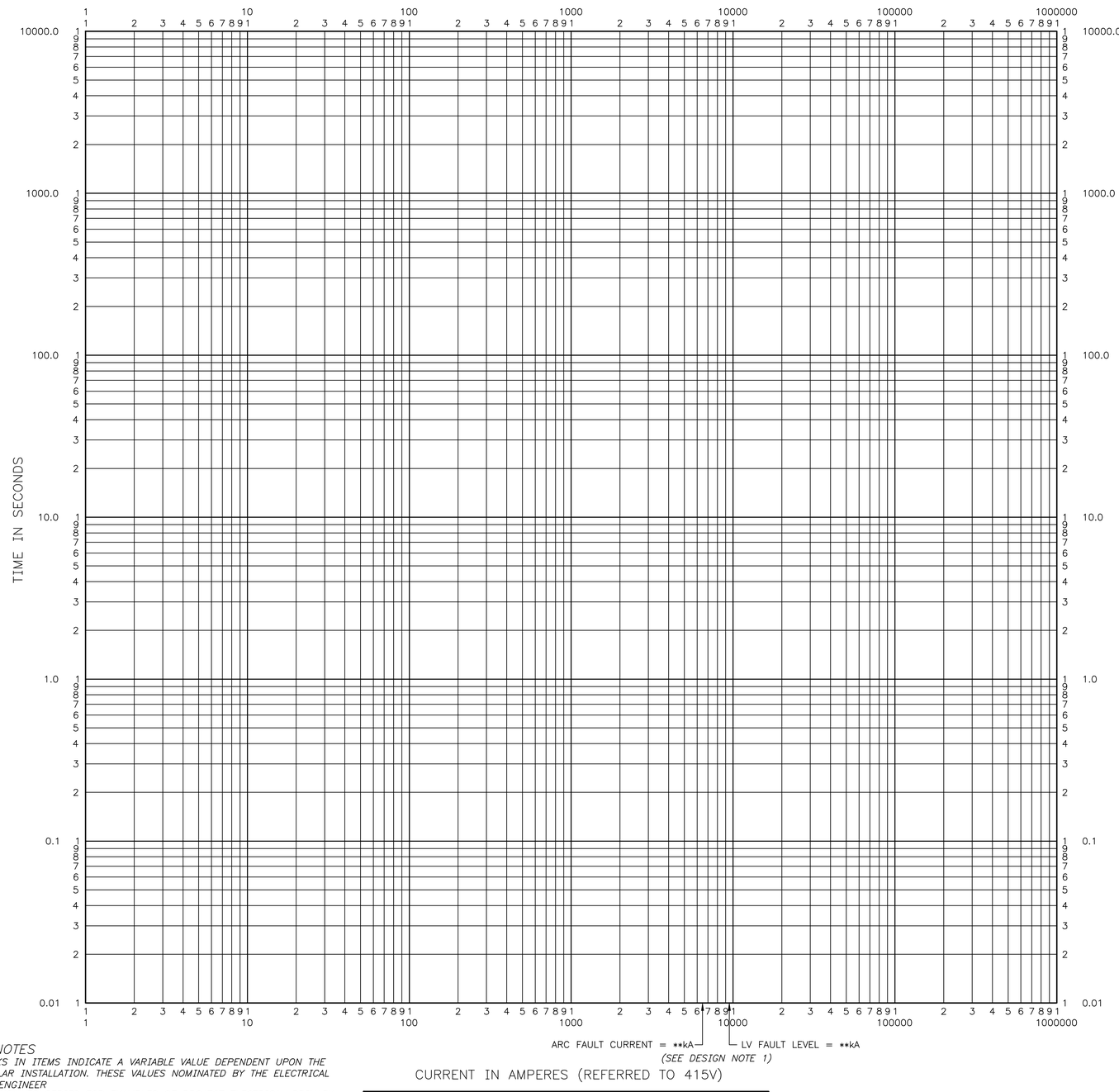
DocuSign Envelope ID: 1FDA3626-97B5-486F-AC59-BE2DC00589B9



NO CHANGES TO THE PROTECTION GRADING SETTINGS WITHOUT REFERENCE TO THE DESIGNER

DESIGN NOTES

1. *ASTERISKS IN ITEMS INDICATE A VARIABLE VALUE DEPENDENT UPON THE PARTICULAR INSTALLATION. THESE VALUES NOMINATED BY THE ELECTRICAL DESIGN ENGINEER*
2. *REFER MN01–30 SERIES FOR EXAMPLES OF PROJECT ELECTRICAL PRIMARY DESIGN DRAWINGS*
3. *THE REQUIRED SEQUENCING OF THE DEVICES IN A PROJECT PROTECTION EQUIPMENT SCHEDULE IS FROM SUPPLY AT THE TOP TO THE LOAD AT THE BOTTOM*
4. *THE DEVICES NAMED AND THE ARRANGEMENT SHOWN IN THE PROTECTION EQUIPMENT SCHEDULE ARE TYPICAL AND CAN BE RENAMED AND REARRANGED TO SUIT A PROJECT.*
5. *FOR AUTOTRANSFORMER WITH 65% TAPPING, STARTING CURRENT = $(0.65^2$ x LOCKED ROTOR CURRENT) + 20% MAGNETISING CURRENT*
6. *SEMICONDUCTOR PROTECTION FUSE NOT REQUIRED FOR STARTERS ABOVE 100A*
7. *MOTOR PROTECTION RELAY NOT REQUIRED WHERE 6.*EM TRIP UNIT IS USED*
8. *WHERE MOTOR PROTECTION RELAY OR SCHNEIDER ELECTRIC MOTOR CIRCUIT BREAKER WITH 6.*EM TRIP UNIT USED, MOTOR PROTECTION CURVES TO BE SHOWN ON GRAPH*
9. *WHERE ELECTRONIC SOFT STARTER OR VARIABLE SPEED CONTROLLER WITH IN–BUILT MOTOR PROTECTION IS USED, MOTOR PROTECTION CURVES NOT TO BE SHOWN ON GRAPH. FOR ELECTRONIC SOFT STARTER AND VARIABLE SPEED CONTROLLER DESIGN NOTES REFER MN01–3–1.2*

PROTECTION EQUIPMENT SCHEDULE

CURVE	CODE	SPECIFICATION	PARAMETER	VALUE	UNIT	INPUT	COMMENT
1	****	*** FUSE *DEVICE NAME*					
		***** *MAKE AND MODEL*	***A	*CURRENT RATING*			
2	****	***** *DEVICE NAME*	In	***	A	–	TRIP UNIT MAX VALUE
		SCHNEIDER ELECTRIC, COMPACT NSX*** : ***A, 36kA,	Ir	***	A	DIAL	MAXIMUM VALUE
		COMPLETE WITH MICROLOGIC 6.*, ***A TRIP UNIT	Ir	***	A	KEYPAD	FINE ADJUSTMENT
			tr	*	s	KEYPAD	
			Isd	*	xIr	DIAL	MAXIMUM VALUE
			Isd	*	xIr	KEYPAD	MAXIMUM VALUE
			tsd	*	s	KEYPAD	
			I^2 (sd)	***	–	KEYPAD	
			Ii	*	xIn	KEYPAD	
			Ig	*	xIn	DIAL	MAXIMUM VALUE
			Ig	***	A	KEYPAD	FINE ADJUSTMENT
			tg	*	s	KEYPAD	
			I^2 (g)	***	–	KEYPAD	
			LONG TIME PROTECTION Ir = ***A				
			SHORT TIME PROTECTION Isd = ***A				
			INSTANTANEOUS CURRENT Ii = ****A				
3	MoCB	***** *DEVICE NAME (SEE DESIGN NOTE 7)*	In	***A	A	–	TRIP UNIT MAX VALUE
		SCHNEIDER ELECTRIC, COMPACT NSX*** : ***A, **kA,	Ir	**A	A	DIAL	MAXIMUM VALUE
		COMPLETE WITH MICROLOGIC 6.* EM, ***A TRIP UNIT	Ir	**A	A	KEYPAD	FINE ADJUSTMENT
		SDTAM MODULE, MOTOR PROTECTION OPENS MAIN CONTACTOR	TRIP CLASS	**	–	KEYPAD	DEFINES tr VALUE
			Isd	***	x Ir	DIAL	MAXIMUM VALUE
			Isd	***	x Ir	KEYPAD	FINE ADJUSTMENT
			Ig	**xIn	**xIn	DIAL	MAXIMUM VALUE
			Ig	**A	**A	KEYPAD	FINE ADJUSTMENT
			tg	**s	**s	KEYPAD	
			LONG TIME PROTECTION Ir = ***A				
			SHORT TIME PROTECTION Isd = ***A				
			INSTANTANEOUS CURRENT Ii = ****A				
4	****	***** *DEVICE NAME*	In	***	A	–	TRIP UNIT MAX VALUE
		SCHNEIDER ELECTRIC, COMPACT NSX*** : ***A, 36kA,	Ir	***	A	DIAL	MAXIMUM VALUE
		COMPLETE WITH MICROLOGIC 5.*, ***A TRIP UNIT	Ir	***	A	KEYPAD	FINE ADJUSTMENT
			tr	*	s	KEYPAD	
			Isd	*	xIr	DIAL	MAXIMUM VALUE
			Isd	*	xIr	KEYPAD	FINE ADJUSTMENT
			tsd	*	s	KEYPAD	
			I^2	***	–	KEYPAD	
			Ii	*	xIn	KEYPAD	
			LONG TIME PROTECTION Ir = ***A				
			SHORT TIME PROTECTION Isd = ***A				
			INSTANTANEOUS CURRENT Ii = ***A				
5	****	***** *DEVICE NAME*	In	***	A	–	TRIP UNIT RATING
		SCHNEIDER ELECTRIC, COMPACT NSX*** : ***A, **kA,	Io	**	A	DIAL	
		COMPLETE WITH MICROLOGIC 2.*, ***A TRIP UNIT	Ir	*	x Io	DIAL	
			tr	16	s	–	NON ADJUSTABLE
			Isd	*	x Ir	DIAL	
			tsd	0.02	s	–	NON ADJUSTABLE
			Ii	***	A	–	NON ADJUSTABLE
			LONG TIME PROTECTION Ir = ***A				
			SHORT TIME PROTECTION Isd = ***A				
			INSTANTANEOUS CURRENT Ii = ***A				
5	****	***** *DEVICE NAME*	In	***	A	–	TRIP UNIT RATING
		SCHNEIDER ELECTRIC, COMPACT NSX*** : ***A, **kA,	Io	**	A	DIAL	
		COMPLETE WITH MICROLOGIC 2.*M, ***A TRIP UNIT	Ir	*	x Io	DIAL	
			TRIP CLASS	**	–	KEYPAD	DEFINES tr VALUE
			Isd	*	x Ir	DIAL	
			tsd	0.02	s	–	NON ADJUSTABLE
			Ii	***	A	–	NON ADJUSTABLE
			LONG TIME PROTECTION Ir = ***A				
			SHORT TIME PROTECTION Isd = ***A				
		>100A ELECTRONIC SOFT STARTER ONLY	INSTANTANEOUS CURRENT Ii = ***A				
6	SPF	SEMICONDUCTOR PROTECTION FUSE *(SEE DESIGN NOTE 6)*					
		***** *MAKE AND MODEL*	**A	*CURRENT RATING*			
7	****	MOTOR PROTECTION *(SEE DESIGN NOTES 7 AND 8)*					
		***** *MAKE AND MODEL*	***A, CLASS **	*SETTING AND CLASS*			
7a		COLD					
7b		HOT					
8		MOTOR					
		BASED ON ** kW, 415V MOTOR, FLC = ***A					
		LOCKED ROTOR CURRENT = ***A					
		STARTING CURRENT = * x FLC = ***A *SEE DESIGN NOTE 5*					
		DUTY RUNNING CURRENT = ***A					

ISSUE	DATE	GRID	REVISION	DRN	REC	APPD
H	12/2021		DESIGN NOTE 7 REVISED. DESIGN NOTES 8 AND 9 ADDED	PH	TL	EG
G	07/2021		LV FAULT LEVEL REVISED; ARC FAULT CURRENT ADDED	PH	TL	EG
F	10/2020		MICROLOGIC 2.*M ADDED	PH	EG	NJ
E	02/2020		PROTECTION EQUIPMENT SCHEDULE REVISED	PH	TL	EG
D	11/2019		MOTOR PROTECTION NOTE REVISED; 6EM AND 2.3M BREAKERS ADDED; PART 2 CREATED ARC FLASH LABELS MOVED TO PART 2	PH	EG	NJ

566
810

DESIGN SURVEY NONE	VERTICAL DATUM NONE	DES CALC E FONG	NORTH POINT
	COORDINATE SYS NONE	DES CHD K O'GRADY	
ASCON SURVEY NONE	DES REF	DRN P HARVEY	
		Q.C. CHD S MEMORY	

SUBMITTED 24/07/2017
E FONG (SIGNED)
SENIOR ENGINEER – ELECTRICAL

RECOMMENDED 24/07/2017
K O'GRADY (SIGNED)
PRINCIPAL ENGINEER – ELECTRICAL

APPROVED 24/07/2017
N JOHNSON (SIGNED)
SNR PRINCIPAL ENGINEER – ELECT

ENGINEERING

WATER CORPORATION

ELECTRICAL STANDARD SWITCHBOARD DESIGNS
SMALL PUMP STATIONS
PRIMARY DESIGN – PROTECTION GRADING TEMPLATE
PROTECTION GRADING CURVES – PART 1

FILE
PROJECT
PLAN MN01–3–1.1
CAD
ISSUE H
ORIGINAL SHEET SIZE A1
MF

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