

	1	2	3	4	5	6	7	8	9
A	Single Line Diagram – Power Circuit								
B									
C									
D									
E									
F									
G									

	Transformer/Power Supply
	Generator
	Air Circuit Breaker
	Molded Case Circuit Breaker
	Current Transformer
	Power Contactor
	Control Circuit Fuse
	Capacitor
	Power Meter
	Reactive Power Compensator
	Transfer Switch Interlock
	Distribution Board
	(MOV) Surge Protection Device

The diagram illustrates a single-line power circuit configuration. It begins with a three-phase supply (L1, L2, L3) connected to a main switch assembly (CB1). This assembly feeds into a common busbar. Three separate branches then lead to individual motor control centers. Each center contains a molded case circuit breaker (MC1, MC2, MC3), a power contactor (OR1, OR2, OR3), and a three-phase motor (U1 V1 W1, U2 V2 W2, U3 V3 W3). The diagram also shows a distribution board and surge protection devices (MOV) connected to the system.

แสดงแบบ

Control Panel 523S

- MCCB 3P, C Curve,
- Icu25kA@415V IEC 60947-2
- Magnetic Contactor 115%
- AC-3 Rated IEC 60947-5-1
- Overload Relay 3elements
- M/A resettable IEC 60947-4
- 3x1A Control Fuse
- Terminal for external control

Total Tech Solution Co.,
Ltd

Inspection and Approval

List of contents

Load Schedule

Single Line Diagram – Control Circuit

This diagram illustrates the control circuit for a motor system, organized into a grid with columns 1 through 9 and rows A through G. The circuit starts with three phase lines (Ph1, Ph2, Ph3) and a Control Fuse (1A x3) in column 1. These lines pass through a Voltage Protection Relay (VPR) in column 2, which is configured for d/dt, L1, L2, L3, and Com (11) settings. The relay is protected by a SW1 switch and a PR bypass switch. The circuit then branches into several parallel paths. The first path includes a 14 MC1 switch and a 13 switch, controlled by a NO1 PPSW1 switch and a NO2 switch. The second path includes a COM switch, a TB2 switch, and an AT1 switch, controlled by a TB2 switch and a TB2 switch. The third path includes an Auto switch, a Manual switch, and a SLWS1 switch, controlled by a 96 OR1 switch and a 95 switch. The fourth path includes a (L) 7 DR1 switch and a (N) 2 switch, controlled by a DRT switch and a NC (5) switch. The fifth path includes a 21 MC3 switch and a 22 switch, controlled by a 21 MC2 switch and a 22 switch. The sixth path includes a 21 MC3 switch and a 22 switch, controlled by a 21 MC2 switch and a 22 switch. The seventh path includes a 21 MC3 switch and a 22 switch, controlled by a 21 MC2 switch and a 22 switch. The eighth path includes a 21 MC3 switch and a 22 switch, controlled by a 21 MC2 switch and a 22 switch. The ninth path includes a 21 MC3 switch and a 22 switch, controlled by a 21 MC2 switch and a 22 switch. The diagram also shows various meters and switches, including MT1 Volt-Amp meter, PL3 Overload, PL1 Normal Voltage, PL2 Run, and A2 MC1 A1, A2 MC3 A1, A2 MC2 A1.

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	1	2	3	4	5	6	7	8	9																																																																																																																															
A	Bill of Quantity									Customer																																																																																																																														
B																																																																																																																																								
C	Star-Delta Starter Control Panel <table><tr><th>No.</th><th>Description</th><th>Brand</th><th>Model</th><th>Qty</th><th>Unit</th><th>Feeder</th></tr><tr><td colspan="7">1 Circuit Breaker</td></tr><tr><td></td><td>MCB 3P 16AT/63AF 6kA IEC 60898-1</td><td>Schneider</td><td>iK60N</td><td>1</td><td>Ea.</td><td>CB1</td></tr><tr><td colspan="7">2 Contactor and Overload Relay</td></tr><tr><td></td><td>MC 3P 09A(AC-3) IEC 60947-4-1</td><td>Schneider</td><td>LC1D09</td><td>1</td><td>Ea.</td><td>MC1</td></tr><tr><td></td><td>OR 3E 7-10A IEC 60947-4-1</td><td>Schneider</td><td>LRD14</td><td>1</td><td>Ea.</td><td>OR1</td></tr><tr><td colspan="7">3 Control circuit</td></tr><tr><td></td><td colspan="2">Phase Protection Relay (0V, UV, PhF, UnB, Seq)</td><td>SUP-03S</td><td>1</td><td>Ea.</td><td>PR1</td></tr><tr><td></td><td colspan="2">Pilot Lamp 380V LED</td><td>AD16-22DS</td><td>3</td><td>Ea.</td><td>PL1-PL3</td></tr><tr><td></td><td colspan="2">Fuse base +Control fuse 1A</td><td>RT18-32</td><td>1</td><td>Set</td><td>F1-F3</td></tr><tr><td></td><td colspan="2">Power Meter V, A 500V 120A</td><td>CH-72</td><td>1</td><td>Ea.</td><td>MT1</td></tr><tr><td></td><td colspan="2">Current Transformer 1000/1A</td><td></td><td>1</td><td>Ea.</td><td>CT1</td></tr><tr><td></td><td colspan="2">Control wiring</td><td>VSF</td><td>1</td><td>Set</td><td></td></tr><tr><td colspan="7">4 Power Wiring</td></tr><tr><td></td><td>IEC01 450/750V 70C°</td><td>BCC</td><td>THW</td><td>1</td><td>Set</td><td></td></tr><tr><td></td><td>Power Terminal PS 3Ph 4W +Motor 3W</td><td></td><td></td><td>3</td><td>Set</td><td></td></tr><tr><td colspan="7">5 Cabinet</td></tr><tr><td></td><td>KBJQ #1 28x35x15cm. IP55</td><td>KJL</td><td>KBJQ</td><td>1</td><td>Ea.</td><td></td></tr></table>									No.	Description	Brand	Model	Qty	Unit	Feeder	1 Circuit Breaker								MCB 3P 16AT/63AF 6kA IEC 60898-1	Schneider	iK60N	1	Ea.	CB1	2 Contactor and Overload Relay								MC 3P 09A(AC-3) IEC 60947-4-1	Schneider	LC1D09	1	Ea.	MC1		OR 3E 7-10A IEC 60947-4-1	Schneider	LRD14	1	Ea.	OR1	3 Control circuit								Phase Protection Relay (0V, UV, PhF, UnB, Seq)		SUP-03S	1	Ea.	PR1		Pilot Lamp 380V LED		AD16-22DS	3	Ea.	PL1-PL3		Fuse base +Control fuse 1A		RT18-32	1	Set	F1-F3		Power Meter V, A 500V 120A		CH-72	1	Ea.	MT1		Current Transformer 1000/1A			1	Ea.	CT1		Control wiring		VSF	1	Set		4 Power Wiring								IEC01 450/750V 70C°	BCC	THW	1	Set			Power Terminal PS 3Ph 4W +Motor 3W			3	Set		5 Cabinet								KBJQ #1 28x35x15cm. IP55	KJL	KBJQ	1	Ea.		แสดงแบบ Control Panel 523S -MCCB 3P, C Curve, Icu25kA@415V IEC 60947-2 -Magnetic Contactor 115% AC-3 Rated IEC 60947-5-1 -Overload Relay 3elements M/A resettable IEC 60947-4 -3x1A Control Fuse -Terminal for external control
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D										Manufacturer Total Tech Solution Co., Ltd 571 ซ.กาญจนาภิเษก 8 แขวงบางแค เขตบางแค กทม. 10160 ผู้รับผิดชอบงาน ธนารักษ์ ชุ่มมงคล 063-909-5000																																																																																																																														
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ตารางที่ 4-2

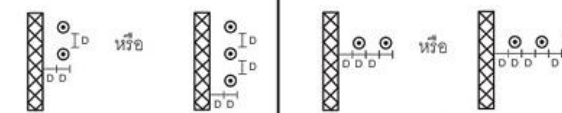
ขนาดต่ำสุดของสายดินของบริภัณฑ์ไฟฟ้า

พิกัดหรือขนาดปรับตั้งของ เครื่องป้องกันกระแสเกินไม่เกิน (แอมแปร์)	ขนาดต่ำสุดของสายดินของบริภัณฑ์ไฟฟ้า (ตัวนำทองแดง) (ตร.มม.)
20	2.5
40	4
70	6
100	10
200	16
400	25
500	35
800	50
1000	70
1250	95
2000	120
2500	185
4000	240
6000	400

หมายเหตุ หากความยาวของวงจรย่อยเกิน 30 เมตร ให้พิจารณาขนาดสายดินของ
บริภัณฑ์ไฟฟ้า โดยคำนึงถึงค่า earth fault loop impedance ของวงจร ที่แสดง
ในภาคผนวก ก

ตารางที่ 5-22

ขนาดกระแสของสายไฟฟ้าตัวนำทองแดงแกนเดียวหุ้มฉนวนพีวีซี มอก.11-2553 สำหรับขนาดแรงดัน (U_o/U) ไม่
เกิน 450/750 โวลต์ อุณหภูมิตัวนำ 70 °C อุณหภูมิโดยรอบ 40 °C เดินบนฉนวนลูกถ้วยในอากาศ

ลักษณะการติดตั้ง	กลุ่มที่ 4	
รูปแบบการติดตั้ง		
รหัสชนิดเคเบิลที่ใช้งาน	60227 IEC 01, 60227 IEC 10, NYY	
ขนาดสาย (ตร.มม.)	ขนาดกระแส (แอมแปร์)	
4	30	37
6	39	48
10	56	67
16	78	92
25	113	127
35	141	157
50	171	191
70	221	244
95	271	297
120	315	345
150	365	397
185	418	453
240	495	535
300	573	617
400	692	741