

Meter Department Pre-Made Wire Bundles
All are solid copper wire

- 1Ø Potentials #14 gauge Black, Green, White
 Currents #12 gauge Blue, Yellow, Brown
- 3Ø Potentials #14 gauge Black, Green, White, Orange
 Currents #12 gauge Blue, Yellow, Brown, Red

Note:

Maximum distance for #12 current wire is 35 feet one way to meet burden of 0.2 on rating factor 4 C.T.'s. For C.T. conduit run over 35 feet use #10 current wire to a maximum of 60 feet for a burden of 0.2. If a longer conduit run than 60 feet is unavoidable – see meter department for C.T. and burden chart's and C.T. sizing.

DISTANCE CHART				
	CT TO METER DISTANCE	TOTAL WIRE DISTANCE	SOLID STATE METER	ADD ELECTRICAL MECHANICAL
#12 WIRE @ .01588 OHM PER 10'			0.01	0.05
			0.002 <MISC>	0.002
			0.009 <TEST SW>	0.009
	35'	70'	0.132	0.17216
	50'	100'	0.1798	0.2198
	70'	140'	0.243	0.28332
	100'	200'	0.3386	0.3786
	125'	250'	0.418	0.458
#10 WIRE @ .009989 OHM PER 10'	150'	300'	0.4974	0.5374
	60'	120'	0.1408	0.1808
	75'	150'	0.1708	0.2108
	80'	160'	0.1808	0.2208
	100'	200'	0.2208	0.2608
	200'	400'	0.4206	0.461

CLARK PUBLIC UTILITY

METERING REQUIREMENTS BASED ON EUSERC SPECIFICATIONS

TYPE OF SERVICE OR SOURCE VOLTAGES	SIZE	NUMBER OF TERMINALS	BYPASS PROVISION	TEST SWITCH	DEMAND METERING	REACTIVE METERING
SINGLE PHASE 120/240 VOLTS (Swimming pools over 35kw will be C.T.'d or 320 amp)	Commercial	200 amp	4	BLOCK BYPASS *	NO	20KW OR GREATER NO
	Residential	200 amp	4	NO	NO	NO
		320 amp	4	BLOCK BYPASS	NO	COMMERCIAL ONLY NO
	Commercial	C.T.	6	NO	YES	20KW OR GREATER NO
	Residential	C.T.	6	NO	NO	NO
NETWORK 120/208V (2 LEGS OF Y)	Commercial	200 amp	5	SAFETY SOCKET	NO	NO
	Residential	200 amp	5	NO	NO	NO
	Commercial	C.T.	8	NO	YES	NO
4 WIRE WYE 120/208 VOLTS	200 amp	7	SAFETY SOCKET	NO	YES	NO
	C.T.	13	NO	YES	YES	YES *
4 WIRE DELTA 240/120 VOLTS	200 amp	7	SAFETY SOCKET	NO	YES	NO
	C.T.	13	NO	YES	YES	YES *
3 WIRE 3 ϕ DELTA 240V (Existing service only. New services, current trans. Will be 4 wire 240/120)	200 amp	5	SAFETY SOCKET	NO	YES	NO
	C.T.	8	NO	YES	YES	YES *
3 WIRE 3 ϕ DELTA 480V (Existing service only. New services, current trans. Will be 4 wire 240/480)	200 amp	5	SAFETY SOCKET	NO	YES	NO
	(Contact district about type of socket and whether or not current transformers and reactive metering will be required before making any 480 volt installations)					
4 WIRE 3 ϕ 277/480 VOLTS	200 amp B/base	7	SAFETY SOCKET	NO	YES	NO
	C.T. & V.T.	13	NO	YES	YES	YES *
	Prim. Met. 7200/120 P.T. & C.T.	13	NO	YES	YES	YES *

C.T. – Current Transformer

V.T. – Voltage Transformer

Rev 2 – Changed blocks marked with a *.



CONSTRUCTION STANDARDS

METERING REQUIREMENTS GENERAL

REVISIONS

R	DATE	ENGR	OPS
0	8/20/02		
1	8/2/05	LB	AH
2	1/13/10	CM	AH

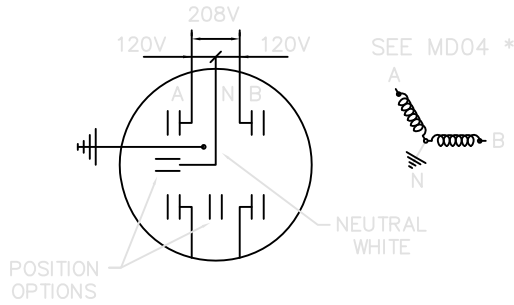
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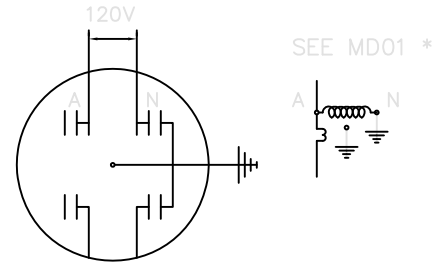
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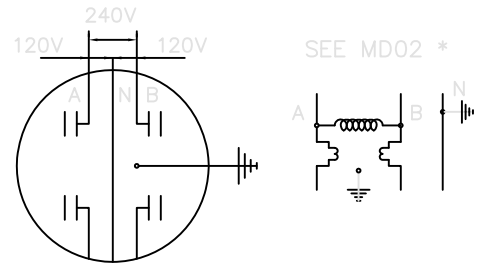
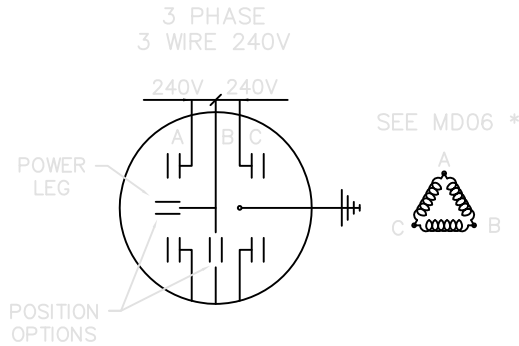
120/208V
1 PHASE NETWORK



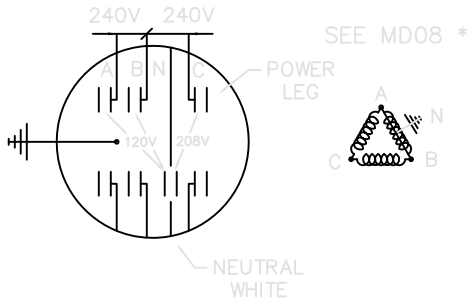
120V
2 WIRE



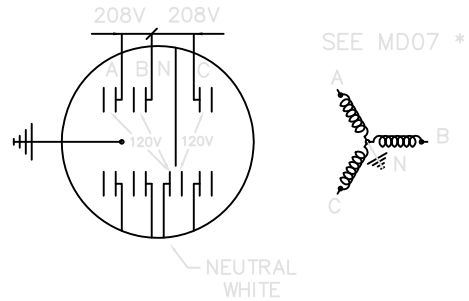
SINGLE PHASE
3 WIRE 120/240V



3 PHASE 4 WIRE
DELTA 240/120V



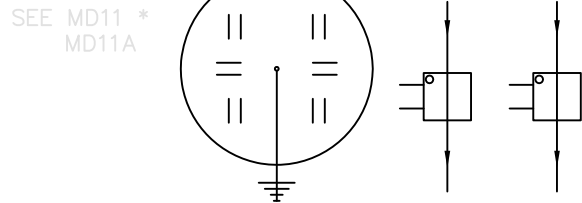
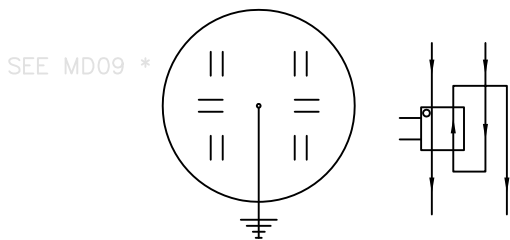
3 PHASE 4 WIRE
WYE 120/208V
(or 277/480V)



3 WIRE SERVICE USING ONE
C.T. 6 TERMINAL SOCKET

C.T. RATED

3 WIRE SINGLE SERVICE USING 2
C.T.'s 6 TERMINAL SOCKET



LEGEND


 CURRENT COIL
 VOLTAGE COIL

ALL METER SOCKETS TO BE GROUNDED

* REV. 1 – Added Metering Diagram Numbers.



CONSTRUCTION STANDARDS
METERING REQUIREMENTS
GENERAL

REVISIONS			
REV	DATE	ENGR	OPS
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1	8/2/05	LB	AH
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Clark Public Utilities Metering Requirements
Commercial Applications

Source Voltage	Ampacity	Reference Circle AW Part Number	Meter Diagram Numbers	Number of Terminals	Bypass Provision Required	Test Switch Required
120 Volts 1Ø 2 Wire	0-100 Amps	U121314*	MD01	4	Yes	No
120/240Volt 1Ø 3Wire	0-200 Amps	U264	MD02	4	Yes	No
120/240Volt 1Ø 3Wire	0-400 Amps	324N, 324NF	MD03	4	Yes	No
120/240Volt 1Ø 3Wire	Over 200 Amps	12146	MD10 MD11	6	No	Yes
240/480Volt 1Ø 3Wire	0-200 Amps	124TB	MD02 MD05 Dmd	4	Yes	No
240/480Volt 1Ø 3Wire	Over 200 Amps	12146	MD10 MD11	6	No	Yes
120/208Volt 3Wire Network	0-200 Amps	125TB	MD04	5	Yes	No
120/208Volt 3Wire Network	Over 200 Amps	12148	MD12	8	No	Yes
240Volt 3Ø 3Wire Delta	0-200 Amps	125TB	MD06	5	Yes	No
120/208Volt 3Ø 4Wire Wye	0-200 Amps	127TB	MD07	7	Yes	No
120/208Volt 3Ø 4Wire Wye	Over 200 Amps	121413	MD13	13	No	Yes
240/120Volt 3Ø 4Wire Delta	0-200 Amps	127TB	MD08	7	Yes	No
240/120Volt 3Ø 4Wire Delta	Over 200 Amps	121413	MD14	13	No	Yes
277/480Volt 3Ø 4Wire Wye	0-200 Amps	127TB	MD07	7	Yes	No
277/480Volt 3Ø 4Wire Wye	Over 200 Amps	121413	MD13	13	No	Yes
480Volt 3Ø 3Wire Delta	0-200 Amps	125TB	MD06	5	Yes	No
480Volt 3Ø 3Wire Delta	Over 200 Amps	12148	MD12	8	No	Yes

Circle AW part numbers are for cross reference only.

All Commercial current transformer cabinets shall have hinged doors.

CURRENT TRANSFORMER CABINET DIMENSIONS, CT MOUNTING BASE


Amperes	Dimensions	Circle AW or Equivalent
200 Amps- 400 Amps 1Ø	24" X 30" X 11"	6019-HAL (LUG LUG)
401 Amps- 800 Amps 1Ø	30" X 36" X 11"	6019-HEL (LUG LUG)
200 Amps- 400 Amps 3Ø	30" X 36" X 11"	6019-HAL or 6067-HAL
401 Amps- 800 Amps 3Ø	36" X 48" X 11"	6019-HEL or 6067-HEEL

See EUSERC Spec – 328B & 329B

Over 800 Amps Switchgear Required

Maximum wire size 600 MCM per lug or parallel per EUSERC SPEC. & UL label

Rev 4: Changed blocks with a *.

	<p>CONSTRUCTION STANDARDS</p> <p>METERING REQUIREMENTS COMMERCIAL APPLICATION</p>			<p>REVISIONS</p>																									
	<p>PAGE: 3 of 4</p>	<p>M</p>		<p>CAD FILE: M</p>	<table border="1"> <thead> <tr> <th>Δ</th> <th>DATE</th> <th>ENGR</th> <th>OPS</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>8/2/05</td> <td>LB</td> <td>AH</td> </tr> <tr> <td>2</td> <td>12/19/07</td> <td>LB</td> <td>AH</td> </tr> <tr> <td>3</td> <td>1/13/10</td> <td>CM</td> <td>AH</td> </tr> <tr> <td>4</td> <td>6/18/10</td> <td>KJP</td> <td></td> </tr> </tbody> </table>	Δ	DATE	ENGR	OPS	1	8/2/05	LB	AH	2	12/19/07	LB	AH	3	1/13/10	CM	AH	4	6/18/10	KJP		<table border="1"> <thead> <tr> <th>APP:</th> <th>SECTION</th> </tr> </thead> <tbody> <tr> <td>JEH</td> <td>900</td> </tr> </tbody> </table>	APP:	SECTION	JEH
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Clark Public Utilities Metering Requirements

Residential Applications

Source Voltage	Ampacity	Reference Circle AW Part Number	Meter Diagram Numbers	Number of Terminals	Bypass Provision Required	Test Switch Required
120 Volts 1Ø 2 Wire	0-100 Amps	011	MD01	4	No	No
120/240 Volt 1Ø 3 Wire	0-200 Amps	204, U204	MD02	4	No	No
120/240 Volt 1Ø 3 Wire	0-400 Amps	324N, 324NF	MD03	4	Yes	No
120/240 Volt 1Ø 3 Wire	Over 400 Amps	U011, 011, 925 or 926	MD09 MD11A	5 or 6	No	No

Circle AW part numbers are for cross reference only.

CURRENT TRANSFORMER CABINET DIMENSIONS, CT MOUNTING BASE

Amperes	Dimensions	Circle AW or Equivalent
200 Amps- 400 Amps 1Ø Window	24"h X 32"w X 9"d	PED
*401 Amps- 800 Amps 1Ø Buss Mt.	24"h X 30"w X 11"d hinged door	6019-HAL (LUG LUG)
200 Amps- 400 Amps 3Ø Window	30"h X 36"w X 11"d	PED
*401 Amps- 800 Amps 3Ø Buss Mt.	36"h X 48"w X 11"d hinged door	6019-HEL (LUG-LUG)

* Optional

- Notes: 1. CT Metering for 200- 400 Amp panels required pre-approval from Clark Public Utilities
 2. All CT cans shall be mounted outside.

Rev 2: Add optional CT cabinet dimensions and notes.


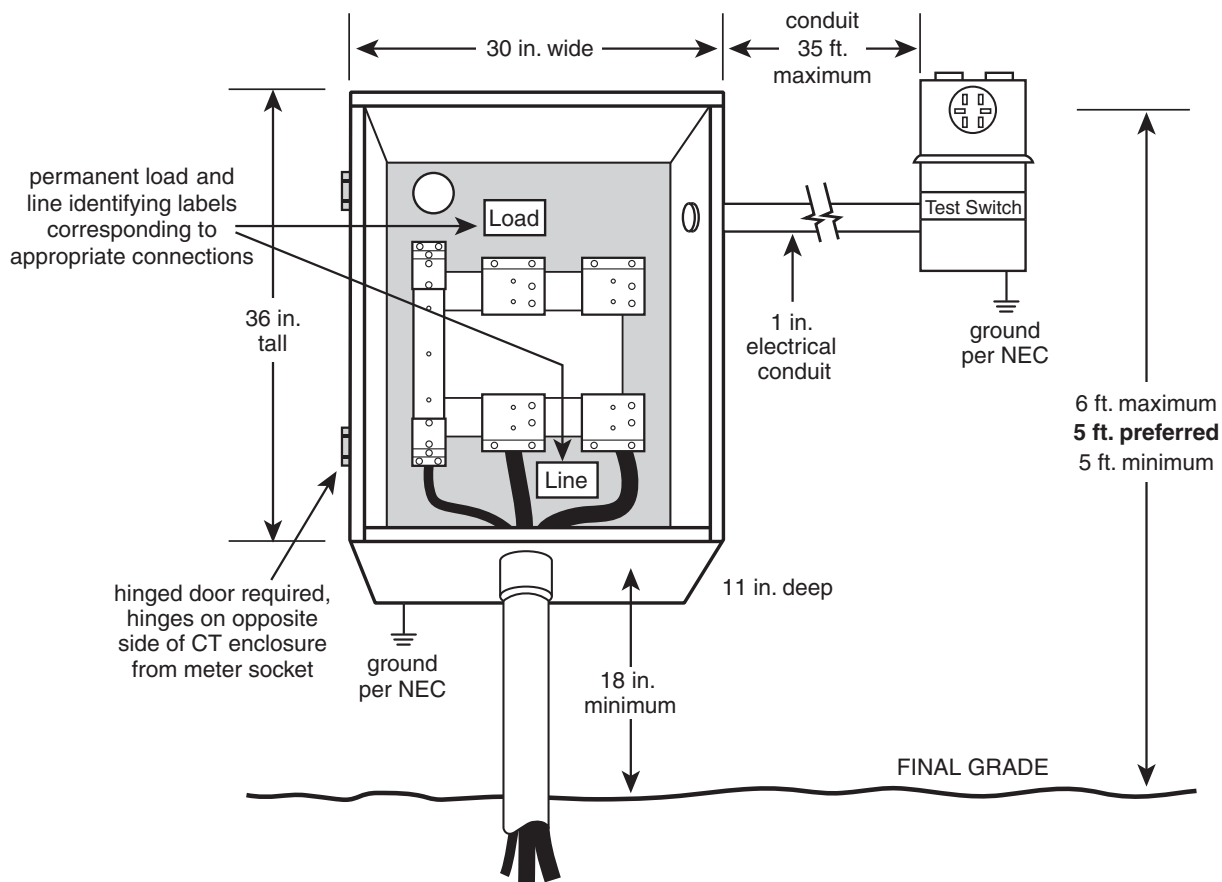
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				1	8/2/05	LB	AH
				2	12/19/07	LB	AH
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Figure 8 Typical 401–800 amp single-phase current transformer (CT) metering

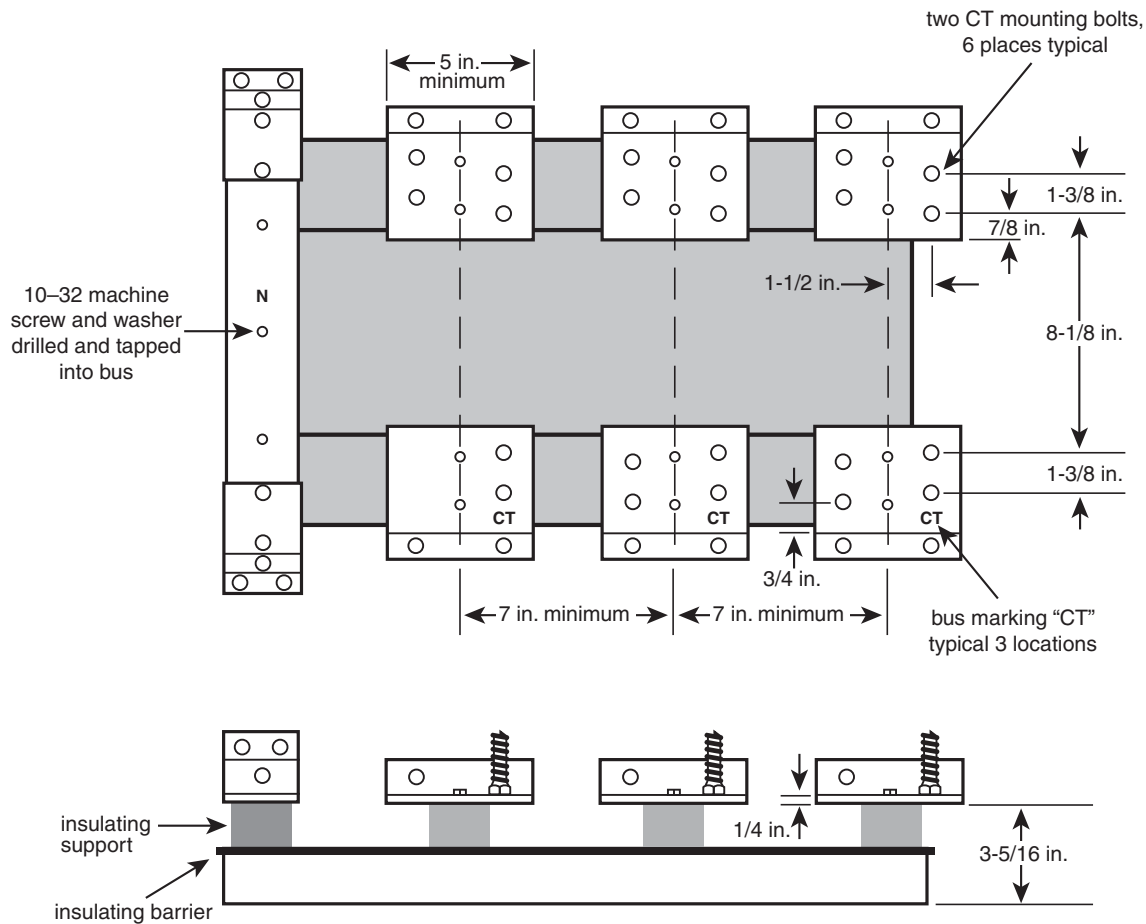
CT mounting base

Installation requirements for current transformer mounting bases are as follows (*Figure 9*):

- ▶ Mounting base is rated for a minimum of 50k amps fault current.
- ▶ Line and load side terminations require two bolts per connector and two bolts on the **neutral** bus.
- ▶ The customer furnishes all lugs and terminates both load and line side conductors to the bus.
- ▶ A 4-wire delta service requires orange marking of the high leg.

Switchboard metering

Switchboard metering is required for three-phase services over 800 amps. At the customer's option, this type of metering may be installed for services sized 201 to 800 amps. The customer-installed equipment must be EUSERC-approved.

Figure 9 Commercial three-phase CT mounting base

NOTE: For additional information see EUSERC drawing 329B.

All customer-installed switchboards require a:

- ▶ Current transformer (CT) mounting base.
- ▶ Service section.
- ▶ Set of bus bars/links.
- ▶ Panel(s).
- ▶ Meter base with provisions for a test switch.
- ▶ Means for locking the meter enclosure with independent 24-hour access to utility personnel.
- ▶ Concrete mounting pad.
- ▶ Case ground as required per the NEC.

NOTE: Customers requiring more than 480 volts of service will have primary metering. Ownership and maintenance agreements for primary metered services will be mutually agreed upon with Clark Public Utilities.

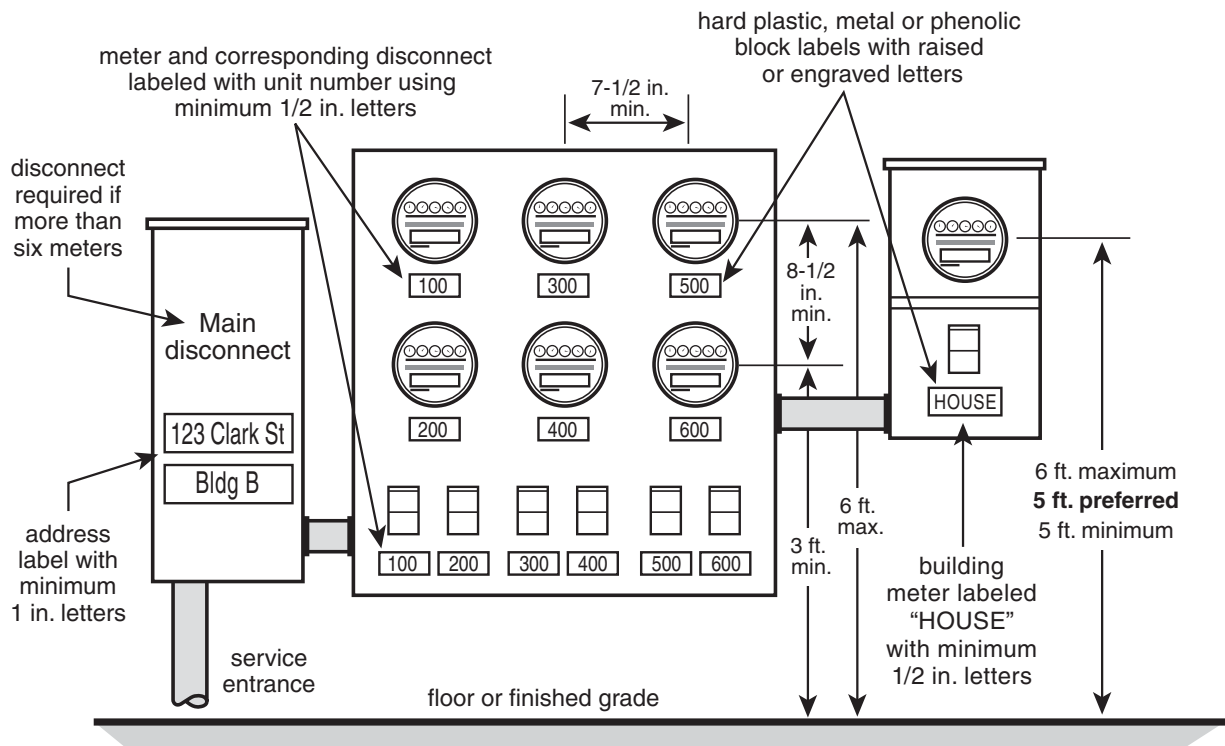
Multiple metered services

Commercial tenant spaces

Non-residential multiple meter installations such as ganged, modular and switch-board metering have the following requirements:

- ▶ Spacing to socket centers a minimum of 3 feet and a maximum of 6 feet above the finished grade or the floor of an approved equipment room (factory-built meter packs require meters installed at least 3 feet above the ground).
- ▶ Meter packs with more than six meters require a main disconnect per the NEC (*Figure 10*).
- ▶ All self-contained meter bases require a safety socket or a manual link bypass.
- ▶ Each metered service is permanently labeled. (See *Multiple meter labeling* section for additional information.)
- ▶ Panel covers must be secured prior to connection of the service.

Figure 10 Multiple meter socket detail



NOTE: See page 31 for meter base bypass requirements.