

SEATTLE CITY LIGHT
CONSTRUCTION GUIDELINE

STANDARD NUMBER. **NTP-80**
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 SUPERSEDING: March 9, 2017
 EFFECTIVE DATE: July 28, 2017

Network Protector Fusing, Lead Sizes and Relays
 Protector Ratings and Lead Sizes per Transformer Capacity

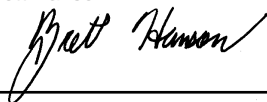
125/216 Volt							
Transformer			Protector	Secondary Cable			
Size kVA	Full Load Amps	Overload Amps	Rating Amps	No. of Cables & Size	Normal Amps Notes 1 & 2	Overload Amps Notes 1 & 2	Network Protector Grounding Wire
500	1336	1670	1600	2-750 Cu 3-500 Cu	1389 1514	1763 1923	500
500/560	1497	1871	1875	3-500 Cu	1514	1923	500
750	2005	2506	2500	3-750 Cu 4-500 Cu	1950 1926	2473 2446	750
750/840	2246	2807	2825	4-750 Cu 5-500 Cu	2480 2291	3152 2910	750
1000	2673	3341	3000	5-750 Cu 6-500 Cu	2950 2749	3750 3491	750
1000/1120	2994	3742	3500	5-750 Cu	2950	3750	750

277/480 Volt							
Transformer			Protector	Secondary Cable			
Size kVA	Full Load Amps	Overload Amps	Rating Amps	No. of Cables & Size	Normal Amps Notes 1 & 2	Overload Amps Notes 1 & 2	Network Protector Grounding Wire
500	600	750	800	1-500 Cu	580	737	250
500/560	670	838	800	1-750 Cu	747	950	250
750	900	1125	1200	2-500 Cu	1079	1370	250
750/840	1008	1260	1200	2-500 Cu	1079	1370	250
1000	1200	1500	1600	2-750 Cu 3-500 Cu	1389 1514	1763 1923	500
1000/1120	1344	1680	1875	2-750 Cu 3-500 Cu	1389 1514	1763 1923	500
1500	1800	2250	2500	3-750 Cu 4-500 Cu	1950 1926	2473 2446	750
1500/1680	2016	2520	2825	3-750 Cu 4-500 Cu	1950 1926	2473 2446	750
2000	2400	3000	3000	4-750 Cu 5-500 Cu	2480 2407	3152 3057	750
2000/2240	2688	3360	3500	6-500 Cu	2749	3491	750
2500	3000	3750	4000	5-750 Cu	2950	3750	750
2500/2800	3360	4200	4500	6-750 Cu	3541	4497	750

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NETWORK PROTECTOR FUSING, LEAD SIZES AND RELAYS

NOTES

1. Cable ampacities are calculated from free air ratings of triplexed cable multiplied by de-rating factor for racking cable when more than one set of cables is required. For cable overload calculations, normal condition was multiplied by 1.27. See Okonite Engineering Bulletin # EHB-81.
2. Network protector leads in conduit must be derated for that condition and additional leads added as required.
3. 750 kcmil aluminum cable may be used in place of 500 kcmil copper.
4. For racking requirements of network protector cables see Construction Guideline NCI-160.
5. Transformers with dual ratings are 55°/ 65° rise. Present specifications require 55°/ 65° average winding temperature rise transformers.
6. Network protector rating to transformer size is based on NEMA Publication SG 3.1.
7. Network protectors are ordered in accordance with City Light Material Standards 4382.16 and 4384.80.
8. Do not place limiters on protector leads where bus and transformer are in the same vault.

Cable Stock Numbers:	500 kcmil	Copper	613740
	750 kcmil	Copper	613743

NETWORK PROTECTOR FUSING, LEAD SIZES AND RELAYS**PROTECTORS, BUS TIE SWITCHES, FUSES AND RELAYS****NETWORK PROTECTORS**

Each network protector requires a relay and a set of three fuses, as listed below.

Transformer Mount, Submersible

SCL Material Standard 4382.16

Stk. No.	Amps	Voltage
336205	1875*	216Y/125 – 480Y/277 V
336207	2825	216Y/125 – 480Y/277 V
334209	3500	480Y/277 V

*With 800/1200/1600:5 multiple rated current transformers.

Transformer Mount, Submersible, 480 V

SCL Material Standard 4384.80

Stk. No.	Amps	Voltage
337205	1875	480Y/277 V
337207	2825	480Y/277 V
337209	3500	480Y/277 V
337210	4500	480Y/277 V

BUS TIE SWITCHES

Bus tie switches are controlled by the fire protection system. Relays and fuses are not required.

Wall Mounted, Submersible

SCL Material Standard 4388.88

Stk. No.	Amps	Voltage
335205	1875	216Y/125 – 480Y/277 V
335207	2825	216Y/125 – 480Y/277 V

RELAY, Network Protector

Solid state. For installation in new Westinghouse-style network protectors including Eaton, Cutler Hammer or Richards.

Note: not to be used for replacement of electromechanical relays or on network protectors with ungrounded current transformers.

Stk. No.	Manufacturer	Model
013087	Digital Grid	DG-6001
014261	ETI	521038
014262	Eaton	MPCV-2X 6417C83G03

FUSES, Network Protector

TRANSFORMER		NETWORK PROTECTOR			FUSE		RELAY
kVA	Secondary Voltage	Stock No.	Voltage	Amps	Stock No.	Type	Stock No.
			313NP or CM22				013087
500	216Y/125	336205	216Y/125	1875	683471	Y	013087
750	216Y/125	336207	216Y/125	2825	683472	Z	013087
			313NP or CM22 – FOR REPLACEMENT ONLY				
500	480Y/277	336205	480Y/277	1875	683480	Lead alloy	013087
750	480Y/277	336205	480Y/277	1875	683481	Lead alloy	013087
1000	480Y/277	336205	480Y/277	1875	683471	Z	013087
1500	480Y/277	336207	480Y/277	2825	013857	Z	013087
2000	480Y/277	334209	480Y/277	3500	683472	Z	013087
			CM52				
500	480Y/277	337205	480Y/277	1875	014085	Silver sand	013087
750	480Y/277	337205	480Y/277	1875	014085	Silver sand	013087
1000	480Y/277	337205	480Y/277	1875	014085	Silver sand	013087
1500	480Y/277	337207	480Y/277	2825	014086	Silver sand	013087
2000	480Y/277	337209	480Y/277	3500	014087	Silver sand	013087
2500	480Y/277	337210	480Y/277	4500	014088	Silver sand	013087

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NETWORK PROTECTOR FUSING, LEAD SIZES AND RELAYS
NETWORK PROTECTOR REPLACEMENT RELAYS AND FUSES

REPLACEMENT RELAYS, Network Protector, Solid State

Electromechanical CAN, CAL, CN-33, CN-J, BN and GE time-delay modules can also be used as in-kind replacements if available.

Network Protector			Relay			
Voltage	Manufacturer/Type	C.T Config.	City Light Spares No.	Manufacturer Model		
				Cutler Hammer	ETI	Digital Grid
216Y/125	Cutler Hmr/West CM22	grounded	-	MPCV-2X	521038	DG-6001
216Y/125	Cutler Hmr/West CM22	energized	5-036118	MPCV-22 216V	521023	-
216Y/125	General Electric MG8/9	-	5-036120	MPCV-GE	521075	DG-6011
216Y/125	Cutler Hmr/West CMD	-	5-036117	MPCV-D	531023	DG-6001
480Y/277	Cutler Hmr/West CM22	grounded	-	MPCV-2X	521038	DG-6001
480Y/277	Cutler Hmr/West CM22	energized	5-036118	MPCV-22 216V	521023	-
480Y/277*	Cutler Hmr/West CM22	energized	5-036119	MPCV-22 480V	-	-
480Y/277	General Electric MG8/9	-	5-036120	MPCV-GE	521075	DG-6011
480Y/277	Cutler Hmr/West CMD	-	5-036117	MPCV-D	531023	DG-6001
480Y/277	General Electric MG14	-	5-036120	MPCV-GE	521075	DG-6001

*CM22 without control transformers, 480 volt relays

REPLACEMENT FUSES, Network Protector

Network Protector			Replacement Fuse		Old Existing Fuse Information		
Voltage	Rating (Amps)	Manufacturer/Type	Stock No.	Spares No.	Type	Manufacturer	Catalog No.
216Y/125	1600	CM22; MG8/9; 313NP	-	5-035486	Y	Burndy	Y-22.5
216Y/125	1875	CM22; MG8/9; 313NP	683471	-	Y	Burndy	Y-25
216Y/125	1875	Cutler Hmr/West CMD	-	5-035390	silver sand	Cutler Hammer	140D318G01
216Y/125	2500/2825	CM22; MG8/9; 313NP	683472	-	Z	Burndy	Z-37.5
216Y/125	2825	Cutler Hmr/West CMD	-	5-036115	silver sand	Cutler Hammer	140D318G02
216Y/125	3000/3500	CM22; MG8/9; 313NP	-	5-035491	Z	Burndy	Z-50
480Y/277	800	CM22; MG8/9; 313NP	683480	-	lead alloy	Cutler Hammer	1254872
480Y/277	800	Cutler Hmr/West CMD	-	5-036116	silver sand	Cutler Hammer	140D318G04
480Y/277	1200	CM22; MG8/9; 313NP	683481	-	lead alloy	Cutler Hammer	1300550
480Y/277	1200	Cutler Hmr/West CMD	-	5-036114	silver sand	Cutler Hammer	140D318G05
480Y/277	1600	CM22; MG8/9	-	5-036112	lead alloy	Cutler Hammer	1300551
480Y/277	1875	CM22; MG8/9; 313NP	013856	-	lead alloy	Cutler Hammer	14A5795G06
480Y/277	1875	Cutler Hmr/West CMD	-	5-035390	silver sand	Cutler Hammer	140D318G01
480Y/277	2500	CM22; MG8/9	-	5-036113	lead alloy	Cutler Hammer	1332318
480Y/277	2825	CM22; MG8/9; 313NP	013857	-	lead alloy	Cutler Hammer	1615572
480Y/277	2825	Cutler Hmr/West CMD	-	5-036115	silver sand	Cutler Hammer	140D318G02
480Y/277	3000/3500	CM22; MG8/9; 313NP	683472	-	lead alloy	Cutler Hammer	15A4106G04
480Y/277	4500	General Electric MG14	-	5-035491	Z	Burndy	Z-50

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