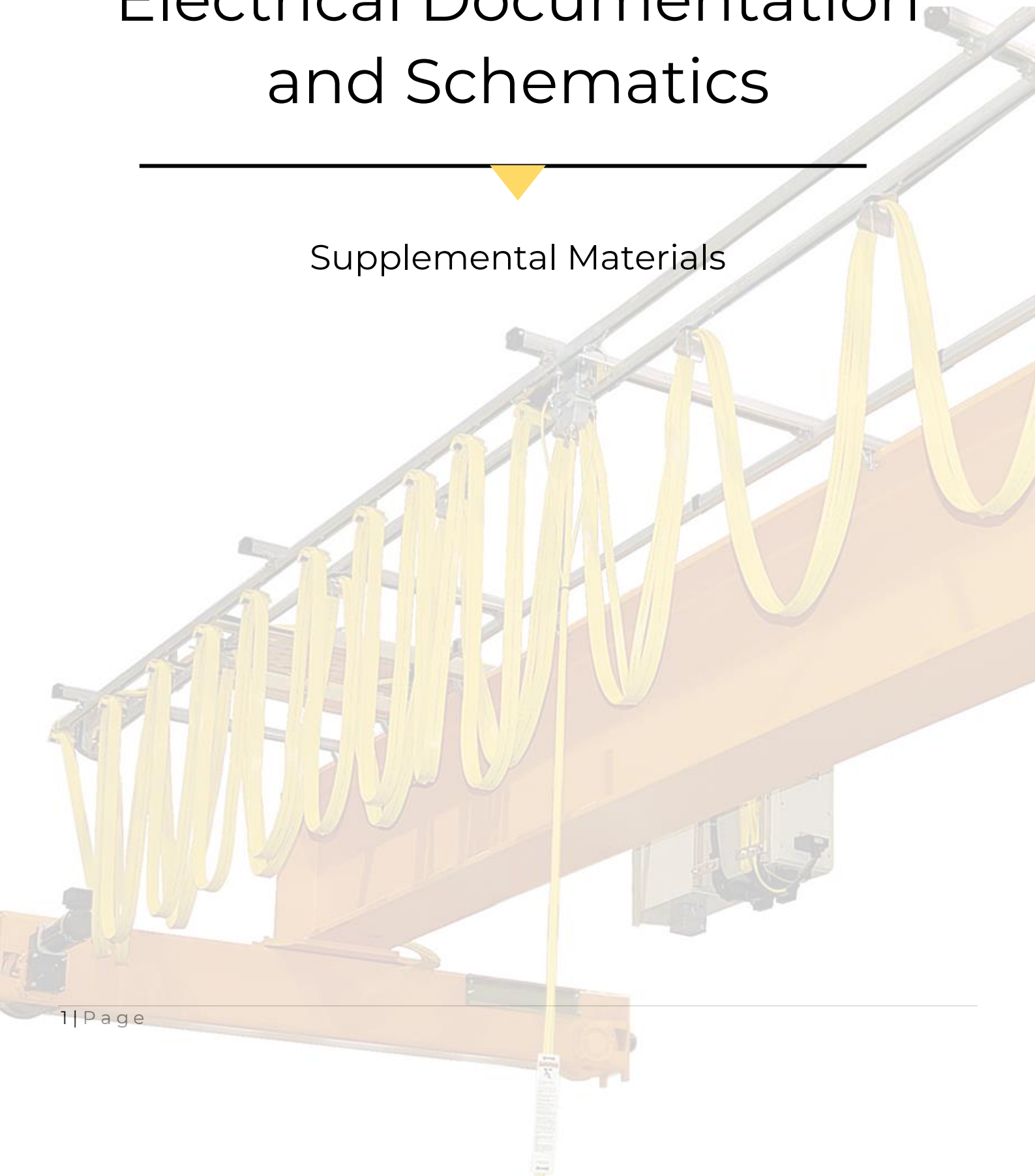
R&M MATERIALS HANDLING

Electrical Documentation and Schematics

Supplemental Materials



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Electrical Labeling Legend

Location Labels

Abbreviation	Location
BR	Bridge
E0	Electrical (no panel)
E1 or E1.1	Bridge Panel
E1.BR	Plug connections on festoon from bridge to bridge panel
E1.W2A	Plug connections on festoon run W2A (power) going to the bridge panel
E1.W3	Plug connections on festoon run W3 (control)going to the bridge panel
E2A or E2A.1	Hoist Panel for Hoist #1
E2B or E2B.1	Hoist Panel for Hoist #2
E2A.W2A	Plug connections on festoon run W2A (power)going to the hoist panel E2A
E2B.W2A	Plug connections on festoon run W2A going (controlto the hoist panel E2B
E2A.TR	Motor junction box for hoist #1
E2B.TR	Motor junction box for hoist #2
TR1	Trolley components not in the panels but shown in the schematics
E3	Pushbutton pendant
E2.W3	Plug connections on festoon run W3 (control) going to the pendant

Device Labels

1st Character	Device
A, B, C, D	Hoisting machinery
E, F, G	Trolley traversing machinery
H	Bridge traveling
H1, H2	Gantry traveling machinery (fixed leg & joint)
K	Slewing machinery
M, N	Grab machinery
O	Power Supply
P	Luffing machinery (double boom cranes)
S	Storm locking machinery
T	Lighting, Heating, Air conditioning circuits
U	Magnet devices, Spreaders
V	Selection circuits
Z	PLC, Overload protection, Monitoring systems

2nd Character	Device
A	Control unit, Regulator, Amplifier
B	Transducer, Load sensor, Synchro, Tachometer, Pulse sensor
D	Timer Relay
F	Fuse, Fused switch, Circuit breaker, Thermal overload
G	Generator, Rectifier, Stabilizer, Battery, Power supply device
H	Light fixture, Horn, Bell, Buzzer, Signal device
K	Contactor, Relay
L	Coil, Inductor, Reactor, Transductor
M	Motor
Q	Main disconnect, Isolator, Mechanically operated switching device
S	Control switch, Selector, Push-button, Limit switch, Switching device
T	Transformer
U	Modulator, Converter, Radio control equipment
X	Terminal block, plug socket, connector
Y	Brake, Clutch, Valve, Electromechanical device

Specifier	Hoist	Trolley	Bridge
1	Up	Right	Forward
2	Down	Left	Reverse

Cable Wiring & Plug Numbers

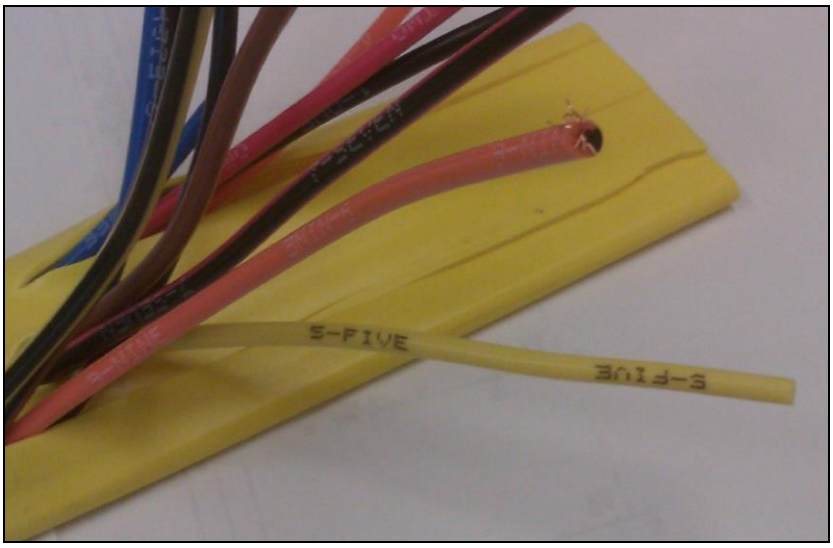
CABLE NUMBER	FROM	PLUG NUMBER	TO	PLUG NUMBER	USE
01	BRIDGE PANEL	X012	POWER SOURCE	NONE	MAIN POWER CONNECTION
21	BRIDGE PANEL	X211	BRIDGE DRIVE NEAR	X212	POWER
22	BRIDGE PANEL	X221	BRIDGE DRIVE FAR	X222	POWER
25	BRIDGE PANEL	X251	BRIDGE TRAVEL LIMIT	NONE	CONTROL
31	BRIDGE PANEL	X31A1	HOIST PANEL	X31A2	HOIST POWER
32	BRIDGE PANEL	X32A1	HOIST PANEL	X32A2	HOIST CONTROL
51	PENDANT TROLLEY	X511	PENDANT CONTROLLER	NONE	CONTROL
52	BRIDGE PANEL	X521	PENDANT TROLLEY	X511	CONTROL
53	BRIDGE PANEL	X521	PENDANT TROLLEY	X511	CONTROL

Wire Conversion Chart

mm^2	AWG
0.82	18
1	-
1.31	16
1.5	-
2.08	14
2.5	-
3.31	12
4	-
5.26	10
6	-
8.37	8
10	-
13.3	6
16	-
21.15	4
25	-
33.62	2
35	-
42.41	1
50	-
53.51	0
67.44	00
70	-
85.03	000
95	-
107.22	0000
120	-

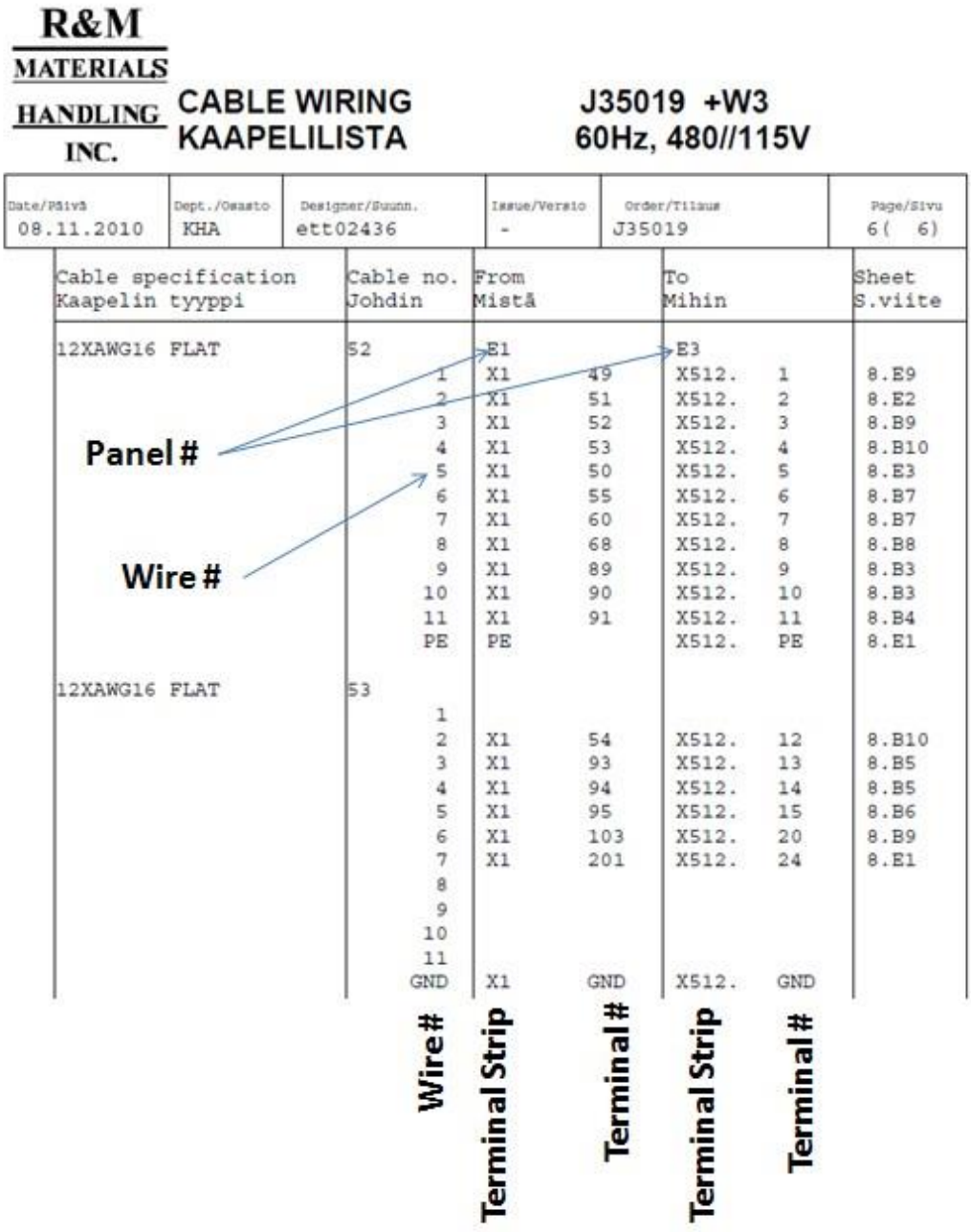
Identifying Cables & Wires

Flat Festoon Cable – Hardwire application example:



Wires are individually numbered & correspond with the wiring diagram.

Identifying Cables & Wires (cont.)



R&M MATERIALS HANDLING INC.

CABLE WIRING
KAAPELILISTA

J35019 +W3
60Hz, 480//115V

Date/Päivä	Dept./Osasto	Designer/Suunn.	Issue/Versio	Order/Tilaus	Page/Sivu
08.11.2010	KHA	ett02436	-	J35019	6(6)

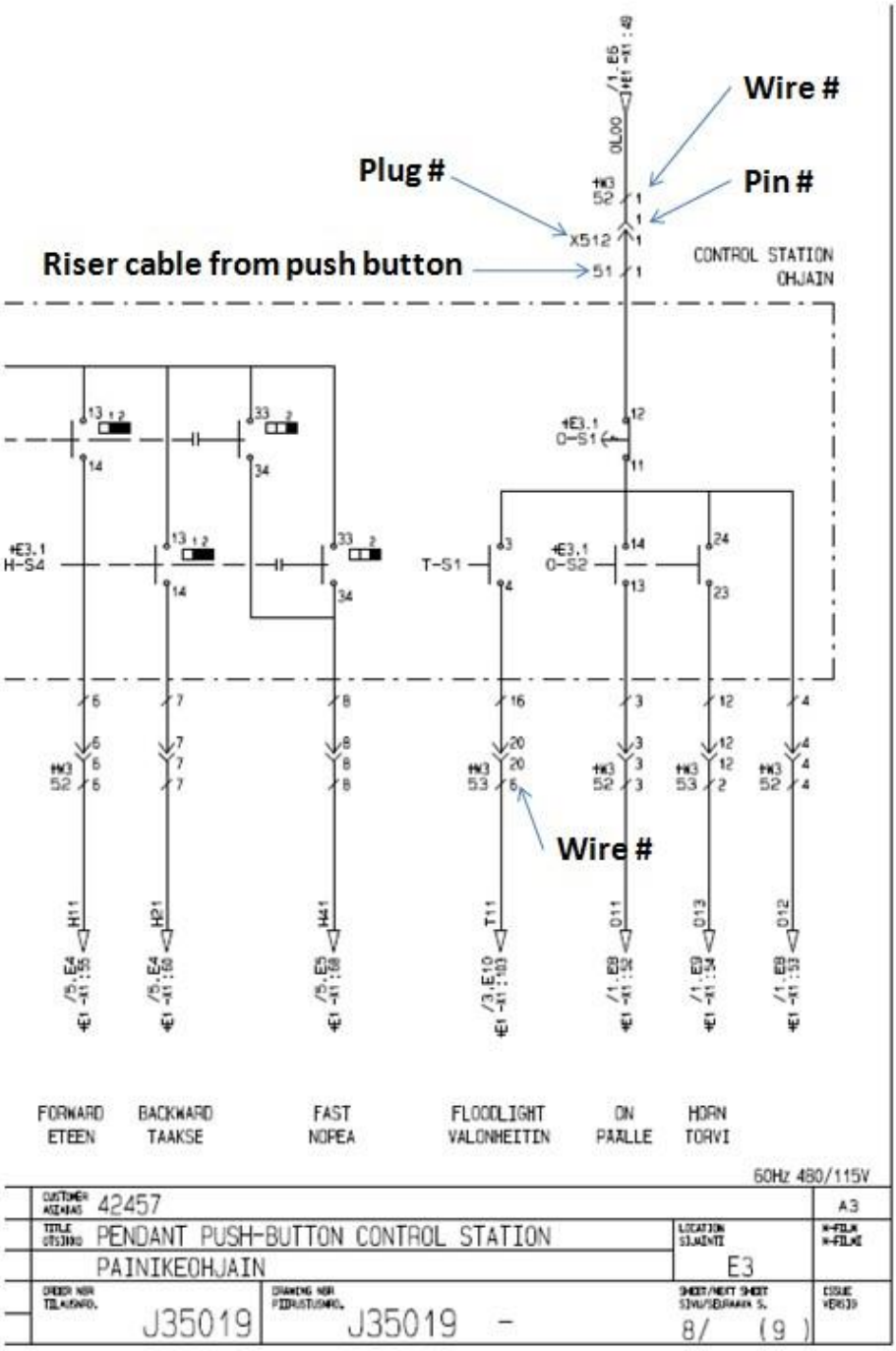
Cable specification Kaapelin tyyppi	Cable no. Johdin	From Mistä		To Mihin		Sheet S.viite
12XAWG16 FLAT	52	E1		E3		
	1	X1	49	X512.	1	8.E9
	2	X1	51	X512.	2	8.E2
	3	X1	52	X512.	3	8.B9
	4	X1	53	X512.	4	8.B10
	5	X1	50	X512.	5	8.E3
	6	X1	55	X512.	6	8.B7
	7	X1	60	X512.	7	8.B7
	8	X1	68	X512.	8	8.B8
	9	X1	89	X512.	9	8.B3
	10	X1	90	X512.	10	8.B3
	11	X1	91	X512.	11	8.B4
	PE	PE		X512.	PE	8.E1
12XAWG16 FLAT	53					
	1					
	2	X1	54	X512.	12	8.B10
	3	X1	93	X512.	13	8.B5
	4	X1	94	X512.	14	8.B5
	5	X1	95	X512.	15	8.B6
	6	X1	103	X512.	20	8.B9
	7	X1	201	X512.	24	8.E1
	8					
	9					
	10					
	11					
	GND	X1	GND	X512.	GND	

Panel #

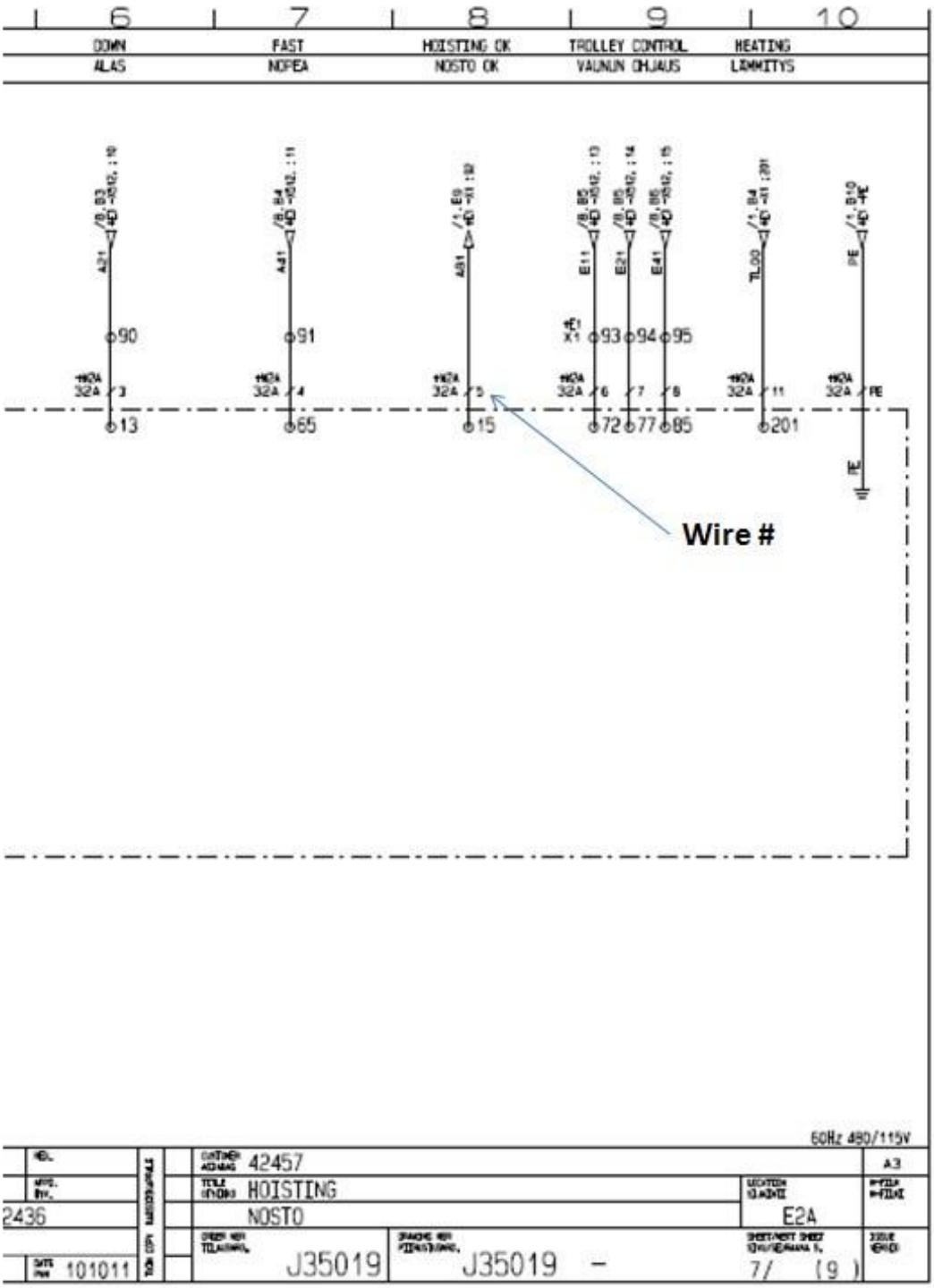
Wire #

Wire # | Terminal Strip | Terminal # | Terminal Strip | Terminal #

Identifying Cables & Wires (cont.)

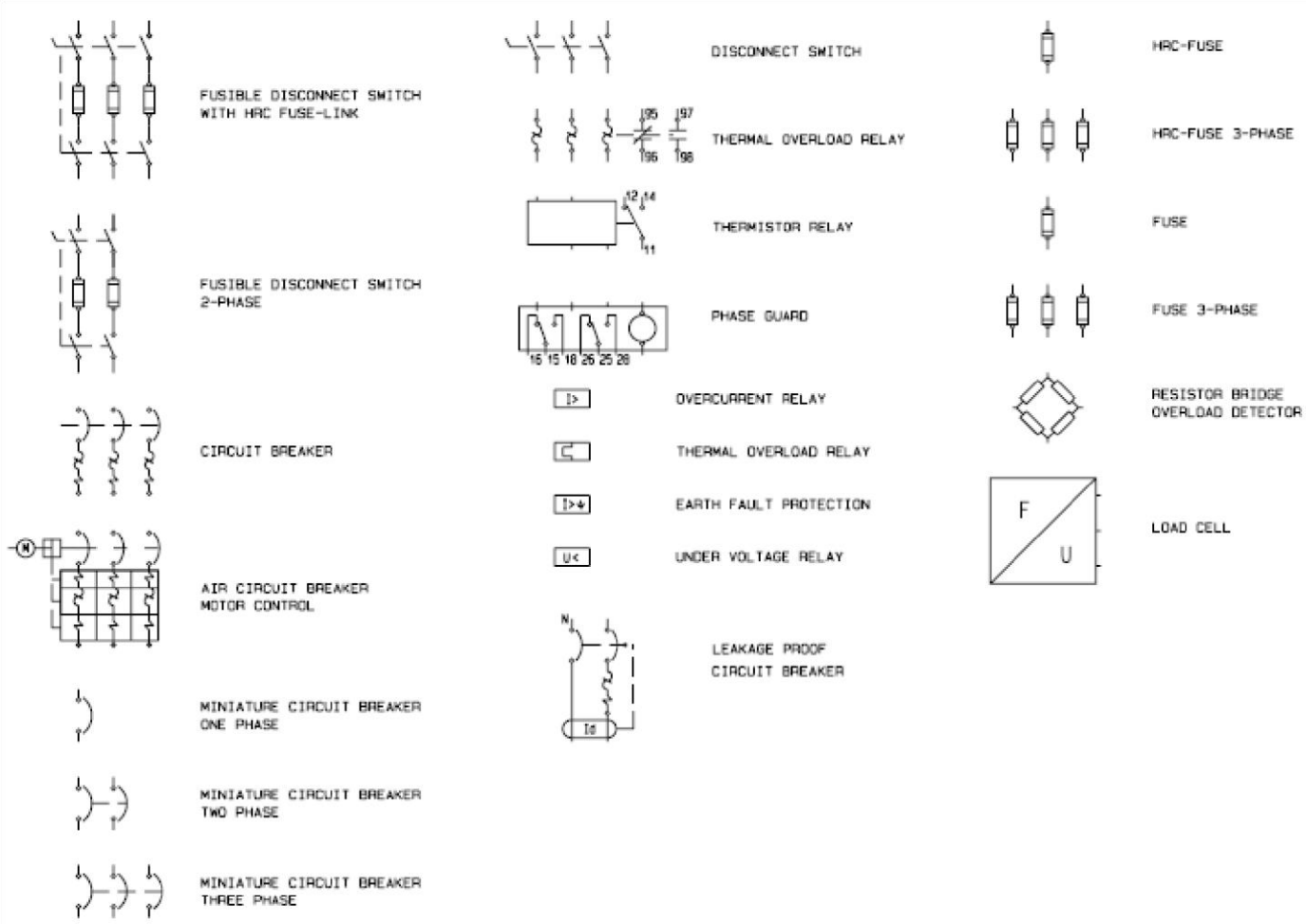


Identifying Cables & Wires (cont.)

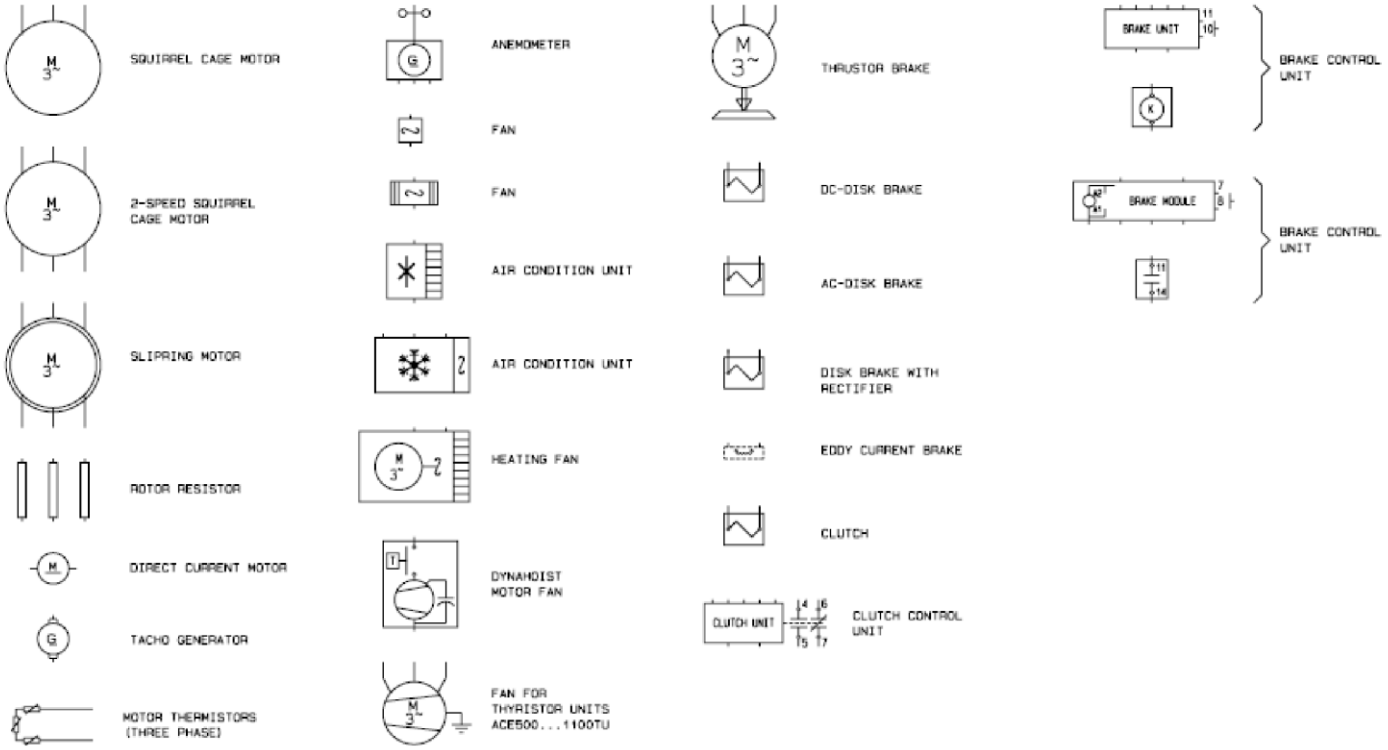


Graphical Symbols for Circuit Diagrams

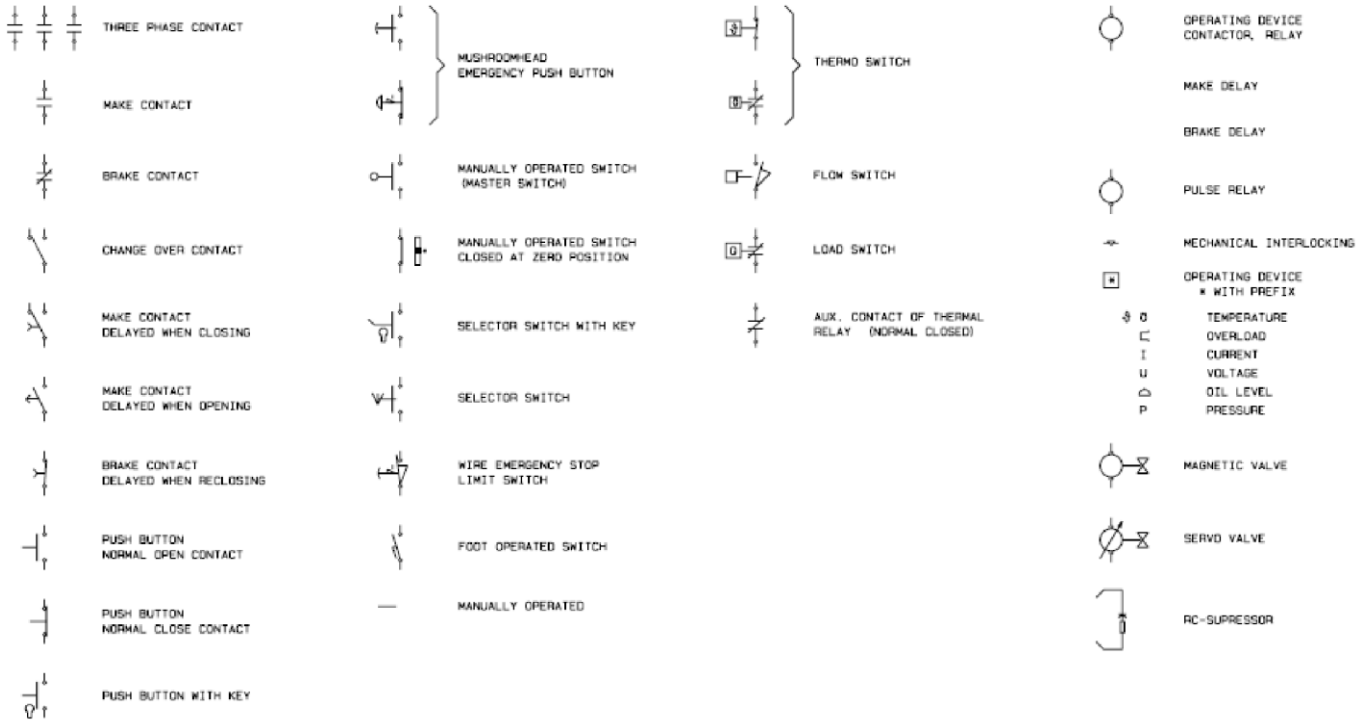
Protection Switches and Devices



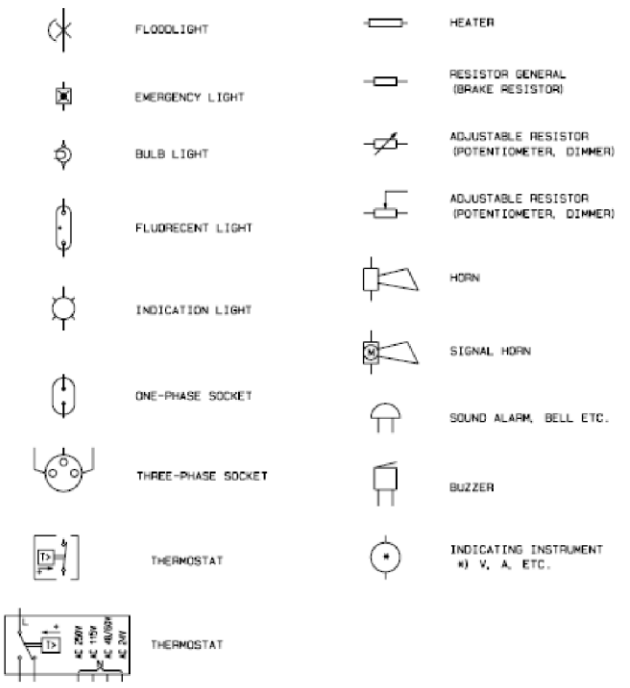
Motors and Brakes



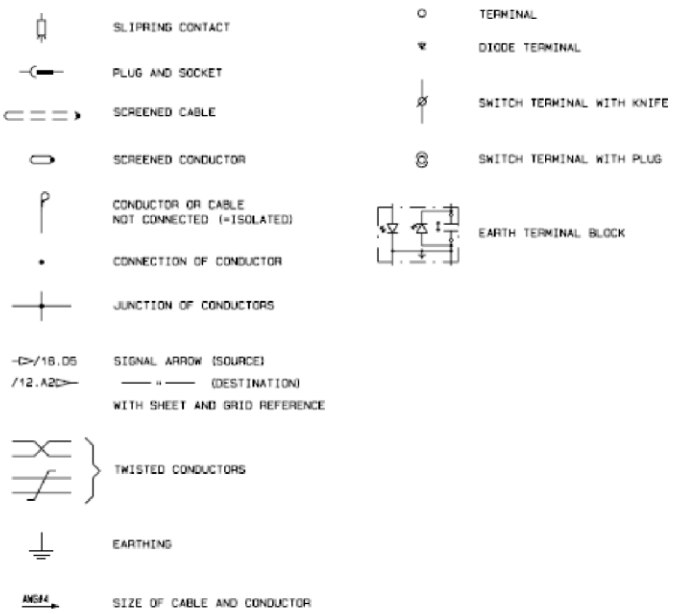
Switches, Push Buttons, Contacts and Relays



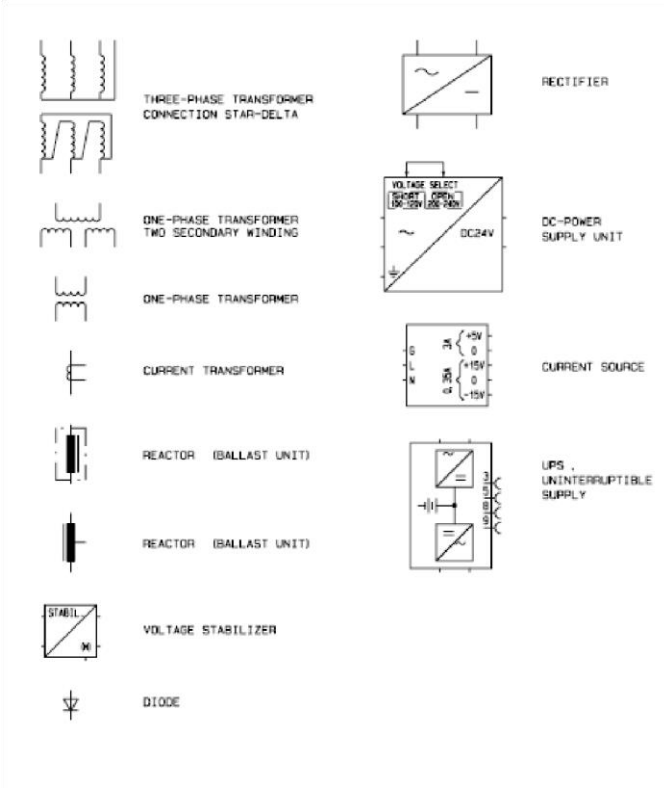
Lighting, Heating and Signaling Devices



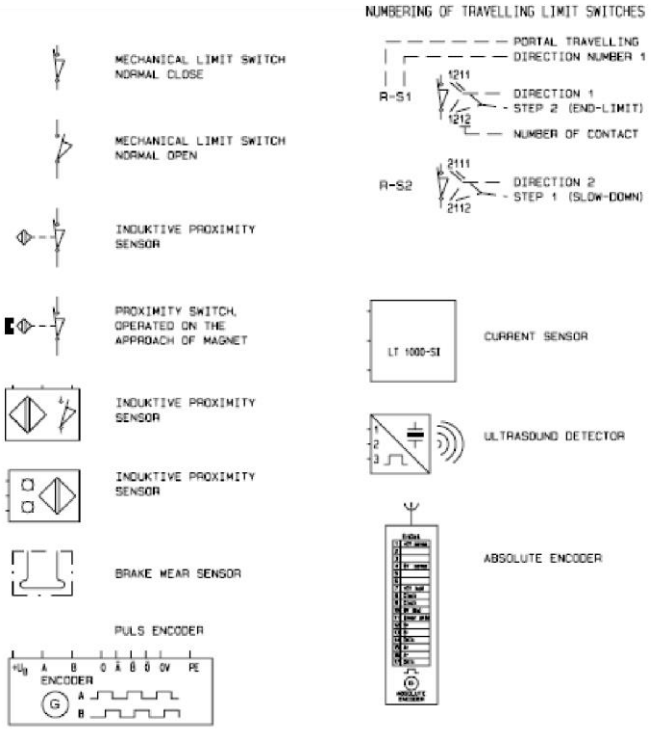
Connection Symbols



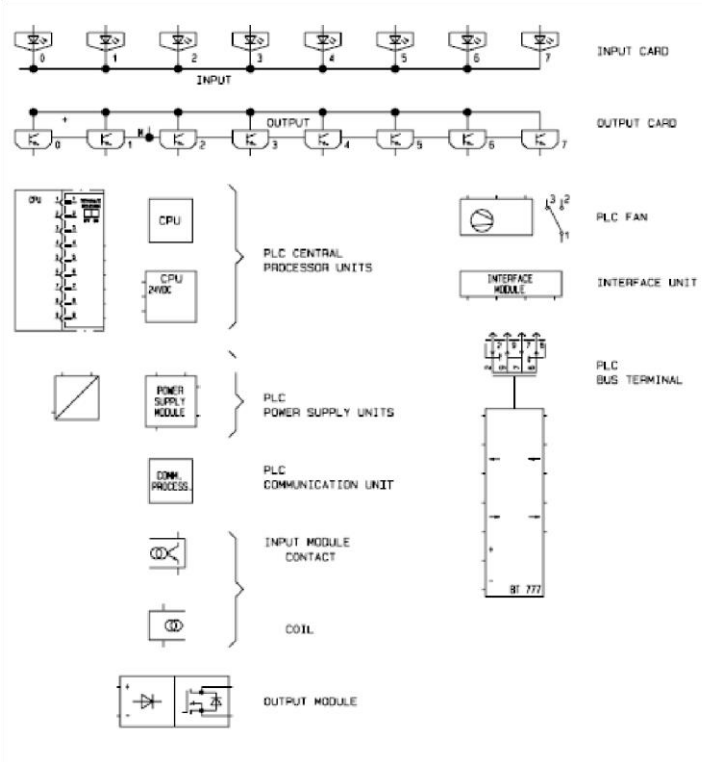
Power Supply Units



Limit Switches and Sensors



PLC Signals



Signal Amplifiers