Enclosed Safety Switches
General Duty Safety Switches

Table 9: Fusible Safety Switch Short Circuit Current Rating

Fuse Class	UL Listed Short Circuit Rating
Plug	10 kA
H, K	10 kA
J [1], R	100 kA
T [2]	100 kA

[1] Only applicable to 200–600 A except D325NT, D325NTR, D326NT and D326NTR.
[2] Only applicable to D325NT, D325NTR, D326NT, D326NTR, T327N and T327NR.

Table 10: Non-Fusible Safety Switch Short Circuit Current Rating

Fuse Class or Circuit Breaker Type [1]	UL Listed Short Circuit Rating
Any Brand Circuit Breaker	10 kA
H or J PowerPact Circuit Breaker	Up to 65 kA [2]
H, K	10 kA
J, R	100 kA [3]
T	100 kA [4]

[1] Ampere rating of fuse or circuit breaker not to exceed switch ampere ratings.
[2] Only applicable to DU324 and DU324NRB. HD, JD = 25 kA maximum.
[3] SCCR = 50 kA, applicable to DU222RB, DU322 and DU322RB.
[4] Only applicable to DU323, DU323RB, DU325 and DU326.

Standards

General duty safety switches are manufactured in accordance with these standards:

- UL 98, Standard for Enclosed and Dead Front Switches, UL Listed File E2875
- NEMA Standards Publication KS1, Enclosed Switches
- Federal Specifications WS-865c for Type NDS (Type 1) and Type LD (Type 3R)

Table 11: Terminal Lug Data [1]

Ampere Rating	Conductors Per Phase	Wire Range Wire Bending Space Per NEC® Table 312.6 AWG/kcmil	Lug Wire Range AWG/kcmil
30 [2]	1	12–8 (Al) or 14–8 (Cu)	12–8 (Al) or 14–8 (Cu)
30		12–6 (Al) or 14–6 (Cu)	12–6 (Al) or 14–6 (Cu)
60	1	12–3 (Al) or 14–3 (Cu)	12–2 (Al) or 14–2 (Cu)
100	1	12–1 (Al) or 14–1 (Cu)	12–1/0 (Al) or 14–1/0 (Cu)
200	1	6–250 (Al/Cu)	6–300 (Al/Cu)
400 Type 1	1 or 2	1/0–600 (Al/Cu) or 1/0–300 (Al/Cu)	(1) 1/0–750 (Al/Cu) or (2) 1/0–300 (Al/Cu)
400 Type 3R	2	1/0–250 (Al/Cu)	(1) 1/0–600 (Al/Cu) or (2) 1/0–250 (Al/Cu)
600	2	4–500 (Al/Cu)	4–500 (Al/Cu)
800	3	3/0–600 (Al/Cu)	3/0–600 (Al/Cu)

[1] 30–100 A switches suitable for 60°C (140 °F) or 75°C (167 °F) conductors. 200–800 A switches suitable for 75°C (167 °F) conductors.
[2] Light duty switches only.

Heavy Duty
Enclosed Safety Switches
General Information

Table 44: Terminal Lug Data [1]

Rating (A)	Wires Per Phase and Neutral	Wire Range Wire Bending Space Per NEC Table 312.6 AWG/kcmil	Lug Wire Range AWG/kcmil	Optional [2] Versa-Crimp™ Compression Lug Field-Installed	Optional Copper Versa-Crimp Compression Lug Field-Installed [2 3]
30	1	12–8 (Al) or 14–8 (Cu)	12–2 (Al) or 14–2 (Cu)	—	C10-14, D8-14, or E6-14
	2	12–10 (Al) or 14–10 (Cu)			
60	1	12–3 (Al) or 14–3 (Cu)	12–2 (Al) or 14–2 (Cu)	—	C10-14, D8-14, or E6-14
100	1	12–1/0 (Al) or 14–1/0 (Cu)	[illegible]	[illegible]	[illegible]
200	1	6–250 (Al/Cu)	6–300 (Al/Cu)	[illegible]	[illegible]
400	1 or 2	[illegible]	[illegible]	[illegible]	[illegible]
600	2	[illegible]	[illegible]	[illegible]	[illegible]
800	3	[illegible]	[illegible]	[illegible]	—
1200	4	[illegible]	[illegible]	[illegible]	—

[illegible footnotes]

Modifications For Factory Assembled Panelboards

Main Circuit Breaker Without Overcurrent Trip

Shunt Trip Circuit Breakers

Special Features

NQ and NF Terminal Data

Table 5.142: NQ Standard Aluminum Mechanical Lugs—Main Lugs

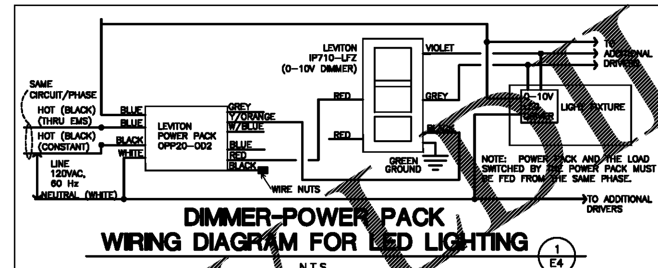
Table 5.143: NQ Standard Aluminum Mechanical Lugs—Main Circuit Breaker

Table 5.147: NF Standard Mechanical Lugs—Main Lugs

Table 5.148: NF Standard Mechanical Lugs—Main Circuit Breaker

GENERAL ELECTRICAL NOTES

1. DRAWINGS ARE DIAGRAMMATIC & ARE NOT TO BE SCALED. SEE THE ARCHITECTURAL PLANS & FIELD VERIFY CONDITIONS FOR DIMENSIONS.
2. ALL ELECTRICAL WORK SHALL COMPLY WITH THE EDITION OF NFPA 70–NATIONAL ELECTRIC CODE (NEC) AS NOTED ON THE CODE SUMMARY SHEET.
3. THE CONTRACTOR SHALL COORDINATE WITH ALL STATE AND LOCAL BUILDING REGULATION AGENCIES AND UTILITY COMPANIES IN THE PROCUREMENT OF AND PAYMENT OF ALL PERMITS, LICENSES, FEES, AND CHANGES REQUIRED FOR THE PERFORMANCE OF THE WORK.
4. THE CONTRACTOR IS RESPONSIBLE FOR ALL FEES AND DIRECT EXPENSES INVOLVED IN ANY INSPECTION REQUIRED FOR THE PROJECT.
5. ALL WIRING SHALL BE IN CONDUIT. ALL UNDERGROUND CONDUIT SHALL BE PVC SCHEDULE 40. EXPOSED OUTDOOR LOCATIONS SHALL BE RGS. ALL INTERIOR CONDUIT SHALL BE EMT ABOVE GRADE. FOOD SERVICE EQUIPMENT, APPLIANCES AND EQUIPMENT WITH MOTORS SHALL BE FLEXIBLE METALLIC CONDUIT. FLEXIBLE METALLIC CONDUIT NOT ALLOWED FOR "HOMERUN" CIRCUITS BEYOND PERIMETER OF ROOM WHERE LOAD IS SERVED. EXCEPT THAT MC–CABLE MAY BE SUBSTITUTED ONLY AS FOLLOWS:
   A. MC–CABLE (MAXIMUM CABLE LENGTH OF 10'–0") MAY BE INSTALLED ONLY FOR BRANCH CIRCUIT WIRING TO LIGHT FIXTURES.
   B. MC–CABLE (MAXIMUM CABLE LENGTHS SHOWN ON DETAIL 2/E2) MAY BE INSTALLED ONLY ABOVE SLAB AND ONLY AT LOCATIONS INDICATED ON SHEET E2.
6. FEEDER CONDUIT SHALL BE IMC OR RGS ABOVE GRADE & PVC BELOW GRADE WITH IMC OR RGS ELLS & RISERS. INTERIOR BRANCH CIRCUIT CONDUIT SHALL BE ELECTRICAL METALLIC TUBING. EXTERIOR BRANCH CIRCUIT CONDUIT SHALL BE PVC BELOW GRADE WITH IMC OR RIGID GALVANIZED STEEL CONDUIT CONTINUING ABOVE GRADE.
7. COORDINATE ALL WORK WITH OTHER TRADES TO AVOID CONFLICTS. COORDINATION DOES NOT MEAN "I WAS HERE FIRST."
8. ALL WIRING IN FINISHED SPACES SHALL BE CONCEALED, UNLESS NOTED OTHERWISE.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING A COMPLETE & FUNCTIONAL SYSTEM IN ACCORDANCE WITH THE INTENT OF THE PLANS, WHETHER OR NOT EVERY ELEMENT THEREOF IS SPECIFICALLY CALLED OUT.
10. COORDINATE ALL EQUIPMENT ROUGH–IN CONNECTION REQUIREMENTS.
11. ALL OUTLET BOXES SHALL BE METALLIC.
12. ALL CAULKING ON BUILDING PENETRATIONS SHALL BE ELASTOMERIC POLYURETHANE (NO EXCEPTIONS), EQUAL TO "VULKEM" 116. ANY CONTRACTOR WHO USES SILICONE OR ANY OTHER CAULKING WILL BE REQUIRED TO REMOVE & REPLACE WITH ELASTOMERIC POLYURETHANE.
13. RECEPTACLES INSTALLED IN RESTROOMS SHALL BE GFCI TYPE OR SHALL BE PROTECTED BY A GFI DEVICE.
14. ALL DEVICES SHALL BE IVORY & SHALL BE EQUAL TO THE FOLLOWING:
    SINGLE POLE SWITCHES –– HUBBELL #CS1221 SERIES
    THREE–WAY SWITCHES –– HUBBELL #CS1223 SERIES
    RECEPTACLES –– HUBBELL #CR5362 SERIES
    APPROVED ALTERNATE MANUFACTURES: LEVITON, PASS AND SEYMOUR.
15. USE DEVICE PLATES MANUFACTURED BY THE DEVICE MANUFACTURER. COLOR BY OWNER.
16. FEEDER & BRANCH CIRCUIT CONDUCTORS SHALL BE COPPER, STRANDED, 600V THHN/THWN INSULATION.
    EXCEPTION: WIRE SIZES #10 AWG & SMALLER SHALL BE SOLID.
17. CONTRACTOR SHALL PROVIDE A TYPED CIRCUIT DIRECTORY FOR ALL PANELS.
18. CONTRACTOR SHALL PROVIDE A ONE (1) YEAR WARRANTY ON ALL WORK PERFORMED.
19. CONTRACTOR SHALL PROVIDE NEW WORKING LAMPS IN ALL LIGHT FIXTURES AT JOB COMPLETION. CONTRACTOR SHALL COORDINATE WITH & SHALL INCLUDE ALL FEES FOR THE SERVING "ELECTRIC UTILITY CO." TO PROVIDE ELECTRIC SERVICE AS SHOWN. CONTRACTOR SHALL ALSO INCLUDE ALL FEES FOR THE "SERVING PHONE COMPANY" TO INSTALL NO LESS THAN 10 PAIR CABLE TO BUILDING.
20. CONTROL WIRING BY HVAC CONTRACTOR. FINAL CONNECTIONS BY HVAC CONTRACTOR. SEE SHEET M1.
21. BRANCH CIRCUITS FEEDING EMERGENCY ILLUMINATION UNITS SHALL BE THE SAME BRANCH CIRCUIT AS THAT SERVING THE NORMAL LIGHTING IN THAT AREA AND CONNECTED AHEAD OF ANY LOCAL SWITCHES. SEE N.E.C. 700–12(E)
22. APPROVED MANUFACTURERS FOR PANELBOARDS: CUTLER HAMMER, GE, SEIMENS, SQUARE D.
23. SUBMIT FOR APPROVAL ELECTRONIC MANUFACTURERS'S DATA ON ALL LIGHTING FIXTURES, SWITCHES, RECEPTACLES, SWITCH GEAR AND SAFETY SWITCHES.
24. GROUNDING AND BONDING SHALL BE IN COMPLIANCE WITH ARTICLE 250 OF THE N.E.C.
25. LIGHTING FIXTURES SHALL BE SPECIFICATION GRADE, LAMPED AND BALLASTED AS SCHEDULED.
26. OUTLET BOXES SHALL BE 4" SQUARE WITH SINGLE AND DOUBLE GANG PLASTER RING. BOXES SHALL BE PRESSED STEEL KNOCKOUT TYPE. INSTALL BOXES SQUARE AND PLUMB, SECURELY FASTENED AND FLUSH WITH THE FINISHED SURFACE.
27. INSTALL ALL CONDUIT PARALLEL AND PERPENDICULAR TO THE LINES OF HE BUILDING STRUCTURE. SUPPORT CONDUIT WITH MANUFACTURED HANGERS AND SPACED IN COMPLIANCE WITH THE N.E.C.
28. COORDINATE PROPER CLEARANCE OF EQUIPMENT INDICATED WITH OTHER WORK IN THAT AREA.
29. UNLESS NOTED OTHERWISE, THE FOLLOWING SHALL BE THE HEIGHT TO THE BOTTOM OF THE OUTLET FROM FINISH FLOOR:
    LIGHT SWITCHES: 48" AFF
    CONVENIENCE OUTLETS 48" AFF
    THERMOSTATS 60" AFF
    TELEPHONE OUTLETS 18" AFF
    DATA OUTLETS 18" AFF
30. BOND ALL NON–CURRENT CARRYING METAL PARTS OF SERVICE ENTRANCE EQUIPMENT (INCLUDING METER ENCLOSURE) PER N.E.C.
31. BOND ALL INTERIOR BUILDING SYSTEM PIPING PER N.E.C.
32. ALL BRANCH CIRCUITS SHALL HAVE AN EQUIPMENT GROUNDING CONDUCTOR ROUTED WITH THE CIRCUIT CONDUCTORS. THIS MEANS ALL CONDUITS MUST HAVE A GREEN WIRE INSTALLED IN THEM AND SIZED IN ACCORDANCE WITH TABLE 250–122 OF THE N.E.C..



DIMMER–POWER PACK WIRING DIAGRAM FOR LED LIGHTING (1/E4)
N.T.S.

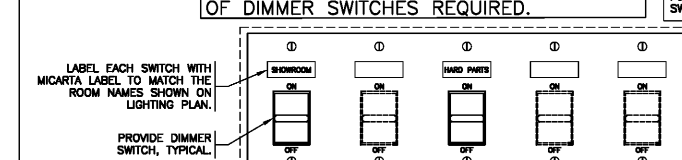
ELECTRICAL SYMBOL LEGEND & ABBREVIATIONS

Symbol	Description
$	SINGLE POLE SWITCH
$2	TWO POLE SWITCH
$3	THREE–WAY SWITCH
$MP	MOTOR STARTING SWITCH WITH PILOT LIGHT
$X	CLASS 1, DIVISION 1 HAZARDOUS LOCATION RATED SWITCH ASSEMBLY
$PW	WALL MOUNTED OCCUPANCY SENSOR EQUAL TO "SENSORSWITCH WSX D IV"
$PW2	WALL MOUNTED OCCUPANCY SENSOR EQUAL TO "SENSORSWITCH WSX 2P FAN–IV" "CONTRACTOR SHALL DISABLE MANUAL SWITCHES PER MANUFACTURERS INSTRUCTIONS. SWITCH SHALL BE FULLY AUTOMATIC."
$SS	FAN SPEED SWITCH (SUPPLIED BY HVAC CONTRACTOR / INSTALLED BY ELECTRICAL CONTRACTOR)
$D	0–10V LED DIMMER SWITCH, EQUAL TO "LEVITON, IP710–LFZ". SEE DETAILS THIS SHEET (5–GANG MAX)
PP	LEVITON POWER PACK OPP20–0D2
	SINGLE RECEPTACLE
	DUPLEX RECEPTACLE
	ISOLATED GROUND DUPLEX RECEPTACLE, DEVICES AND COVERPLATE SHALL BE ORANGE. SEE DETAIL 1/E3
R	DUPLEX RECEPTACLE. DEVICES AND COVERPLATE SHALL BE RED
R	ISOLATED GROUND DUPLEX RECEPTACLE. DEVICES AND COVERPLATE SHALL BE RED
	QUADPLEX RECEPTACLE (TWO DUPLEX RECEPTACLES IN ONE 2–GANG BOX UNDER A SINGLE COVERPLATE)
	EXISTING UNPOWERED DUPLEX RECEPTACLE
R	ISOLATED GROUND QUADPLEX RECEPTACLE (TWO ISO. GRD. DUPLEX RECEPTACLES IN ONE 2–GANG BOX UNDER A SINGLE COVERPLATE. DEVICES AND COVERPLATE SHALL BE RED
S	QUADPLEX RECEPTACLE (CIRCUIT TO BE WIRED THRU OCCUPANCY SENSOR) INSTALL A PERMANENT LABEL ON EACH OUTLET STATING "SENSOR CONTROLLED OUTLET". SEE DETAIL ON SHEET E2
AC	ABOVE COUNTER GFCI (GROUND FAULT CIRCUIT INTERRUPTING) DUPLEX RECEPTACLE
WP	WEATHER PROOF GFCI (GROUND FAULT CIRCUIT INTERRUPTING) DUPLEX RECEPTACLE. COVER TO PROVIDE WEATHER PROOF PROTECTION WITH CORD AND PLUG IN USE
	TELE–POWER POLE
J	JUNCTION BOX
PC	REMOTE PHOTO CONTROL
	COMPUTER DATA OUTLET BOX.
	TELEPHONE OUTLET BOX.
	TELEPHONE OUTLET FLOOR BOX. SEE DETAIL 4/E2.
	4" SQUARE STEEL BOX MOUNTED FLUSH ON FLOOR W/QUADPLEX RECEPTACLE (SEE ABOVE RECEPTACLE DESCRIPTION). SEE DETAIL 4/E2 FOR INSTALLATION OF BOX.
	4" SQUARE STEEL BOX MOUNTED FLUSH ON FLOOR W/QUADPLEX ISOLATED GROUND RECEPTACLE (SEE ABOVE ISOLATED GROUND RECEPTACLE DESCRIPTION). SEE DETAIL 4/E2 FOR INSTALLATION OF BOX
R	4" SQUARE STEEL BOX MOUNTED FLUSH ON FLOOR W/QUADPLEX ISOLATED GROUND RECEPTACLE (SEE ABOVE ISOLATED GROUND RECEPTACLE DESCRIPTION). SEE DETAIL 4/E2 FOR INSTALLATION OF BOX. DEVICES AND COVERPLATE SHALL BE RED.
	2" x 4" RECTANGULAR STEEL BOX MOUNTED FLUSH ON FLOOR W/DUPLEX RECEPTACLE (SEE ABOVE RECEPTACLE DESCRIPTION). SEE DETAIL 4/E2 FOR INSTALLATION OF BOX
●	NEMA L5–30R – SPECIAL RECEPTACLE
	MOTOR
XX/XX	FUSED DISCONNECT (SAFETY) SWITCH W/ SWITCH AMPACITY / FUSE AMPACITY AS INDICATED
	NON–FUSED DISCONNECT (SAFETY) SWITCH
	POWER OR LIGHTING PANEL W/PANEL DESIGNATION SHOWN ON PLAN (SIZES & MOUNTING INDICATED ON PLANS)
	24 HOUR EGRESS & SECURITY LIGHT, WIRE DIRECT TO ELECTRIC PANEL AHEAD OF ANY LOCAL SWITCHES AND LIGHTING CONTROL PANEL
XR	WALL/CEILING MOUNTED COMBINATION "EXIT/EMERGENCY" SIGN W/SHADING INDICATING FACES
EM	EMERGENCY LIGHTING FIXTURE WITH BATTERY
PLP–11,13	FEEDING PANEL AND CIRCUIT NUMBER(S); NOTE: EQUIPMENT GROUND CONDUCTOR NOT SHOWN; CIRCUIT CONDUCTORS; GROUNDED CIRCUIT CONDUCTOR (OR NEUTRAL)
MD	MOTION DETECTOR – SEE EM SHEETS FOR MORE INFORMATION
OS	OCCUPANCY SENSOR EQUAL TO "LEVITON, OSC20–MAW" WITH POWER PACK

AC	LOCATED ABOVE COUNTER	RTU	PACKAGED ROOFTOP UNIT	UPO	UN–POWERED OUTLET
AFF	ABOVE FINISHED FLOOR	IMC	INTERMEDIATE METALLIC TUBING	TS	TIME SWITCH
BCU	BLOWER COIL UNIT	LC	LIGHTING CONTRACTOR	W	WALL OUTLET (46" AFF SEE MOUNTING HEIGHTS)
CDU	CONDENSING UNIT	M	MOTOR STARTING	WP	WEATHERPROOF (ENCLOSURE)
EF	EXHAUST FAN	R	RED IN COLOR DEVICES & COVERPLATE	X	EXPLOSION PROOF ASSEMBLY
EFU	ELECTRIC FURNACE	MP	MOTOR STARTING W/PILOT LIGHT	GFCI	GRD./FAULT CIRCUIT INTERRUPT
FURN	GAS FURNACE	NL	NIGHT LIGHT	EMT	ELECTRICAL METALLIC TUBING
AHU	AIR HANDLER	PEC	PHOTOELECTRIC CONTROL	CM	CEILING MOUNTED
HP	HEAT PUMP UNIT	RGS	RIGID GALVANIZED STEEL		
PP	POWER PACK				

SEE LIGHTING PLAN FOR ACTUAL QUANTITY OF DIMMER SWITCHES REQUIRED.

5–GANG MAX FOR DIMMER SWITCHES



VERIFY QUANTITY OF DIMMER SWITCHES REQUIRED WITH LIGHTING PLAN.

MORE THAN 4 DIMMER ARE REQUIRED

LIGHT SWITCH LABELS AND ARRANGEMENT (2/E4)
N.T.S.

ENGINEER OF RECORD RYAN JONES
ENGINEER LICENSE NUMBER 34781

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ELECTRICAL NOTES

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DATE: 03/29/2019	
REVISION:	
PROJECT NUMBER: 19035-HHL	
SHEET NUMBER E4	

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