SaskPower	Self-Contained Socket Type Meter Exchange Less than 300V - Energized	Standard Operating Procedure

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1.0 Purpose

This SOP provides:

- A standard operating procedure intended to reinforce safe work procedure when performing exchanges of self-contained metering less than 300 volts in the energized state

2.0 Roles and Prerequisites

Role(s)	Quantity Required	Prerequisites
Qualified electrical worker(s)	1 or more	1. Clear understanding of the information contained within this SOP

3.0 Tools and Equipment

Minimum Tools and Equipment Required:

- Required Personal Protective Equipment (PPE)
- FR clothing (as required by Arc Flash Tables)
- Arc rated face shield
- Minimum Class Zero rubber gloves
- Meter Removal/Install Device (Meter Puller)
- Jaw Tester
- Supply of meters, replacement seals and sealing rings
- Basic installation tools
- Fire Extinguisher (Accessible if required)
- Ladder (Accessible if required)
- Deox

4.0 Procedure

The Procedure

NOTE: The following requirements shall be met prior to the start of the procedure:

- Complete Hazard, Aspect and Risk Assessment (HARA)
- Applicable Personal Protective Equipment (PPE) is available and in good condition
- Consider Environmental Best Management Practices

1.0 Prepare to use Personal Protective Equipment and Safety Equipment

- *Meter removal tool, class Zero rubber gloves and face shield*
  - Are to be used together while installing and removing the meter
- *Ladder*
  - To be used if the meter is above the workers reach
- *Fire Extinguisher*
  - Fire extinguisher must be present in vehicle, not required at site of exchange

2.0 Identify Hazards

2.1 Identify Hazards

2.1.1 Qualified worker shall identify hazards that should raise awareness

- *Meter socket is not properly secured to the attachment point*
- *Meter socket is not level*
- *Meter is not oriented in the Meter socket correctly*
- *Conduit is pulled out of the bottom of the Meter socket*
- *Burn marks or other evidence of previous ground faults*
- *Meter socket cover is broken, improperly placed or missing*
- *Missing seal or ring or condition of the ring*
- *Cable/Phone wires pulled tight on conduit*
- *Discoloration of meter glass*
- *Face-plate information found indicates a different form type*
- *Oil marks on the bottom of the meter glass*
- *Obvious evidence of tampering*
- *Evidence of excessive ground settling (i.e., sunken driveway or sidewalks, exposed concrete below parging, cracks in the house or foundation, etc.)*
- *Height of the meter, anything over 6 feet may indicate ground settling*
- *Excessive speed of the spinning disc inside the meter (indicative of excessive load current)*
- *Identify if any holes in the meter box (install plug to seal)*
- *Condition of the mast (If rotten or damaged, exchange the meter in the isolated state)*

2.2 Power Line Technician's (PLT) responsibilities for identified hazards

2.2.1 PLT will be allowed to remove the meter and face plate of the meter socket to allow for the following:

- *Extending the utility owned service cables*

- *Leveling and re-attaching the meter socket to the wall by means of installing screws*
- *Disconnecting the customer side of the service to temporarily splice through/jumper to provide service until a qualified licensed person repairs damages to the meter socket/service components. This would only be allowed in an emergent situation when there is no possibility of having a qualified licensed person repair the socket*

Under no circumstances would the PLT be allowed to replace the customer owned meter box or the jaws of the meter socket

NOTE: The District Staff will be responsible to make the customer aware of the repairs that were completed as a temporary measure only

The District Staff will ensure the customer has power or that power is being restored, before leaving the location

If temporary repairs have been done, the district staff is to have a notification/task assigned to them to follow up to ensure the repairs have been completed

District Staff to notify the inspections branch of defects found and if any temporary repairs had been made

3.0 Prepare for Process if Ground Fault Occurs

3.1 QEW's responsibility if ground fault occurs

- *QEW shall ensure the following steps are performed if a ground fault occurs during exchange of meter(s). This process will be used in all cases - Overhead, Underground, Apartments*
- *Step back*
- *If the ground fault clears itself immediately isolate the installation*
- *If the ground fault does not clear itself immediately:*
  - If safe to do so remove meter
  - If necessary (fire, flames or excessive smoke) activate the EMS (call 911)
  - Evacuate the building if occupied
  - If necessary (fire, flames or excessive smoke) and safe to do so deploy the fire extinguisher
  - Isolate the installation
  - Notify your Supervisor who will activate SaskPower Incident Command system protocols if required
  -

4.0 Prepare to Exchange Self Contained Meter

4.1 Prepare to Exchange Meter

4.1.1 QEW shall ensure the following steps are performed before exchanging meter(s):

- *Verify the correct address (location)*
- *Review HARA*
- *If possible, inform the customer of momentary service interruption. Advise customer to turn off main breaker or any electronic equipment as they may be at higher potential for damage when the exchange occurs*
- *Verify meter number with meter number on work order*
- ***Verify old and new meter correspond to the applicable CD drawing. If it is an A base style meter, an adapter will be required (refer to A-Base - Adapter Installation and meter exchange - Energized SOP)***
- ***Picture #1** - From a few paces back, capture digital image(s) of the meter box showing the entire socket and the conduit entering the socket. Either from the ground if possible, or including the overhead mast if possible*
- *Conduct a load calculation on the meter using the Load Calculation Job Aid. If the load calculation exceeds 10 Kw request the customer to turn off their main breaker. If other meter brands or types are encountered have the customer turn off the main breaker. If the customer is not home or if the customer is unable to assist (do not enter the customer's house if requested to turn off the breaker - politely decline). Notify Dispatch so an appointment can be made to exchange this meter when the customer is present to turn off their main breaker or isolate the service if possible*
- ***Picture #2** - Capture digital image(s) of the existing meter kilowatt hour read(s)*
- *Document all out readings in provided click mobile task*

5.0 Exchange Single Phase Meter

5.1 Qualified electrical worker shall ensure the following steps are performed while exchanging the meter

- *Ensure proper PPE is on and used appropriately,(i.e. FR, Class 0 gloves, safety glasses and face shield lowered)*
- *Check for hazardous conditions (i.e. loose cover, discolored meter cover, loose meter socket, meter socket tilted, pulled conduit, disoriented additional utility services, phone, gas, cable, etc.)*
- *Perform "wiggle test" (stand off to the side, grasp meter and gently turn side to side, look, listen and feel for evidence of cracked or broken bakelite inside the meter socket)*
- ***If hazardous conditions exist, isolate the installation***
- *If hazardous conditions do not exist, proceed to next step*

- *Loosen the ring and conduct a second "wiggle test" (stand off to the side, grasp meter and gently turn side to side, look, listen and feel for evidence of cracked or broken bakelite inside the meter socket)*
- *If there are any abnormal conditions observed at this point, isolate the installation*
- *If safe to proceed, remove the meter using a meter removal device, class zero rubber gloves, safety glasses and face shield.*
- ***For Underground Electric Services** - Standing to the side, pull/roll in an upward motion to disengage the load side jaws (do not completely remove the meter, meter remains attached to the line side lugs and the load side blades will remain energized). Look up from the bottom with flashlight at the wire tension and condition of bakelite. If any damage or tension is evident, re-install the meter if safe to do so and isolate the installation. If no damage is evident continue to remove the meter.*
- ***For Overhead Electric Services** -Standing to the side, pull in a downward motion to disengage the line side jaws first and complete the removal*
- ***Picture #3** - Capture a digital image(s) of the back of the meter(s) showing the condition of the meter blades*
- *Once the meter is removed you will be able to inspect the internal components of the socket for any "abnormal conditions" (i.e. broken or cracked porcelain or bakelite, broken jaws, pulled conductors, any condition which would lead you to suspect there is high potential for a "Ground Fault", etc.). If abnormal conditions exist, isolate the installation. If required, the cover can be removed for further inspection*
- *Verify the wiring as per the applicable CD Drawing*
- *Verify jaw condition using Jaw testing tool*
- *Check for any signs of energy diversion (theft) and if found initiate the Energy Theft Process*
- *Perform source voltage and back-feed checks. See 6.0 below*
- ***Picture #4** - Capture a digital image(s) of the meter socket showing the condition of the meter socket jaws and wiring*
- *Prior to installing the new meter, anti-oxidizing Lubrication shall be applied only to the blades on the back of the new meter*
- ***Picture #5** - Capture a digital image of the back of the new meter*
- *Install meter using removal/install device:Lline up the lower, load side jaws first and install in an upwards rotation with a firm pushing motion*
- *Replace sealing ring and install a new seal*
- *Ensure the new meter boot up sequence is completed*

- *If applicable, press the plunger in to ensure demand reading is zero and clear previous errors*
- *Ensure there are no error codes on the meter, if new errors populate follow error report procedure*
- ***Picture #6** - Capture a digital image(s) of the new meter(s) showing the kilowatt hour read*
- *Document the new meter exchange information in the provided click mobile task or MEX APP*
  - Record the new meter number
  - Record the kwh reading(s)
  - Record location
  - Record hazard
  - Record meter use
  - Record volt code
  - Record CDNO
  - Record APR
- *Clean-up the area as necessary.*
- *Conduct post install inspection of the area/building/residence for evidence of property damage. Inquire with the customer if they are home*
- *Inform the customer that you are leaving the property. If unable to inform customer, leave applicable door hanger*

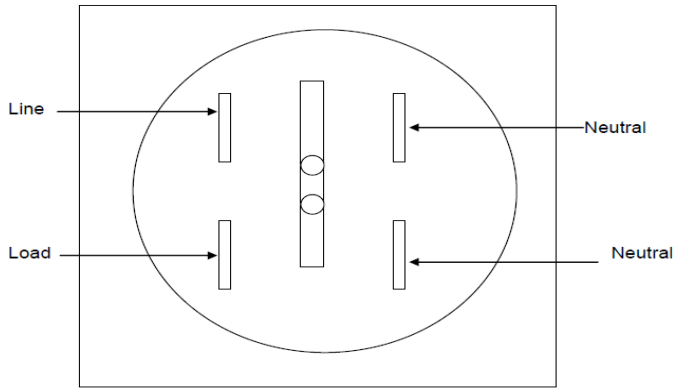
6.0 Prepare for Socket Safety Check.

6.1 Socket Safety Check

6.1.1 Qualified electrical worker shall ensure to follow the Socket Safety Check

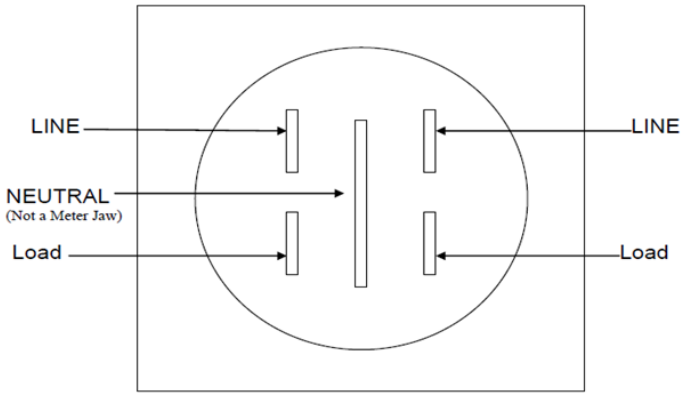
- *See below:*

SOURCE VOLTAGE CHECKS	Test from Line Side Jaw to Neutral Multi-Tester should read 120 Volts
BACK-FEED CHECK	Test from the Load Side Jaw to Neutral Multi-Tester should read 0 Volts
TEST YOUR TESTER	Always end your voltage test by testing across the top two jaws. This ensures your back-feed test did not fail. Reading should be 120 Volts



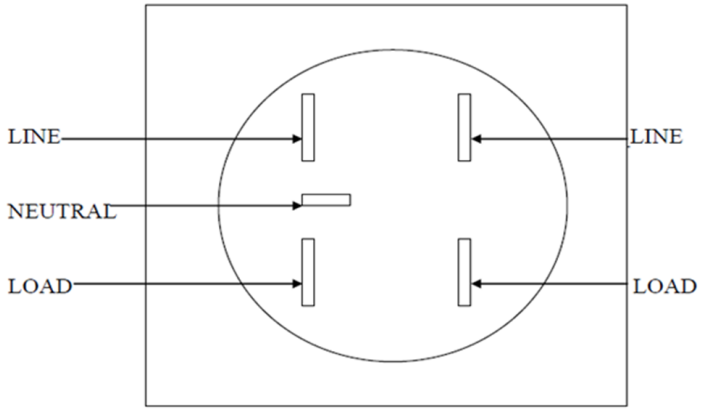
120 VOLT 2 WIRE
Form 1S

SOURCE VOLTAGE CHECKS	Test from both Line Side Jaws to Neutral Multi-Tester should read 120 Volts
BACK-FEED CHECK	Test from both Load Side Jaws to Neutral Multi-Tester should read 0 Volts
TEST YOUR TESTER	Always end your voltage test by testing across the top two jaws. This ensures your back-feed test did not fail. Reading should be 240 Volts



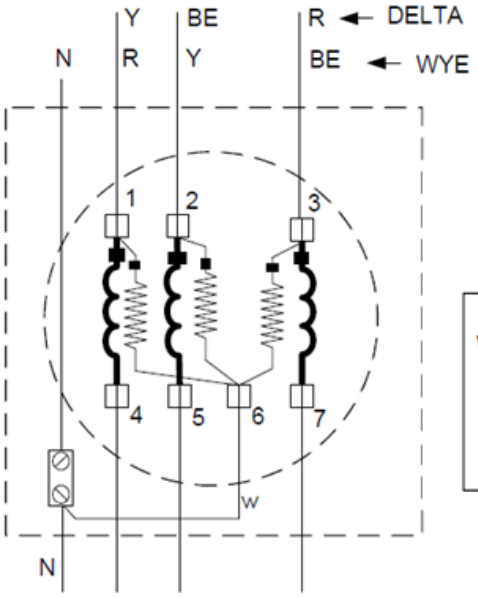
120/240 VOLT 3 WIRE
Form 2S

SOURCE VOLTAGE CHECKS	Test from both Line Side Jaws to Neutral Multi-Tester should read 120/208 Volts
BACK-FEED CHECK	Test from both Load Side Jaws to Neutral Multi-Tester should read 0 Volts
TEST YOUR TESTER	Always end your voltage test by testing across the top two jaws. This ensures your back-feed test did not fail. Reading should be 208 Volts



120/208 VOLT, 2 Stator
120 volt 3 wire Form 12S

CD - 181



		Service Voltage	
		WYE	DELTA
	Terminal	120/208	120/240
VOLTAGE AT SOCKET	1 & 6	120	120
	2 & 6	120	120
	3 & 6	120	208
	1 & 2	208	240
	2 & 3	208	240
	1 & 3	208	240

120/208V 3 Phase 4 Wire - WYE
or Existing 120/240V 3 Phase 4 Wire - Delta

5.0 Components

The following is a list of components for this SOP which can be accessed through the SOP System:

Component Name	Component Type	Component Description	Location of Component
Conducting a Load Calculation Checksheet	Job Aid	Instructions on how to carry out a Load Calculation prior to exchanging a meter	SOP Online - SOP Bundle: Self-Contained Socket Type Meter Exchange less than 300V- Energized State

6.0 Acronyms, Definitions and Symbols

Acronyms and Abbreviations

FR - Flame Retardant
ICS - Incident Command System
PLT - Power Line Technician
HARA - Hazard/Aspect and Risk Assessment

APR - Active Primary Ratio

Definitions

Qualified electrical worker - Occupational Health and Safety Regulation 465 (c)

- *(i) the holder of a journeyperson's certificate in the electrician trade issued pursuant to The Apprenticeship and Trade Certification Act, 1999, and includes an apprentice in the trade while under the supervision of a journeyperson;*
- *(ii) the holder of a journeyperson's certificate in the power lineperson*
- *trade issued pursuant to The Apprenticeship and Trade Certification*
- *Act, 1999, and includes an apprentice in the trade while under the*
- *supervision of a journeyperson; or*
- *(iii) for the purpose of design, calibrating of equipment, inspection,*
- *monitoring, testing, and commissioning of equipment in high voltage*
- *installations, electrical engineers, applied science technologists or certified technicians who have achieved professional certification within an electrical, electronics, industrial or instrumentation discipline*

Personal Protective Equipment – All workers shall ensure the following **Mandatory PPE** is used and in good condition

- **Head Protection** - CSA approved head protection shall be worn by all personnel at the job site, work areas and in posted areas on site

- **Eye Protection** - Approved safety glasses with side shields shall be worn by all personnel at the job site
- **Clothing** - Minimum Class 2 FR/Class 2 High Visibility Clothing shall be worn by all personnel at the job site
- **Footwear** - CSA approved, electric shock resistant footwear with minimum six inch (6") leather uppers for ankle support and a steel or composite toe
    - ***Additional PPE Requirements*** *- To be determined according to the requirements of the task being performed. (Face Shield, rubber gloves, additional FR as determined using the SaskPower Arc Flash Tables) Review the procedure above for additional PPE requirements*

Symbols

N/A

7.0 Policies and Regulatory Requirements

This SOP is a result of the following regulations, policies, industry standards, and corporate directives and standards:

Regulatory Requirement(s)

Saskatchewan Occupational Health & Safety Act and Regulations, 1996

- Section 465(c) - Qualified Electrical Worker

Policies

- Hazard/Aspect and Risk Assessment Policy
- Personal Protective Equipment Policy
- Working Alone Policy
-

Standards

- Hazard/Aspect and Risk Assessment Standard
- ARC Flash Standard
- Deviation from Safe Work Procedures Standard
-

Other

- Safety and Environment Rulebook
- Environmental Best Management Practices

8.0 References

References

CAN/ULC-S801-14
Electric Service Requirements