

	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

แหล่งจ่าย
L1 L2 L3

U1 V1 W1 U2 V2 W2 มอเตอร์

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

The diagram illustrates the control circuit for a motor system. It features three main components: a Voltage Protection Relay (VPR), a Motor Control Center (MCC), and a Motor (M1). The VPR is connected to the three-phase supply (Ph1, Ph2, Ph3) and provides protection against UV/OV, Phase loss, and Wrong Phase Sequence. The MCC includes a Main Switch (SW1) with a PR bypass, a Thermal Relay (TR1), and a Motor Control Unit (MCU). The MCU is controlled by a combination of interlocking contacts (NC1, NC2, NC3, NC4, NC5, NC6, NC7, NC8, NC9, NC10, NC11, NC12, NC13, NC14, NC15, NC16, NC17, NC18, NC19, NC20, NC21, NC22, NC23, NC24, NC25, NC26, NC27, NC28, NC29, NC30, NC31, NC32, NC33, NC34, NC35, NC36, NC37, NC38, NC39, NC40, NC41, NC42, NC43, NC44, NC45, NC46, NC47, NC48, NC49, NC50, NC51, NC52, NC53, NC54, NC55, NC56, NC57, NC58, NC59, NC60, NC61, NC62, NC63, NC64, NC65, NC66, NC67, NC68, NC69, NC70, NC71, NC72, NC73, NC74, NC75, NC76, NC77, NC78, NC79, NC80, NC81, NC82, NC83, NC84, NC85, NC86, NC87, NC88, NC89, NC90, NC91, NC92, NC93, NC94, NC95, NC96, NC97, NC98, NC99, NC100, NC101, NC102, NC103, NC104, NC105, NC106, NC107, NC108, NC109, NC110, NC111, NC112, NC113, NC114, NC115, NC116, NC117, NC118, NC119, NC120, NC121, NC122, NC123, NC124, NC125, NC126, NC127, NC128, NC129, NC130, NC131, NC132, NC133, NC134, NC135, NC136, NC137, NC138, NC139, NC140, NC141, NC142, NC143, NC144, NC145, NC146, NC147, NC148, NC149, NC150, NC151, NC152, NC153, NC154, NC155, NC156, NC157, NC158, NC159, NC160, NC161, NC162, NC163, NC164, NC165, NC166, NC167, NC168, NC169, NC170, NC171, NC172, NC173, NC174, NC175, NC176, NC177, NC178, NC179, NC180, NC181, NC182, NC183, NC184, NC185, NC186, NC187, NC188, NC189, NC190, NC191, NC192, NC193, NC194, NC195, NC196, NC197, NC198, NC199, NC200, NC201, NC202, NC203, NC204, NC205, NC206, NC207, NC208, NC209, NC210, NC211, NC212, NC213, NC214, NC215, NC216, NC217, NC218, NC219, NC220, NC221, NC222, NC223, NC224, NC225, NC226, NC227, NC228, NC229, NC230, NC231, NC232, NC233, NC234, NC235, NC236, NC237, NC238, NC239, NC240, NC241, NC242, NC243, NC244, NC245, NC246, NC247, NC248, NC249, NC250, NC251, NC252, NC253, NC254, NC255, NC256, NC257, NC258, NC259, NC260, NC261, NC262, NC263, NC264, NC265, NC266, NC267, NC268, NC269, NC270, NC271, NC272, NC273, NC274, NC275, NC276, NC277, NC278, NC279, NC280, NC281, NC282, NC283, NC284, NC285, NC286, NC287, NC288, NC289, NC290, NC291, NC292, 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NC722, NC723, NC724, NC725, NC726, NC727, NC728, NC729, NC730, NC731, NC732, NC733, NC734, NC735, NC736, NC737, NC738, NC739, NC740, NC741, NC742, NC743, NC744, NC745, NC746, NC747, NC748, NC749, NC750, NC751, NC752, NC753, NC754, NC755, NC756, NC757, NC758, NC759, NC760, NC761, NC762, NC763, NC764, NC765, NC766, NC767, NC768, NC769, NC770, NC771, NC772, NC773, NC774, NC775, NC776, NC777, NC778, NC779, NC780, NC781, NC782, NC783, NC784, NC785, NC786, NC787, NC788, NC789, NC790, NC791, NC792, NC793, NC794, NC795, NC796, NC797, NC798, NC799, NC800, NC801, NC802, NC803, NC804, NC805, NC806, NC807, NC808, NC809, NC810, NC811, NC812

แสดงแบบ
Control Panel 523S
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 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

Inspection and Approval

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Load Schedule

	1	2	3	4	5	6	7	8	9	
A	Layout and Dimensions									Customer
B										
C										
D										
E										
F										
G	Load Schedule									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 Manufacturer Total Tech Solution Co., Ltd 571 ซ.กาญจนาภิเษก 8 แขวงบางแค เขตบางแค กทม. 10160 ผู้รับผิดชอบงาน ธนธิป ชุ่มมงคล 063-909-5000 Inspection and Approval
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B	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 2P 32AT/63AF 6kA IEC 60898-1</td><td>Nano</td><td>PMD42</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 32A(AC-3) IEC 60947-4-1</td><td>Schneider</td><td>LC1E32</td><td>1</td><td>Ea.</td><td>MC1</td></tr><tr><td></td><td>OR 3E 23-32A IEC 60947-4-1</td><td>Schneider</td><td>LRE32</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 (OV, 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 1Ph 2W +Motor 2W</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>KBSS #0 25x35x15cm. IP20</td><td>KJL</td><td>KBSS</td><td>1</td><td>Ea.</td><td></td></tr></table>									No.	Description	Brand	Model	Qty	Unit	Feeder	1 Circuit Breaker								MCB 2P 32AT/63AF 6kA IEC 60898-1	Nano	PMD42	1	Ea.	CB1	2 Contactor and Overload Relay								MC 3P 32A(AC-3) IEC 60947-4-1	Schneider	LC1E32	1	Ea.	MC1		OR 3E 23-32A IEC 60947-4-1	Schneider	LRE32	1	Ea.	OR1	3 Control circuit								Phase Protection Relay (OV, 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 1Ph 2W +Motor 2W			3	Set		5 Cabinet								KBSS #0 25x35x15cm. IP20	KJL	KBSS	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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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_0/U) ไม่
เกิน 450/750 โวลต์ อุณหภูมิตัวนำ 70 °C อุณหภูมิโดยรอบ 40 °C เดินบนฉนวนลวกด้วยในอากาศ

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