NSPI Meter Service Centre

25 Lakeside Park Drive
Halifax, NS B3T 1M9

Mailing Address:

P.O. Box 910
Halifax, NS B3J 2W5

This manual, or the appropriate sections, shall be held by those involved with revenue metering at Nova Scotia Power and is assigned to the person named on this page.

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Dave Stanford P. Eng.
Senior Meter Engineer

Introduction

These guidelines are to be applied for new and upgraded revenue metering installations.

General

All meter installations shall comply with these Standards, and it will be the responsibility of all trained personnel to ensure compliance. Existing non-standard installations shall be changed to conform with these standards when alterations are made to the service.

All new and upgraded three phase 4 wire meter installations, self-contained or transformer rated, shall require 3 element meters to be installed. Three phase 2 ½ element meters are only used for replacement of existing 2 ½ element meters.

Specialized metering installations not covered by these standards shall be developed by Regional Engineering and approved by Meter Services.

1.0 **Electrical Contractor's Responsibilities**

1.1 The electrical contractor shall supply and install all meter sockets, cabinets, conduit (for CT & PT secondary leads as required) and current transformers lugs. (Refer to Table STD 4.7)

1.2 The contractor is responsible for the installation of transformers in metal enclosures as per the requirements of Canadian Electrical Code for enclosures for instrument transformers (C.E. Code Part I, Rule 6-404). Enclosures shall have provision for sealing.

1.3 The contractor is a responsible for connections to the primary side of current transformers.

Note: #1 NSPI will supply all revenue class potential and current transformers unless specified otherwise.

Note: #2 NSPI will supply and install colour-coded secondary, stranded wiring from current transformers to meter socket and wiring to the primary and secondary side of potential transformers.

2.0 **Meter Locations**

2.1 The meter and associated metering equipment shall be in locations satisfactory to both inspection and supply authority (refer to C.E. Code Part I, Rules 6-402 and 6-408, and metering standards MS 7.0). The center of the meter shall not be higher than 1.8m or lower than 1.4m from the floor or ground level. Meters and metering equipment may be placed outdoors if they are of weatherproof construction or in weatherproof enclosures

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2.2 Meters shall not be located in bins, clothes closets, bathrooms, stairways, high ambient temperature room, dangerous or hazardous locations, or in any similar undesirable places.

2.3 For multiple meter installations, as in apartment buildings, office buildings, industrial complexes, etc., the meters shall be conveniently grouped and readily accessible to Meter Readers and Installers during normal business hours.

2.4 A clear working space of 1.0m minimum must be provided in front of all meter panels, free of any temporary or permanent obstruction. Passageways and working space around electrical equipment shall not be used for storage and must be kept free from obstruction. (C.E. Code, Part I, Rules 2-300 through 2-322 deal with these and related items).

2.5 Every meter shall be installed in a level position and solidly fixed to a wall or other support supplied by the customer, free from excessive vibration. If the meter location proves to be susceptible to vandalism or frequent breakage by other means, a protective enclosure shall be installed at the customer's expense.

2.6 When a customer requires a recessed wall installation, adequate room must be provided to install/remove meters and faceplate of the meter base.

2.7 For temporary service enclosures the meter base shall be installed on the outside of the weather proof box. (Ref. Electrical Inspection Bulletin B-76-008)

3.0 Instrument Transformers - - - 0 to 600 Volts

3.1 NSPI will supply the necessary Instrument Transformers; however, the contractor must arrange to have them installed at his expense at the factory or in the field. Refer to Metering Standard MS 4.0 for standard layouts.

3.2 In the case of factory-built custom switchgear, space is to be provided for instrument transformers and test blocks which are readily accessible for inspection; the compartment or enclosure for instrument transformers must have provision for sealing.

3.3 The instrument transformers are to be electrically connected on the load side of the service box immediately after customer main service switch (C.E. Code Part I, Rule 6-402(2)).

4.0 Primary Metering 2.4 kV and Above

4.1 All instrument transformers necessary for primary metering will be supplied by NSPI with the following exception. If the instrument transformers are to be located in customer-owned switchgear, the contractor must supply and install them; otherwise, installation is by NSPI.

4.2 Refer to Section 4.4 of NSPI's Rates and Regulations for applicable customer capital contribution.

4.3 Refer to section Z of the Distribution Standard (Overhead) and metering standard MS 5.0 for details on primary metering connections.

5.0 Secondary Wiring

5.1 Electrical raceway shall be supplied and installed by the contractor from instrument transformer cabinets or primary metering equipment to meters in minimum sizes noted below:

a) Single phase service 2 & 3-wire meter, 20 mm (3/4").
b) Three phase four-wire service, 25 mm (1").

5.2 The raceway run shall be as short as practical; however, no run may exceed 30 m or contain the equivalent of more than three 90 degree bends.

5.3 All meters, meter sockets, metal raceways, cabinets, etc. shall be bonded to ground with a green coloured conductor in accordance with C.E. Code Part I, Section 10.

6.0 Service (System) Neutral

6.1 The service (system) neutral conductor is to be connected to all single phase meter sockets up to and including 200 A. For single phase transformer rated installations the instrument transformer cabinet must be bonded either through metallic conduit or suitably rated conductor (C.E. Code, Table 16). The neutral shall not be broken.

6.2 Every three phase, four-wire system being metered with instrument transformers shall have the service neutral available at the main switch. The neutral must be accessible (at a lug) for line to neutral metering.

6.3 In some installations, the customer does not require phase-to-neutral voltage; however, NSPI is required by Measurement Canada to use phase-to-neutral connections on low potential installations.

6.4 For further details on system neutral sizing requirements refer to C.E. Code Rule 4-022. For neutral resistor grounded systems refer to STD 6.21 or 6.22 for the metering configuration.

7.0 Customer Requests for Parallel Metering

7.1 Customers may ask NSPI's permission to install a meter in parallel with their revenue meter. In such cases, customers will pay NSPI's actual installation and commissioning costs. The following may motivate customers to install a parallel meter:

- They want to confirm the accuracy of the revenue meter.
- They need measurement and communication options that the revenue meter lacks.

7.2 Guidelines

- Refer to STD 6.55, STD 6.56, and STD 6.57 for diagrams that show the connection of the second meter and test block to the revenue metering circuit.
- When either NSPI or the customer changes a parallel metering installation, it must be re-commissioned.
- NSPI must seal the customer-owned test block.
- The test block will also include a label indicating "Please contact NSPI before removing meter."

7.3 Approval

- All requests to install parallel metering must be approved by the Meter Data Engineer, Meter Services.
- The Meter Data Engineer or designate will confirm that the parallel metering installation's burden does not exceed the burden ratings of any associated Current Transformers and Potential Transformers.

1.0 PURPOSE

The purpose of this standard is to describe the method of installation and removal of transformer rated metering installations.

2.0 SCOPE

This standard applies to the installation and removal of transformer rated metering installations by qualified Nova Scotia Power Inc. employees.

3.0 REFERENCES

3.1 NSPI Safety Manual
3.2 Document 83-01-0010, "Risk Assessment Form"
3.3 MS 1.0, "Guidelines For Metering Installations"
3.4 MS 5.0, "Index of Standard Meter Drawings"
3.5 NSP-DOC-021, "Nonconformance Report" (NCR)
3.6 Document 80-50-1440, "Installation Form"
3.7 MS 2.2, "Commissioning Procedure"

4.0 EQUIPMENT REQUIREMENTS

4.1 Safety Equipment

- Safety Glasses
- Safety Footwear
- Hard Hat
- Work Gloves
- Rubber Gloves
- Fire retardant clothing (for use under live conditions)
- Meter Removal Safety Tool type [MGS-DH CAT. #9737-8001, or Houston Industries M-002a]
- Alternative Light Source
- Fuse Puller
- Arc Flash Hard Hat and Face shield

4.2 Test Equipment

- Multi Meter with Clip-On CT
- Wide Jaw Amp Stick
- Meter Installation Circuit Analyzer
- Stopwatch
- Butt-In Phone Set
- Megger

5.0 CUSTOMER IDENTIFICATION AND CONTACT

5.1 Check the service order to confirm the metering site is the correct location.

5.2 Whenever practical the meterperson, upon arrival at site, is to notify the customer of the work to be performed and the expected duration for the site visit.

6.0 SAFETY

6.1 Upon arrival at site, wear safety equipment and follow safety practice as per NSPI Safety Manual (Ref. 3.1).

6.2 Before working on or near energized lines and equipment, review SWP 37 in the NSPI Safety Manual as needed.

6.3 Complete a Risk Assessment (Ref. 3.2) before you begin work. Report risks that you cannot correct at site to your supervisor and document them in an At Risk incident report.

Note: Verify that the meter installation is de-energized and that adequate isolation exists from any energized equipment. Confirm that no service back feed exists.

7.0 NEW / UPGRADED INSTALLATIONS

7.1 Preliminary Investigation

7.1.1 Confirm the installation has passed an NSPI electrical inspection under an approved wiring permit.

7.1.2 Ensure the main switch or circuit breaker used for the metered service is tagged in the open position using a yellow NSPI Standard Protection Code 'Caution' tag.

7.1.3 Confirm the electrical contractor has installed metering equipment in accordance with the MS 1.0, Guidelines for Metering Installations (Ref. 3.3).

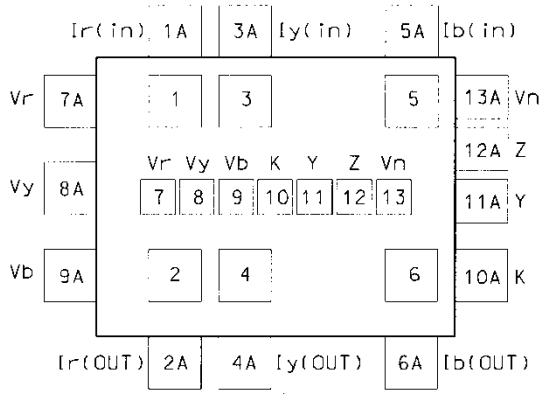
Section 1.0	Electrical Contractor’s Responsibilities
Section 2.0	Meter Locations
Section 3.0	Instrument Transformers - 0 to 600 volts
Section 4.0	Primary Metering 2.4 kV and above (where applicable)
Section 5.0	Secondary Wiring
Section 6.0	Service (System) Neutral

7.1.4 Verify that the proper polarity has been utilized in the primary CT wiring.

7.1.5 Inspect the meter socket base for defects or damage. Ensure the meter mounting socket within the meter base is properly mounted with correct top and bottom orientation.

7.2 Meter Socket Testing

Perform the following tests, without any secondary wiring connected to the meter socket:



7.2.1 *Meter Socket Short Circuit:*

Megger the meter socket for short circuits as per the following:

a) Megger between each of the wiring terminals (1A to 13A) and the grounded cabinet.

b) Megger the meter socket for short circuits between wiring terminals.

- 1A and 3A, 3A and 5A, 1A and 5A
- 2A and 4A, 4A and 6A, 2A and 6A
- 7A and 8A, 8A and 9A, 7A and 9A
- 7A and 13A, 8A and 13A, 9A and 13A
- 12A and 11A, 11A and 10A, 12A and 10A

7.2.2 *Meter Socket Continuity Test*

Use an ohmmeter to check for continuity between the wiring terminals as follows:

- 1 and 1A, 3 and 3A, 5 and 5A
- 2 and 2A, 4 and 4A, 6 and 6A
- 7 and 7A, 8 and 8A, 9 and 9A
- 10 and 10A, 11 and 11A, 12 and 12A
- 13 and 13A

7.2.3 *Reporting and Correcting Meter Socket Problems*

Create an NCR (Ref. 3.5) that identifies the meter base problem, manufacturer, device model number and the immediate corrective action taken.

a) If you can correct the problem immediately, record the immediate corrective action in the NCR.

b) If you cannot correct the problem immediately, notify the electrical contractor and request that they correct meter base problem before proceeding with secondary wiring. Record this immediate corrective action in the NCR.

7.3 Meter Test Switch

7.3.1 Install the meter test switch in accordance with the applicable NSPI Metering Standard, MS 5.0 (Ref. 3.4).

7.4 Secondary Wiring

7.4.1 Install the secondary wiring from the CTs and PTs to the meter test switch and from the meter test switch to the meter socket base, in accordance with the NSPI Metering Standard, MS 5.0.

7.4.2 Open the CTs' shorting bars and short the CTs at the meter test switch. Open the voltage contacts at the test switch.

7.5 Meter Installation

Note: Do not install a meter on a de-energized service. In this case, do the following:

a) Advise the customer or contractor that you have completed the metering installation but cannot install the meter until we have energized their service.
b) Ensure that the CTs are shorted and the voltages are open at the test switch.
c) Ensure that the CTs' shorting bars are open.
d) Notify the Regional Planner of the site’s status and request that he or she reschedule the meter installation.

7.5.1 Ensure that the meter to be installed is the proper metering device for the service and visually inspect for the following:

a) Verify the meter seal is intact.
b) The test links are closed.
c) Physical damage.

Should any of the above visual checks reveal a problem, initiate a Nonconformance Report (Ref. 3.5).

7.5.2 With the voltage contacts of the meter test switch open and the current contacts shorted, install the meter and complete the Installation Form, (Ref. 3.6).

7.5.3 Coordinate with the contractor/customer to energize the service.

7.5.4 With the voltage contacts of the meter test switch open, measure all phase to phase and phase to neutral voltages to ensure they are compatible with the customer's service requirements.

7.5.5 With the current contacts of the meter test switch shorted, measure for the presence of CT secondary current to ensure that there are no problems with the circuit on the line side of the test switch.

7.5.6 If satisfied with voltage and current measurements stand to one side and close the voltage contacts and unshort the current contacts of the test switch.

7.5.7 Verify that the CT secondary circuits are still in tact by measuring for the presence of secondary current in each phase.

7.5.8 If this is an automatic meter reading (AMR) installation, perform the following:

a) If there is no jack on the telephone cable drop, install the grease-filled RJ11 jack shipped with the meter. For unsecured installations, place the RJ11 inside the meter base.
b) Using the butt-in phone set, test the jack for dial tone.
c) Plug the meter telephone cable into the jack.
d) Contact Meter Data Services to confirm meter communication or report a phone jack problem.

7.5.9 Should the electrical demand be of sufficient magnitude to proceed with the meter commissioning, commission the site following MS 2.2 Commissioning Procedure (Ref. 3.7).

7.5.10 Close and seal the meter, the test switch, and the CT/PT cabinet.

Note: If the CT/PT cabinet cannot be adequately sealed, ensure CTs and PT's are individually sealed.

7.5.11 If the metering installation cannot be commissioned at this time, inform the customer/contractor that the installation is complete.

7.5.12 Notify the Regional Planner of the inability to commission this site. Request a Customer Service order be initiated to commission the site within 3 months.

Note: For installations 2 MVA and above the metering installation must be commissioned within 1 day of energization of the load. Notify MDS that the installation is complete but not commissioned. MDS has the responsibility to track all installations 2 MVA and above.

7.5.13 Fax the completed installation form to the Meter Service Centre the same day the service order is closed.

8.0 CHANGING AND REMOVING

8.1 Meter Change

8.1.1 Confirm that the meter number agrees with that on the service order.

8.1.2 Ensure that the meter to be installed is the proper metering device for the service and visually inspect for the following:

a) Verify the meter seal is intact.
b) The test links are closed.
c) Physical damage.

Should any of the above visual checks reveal a problem, initiate a Nonconformance Report (Ref. 3.5).

8.1.3 Visually inspect the metering site for any indication of metering problems that may involve defective equipment, power diversion, or tampering. This inspection is to include, but is not limited to, security seals, CT/PT cabinet, meter test switch, meter, meter base, wiring, meter sealing ring, and, where possible, customer service main disconnect or breaker.

Note: Should problems be discovered, refer to Problem Resolution, Section 10.0.

8.1.4 If this is an Alpha+ or A3 AMR installation, initiate a "critical call" from the meter by following these steps:

a) Power down the meter for more than 60 seconds.
b) Power up the meter.
c) You will then observe the meter doing the following:

a. It will scroll through its alternate display once.
b. It will then start scrolling through its normal (billing) display continuously.
c. Within ten minutes, the meter will try to call MV90. When it initiates the call, it will briefly show a "Phone 2" or "Phone 3" message.
d. When it connects, it will show six dashes for the duration of the call.
e. Lastly, it will resume scrolling through its normal display when it finishes uploading the data collected since its last scheduled call.

d) Contact Meter Data Services to confirm that MV90 retrieved the meter's data.

8.1.5 Record the "as found" readings from the meter to be changed out on the service order.

8.1.6 Operate the test switch to short CT secondaries and isolate PT voltages from the meter. Measure on the meter side of the open switch to ensure voltage and current are zero.

Note: For bottom connected meters with no test switch, install a test switch prior to changing the meter only if your site safety plan has determined that the CT secondaries can be safely shorted and voltage leads isolated. Otherwise, arrange for a customer service outage to install the test switch under de-energized conditions.

Socket style meter installations with no test switch will not require one to be installed. Complete the meter change under live conditions only if your site safety plan has determined the CT secondaries can be safely shorted. Otherwise, arrange for a customer service outage to complete the meter change.

8.1.7 Remove the old seal and meter sealing ring. Remove the installed meter by pulling it out and down, thereby removing the top lugs first. A meter removal tool must be used if a meter glass cover is broken or cracked or if the meter cannot be freed from the socket by hand.

8.1.8 Visually inspect the meter socket connections and internal wiring for problems. Inspect the removed meter for defects and verify that the meter seal is intact.

8.1.9 Install the replacement meter, bottom legs first. Some pressure will be required to get the meter to fit tightly against the socket rim. Install sealing ring and seal.

8.1.10 Energize the meter by closing the voltage contacts and un-shorting the current contacts of the test switch.

Note: For socket style meter installations with no test switch, un-short the CT secondaries.

8.1.11 Record the replacement meter readings on the service order.

8.1.12 If this is an AMR installation, perform the following:

a) If there is no jack on the telephone cable drop, install the grease-filled RJ11 jack shipped with the meter. For unsecured installations, place the RJ11 inside the meter base.
b) Using the butt-in phone set, test the jack for dial tone.
c) Plug the meter telephone cable into the jack.
d) Contact Meter Data Services to confirm meter communication or report a phone jack problem.

8.1.13 Commission the service in accordance with MS 2.2 Commissioning Procedure (Ref. 3.7)

8.1.14 Ensure the metering site is returned to normal operating conditions, and that the metering is adequately secured from unauthorized personnel. Remove all used seals.

8.2 **Removing Equipment**

8.2.1 Confirm that the equipment number agrees with that on the service order and record the "as found" meter readings.

8.2.2 Ensure the service disconnect or breaker is de-energized before removing any NSPI-owned equipment. This includes CTs, PTs, secondary wiring, test switch and meter.

8.2.3 Remove all used seals from the site.

8.2.4 Complete the installation form and fax to the Meter Service Centre the same day the service order is closed.

8.2.5 Use the installation form to report lost, stolen, or destroyed metering equipment.

9.0 DISCONNECTING AND RE-CONNECTING

9.1 Disconnection of Transformer Rated services

9.1.12 Confirm that the meter number agrees with that on the service order.

9.1.13 Visually inspect the metering site for any indication of metering problems that may involve defective equipment, power diversion, or tampering. This inspection is to include, but is not limited to, security seals, CT/PT cabinet, meter test switch, meter, meter base, wiring, meter sealing ring, and, where possible, customer service main disconnect or breaker.

Note: Should problems be discovered, refer to Problem Resolution, clause 10.0.

9.1.14 If this is an AMR installation, power-down then power-up the meter and wait several minutes. The meter will initiate a call and upload residual data since the last scheduled call.

9.1.15 Record the reading(s) from the meter on the service order.

9.1.16 For services with a disconnect switch that can be sealed, open the disconnect switch and remove the fuses. Store the fuses in the bottom of the switch enclosure, close the enclosure and seal the switch in the open position with a red padlock seal.

Note: If the padlock seal is not adequate to secure the switch in the open position install an alternate devise such as a company padlock.

9.1.17 Alternatively, for services with no disconnect switch or switches that cannot be secured, arrange to have the service disconnected at the supply.

9.1.18 If this a permanent disconnection of service refer to clause 8.2 of this standard.

9.2 Re-connection of Transformer Rated services

9.2.12 Confirm that the meter number agrees with that on the service order.

9.2.13 Visually inspect the metering site for any indication of metering problems that may involve defective equipment, power diversion, or tampering. This inspection is to include, but is not limited to, security seals, CT/PT cabinet, meter test switch, meter, meter base, wiring, meter sealing ring, and, where possible, customer service main disconnect or breaker.

Note: Should problems be discovered, refer to Problem Resolution, clause 10.0.

9.2.14 Remove all sealing devices that were put in place for the disconnection and install fuses in the disconnect switch as necessary. Coordinate with the contractor/customer to energize the service.

9.2.15 Record the reading(s) from the meter on the service order.

Note: Services that have been disconnected at the supply point will be dealt with in accordance with clause 7.0 "New/Upgraded Installation".

10.0 PROBLEM RESOLUTION

10.1 Perform an as-found commissioning in accordance with Metering Standard MS 2.2 'Commissioning Procedure'.

10.2 For any real or suspected problem associated with the commissioning, generate a nonconformance report (NCR), NSP-DOC-021, (Ref. 3.5). Examples of the types of problems to be reported by NCR are:

- Defective metering equipment
- Improperly sized or rated equipment
- Defective wiring
- Meter registering off scale or not registering
- Damaged or vandalized metering equipment
- Incorrect meter multiplier or billing multiplier
- Power diversion
- Tampering
- Incorrect billing rate
- CIS database errors or omissions
- Improperly sealed metering installations

10.3 For suspected problems, forward the NCR, and As-Found Commissioning results to the Quality Assurance Specialist (QAS) immediately.

10.4 For known problems that cannot be corrected immediately, forward the NCR, and As-Found Commissioning results to the QAS immediately.

10.5 For known problems that can be corrected immediately, initiate corrective action and perform an As-Left Commissioning. Forward the NCR, As-Found Commissioning results, and As-Left Commissioning results to the QAS immediately.

1.0 PURPOSE

The purpose of this standard is to describe the method for commissioning transformer rated metering installations.

2.0 SCOPE

This standard applies to the commissioning of transformer rated metering installations by qualified Nova Scotia Power Inc. employees. This includes all new installations and any upgrades, modifications or expansions of existing installations.

3.0 REFERENCES

3.1 NSPI Safety Manual
3.2 Document 83-01-0010, "Risk Assessment Form"
3.3 Document 80-50-1060, "Metering Installation Commissioning Sheet" (MICS)
3.4 TI-CAN-002.doc "NSPI Commissioning With the Candura Analyzer"
3.5 NSP-DOC-021, "Nonconformance Report" (NCR)

4.0 EQUIPMENT REQUIRED

4.1 Safety Equipment

- Safety Glasses
- Safety Footwear
- Hard Hat
- Work Gloves
- Rubber Gloves
- Fire retardant clothing (for use under live conditions)
- Meter Removal Safety Tool type MGS-DH CAT. #9737-8001 or Houston Industries M-002a
- Alternate Light Source
- Arc Flash Hard Hat and Face shield

4.2 Test Equipment

- Multi Meter with Clip-On CT
- Wide Jaw Amp stick
- Meter installation Circuit Analyzer
- Stopwatch
- Butt-In Phone Set

5.0 CUSTOMER CONTACT

5.1 Whenever practical the meterperson or designate, upon arrival at site, is to notify the customer of the work to be performed and the expected duration for the site visit.

6.0 SAFETY

6.1 Upon arrival at site, wear safety equipment and follow safety practice as per NSPI Safety Manual (Ref. 3.1).

6.2 Before working on or near energized lines and equipment, review SWP 37 in the NSPI Safety Manual as needed.

6.3 Complete a Risk Assessment (Ref. 3.2) before you begin work. Report risks that you cannot correct at site to your supervisor and document them in an At Risk incident report.

7.0 GENERAL

7.1 All new installations, any upgrade, modification or expansion to existing installations, and all primary metered installations require a complete commissioning, which must include measuring the primary currents. Also, complete an installation form and submit it the applicable Sharepoint site in each of these cases. In some cases, this will require the coordination of other qualified staff to assist. E.g.: Powerline Technicians, Transmission Maintenance & Operations.

Note: For installations 2 MVA and above, the commissioning must be completed within 1 day of energizing the load. Notify MDS who have the responsibility for tracking installations 2 MVA and above.

7.2 For an existing installation, verify that the customer information section of the Metering Installation Commissioning Sheet (MICS) (ref. 3.3) is correct and complete.

8.0 PRELIMINARY INVESTIGATION

8.1 Visually inspect the metering site for any indication of metering problems that may involve defective equipment, power diversion, or tampering. This inspection is to include, but is not limited to, security seals, CT/PT cabinet, meter test switch, meter, meter base, wiring, meter sealing ring, and, where possible, customer service main disconnect or breaker.

Note: Should problems be discovered, refer to Problem Resolution, clause 11.0.

9.0 METERING EQUIPMENT IDENTIFICATION

9.1 For a new installation or existing installations with no pre-printed MICS ensure the "Voltage Metered", "Current Transformers" and "Potential Transformers" sections of the blank Metering Installation Commissioning Sheet (MICS) are filled in completely.

9.2 For an existing installation with a pre-printed MICS, verify the "Voltage Metered", "Current Transformers" and "Potential Transformers" sections.

9.3 For situations where the required equipment information cannot be obtained, record the reason in the affected section of the MICS.

10.0 TEST INFORMATION

10.1 Test Switch

10.1.1 Identify and record the CT connection as Wye, Delta, or Single Phase.

10.1.2 Identify and record the test switch as 7 terminals or 10 terminals. Note any deficiencies in the remarks section, (i.e. No test switch).

10.1.3 Measure and record the voltages.

10.2 **Phase Currents**

10.2.1 Measure primary and secondary currents as close to the same time as practical, to avoid errors caused by fluctuating load. Refer to SWP 37 in the NSPI Safety Manual.

10.2.2 Where it is not practical to measure the primary current, such as no access to the CTs, then the CT ratio measurements check can be ignored. Ensure you record in the 'Remarks' section of the MICS the reason for not measuring the primary current.

Note: All new, upgraded, and primary metered installations require a complete commissioning as previously stated in clause 7.1.

10.2.3 CT ratios are determined by:
CT ratio = (Primary Amps) ÷ (Secondary Amps)

10.2.4 CT ratios must be within ±3% of the recorded nameplate ratios to be acceptable.

10.2.5 For cases where CT ratios are not within ±3% of nameplate, but are within ±10% of nameplate, document the reason(s) in the 'Remarks' section of the MICS to explain the larger deviation.

10.2.6 CTs found to have ratios in excess of ±10% deviation from nameplate should be considered suspect and appropriate problem resolution carried out as per clause 11.0

10.3 **Meter**

10.3.1 Measure the time it takes to complete one revolution of a rotating disc or the time between flashes of visible light of an electronic meter. Calculate the secondary watts as follows:

$$\text{Watts} = (3600*Kh)/t$$

Where Kh is the nameplate "watt hour per rev" value and t is the time in seconds for the disc to make one complete revolution.

10.3.2 Record the dial register reading. Confirm the meter pulse output indication if applicable.

10.4 **Demand**

10.4.1 Record the meter present and peak demand, verify the meter multiplier, and circle the applicable demand units (W or VA).

Note: Verify the meter's present demand is within ±20% of the calculated demand from clause 10.3.1. Document the reason(s) for the large deviation in

the remarks section of the MICS. If it is not explainable, then the meter should be considered suspect and appropriate problem resolution carried out as per clause 11.0.

10.4.2 For electronic meters with no disc, switch the meter into the alternate display mode to obtain the "Instantaneous Watts" and record this in the present demand location on the MICS. Also record the peak demand from the normal display, verify the meter multiplier, and circle the applicable demand units (W or VA).

10.5 **Circuit Analysis**

10.5.1 Perform a vector analysis as per Use of Circuit Analyser instructions (ref. 3.4). Analyzer readings should be taken at the same time as the meter readings for comparison purposes to avoid errors caused by fluctuating load.

Note: If the circuit analyzer cannot be used at this site, explain the reason in the 'Remarks' section of the MICS.

10.5.2 If the circuit analyzer was not used, calculate VA, PF, and watt using the formulas found under clause 12.0, record the calculated results on the MICS.

10.5.3 If the power factor is less than 75% provide an explanation in the remarks section of the MICS (i.e. motor load, manufacturing facility, elevator, pumping station, etc.). If poor power factor is unexplainable, investigate and resolve incorrect metering.

10.5.4 Once the meter site commissioning work is complete, disconnect the test equipment and return the CT/ PT cabinet and meter test switch back to its normal operating state. Install security seals to ensure the metering is adequately secured from unauthorized personnel.

10.5.5 Submit the MICS and analyzer results to the Meter Service Centre within five (5) working days.

11.0 PROBLEM RESOLUTION

11.1 For any real or suspected problem associated with the commissioning, generate a nonconformance report (NCR), NSP-DOC-021, ref. 3.5. Examples of the types of problems to be reported by NCR are:

- Defective metering equipment
- Improperly sized or rated equipment
- Defective wiring
- Meter registering off scale or not registering
- Damaged or vandalized metering equipment
- Incorrect meter multiplier or billing multiplier
- Power diversion
- Tampering
- Incorrect billing rate
- CIS database errors or omissions
- Improperly sealed metering installations

11.2 For suspected problems, forward the NCR, and As-Found Commissioning results to commissioningsheets@nspower.ca immediately.

11.3 For known problems that cannot be corrected immediately, forward the NCR, and As-Found Commissioning results to commissioningsheets@nspower.ca immediately.

11.4 For known problems that can be corrected immediately, initiate corrective action and perform an As-Left Commissioning. Forward the NCR, As-Found Commissioning results, and As-Left Commissioning results to commissioningsheets@nspower.ca immediately.

12.0 FORMULAS

CT Ratio

Ratio = Primary Amps / Secondary Amps

Secondary Watts

Watts = (3600 x Kh) / time

Secondary VA

1 or 1.5 Element	= $I_{avg\ sec}$ x Vp-p
2 or 2.5 Element	= $I_{avg\ sec}$ x 1.732 x Vp-p
3 Element	= (Ia x Va) + (Ib x Vb) + (Ic x Vc)

Power Factor

PF = Watts / VA

Where:

$I_{avg\ sec}$ = Average Secondary Current

V_{p-p} = Phase to Phase Voltage

Kh = Watt hr per rev of meter

Guidelines

MS 3.1 Pulse Metering
MS 3.2 Telephone Cables
MS 3.3 Time Of Use Meters

Drawings

STD 3.1 Wiring Colour Code Tables - Pulse Outputs
STD 3.2 Connection Diagram - UIR-3 - One Output
STD 3.3 Connection Diagram - UIR-3 - Two Outputs
STD 3.4 Connection Diagram - Sentry 70
STD 3.5 Connection Diagram - I/O Expander - Left View
STD 3.6 Connection Diagram - I/O Expander - Right View
STD 3.7 Connection Diagram - Load Control Relay - TOU Meter
STD 3.8 Load Control Relay Connectors

1.0 CUSTOMER REQUESTS

Customers may ask NSPI to install a pulse meter to provide pulse data to their energy management system (EMS). Here, customers must pay the following:

- The price difference between a pulse meter and a regular meter.
- The cost of an isolation device between the customer and NSPI's equipment.
- NSPI's expenses during the work.

Before installing the new meter, Meter Services must receive a purchase order from the customer. We will then issue a service order for the meter change or installation.

NSPI normally has an adequate supply of pulse meters in stock to meet most customer requests; if so, one to three weeks will elapse between the customer's initial contact and the date of completion. However, if Meter Services must order the meter, add three to five months to the period between initial contact and job completion.

2.0 GENERAL

Pulse meters generate pulses that flow through an isolation relay to the customer's monitoring system. Normally mounted on the wall near the meter, this isolation relay includes input terminals for the meter, output terminals for NSPI's use, and output terminals for the customer. Customers must connect their own equipment to the outputs assigned to them.

Pulse meters generate KYZ pulses - i.e., transitions from low to high and vice versa - that represent a particular amount of energy. Refer to the Electronic Meter Program Database or contact Meter Data Services for KYZ Pulse Weights associated with specific meters and programs.

With the exception of a few meters programmed for specific customers, these pulse weights are secondary units; i.e. these values *do not* reflect the actual load. To determine actual consumption (primary units), use this formula:

$$\text{Energy} = (\text{pulse count})(\text{pulse weight})\,(\text{meter multiplier})(\text{CT ratio})(\text{PT ratio})$$

To determine demand, count the number of pulses during a timed interval and apply the following formula:

$$\text{Demand} = \left(\frac{\text{pulse count}}{\text{interval length}}\right)(\text{pulse weight})\left(\frac{\text{minutes}}{\text{hour}}\right)$$

Example:

$$\text{Demand} = \left(\frac{165\ \text{pulses}}{15\ \text{minutes}}\right)\left(0.25\ \frac{\text{Wh}}{\text{pulse}}\right)\left(\frac{60}{1}\frac{\text{minutes}}{\text{hour}}\right) = 165\text{Watts}$$

where 0.25 Wh / pulse is an arbitrary value.

3.0 ISOLATION RELAY - UIR-3

Refer to STD 3.2 and STD 3.3 for schematics that show the pulse isolator's input and output connections. NSPI configures the isolator in this way:

1. Input 1 pulses are duplicated on outputs 1 and 3.
2. Input 2 pulses are duplicated on output 2

Because the UIR-3 has mercury wetted relay contacts, mount the device so that the arrows shown on the three relays point upwards.

When customers make their connections, they should remove the isolator's black cover, attach their wires and replace the cover.

4.0 ISOLATION RELAY – SENTRY 70

Refer to STD 3.4 for a schematic that shows the pulse isolator's input and output connections. NSPI configures the isolator in this way:

1. Input 1 pulses are duplicated on outputs 1 and 4.
2. Input 2 pulses are duplicated on outputs 2 and 5.
3. Input 3 is not used in Alpha+ applications.

The Sentry does not use any electro-mechanical or mercury wetted relays. Consequently, the device has no orientation constraints.

5.0 I/O EXPANDER - ION 8000 SERIES METERS

Using an I/O Expander, a customer can access a variety of digital and analog outputs from ION 8000 series meters. There are two versions of I/O Expanders:

Analog - Four analog outputs and four Form C digital outputs
Digital - Four Form C digital outputs and four Form A digital outputs

5.1 Installation

- Locate the device within five feet of the meter. If required, the I/O Expander can be ordered with a fifteen-foot cable.
- Mount the I/O Expander flush against any flat surface in a dry, dirt free location.
- Connect the I/O Expander ground to the earth ground or switchgear chassis ground (use the same ground as the meter ground). Use an AWG 14 or larger wire.
- Have the customer connect their I/O to the appropriate outputs. The I/O Expander's top label shows the proper connection diagram. Refer to STD 3.5 and STD 3.6 as well.
- Connect the meter's molex connector to the female molex connector located on the left end of the I/O Expander.
- Analog I/O Expanders require their own fused 120-Volt power supply. This fuse should be a 2 Amp slow blow fuse.

5.2 Verifying Operation

After powering up the meter and I/O Expander, check the following:

- Status LED: located at the lower right corner of the I/O Expander's faceplate, this green LED blinks once per second when the I/O Expander is working normally. If this LED is on for one second and off for five, there is a communications problem.
- I/O LEDs: Each digital input and output port has an LED that blinks when its associated I/O device's state changes.
- Power LED: if installing an Analog I/O Expander, verify that it has power by checking the red LED located by the power supply connectors located on the right end if the device.
- Analog outputs do not have monitoring LEDs. Use a clip-on ammeter to verify that each output is functioning.

1.0 GENERAL

NSPI uses both dedicated and shared telephone lines to interrogate AMR meters. When sharing a line with an AMR customer, NSPI asks the customer's phone service supplier to extend a line to the meter base at NSPI's cost. The following specifications apply to dedicated and shared lines.

2.0 PHONE LINE SPECIFICATION – INSIDE METERS

The phone service provider shall do the following:

2.1 Install a phone jack within six (6) inches of the bottom of the meter's base.

2.2 The phone extension cable provided shall have a minimum insulation rating of 300 VAC.

2.3 Do *not* install an "alarm" connection. An "alarm" connection disconnects all other phones in the customer's building when the extension goes off-hook.

3.0 PHONE LINE SPECIFICATION – OUTSIDE INSTALLATIONS

The phone service provider shall do the following:

3.1 When installing the phone cable, leave three feet of un-terminated cable coiled up at the meter location.

3.2 A phone jack is not needed.

3.3 Apply a "scotch-lock" connector to each conductor of the phone cable at the meter location. These connectors will protect the live phone line from the weather.

3.4 The phone extension cable provided shall have a minimum insulation rating of 300 VAC.

3.5 Do not install an "alarm" connection.

3.6 Install the phone line in conduit if the line is accessible.

1.0 GENERAL

The Time Of Use (TOU) Rate is restricted to residential customers who use either Electric Thermal Storage (ETS) equipment that they have purchased from NSPI or residential customers who use electric in-floor radiant heating systems equipped with time shifting technology that NSPI has approved.

For more information about the TOU rate (Rate 06), see NSPI's Rates and Regulations.

2.0 TOU METER

Each TOU meter has a normally open load control relay. By programming the meter to close and open the relay contacts at specific times, the meter can notify the customer's control system when peak, shoulder, and off-peak kWh are available. Specifically, the contacts are closed during peak and shoulder periods and open during off-peak periods.

Some TOU installations, however, do not use the meter's load control relay.

3.0 SCHEMATIC

Regardless of the type of heating system, when it requires a connection to the TOU meter's load control relay, the schematic shown in STD 3.7 applies.

4.0 CABLES AND CONNECTORS

4.1 The Meter Service Centre will prepare a two-wire cable in accordance with STD 3.8; this cable connects the TOU meter to the customer's heating system control. Typically, this cable is eleven feet long with a female connector on one end and no termination on the other.

4.2 The contractor installs this cable, leaving the slack coiled in the meter base.

4.3 Also, the Meter Service Centre installs a male connector on the wires leading from the meter's load control relay.

5.0 SINGLE RESIDENCE – ETS

Single-family residences require the connection of the load control relay.

6.0 MULTI-RESIDENCE – ETS

While each unit requires a TOU meter, only one provides a load control signal. The remaining TOU meters, therefore, do not have their relays connected. Consequently, the meter whose relay is connected should be flagged in CIS, and it must not be disconnected.

7.0 SINGLE RESIDENCE – IN-FLOOR RADIANT

Most systems use timers and/or programmable thermostats to control the heating system and other appliances. Here, the TOU meter's load control relay is not connected.

When customers choose to use this load control relay, they must also install the same control panel installed with ETS systems.

8.0 MULTI-RESIDENCE – IN-FLOOR RADIANT

As with single residence systems, most contractors use timers and/or programmable thermostats as controls rather than the meter's load control relay. However, if they want load control from a TOU meter, only one meter can provide the signal. All other residential units in the complex will have TOU meters, but their load control relays are not connected.

9.0 OTHER SYSTEMS

There are three other heating systems that use the TOU rate:

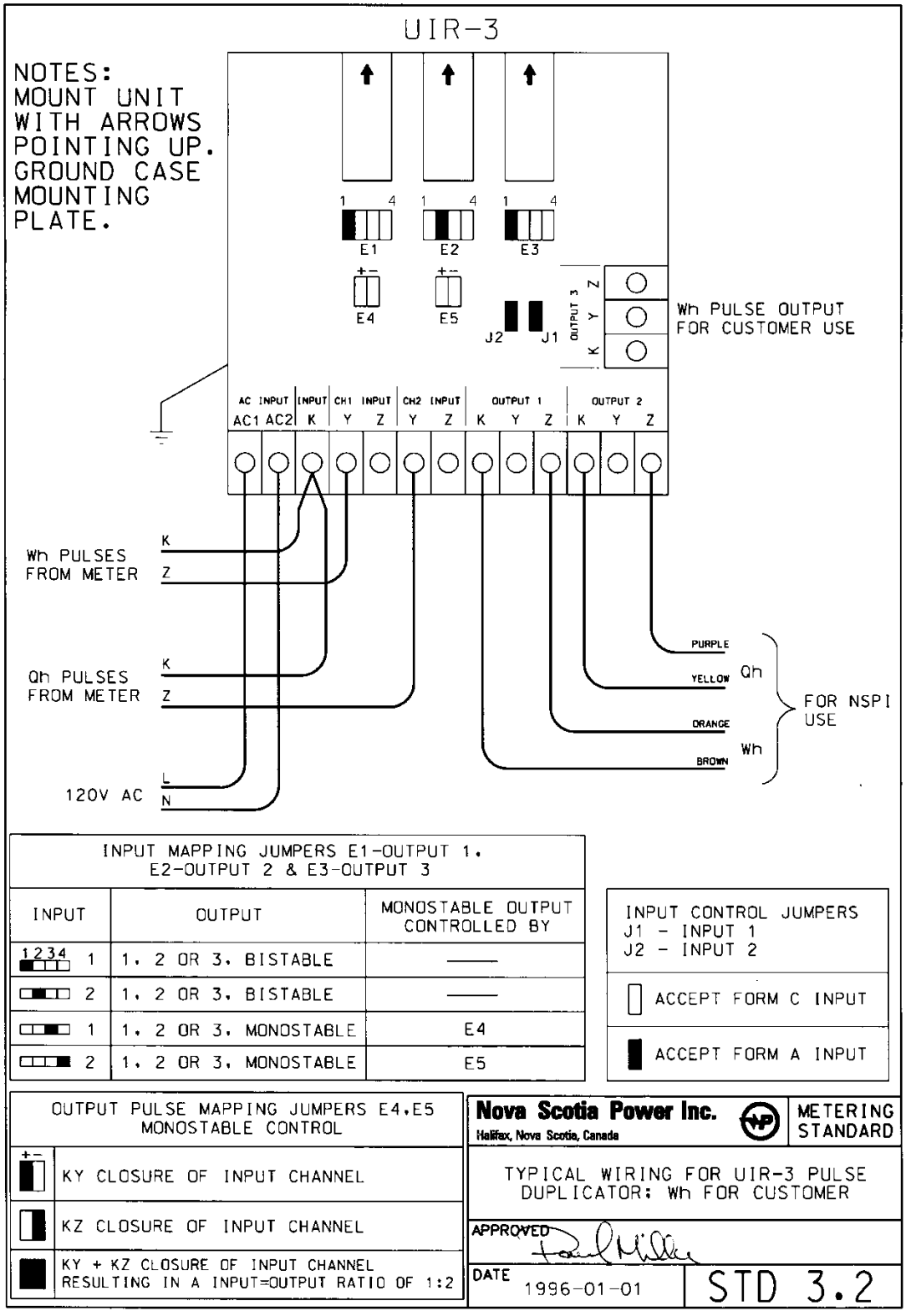
- Steffes 3120 – a combination of a single ETS duct heater and a heat pump
- Steffes 4100 – a single ETS heater with a forced air distribution system
- Steffes 5100 – a single ETS boiler with an in-floor radiant distribution system

Each of these systems requires connection to the TOU meter's load control relay.

	Meter				
Contacts	Units Pulsed	KVI, SVI, VIM	VMW (M90)	ABB Alpha, A3[1]	Vectron, Sentinel
K1	Wh Del	Red	Red	Red	Red
Y1		Yellow	Yellow	Yellow	Yellow
Z1		Black	Black	Black	Black
K2	Qh Del	Brown		Orange	Red/White
Y2		Orange		Black/White	Yellow/White
Z2		Blue		Blue	Black/White

Note: Elster (ABB) Alpha+ and A3 and Itron Sentinel meters output VARh on Channel 2.

[1] Elster (ABB) Alpha Meters output VARh pulses on Channel 2.



INPUT MAPPING JUMPERS E1-OUTPUT 1, E2-OUTPUT 2 & E3-OUTPUT 3

INPUT	OUTPUT	MONOSTABLE OUTPUT CONTROLLED BY
1234 1	1, 2 OR 3, BISTABLE	——
2	1, 2 OR 3, BISTABLE	——
1	1, 2 OR 3, MONOSTABLE	E4
2	1, 2 OR 3, MONOSTABLE	E5

INPUT CONTROL JUMPERS
J1 - INPUT 1
J2 - INPUT 2

ACCEPT FORM C INPUT

ACCEPT FORM A INPUT

OUTPUT PULSE MAPPING JUMPERS E4,E5
MONOSTABLE CONTROL

+−	KY CLOSURE OF INPUT CHANNEL
	KZ CLOSURE OF INPUT CHANNEL
	KY + KZ CLOSURE OF INPUT CHANNEL RESULTING IN A INPUT=OUTPUT RATIO OF 1:2

Nova Scotia Power Inc.
Halifax, Nova Scotia, Canada

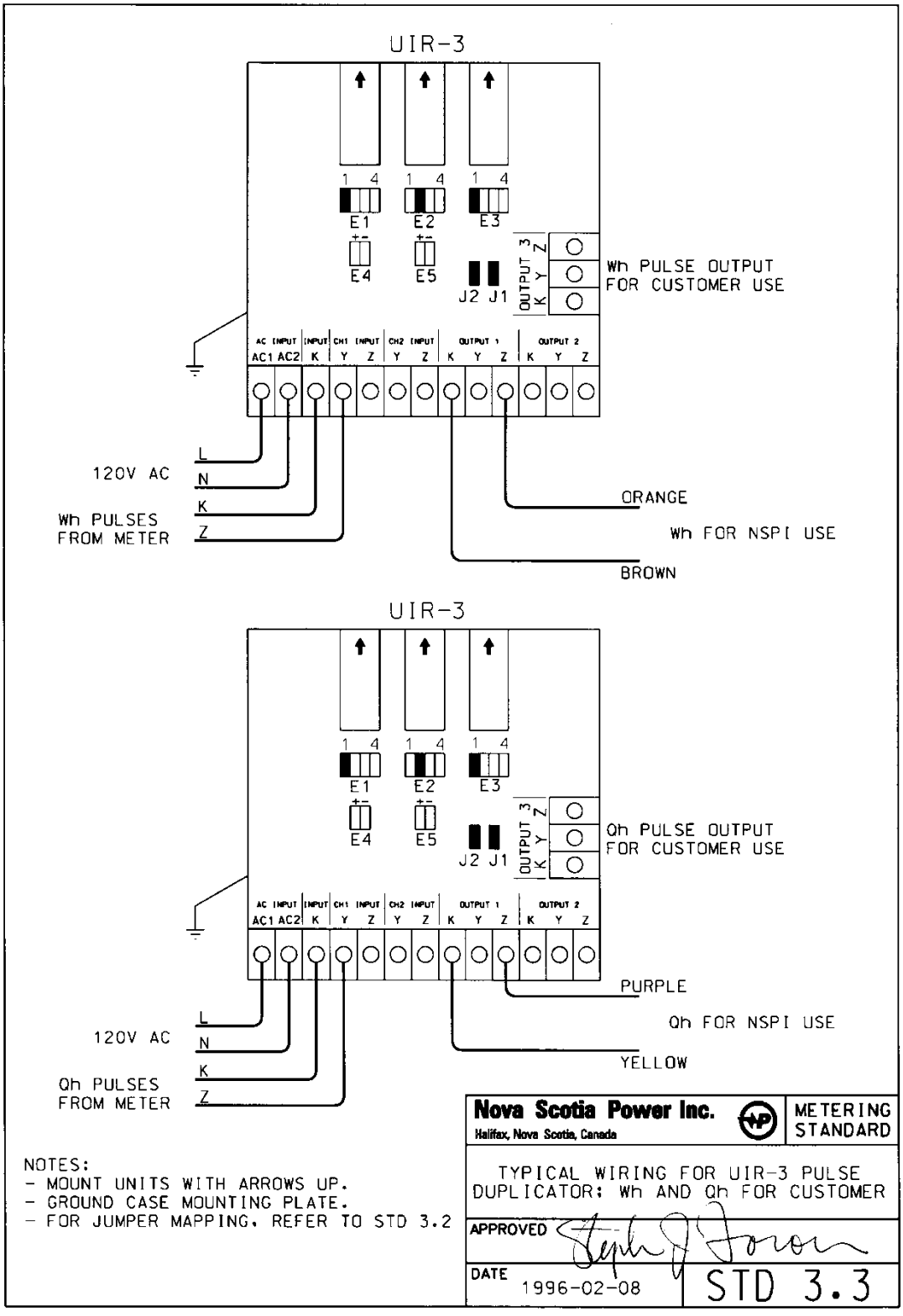
METERING STANDARD

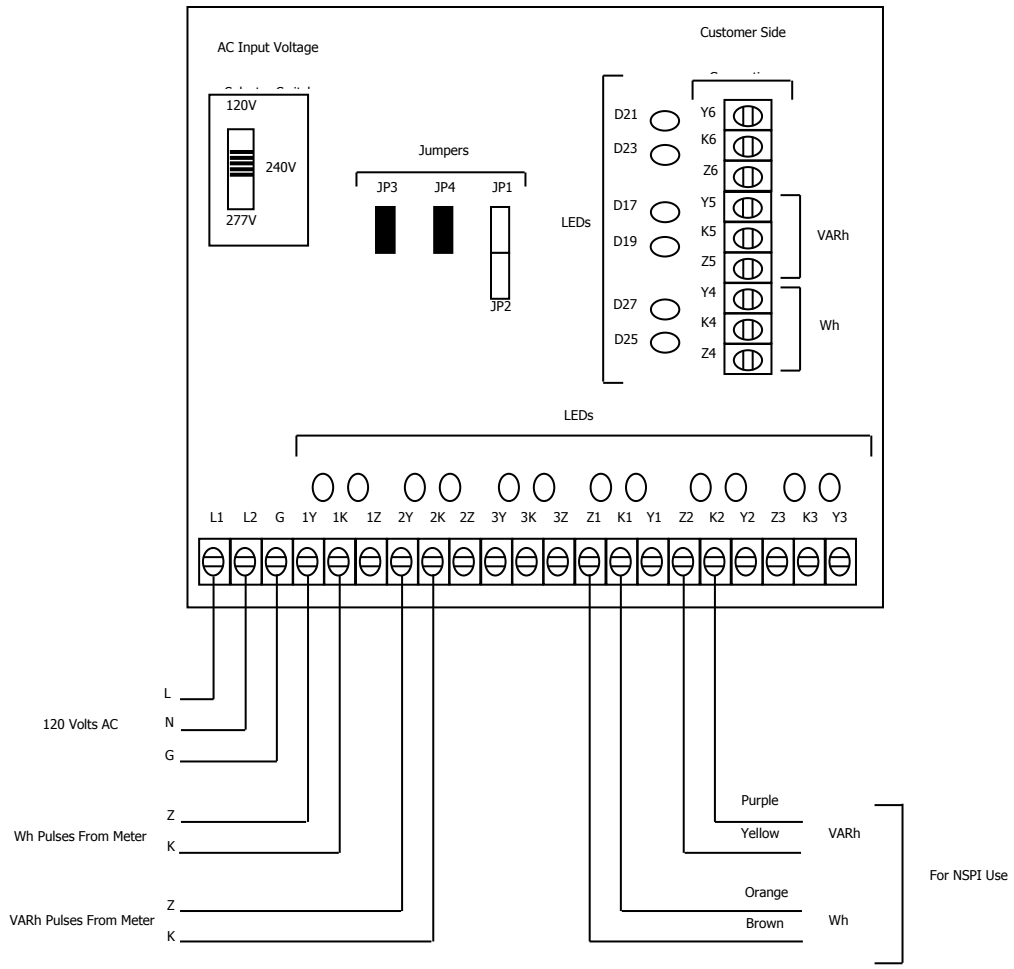
TYPICAL WIRING FOR UIR-3 PULSE DUPLICATOR: Wh FOR CUSTOMER

APPROVED

DATE 1996-01-01

STD 3.2


UIR-3
1 4
E1
E2
E3
E4
E5
J2 J1
OUTPUT 3
Z
Y
K
Wh PULSE OUTPUT
FOR CUSTOMER USE
AC INPUT
AC1 AC2
INPUT
K
CH1 INPUT
Y Z
CH2 INPUT
Y Z
OUTPUT 1
K Y Z
OUTPUT 2
K Y Z
L
N
K
Z
120V AC
Wh PULSES
FROM METER
ORANGE
Wh FOR NSPI USE
BROWN
UIR-3
Qh PULSE OUTPUT
FOR CUSTOMER USE
PURPLE
Qh FOR NSPI USE
YELLOW
120V AC
Qh PULSES
FROM METER
NOTES:
- MOUNT UNITS WITH ARROWS UP.
- GROUND CASE MOUNTING PLATE.
- FOR JUMPER MAPPING, REFER TO STD 3.2
Nova Scotia Power Inc.
Halifax, Nova Scotia, Canada
METERING STANDARD
TYPICAL WIRING FOR UIR-3 PULSE DUPLICATOR: Wh AND Qh FOR CUSTOMER
APPROVED
DATE
1996-02-08
STD 3.3

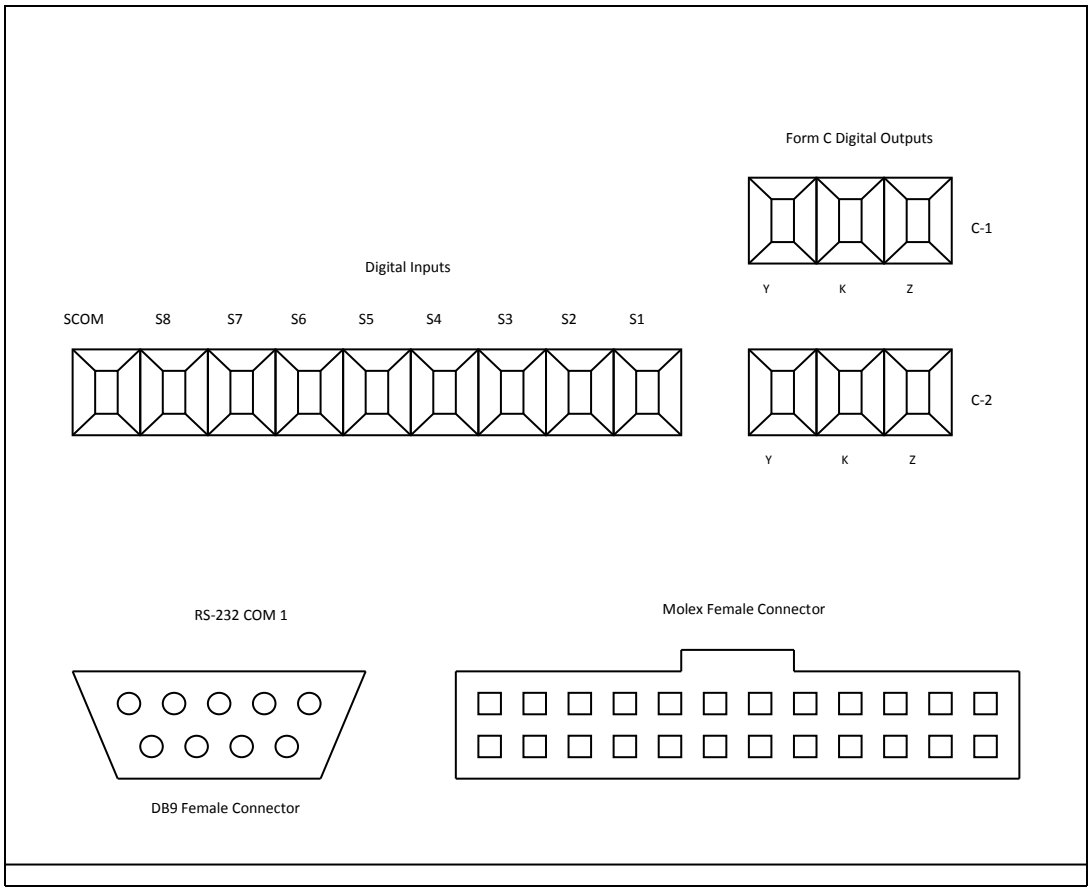


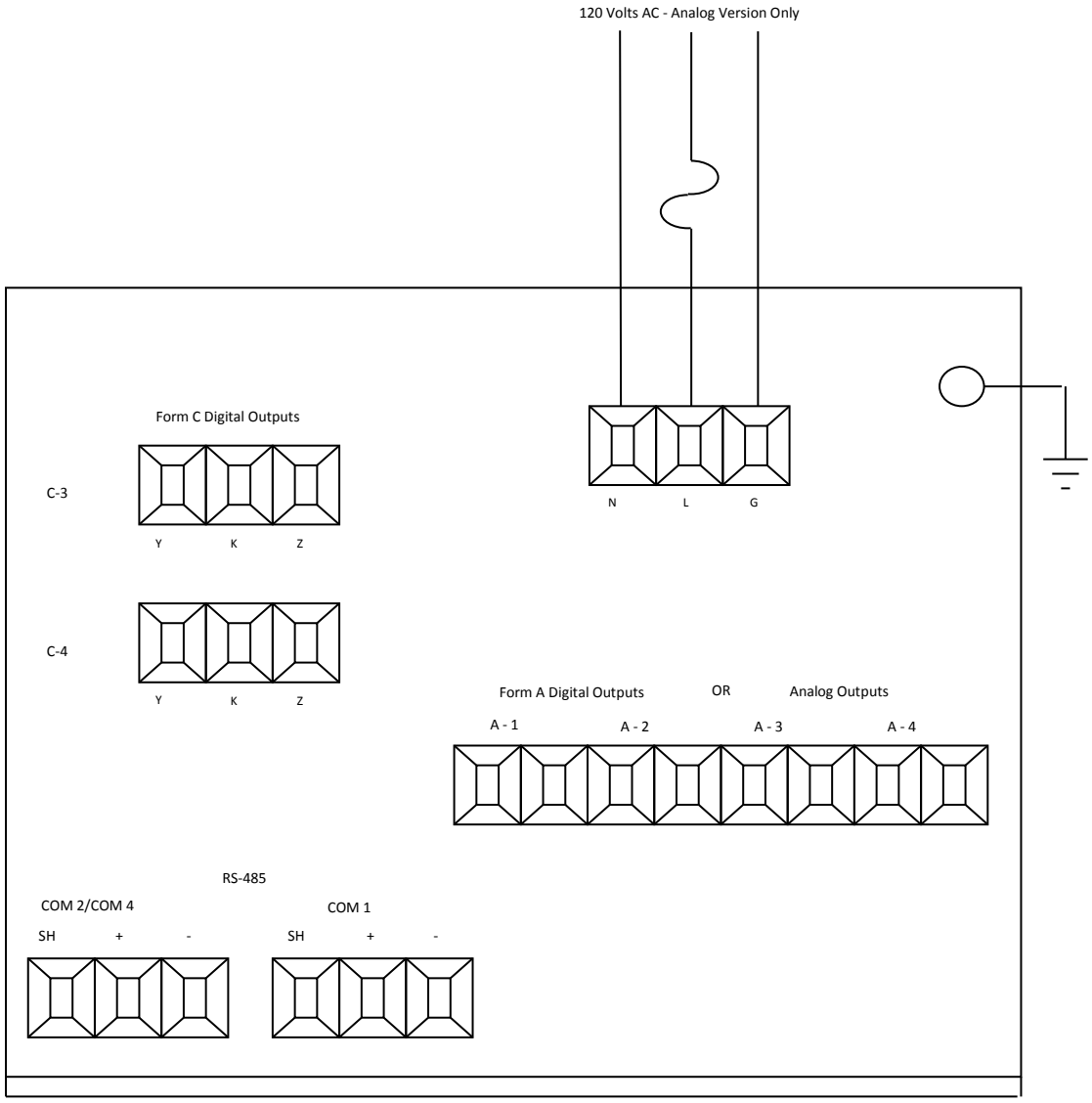
Jumpers:

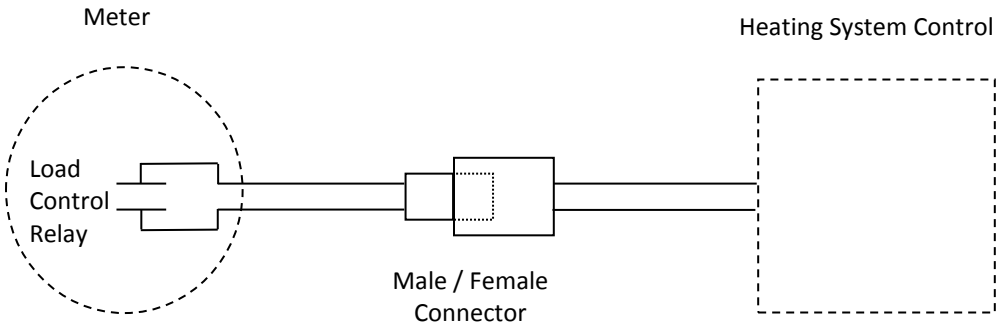
Item Function	Installed	Open
JP3 Input Type Select Jumper for Input 1	Form A	Form C
JP4 Input Type Select Jumper for Input 2	Form A	Form C
JP1 Input Type Select Jumper for Input 3	Form A	Form C
JP2 Totalizer Mode Select – (See Firmware Version)		

Sentry 70 - Firmware Versions:

Version	JP2 Installed	JP2 Not Installed
Version 1: (S70-3/6+T)	Sentry 70 becomes a two input totalizer. Input channels 1 and 2 are totalized, and the result activates outputs 1, 2, 4, and 5. Input 3 and output 6 are unaffected.	Provides full isolation relay function for all three channels, each having two outputs
Version 2: (S70-1/6)		Pulses connected to input 1 are used to activate all six outputs. Inputs two and three are not used and totalization is not provided
Version 3: (S70-2/1+2)		Pulses connected to input 1 activate outputs one and four; pulses connected to input two activate the remaining outputs. Input three is not used.
Version 4: (S70-3/6)		This version is the same as Version 1 except that totalization is not provided


Form C Digital Outputs
C-1
Y K Z
Digital Inputs
SCOM S8 S7 S6 S5 S4 S3 S2 S1
C-2
Y K Z
RS-232 COM 1
Molex Female Connector
DB9 Female Connector


120 Volts AC - Analog Version Only
N
L
G
Form C Digital Outputs
C-3
Y
K
Z
C-4
Y
K
Z
Form A Digital Outputs
OR
Analog Outputs
A - 1
A - 2
A - 3
A - 4
RS-485
COM 2/COM 4
SH
+
-
COM 1
SH
+
-


Meter
Heating System Control
Load
Control
Relay
Male / Female
Connector

Parts List - Connector

Supplier	Description	Part Number
PEI Genesis	Strain Relief Housing	029-0263-000
	Female Connector	120-1804-000
	Male Connector	120-1807-000
	Female Pins	031-1267-005
	Male Pins	030-2196-006

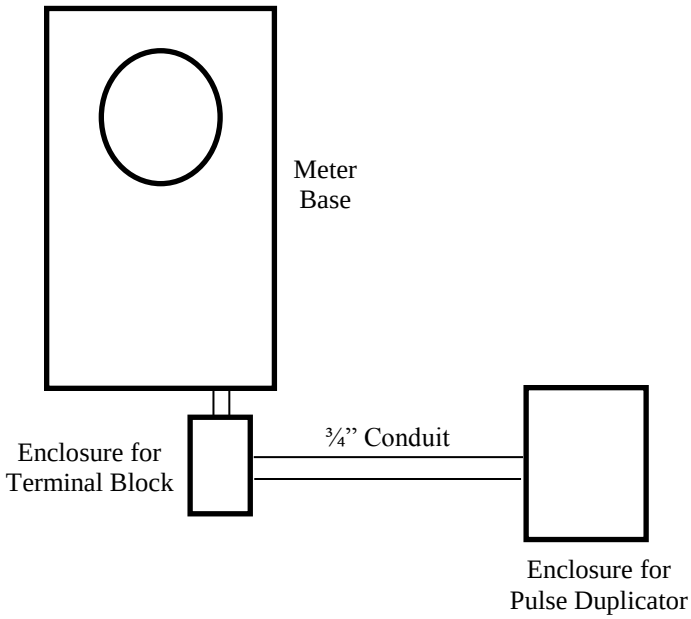
Colour Codes - Male Connector

Meter	Wire Colour	Pin Type	Pin Number
Alpha	Orange	Male	1
	Blue	Female	2
Vectron	Red	Male	1
	Yellow	Female	2
KV	Brown	Male	1
	Orange	Female	2
Focus	Red / White	Male	1
	Green / White	Female	2

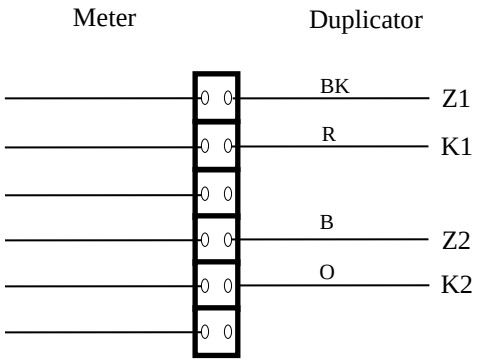
Colour Code - Female Connector

Wire Colour	Pin Type	Pin Number
Black	Female	1
White	Male	2

Physical Layout



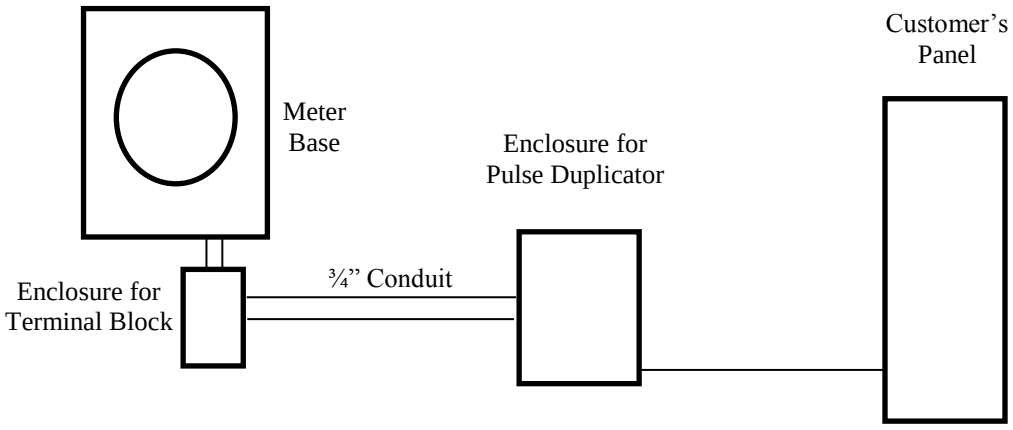
Detail for Terminal Block



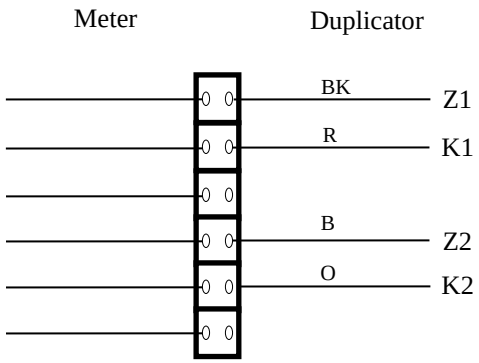
Notes:

1. The customer must supply and install the meter base, the two enclosures, the terminal block, and the conduit.
2. The pulse duplicator's enclosure's dimensions must be a minimum 10" x 10" x 4".
3. Mount the pulse duplicator's enclosure on a piece of ply wood.
4. A minimum six-pole terminal block must be installed below the meter base.
5. For the connections between the terminal block and the pulse duplicator, use #18 AWG conductors.
6. The customer shall provide a 15 amp, 120 Volt branch circuit to power the pulse duplicator. If this is impractical, consult NSPI for approval of a fused circuit from the phase A PT..

Physical Layout



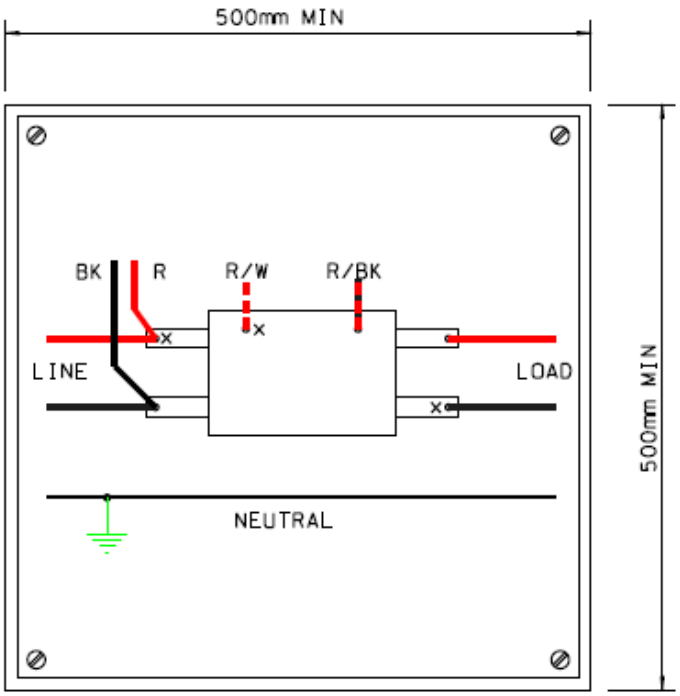
Detail for Terminal Block



Notes:

1. The customer must supply and install the meter base, the two enclosures, the terminal block, the conduit, and a 120-Volt supply for the pulse duplicator.
2. The customer must run this 120-Volt supply from their panel, and the circuit must be protected with a 15-Amp breaker.
3. The pulse duplicator's enclosure's dimensions must be a minimum 10" x 10" x 4".
4. Mount the pulse duplicator's enclosure on a piece of ply wood.
5. A minimum six-pole terminal block must be installed below the meter base.
6. For the connections between the terminal block and the pulse duplicator, use #18 AWG conductors.

STD 4.1 1, 3 Wire, 120/240 V Service exceeding 200A, Less than 800 A
STD 4.2 3, 4 Wire, 120/208 V Service exceeding 200 A, Less than 1200A
STD 4.3 3, 4 Wire, 120/208 V Service exceeding 1200 A
STD 4.4 3, 4 Wire, 347/600 V Service exceeding 200 A, less than 1200 A
STD 4.5 3, 4 Wire, 347/600 V Service exceeding 1200 A
STD 4.6 Physical Diagrams for Various Current Transformers
STD 4.7 Metering Accessories
Pictures Of Bar Type Current Transformers
Pictures Of Window Type Current Transformers
STD 4.10 Shorting Current Transformers



NOTES:
1. SEE STD 4.6 FOR CT MOUNTING ARRANGEMENTS.

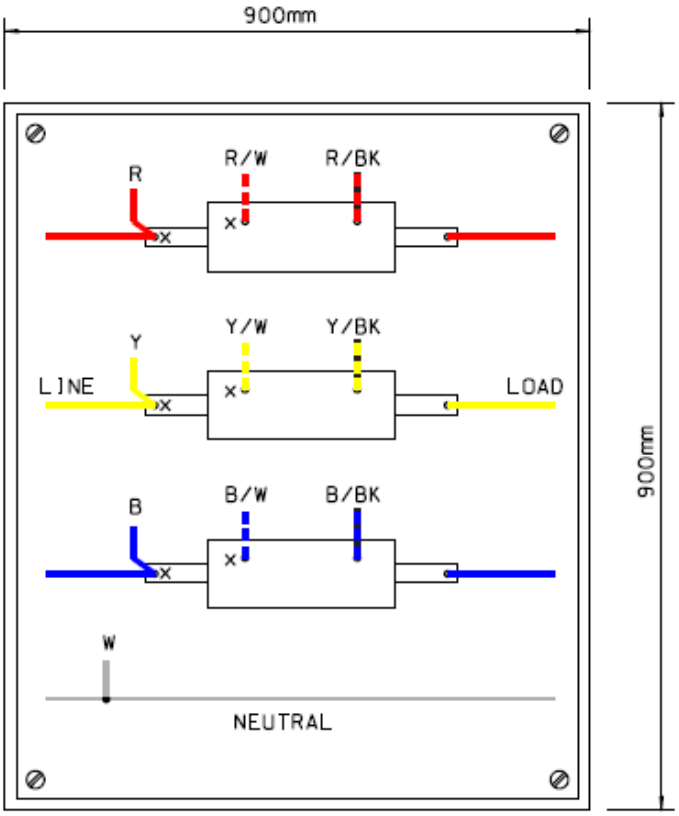
Nova Scotia POWER An Emera Company energy everywhere.

METERING STANDARD

1Φ, 3-WIRE, 120/240V SERVICE EXCEEDING 200A, LESS THAN 800A METERING CABINET BACKPLATE LAYOUT

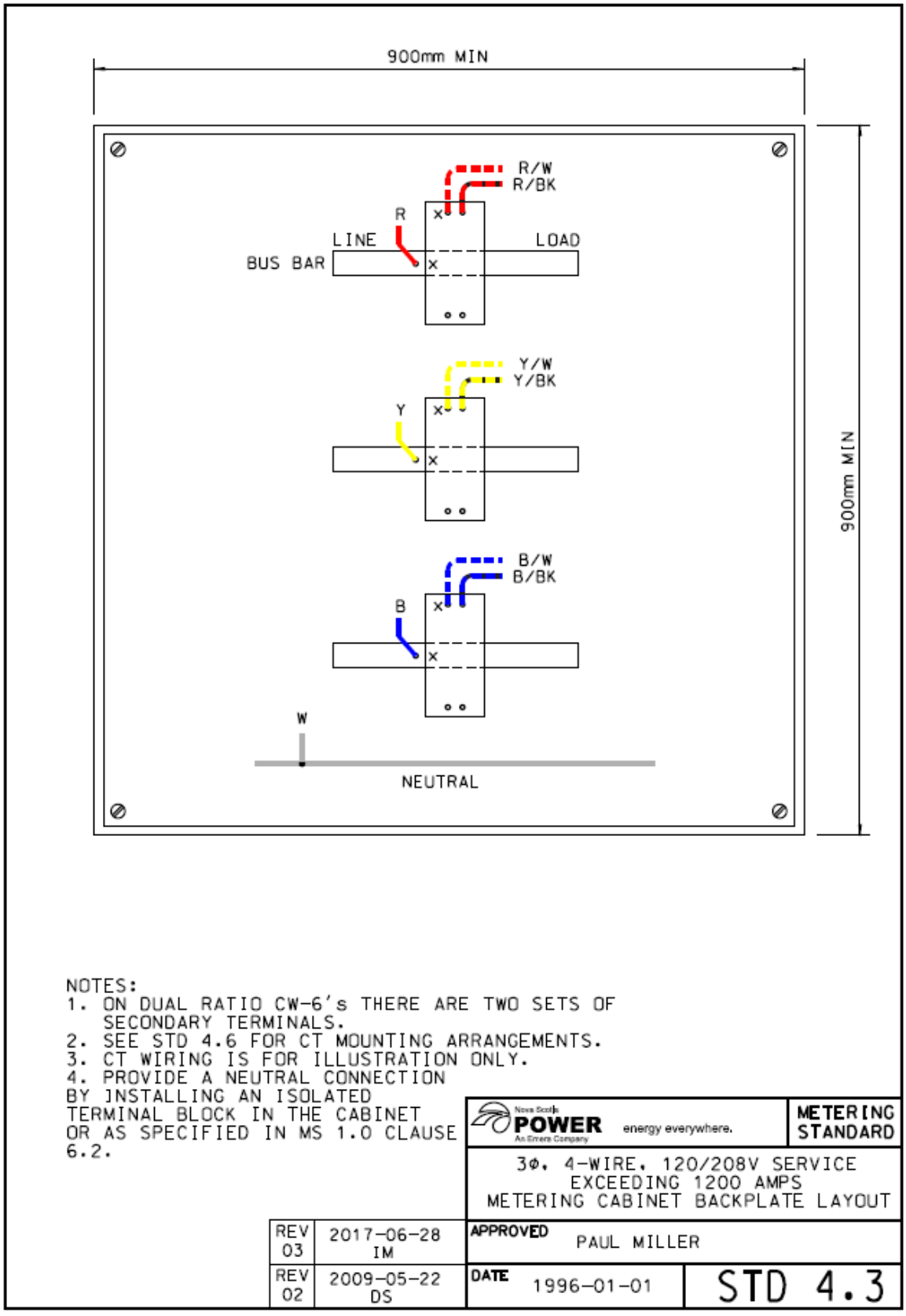
APPROVED PAUL MILLER

REV		DATE	STD 4.1
01	2009-05-22 DS	1996-01-01	



NOTES:
1. 2W – BAR TYPE CT's ARE USED UP TO 1200 AMPS.
2. SEE STD 4.6 FOR CT MOUNTING ARRANGEMENTS.
3. PROVIDE A NEUTRAL CONNECTION BY INSTALLING AN ISOLATED TERMINAL BLOCK IN THE CABINET OR AS SPECIFIED IN MS 1.0 CLAUSE 6.2.

		Nova Scotia POWER An Emera Company energy everywhere.	METERING STANDARD
		3ø, 4-WIRE, 120/208V SERVICE EXCEEDING 200A, LESS THAN 1200A METERING CABINET BACKPLATE LAYOUT	
REV 03	2017-06-28 IM	APPROVED PAUL MILLER	
REV 02	2009-05-22 DS	DATE 1996-01-01	STD 4.2



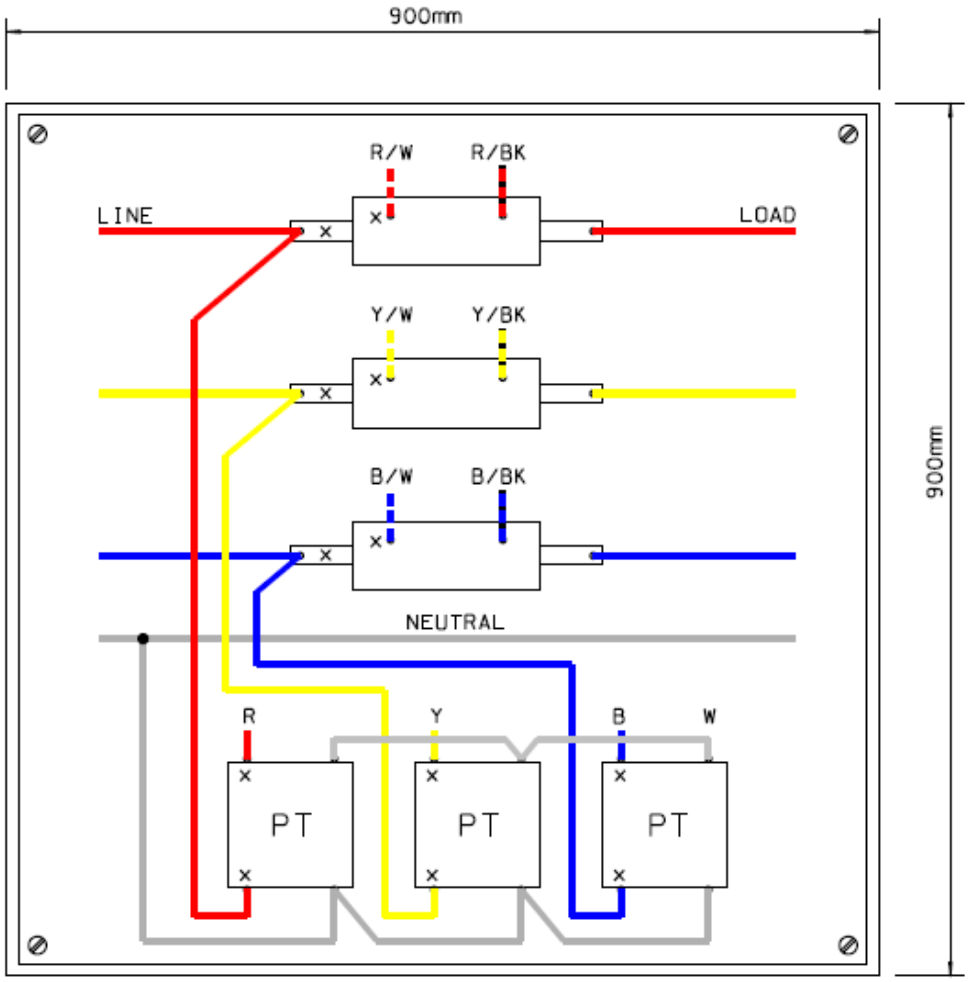
NOTES:
1. ON DUAL RATIO CW-6's THERE ARE TWO SETS OF SECONDARY TERMINALS.
2. SEE STD 4.6 FOR CT MOUNTING ARRANGEMENTS.
3. CT WIRING IS FOR ILLUSTRATION ONLY.
4. PROVIDE A NEUTRAL CONNECTION BY INSTALLING AN ISOLATED TERMINAL BLOCK IN THE CABINET OR AS SPECIFIED IN MS 1.0 CLAUSE 6.2.

Nova Scotia POWER An Emera Company energy everywhere.

METERING STANDARD

3ϕ, 4-WIRE, 120/208V SERVICE EXCEEDING 1200 AMPS METERING CABINET BACKPLATE LAYOUT

REV		APPROVED	
03	2017-06-28 IM		PAUL MILLER
02	2009-05-22 DS	DATE 1996-01-01	STD 4.3



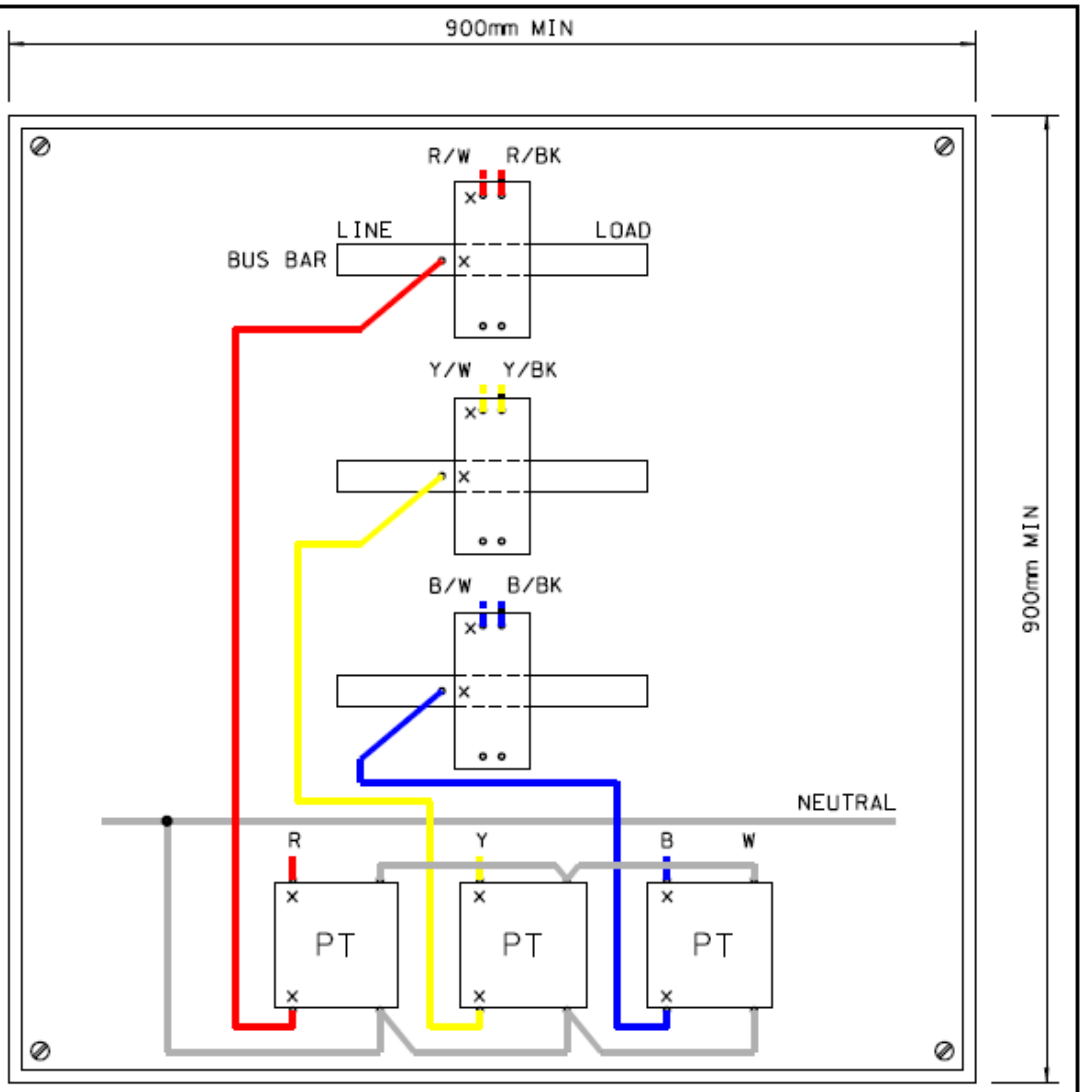
NOTES:
1. 2W – BAR TYPE CT's USED.
2. SEE STD 4.6 FOR MOUNTING ARRANGEMENTS.
3. PROVIDE A NEUTRAL CONNECTION BY INSTALLING AN ISOLATED TERMINAL BLOCK IN THE CABINET OR AS SPECIFIED IN MS 1.0. CLAUSE 6.2.

Nova Scotia POWER An Emera Company energy everywhere.

METERING STANDARD

3Φ, 4-WIRE, 347/600V SERVICE EXCEEDING 200A, LESS THAN 1200A METERING CABINET BACKPLATE LAYOUT

REV		APPROVED	
03	2016-12-21 IM	PAUL MILLER	
02	2009-05-22 DS	DATE 1996-01-01	STD 4.4



NOTES:
1. WINDOW TYPE CW-6 CT's USED.
2. SEE STD 4.6 FOR CT MOUNTING ARRANGEMENTS.
3. OTHER CONFIGURATIONS ARE ACCEPTABLE.
4. CT WIRING IS FOR ILLUSTRATION ONLY.
5. PROVIDE A NEUTRAL CONNECTION BY INSTALLING AN ISOLATED TERMINAL BLOCK IN THE CABINET OR AS SPECIFIED IN MS 1.0. CLAUSE 6.2.

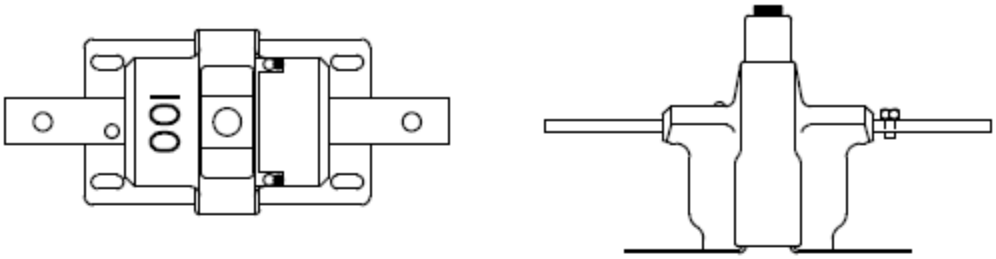
Nova Scotia POWER An Emera Company energy everywhere.

METERING STANDARD

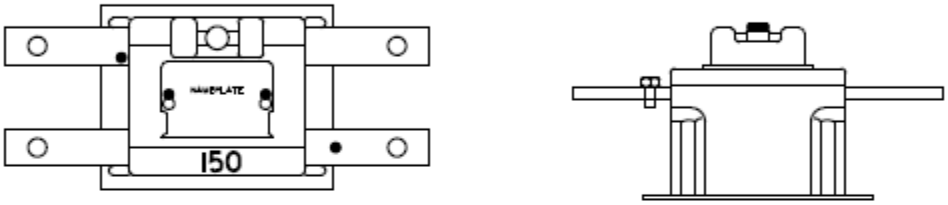
3φ, 4-WIRE, 347/600V SERVICE EXCEEDING 1200 AMPS METERING CABINET BACKPLATE LAYOUT

REV		APPROVED	
03	2017-06-28 IM		PAUL MILLER
02	2009-05-22 DS	DATE	1996-01-01

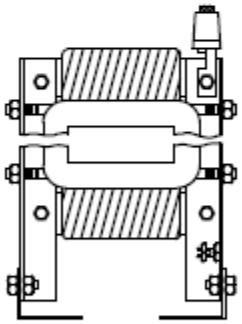
STD 4.5



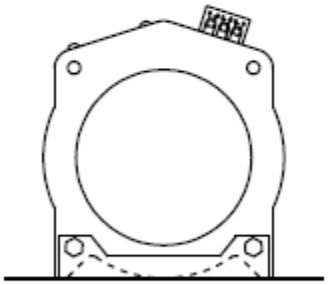
2-WIRE BAR TYPE



3-WIRE BAR TYPE



WINDOW TYPE CW-6



WINDOW TYPE R6L

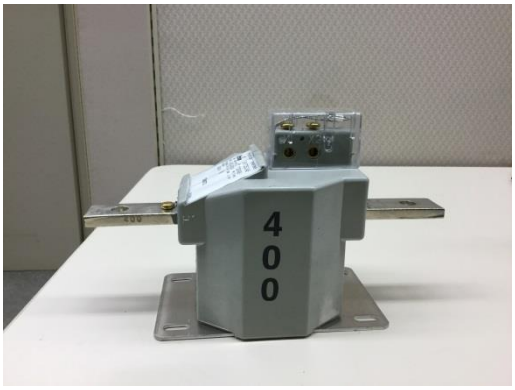
Nova Scotia Power Inc. Halifax, Nova Scotia, Canada	METERING STANDARD
PHYSICAL DIAGRAMS FOR CURRENT TRANSFORMERS	
APPROVED PAUL MILLER	
REV 02 2009-05-22 DS / DATE 1996-01-01	STD 4.6

METERING ACCESSORIES STD 4.7

SERVICE	CT CABINET	SOCKETS REQUIRED	INSTRUMENT TRANSFORMERS REQUIRED	NOTES SEE NEXT PAGE
1PH, 3-WIRE, 100A MAX	N/A	4 JAW, 100A	NONE	B
1PH, 3-WIRE, 200A MAX AND 100A MAX UNDERGROUND	N/A	4 JAW HEAVY DUTY	NONE	B
1 PH, 3-WIRE, ABOVE 200A	YES	4 JAW COMBINATION	ONE 3-WIRE CT or TWO 2-WIRE CTs	
NETWORK, 120/208V 200A MAX	N/A	5 JAW, 9 O'CLOCK POSITION	NONE	B
3 PH, 4-WIRE, 120/208V 200A MAX	N/A	7 JAW	NONE	B
3 PH, 4-WIRE, 120/208V ABOVE 200A	YES	13 JAW COMBINATION	THREE 2-WIRE CTs	E
3 PH, 4-WIRE, 347/600V 200A MAX	N/A	7 JAW	NONE	A, B
3 PH, 4-WIRE, 347/600V ABOVE 200A	YES	13 JAW COMBINATION	THREE 2-WIRE CTs and THREE PTs	E

NOTES:

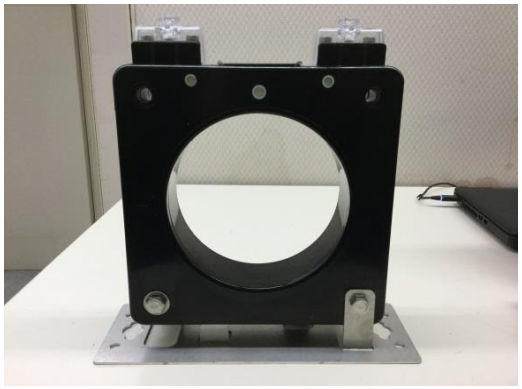
a) All three phase self-contained services or sub-services above 300 v shall have a disconnect on the line side of the meter and shall be immediately adjacent to or integrated with the meter base.
b) Isolated neutral required when meter base is located on load side of disconnecting means.
c) Where compact stranded conductors are used, the meter socket must be CSA certified for such use.
d) Meter bases to be used in conjunction with instrument transformer type meters shall be combination type to accept the test switch.
e) Switchgear rated above 1200A could require window style CTs instead of the 2-wire CTs.



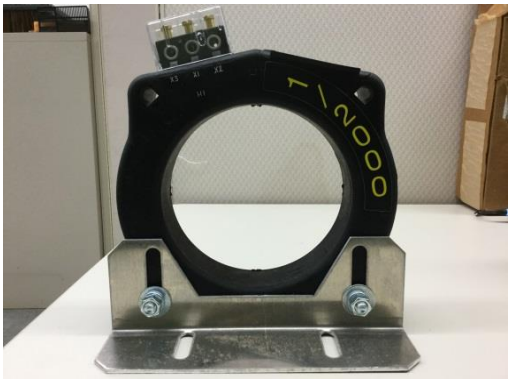
2 – WIRE BAR TYPE

3 – WIRE BAR TYPE

Nova Scotia Power Inc	METERING STANDARD
PICTURES OF BAR TYPE CURRENT TRANSFORMERS	
APPROVED	
DATE 2017-06-28	



GE TYPE JAD-0C



ITRON TYPE R6L

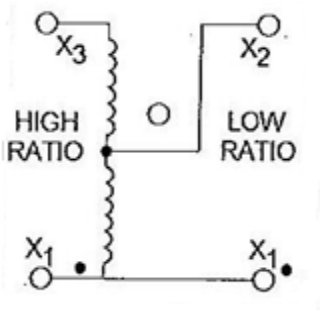
SANGAMO TYPE CW-6

Nova Scotia Power Inc	METERING STANDARD
PICTURES OF WINDOW TYPE CURRENT TRANSFORMERS	
APPROVED	
DATE 2017-06-28	

Dual Ratio General Electric JAD-0C

The four-terminal, dual ratio General Electric JAD-0C is a tapped-secondary current transformer. In general, after installing a tapped-secondary current transformer, leave all unused terminals open. Note for the GE JAD-0C, transformers are shipped with shorting bars on both terminal blocks and both bars must be opened (removed) after the installation.

Dual Ratio JAD-0C schematic; note that the white dot on both sides of the transformer represents X1.



Additionally, the dual ratio Itron R6L, Arteche CRE-17, Arteche CRF-24, and General Electric JKW-6 are tapped-secondary current transformers.

Dual Ratio Sangamo CW-6 Current Transformer

This transformer has two terminal blocks, each of which has a polarity mark. Its secondary winding has two sections.

High ratio: connect the sections in series by connecting the shorting bar on one set of terminals and leave the other set open.

Low ratio: open both shorting bars and connect each section in parallel, observing the correct polarities. Connect the paralleled terminals to the test switch from either of the sets of terminals.

Definition: Standard Drawings in this section are to be used for new services.

Single Phase 3 Wire Service

STD 5.1	3 Wire 240 Volt Self-Contained Socket Meter
STD 5.2	2 Wire 240 Volt Transformer Rated Socket Meter with 3 Wire C.T.
STD 5.3	3 Wire 240 Volt Transformer Rated S-Base Meter with 2-2 Wire C.T.
STD 5.13	2-Wire, 120 Volt, Transformer Rated S-Base with 1 2-Wire C.T. and 1 P.T.

Network 3 Wire Service 120/208 V or 345/600 V

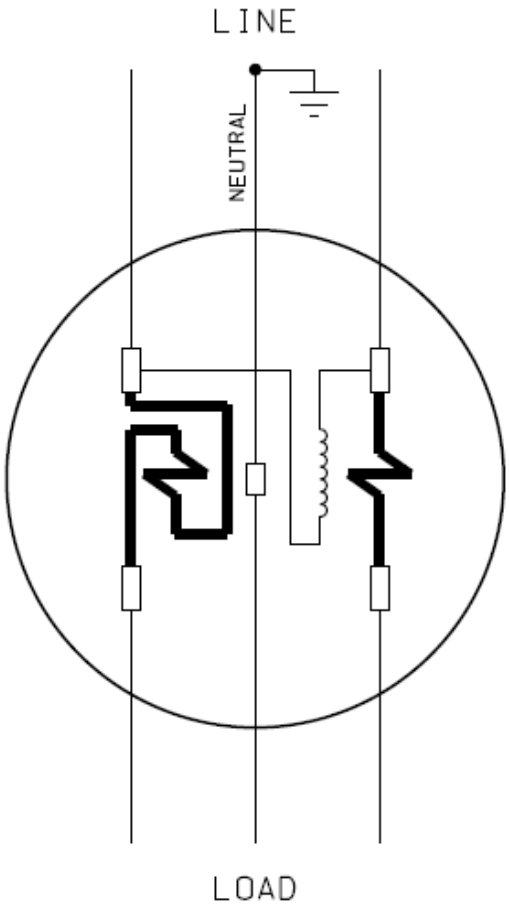
STD 5.4	2 Element 120 V or 345 V, Self-Contained S- Base Meter

Three Phase 4 Wire WYE Service

STD 5.5 3	Element, 120 V or 345 V, Self-Contained S-Base Meter
STD 5.6 3	Element, 120 V Transformer Rated, S-Base Meter with 3 C.T.'s
STD 5.7 3	Element, 120 V Transformer Rated, S-Base Meter, 3 C.T.'s & 3 P.T.'s
STD 5.8 3	Element, 120 V, Transformer Rated, Panel Mounted Quantum Meter with 3 2-wire C.T.'s & 3 P.T.'s
STD 5.11	3 Element, 120v, Transformer-Rated, Panel Mount Ion 8X00 Meter with 3 2-Wire C.T.'s And 3 P.T.'s

Primary Metering Tanks/Enclosures

STD 5.9	Single Phase, 2-wire Service Above 240 volts
STD 5.10	3 Element Generic
STD 5.12	3 Element, Primary Metering Rack



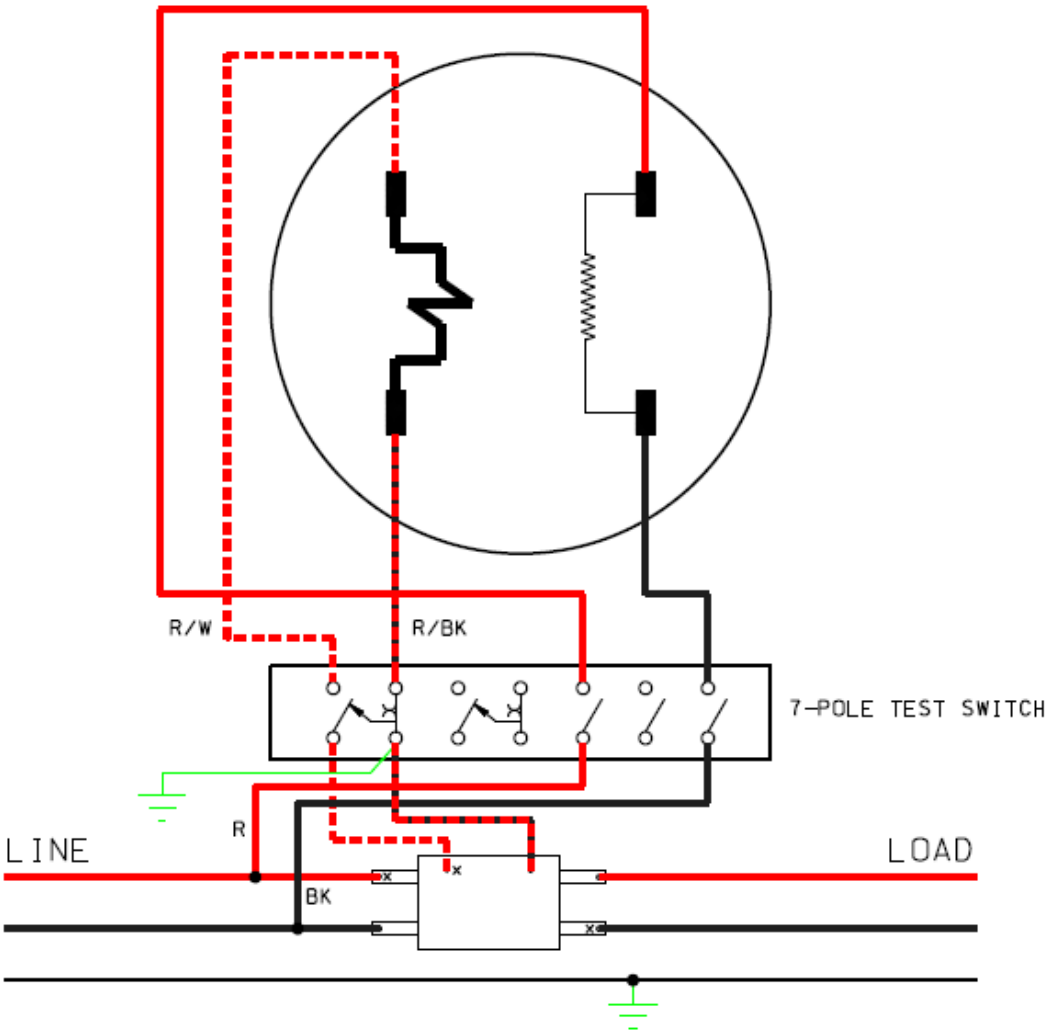
METER FORM:2S
CIRCUIT: 1φ, 3-WIRE, 120/240V
-200 AMP SERVICES:USE A CL200 METER
-400 AMP SERVICES:USE A CL320 METER
BILLING MULTIPLIER IS METER MULTIPLIER

Nova Scotia POWER An Emera Company energy everywhere. | METERING STANDARD

3-WIRE, 240 VOLT,
SELF-CONTAINED SOCKET METER

APPROVED PAUL MILLER

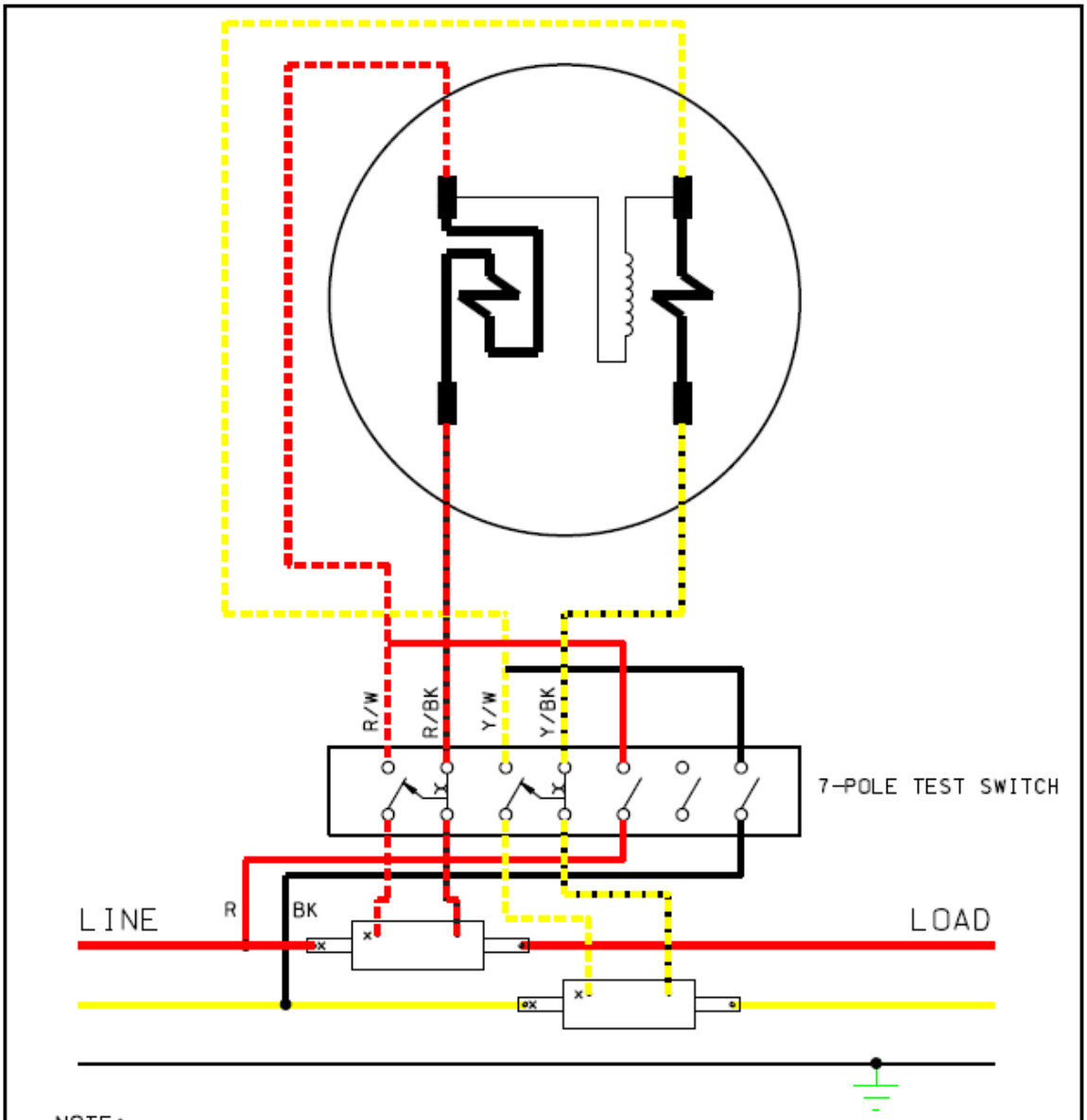
REV		DATE	
01	2017-06-28 I M	1996-01-01	STD 5.1



CIRCUIT: 1Φ , 3-WIRE, 120/240V, ABOVE 200AMPS
TRANSFORMER: 1 3-WIRE CT (BAR-TYPE)

BILLING MULTIPLIER IS METER MULTIPLIER X CT RATIO

Nova Scotia POWER An Emera Company energy everywhere.	METERING STANDARD
2-WIRE, 240 VOLT, TRANSFORMER RATED SOCKET METER WITH 3-WIRE C.T.	
APPROVED PAUL MILLER	
DATE 1996-01-01	STD 5.2



NOTE:
TO BE USED WHEN 5.2 CANNOT BE USED.

CIRCUIT: 1φ, 3-WIRE, 120/240V, ABOVE 200 AMPS MAX
TRANSFORMER: 2 2-WIRE CT's (BAR-TYPE)

BILLING MULTIPLIER IS METER MULTIPLIER X CT RATIO

CAUTION

CT CIRCUITS
NOT TO BE GROUNDED

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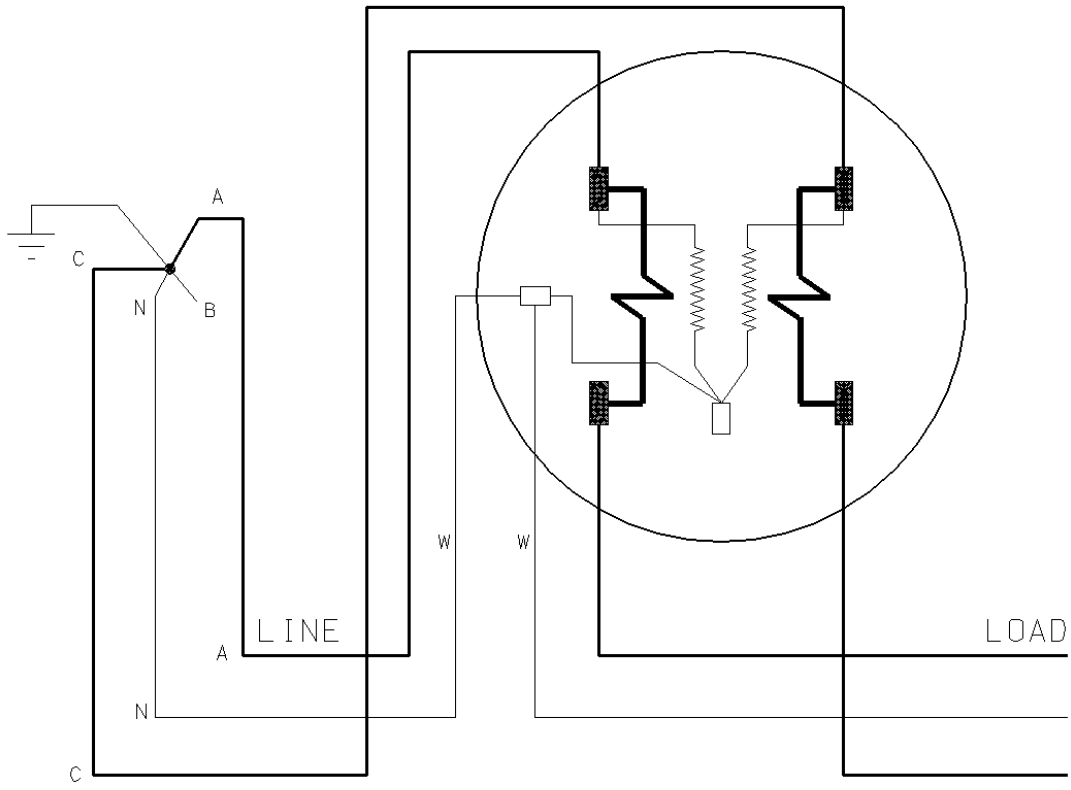
METERING STANDARD

3-WIRE, 240 VOLT, TRANSFORMER RATED S-BASE METER WITH 2 2-WIRE C.T.'s

APPROVED PAUL MILLER

DATE 1996-01-01

STD 5.3

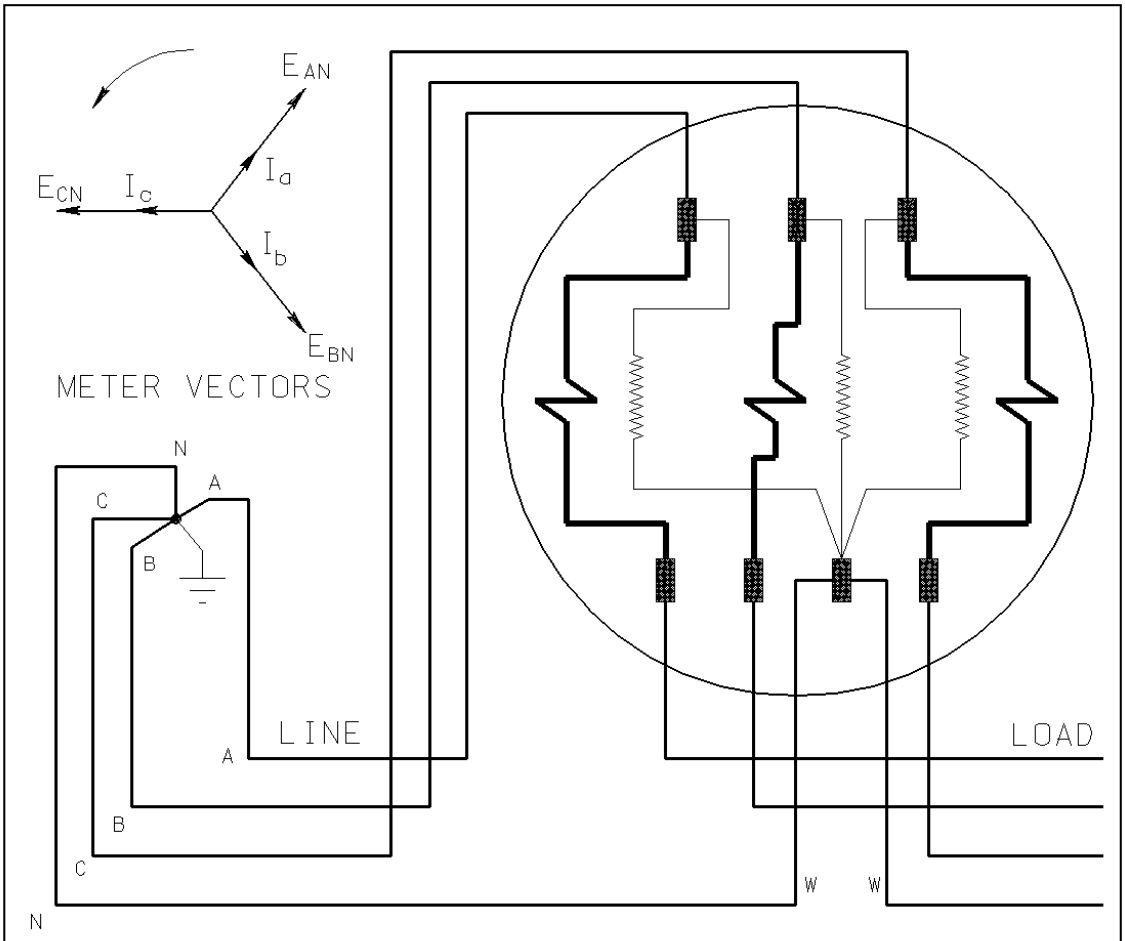


CIRCUIT: NETWORK (3-WIRE, 2ϕ), 120/208V, 200 AMPS MAX,
OR 347/600V 200 AMPS MAX

BILLING MULTIPLIER IS METER MULTIPLIER

NOTES:
1. DISCONNECT MUST BE ADJACENT TO OR INTEGRAL WITH THE METER BASE.
2. ENSURE 5th JAW IS IN 9 O'CLOCK POSITION.

Nova Scotia Power Inc. Halifax, Nova Scotia, Canada	METERING STANDARD
2 ELEMENT, 120 VOLT OR 345 VOLT SELF-CONTAINED S-BASE METER	
APPROVED PAUL MILLER	
REV 01 2003-11-03 / DATE 1996-01-01	STD 5.4

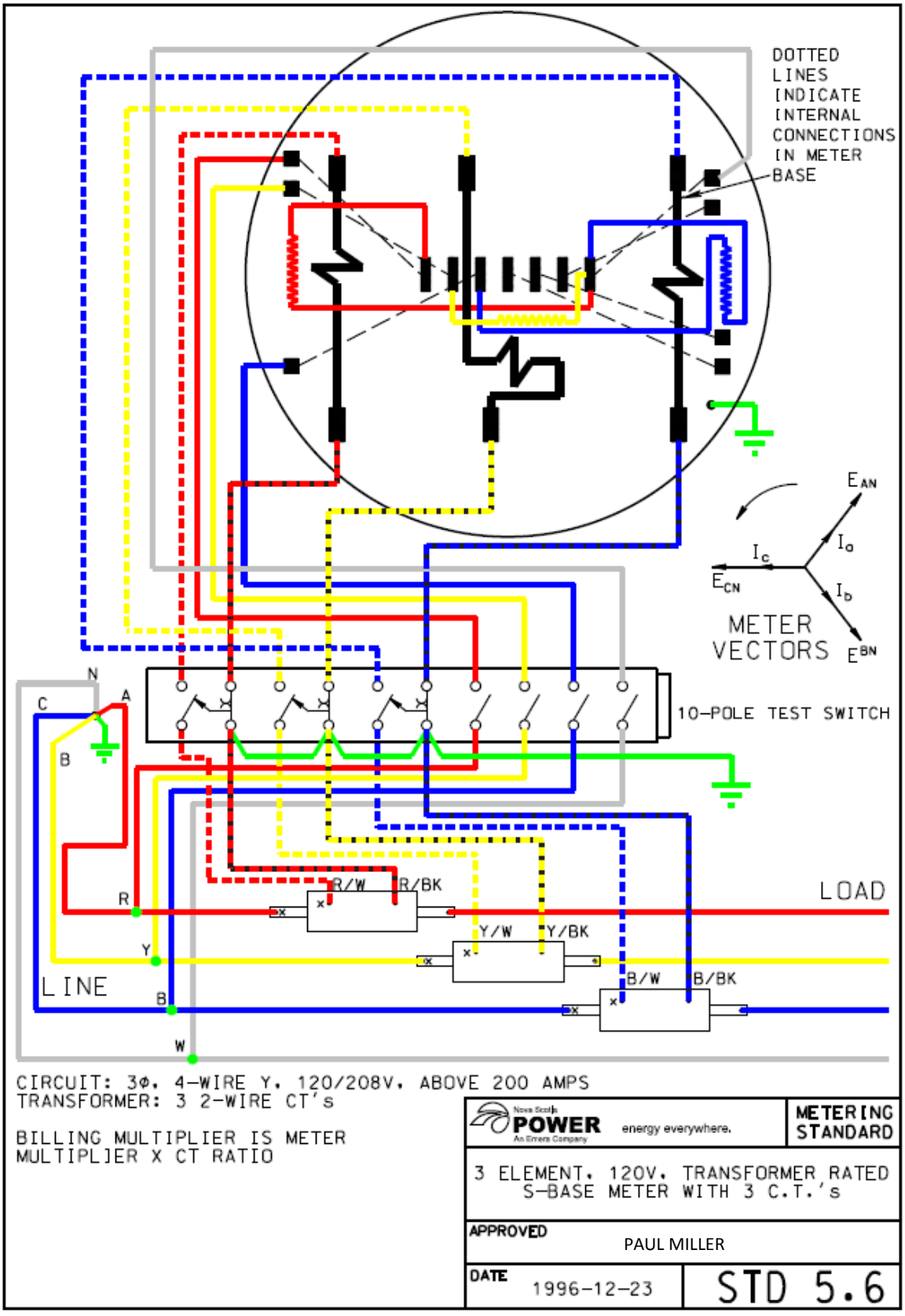


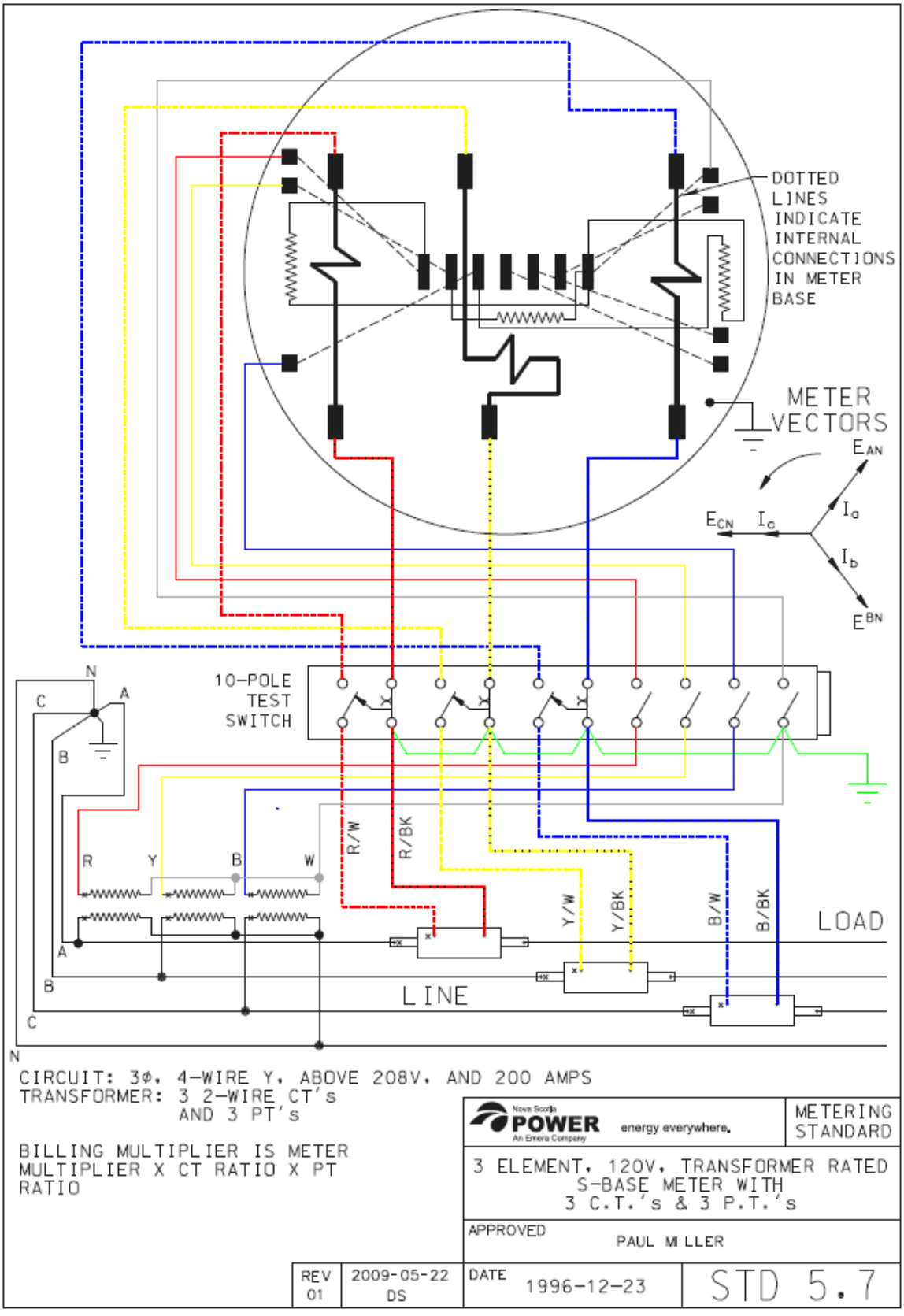
CIRCUIT: 3ϕ, 4-WIRE Y, 120/208V, 200 AMPS MAX OR
347/600V 200, AMPS MAX

BILLING MULTIPLIER IS METER MULTIPLIER

NOTES:
1. DISCONNECT MUST BE ADJACENT TO OR INTEGRAL WITH THE METER BASE, REFER TO SECTION 7.

Nova Scotia Power Inc. Halifax, Nova Scotia, Canada	METERING STANDARD
3 ELEMENT, 120 VOLT OR 345 VOLT SELF-CONTAINED S-BASE METER	
APPROVED PAUL MILLER	
REV 01 2003-11-03 / DATE 1996-12-20	STD 5.5


DOTTED LINES INDICATE INTERNAL CONNECTIONS IN METER BASE
E_{AN}
I_a
I_c
E_{CN}
I_b
METER VECTORS
E_{BN}
N
C
A
B
10-POLE TEST SWITCH
R/W
R/BK
LOAD
R
Y/W
Y/BK
Y
LINE
B/W
B/BK
B
W
CIRCUIT: 3Φ, 4-WIRE Y, 120/208V, ABOVE 200 AMPS
TRANSFORMER: 3 2-WIRE CT's
BILLING MULTIPLIER IS METER MULTIPLIER X CT RATIO
Nova Scotia POWER An Emera Company
energy everywhere.
METERING STANDARD
3 ELEMENT, 120V, TRANSFORMER RATED S-BASE METER WITH 3 C.T.'s
APPROVED
PAUL MILLER
DATE
1996-12-23
STD 5.6



CIRCUIT: 3Φ, 4-WIRE Y, ABOVE 208V, AND 200 AMPS
TRANSFORMER: 3 2-WIRE CT's
AND 3 PT's

BILLING MULTIPLIER IS METER MULTIPLIER X CT RATIO X PT RATIO

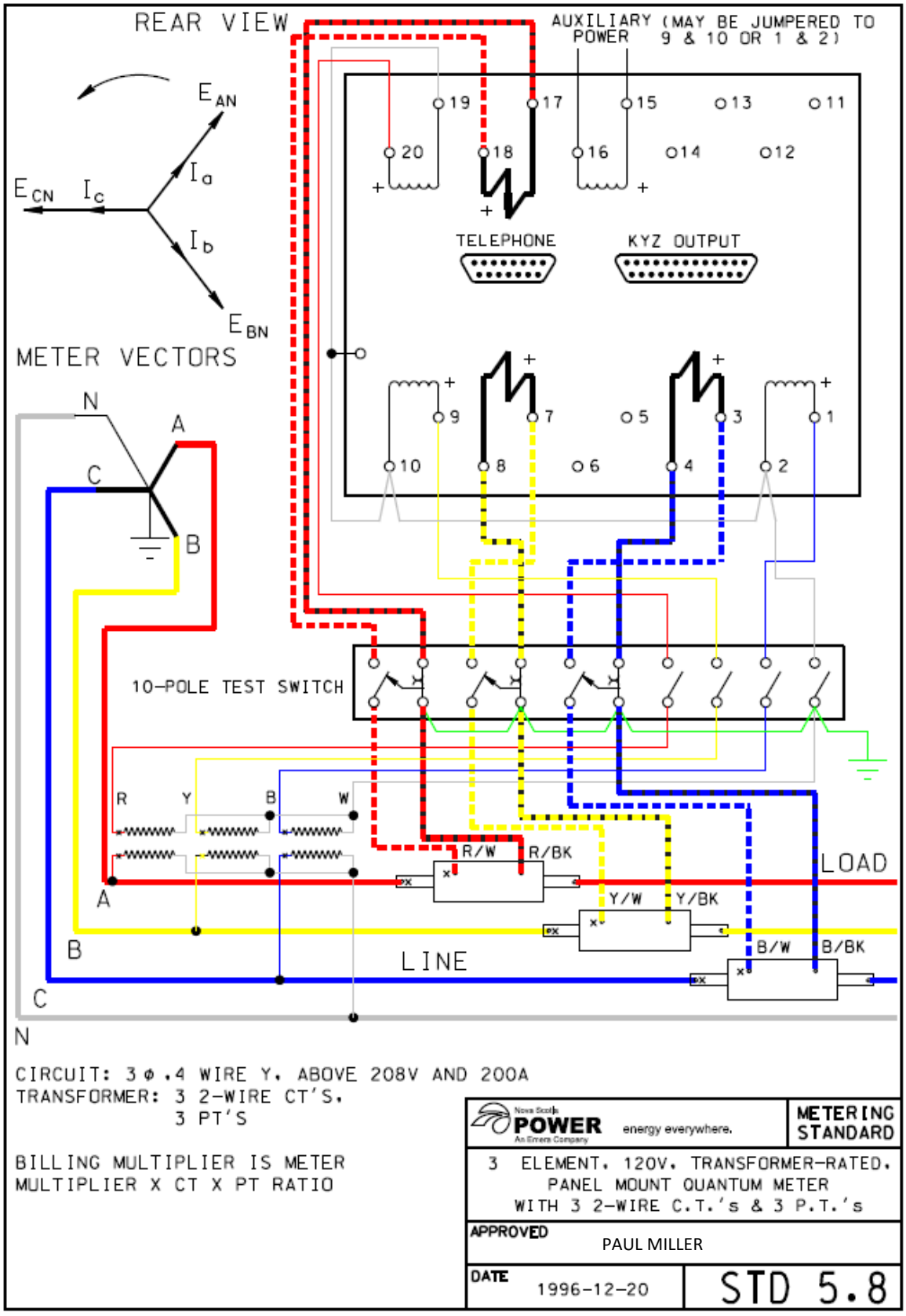
Nova Scotia POWER An Emera Company energy everywhere.

METERING STANDARD

3 ELEMENT, 120V, TRANSFORMER RATED S-BASE METER WITH 3 C.T.'s & 3 P.T.'s

APPROVED PAUL MILLER

REV		DATE	STD
01	2009-05-22 DS	1996-12-23	5.7



CIRCUIT: 3 φ .4 WIRE Y. ABOVE 208V AND 200A
TRANSFORMER: 3 2-WIRE CT'S.
3 PT'S

BILLING MULTIPLIER IS METER MULTIPLIER X CT X PT RATIO

Nova Scotia POWER An Emera Company energy everywhere.

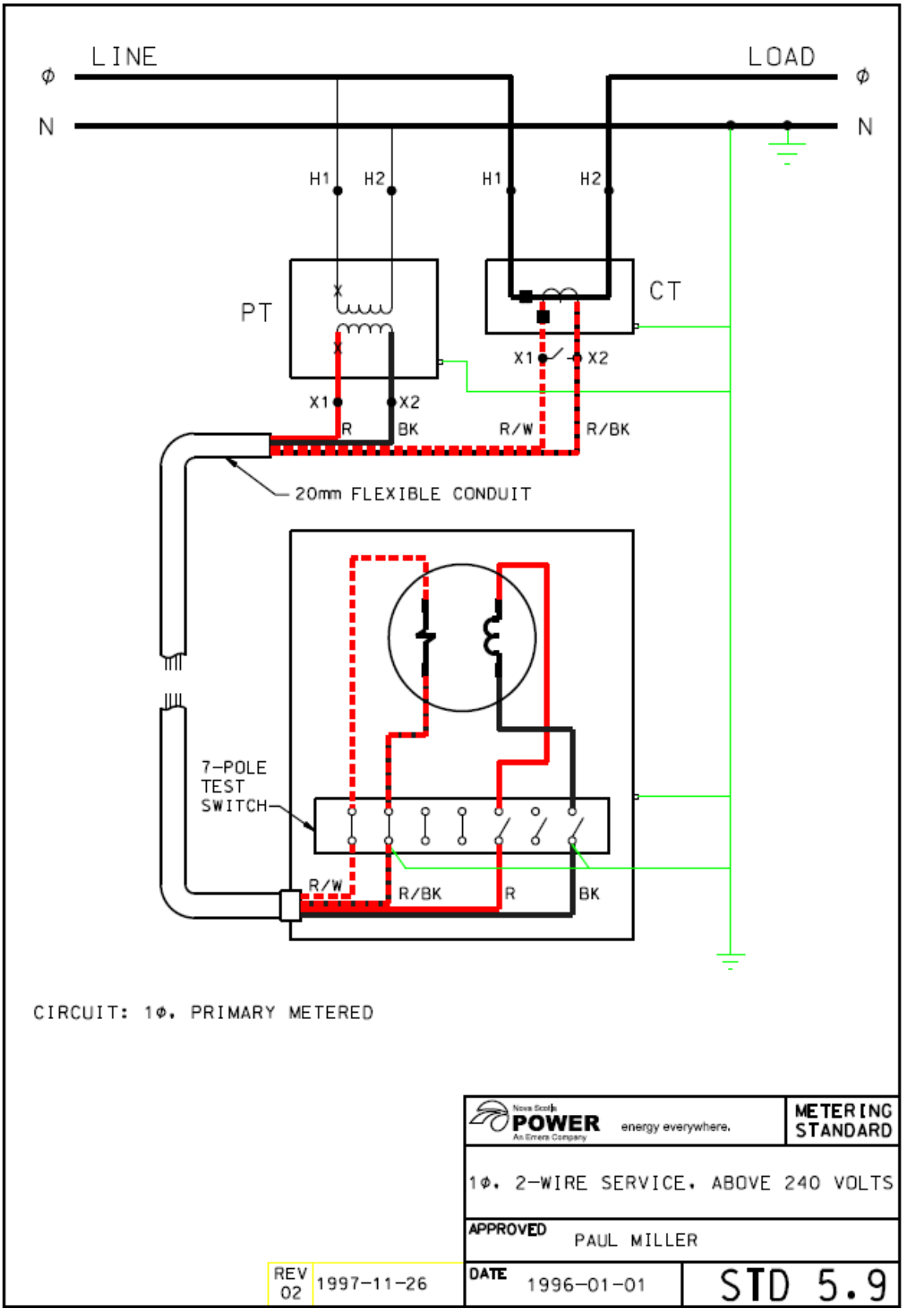
METERING STANDARD

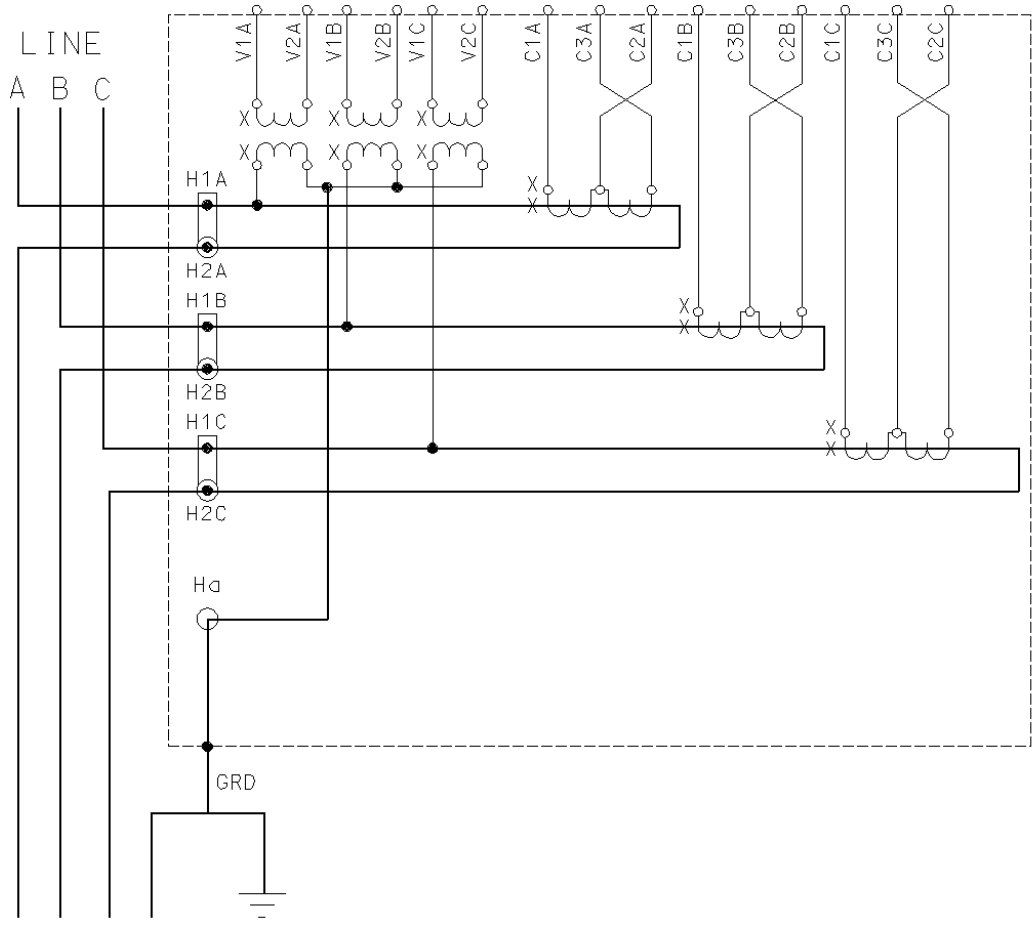
3 ELEMENT, 120V, TRANSFORMER-RATED, PANEL MOUNT QUANTUM METER WITH 3 2-WIRE C.T.'s & 3 P.T.'s

APPROVED PAUL MILLER

DATE 1996-12-20

STD 5.8

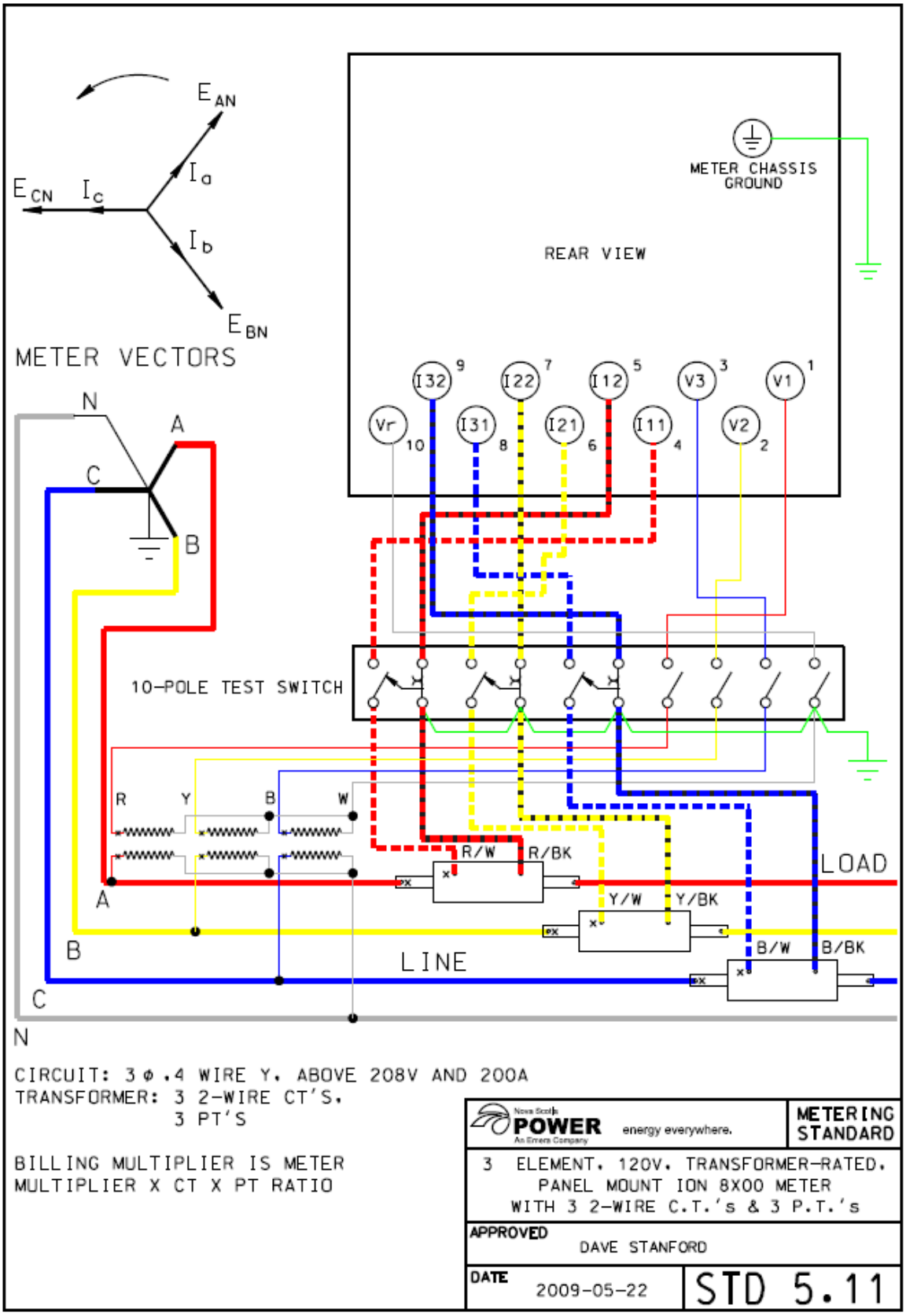

LINE
LOAD
ϕ
N
ϕ
N
H1
H2
H1
H2
PT
CT
X
X
X1
X2
X1
X2
R
BK
R/W
R/BK
20mm FLEXIBLE CONDUIT
7-POLE
TEST
SWITCH
R/W
R/BK
R
BK
CIRCUIT: 1ϕ, PRIMARY METERED
Nova Scotia POWER An Emera Company
energy everywhere.
METERING STANDARD
1ϕ, 2-WIRE SERVICE, ABOVE 240 VOLTS
APPROVED
PAUL MILLER
REV 02
1997-11-26
DATE
1996-01-01
STD 5.9



DUAL RATIO CT CONNECTION	
LOW	HIGH
C1A & C2A	C1A & C3A
C1B & C2B	C1B & C3B
C1C & C2C	C1C & C3C

NOTE:
1. OPEN CT SHORTING LINKS AFTER METER IS CONNECTED AND BEFORE ENERGIZATION OCCURS.

Nova Scotia Power Inc. Halifax, Nova Scotia, Canada	METERING STANDARD
PRIMARY METERING 3 ELEMENT GENERIC	
APPROVED DAVID STANFORD	
DATE 2003-05-12	STD 5.10



CIRCUIT: 3 φ .4 WIRE Y. ABOVE 208V AND 200A
TRANSFORMER: 3 2-WIRE CT'S.
3 PT'S

BILLING MULTIPLIER IS METER
MULTIPLIER X CT X PT RATIO

Nova Scotia POWER An Emera Company energy everywhere.

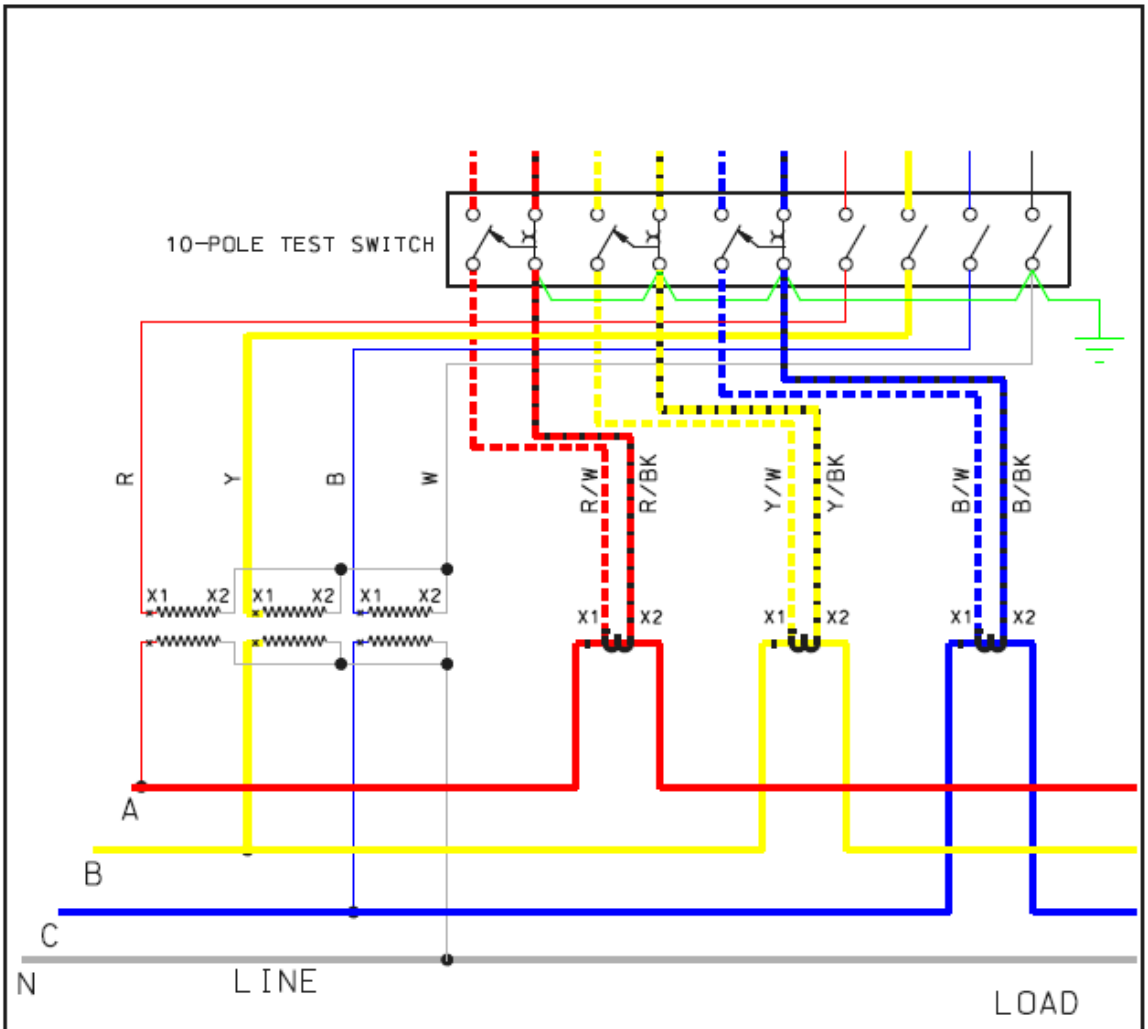
METERING STANDARD

3 ELEMENT. 120V. TRANSFORMER-RATED.
PANEL MOUNT ION 8X00 METER
WITH 3 2-WIRE C.T.'s & 3 P.T.'s

APPROVED DAVE STANFORD

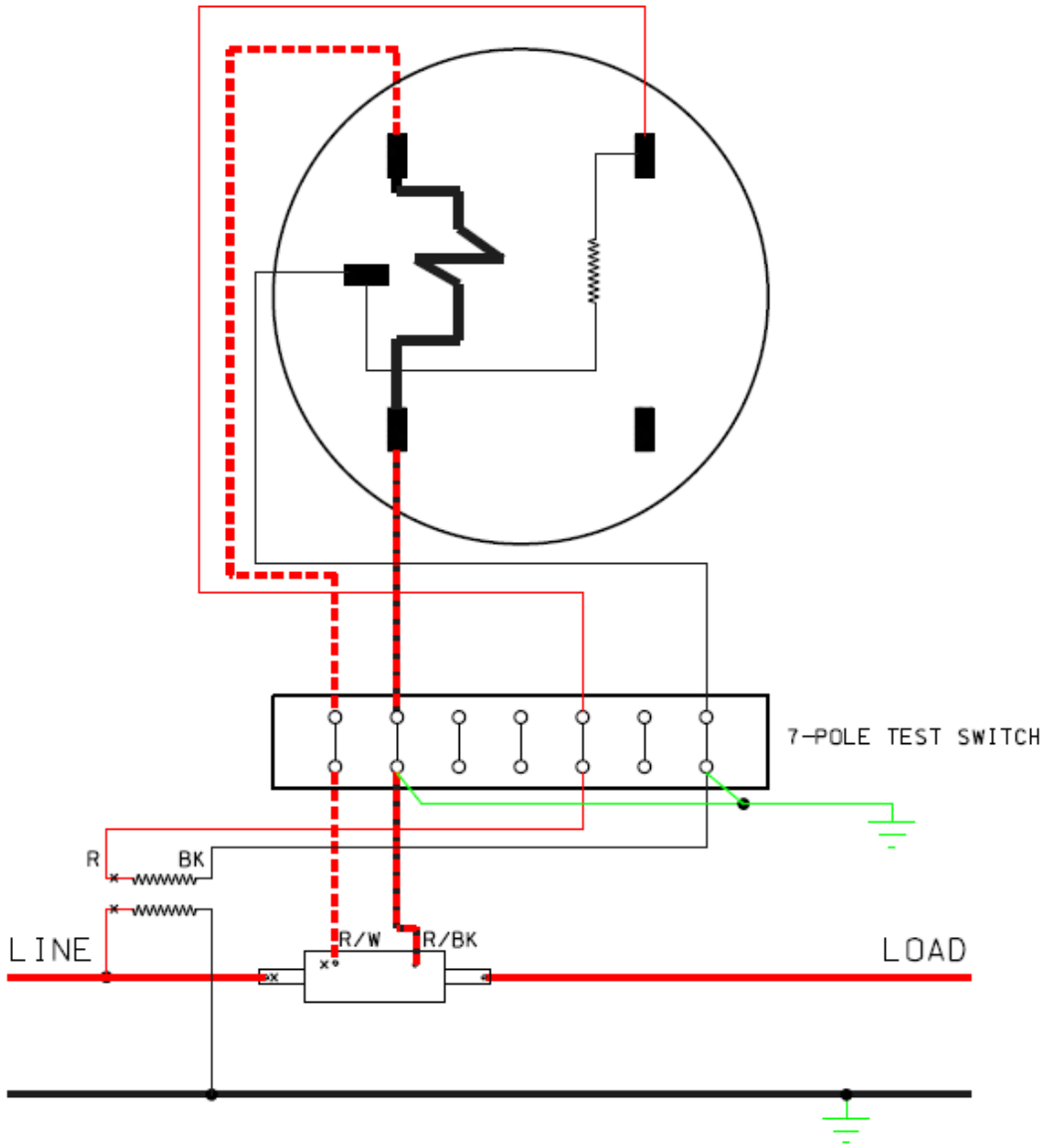
DATE 2009-05-22

STD 5.11



NOTES:
1. BILLING MULTIPLIER IS METER MULTIPLIER X CT X PT RATIO.
2. REFER TO STD 5.7 FOR CONNECTIONS BETWEEN THE TEST SWITCH AND THE METER.
3. WITH INDEPENDENT POWER PRODUCERS, THE GENERATOR SIDE IS THE LINE SIDE AND NSPI IS THE LOAD SIDE.
4. PULL A BOND WIRE (GREEN) BETWEEN ALL COMPONENTS AND THE METER BASE.

Nova Scotia POWER An Emera Company energy everywhere.			METERING STANDARD
3 ELEMENT, PRIMARY METERING RACK			
APPROVED DAVE STANFORD			
REV 01	2017-06-28 IM	DATE 2009-05-22	STD 5.12



METER FORM: 3S
FIFTH JAW AT 9 O'CLOCK POSITION
CIRCUIT: 1Φ, 2 WIRE, ABOVE 240V
BILLING MULTIPLIER: METER MULTIPLIER X PT RATIO X CT RATIO

Nova Scotia POWER An Emera Company energy everywhere.

METERING STANDARD

2-WIRE, 120 VOLT, TRANSFORMER RATED S-BASE METER WITH 1-2 WIRE C.T. AND 1 1 P.T.

APPROVED IAN MACKILLOP

DATE 2017-06-28

STD 5.13

DEFINITION: Non Standard Drawings in this Section are to be used to maintain existing services as long as equipment is available. Refer to Section 5 for new services.

Single Phase 2 or 3-Wire Service

STD 6.1	2-Wire 120 V Self-Contained A-Base Meter
STD 6.2	2-Wire 120 V Self-Contained S-Base Meter
STD 6.3	2-Wire 240V Transformer Rated A-Base Meter with 1-3-w C.T.
STD 6.4	2-Wire 240V Transformer Rated A-Base Meter with 1 Donut C.T.
STD 6.5	2 Wire 120 V Transformer Rated S-Base Meter with 1 2-wire C.T. & 1 P.T.
STD 6.6	2-Wire 240 V Transformer Rated S-Base Meter with 1 Donut C.T.
STD 6.7	2-Wire 240 V Transformer Rated A-Base Meter with 2 Donut C.T. (secondaries paralleled)
STD 6.7A	2-Wire, 240 Volt, Transformer Rated S-Base With 2, 2-Wire C.T.'s
STD 6.8	2-Wire 120 V Transformer Rated A-Base Meter with 1 2-wire C.T. & 1 P.T.
STD 6.9	3-Wire 240 V Self-Contained A-Base Meter
STD 6.10	3-Wire 240 V Transformer Rated A-Base Meter with 2 2-Wire C.T.'s
STD 6.11	3-Wire 240 V Transformer Rated A-Base Meter with 2 Donut C.T.'s
STD 6.12	3-Wire 240 V Transformer Rated S-Base Meter with 2 Donut C.T.'s

Three Phase 3-Wire Delta Service

STD 6.16	2 Element 240 V or 600 V, Self-Contained P-Base Meter
STD 6.17	2 Element 240 V, Transformer Rated P-Base Meter with 2 2-W C.T.
STD 6.18	2 Element 120 V, Transformer Rated P-Base Meter with 2-2W C.T. & 2 P.T.'s
STD 6.19	2 Element 120 V, Transformer Rated, Panel Mount Quantum 2 2-W C.T.'s & 2 P.T.'s
STD 6.20	2 Element 240 V or 600 V, Self-Contained S-Base Meter
STD 6.21	2 Element 240 V, Transformer Rated S-Base Meter with 2-2W C.T.
STD 6.22	2 Element 120 V, Transformer Rated S-Base Meter with 2 2-W & 2 P.T.'s
STD 6.24	2 Element 120 V, Transformer Rated Panel Mount DS--63 Meter with 2 2-WC.T.'s & 2 P.T.'s
STD 6.25	2 Element 120 V, Transformer Rated Panel Mount D4B - 2F Meter with 2 2-W C.T.'s & 2 P.T.'s
STD 6.53	2 Element, 120v, Transformer-Rated, Panel Mount Ion 8X00 Meter with 2 2-Wire C.T.'s And 2 P.T.'s

3 Phase 4-Wire WYE Services

STD 6.27	2½ Element 120 V or 345 V, Self-contained P Base Meter
STD 6.28	2½ Element 120 V, Transformer Rated P Base Meter with 3 2-W C.T.'s
STD 6.29	2½ Element 120 V, Transformer Rated P Base Meter with 3 2-W C.T.'s & 2 P.T.'s
STD 6.31	2½ Element 120 V, Transformer Rated Panel Mount Quantum Meter with 3 2-W C.T.'s & 2 P.T.'s

3 Phase 4-Wire WYE Services with Delta Bridle for C.T.'s on the Testblock

STD 6.32	2 Element 120 V, Transformer Rated, P-Base Meter with 3 2-W C.T.
STD 6.33	2 Element 120V, Transformer Rated, S-Base Meter with 3 2-W C.T.
STD 6.34	2 Element 120 V, Transformer Rated, P-Base Meter wtih 3 2-W C.T.'s & 2 P.T.'s
STD 6.35	2 Element 120V, Transformer Rated, S-Base Meter with 3 2-W C.T.'s & 2 P.T.'s

Network 3-Wire Service

STD 6.36 2 Element 120V Self Contained A-Base Meter

3 Phase 4-Wire Delta Services

STD 6.37 2½ Element 240 V, Self-Contained, S-Base Meter
STD 6.38 2½ Element 240 V, Self-Contained P-Base Meter
STD 6.40 2½ Element 240 V, Transformer Rated P-Base Meter with 3 2-W C.T.'s
*STD 6.41 2 Element 240 V Transformer Rated, S-Base Meter with 1 2-W C.T.'s & 1 3-W C.T.'s
*STD 6.42 2 Element 240 V Transformer Rated, P-Base Meter with 1 2-W C.T.'s & 1 3-W C.T.'s
STD 6.44 2½ Element 240 V, Transformer Rated S-Base Meter with 3 2-W C.T.'s

* Indicates that in some cases, Donut CT was used instead of 3 wire C.T.

Three Phase 4-Wire Service

STD 6.45 2½ Element, 120 V or 345 V, Self-Contained, S-Base Meter
STD 6.46 2½ Element, 120 V, Transformer Rated, S-Base Meter with 3 C.T.'s
STD 6.47 2½ Element, 120 V, Transformer Rated, S-Base Meter with 3 C.T.'s & 2 P.T.'s
STD 6.54 2½ Element 120 V, Transformer-Rated, Panel Mount Ion 8X00 Meter with 3 2-Wire C.T.'s & 2 P.T.'s

Primary Metering

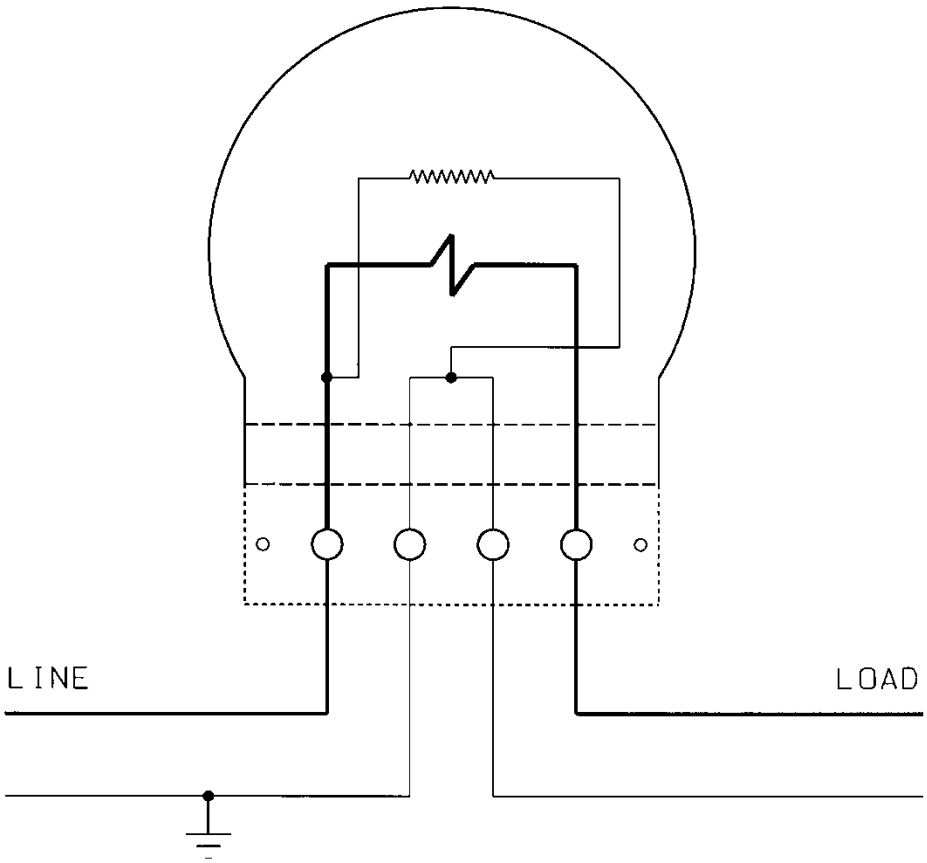
STD 6.48 Three Phase, 2.5 Element Generic
STD 6.49 Three Phase, 2 Element Generic

Parallel Metering

STD 6.50 3 Element
STD 6.51 2.5 Element
STD 6.52 2 Element
STD 6.55 1 Element
STD 6.56 1.5 Element

P – S Adapter Connection

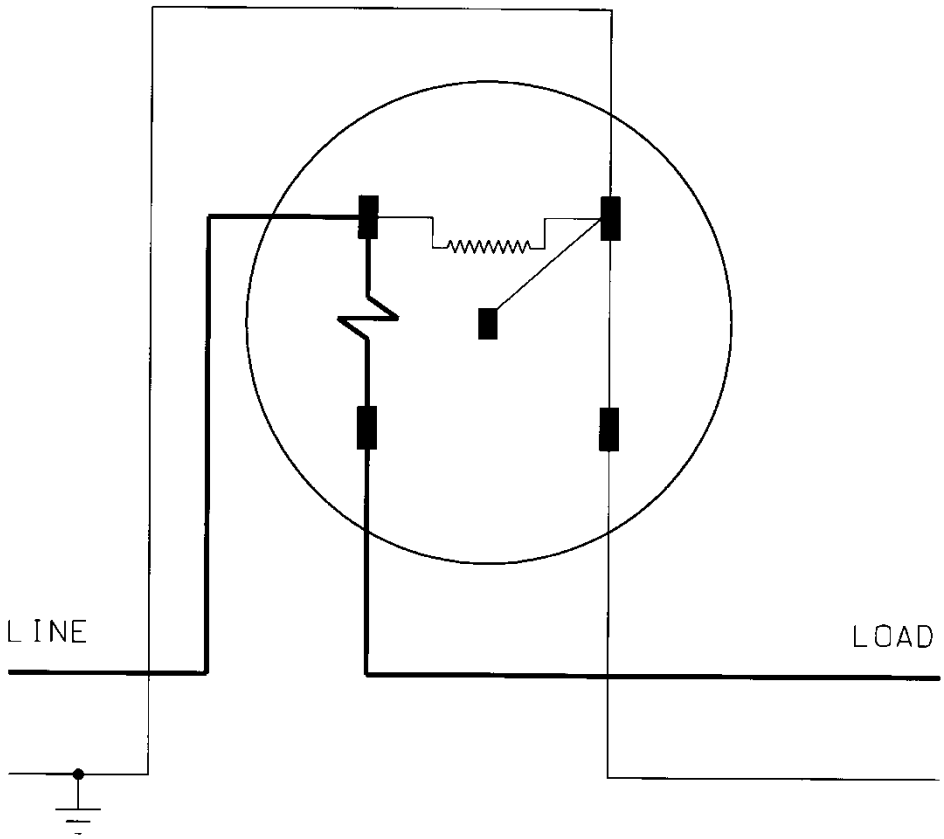
STD 6.57 2.5 Element P – S Adapter Connection
STD 6.58 2.0 Element P – S Adapter Connection



CIRCUIT: 1ϕ, 2-WIRE, 120V

BILLING MULTIPLIER IS METER MULTIPLIER

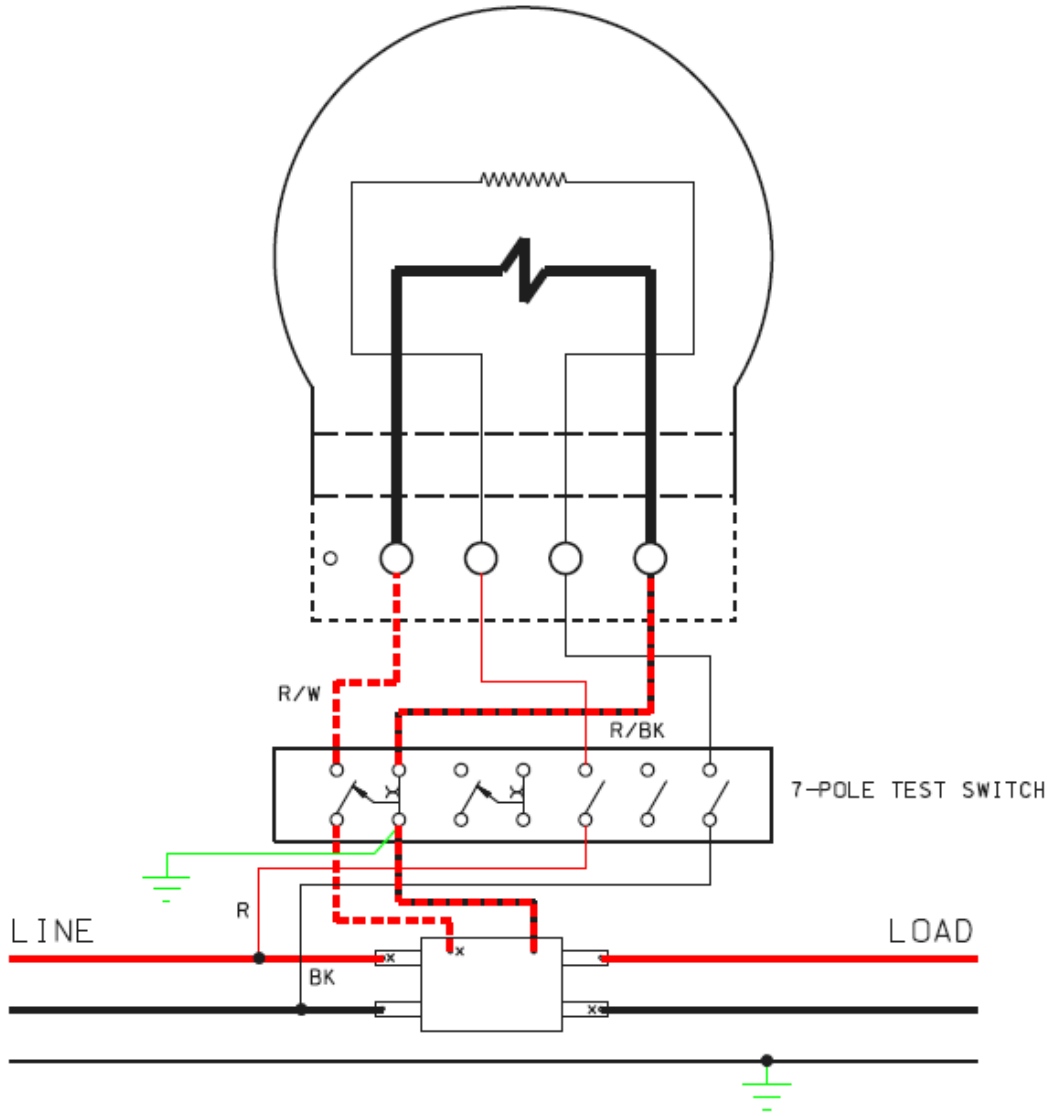
Nova Scotia Power Inc. Halifax, Nova Scotia, Canada	METERING STANDARD
2-WIRE, 120 VOLT, SELF-CONTAINED A-BASE METER	
APPROVED Paul Miller	
DATE 1996-01-01	STD 6.1



CIRCUIT: 1φ, 2-WIRE, 120V

BILLING MULTIPLIER IS METER MULTIPLIER

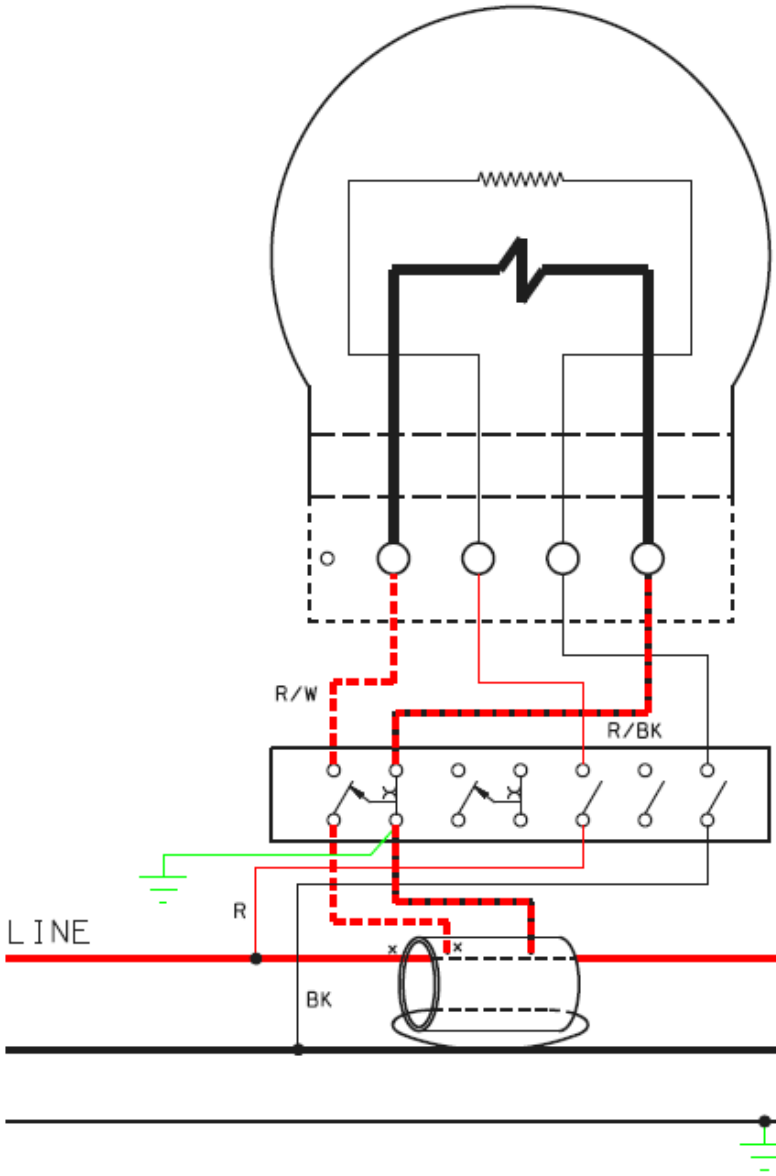
Nova Scotia Power Inc. Halifax, Nova Scotia, Canada	METERING STANDARD
2-WIRE, 120 VOLT, SELF-CONTAINED S-BASE METER	
APPROVED	
DATE 1996-01-01	STD 6.2



CIRCUIT: 1φ, 3-WIRE, 120/240V, ABOVE 200 AMPS

BILLING MULTIPLIER IS METER MULTIPLIER X CT RATIO

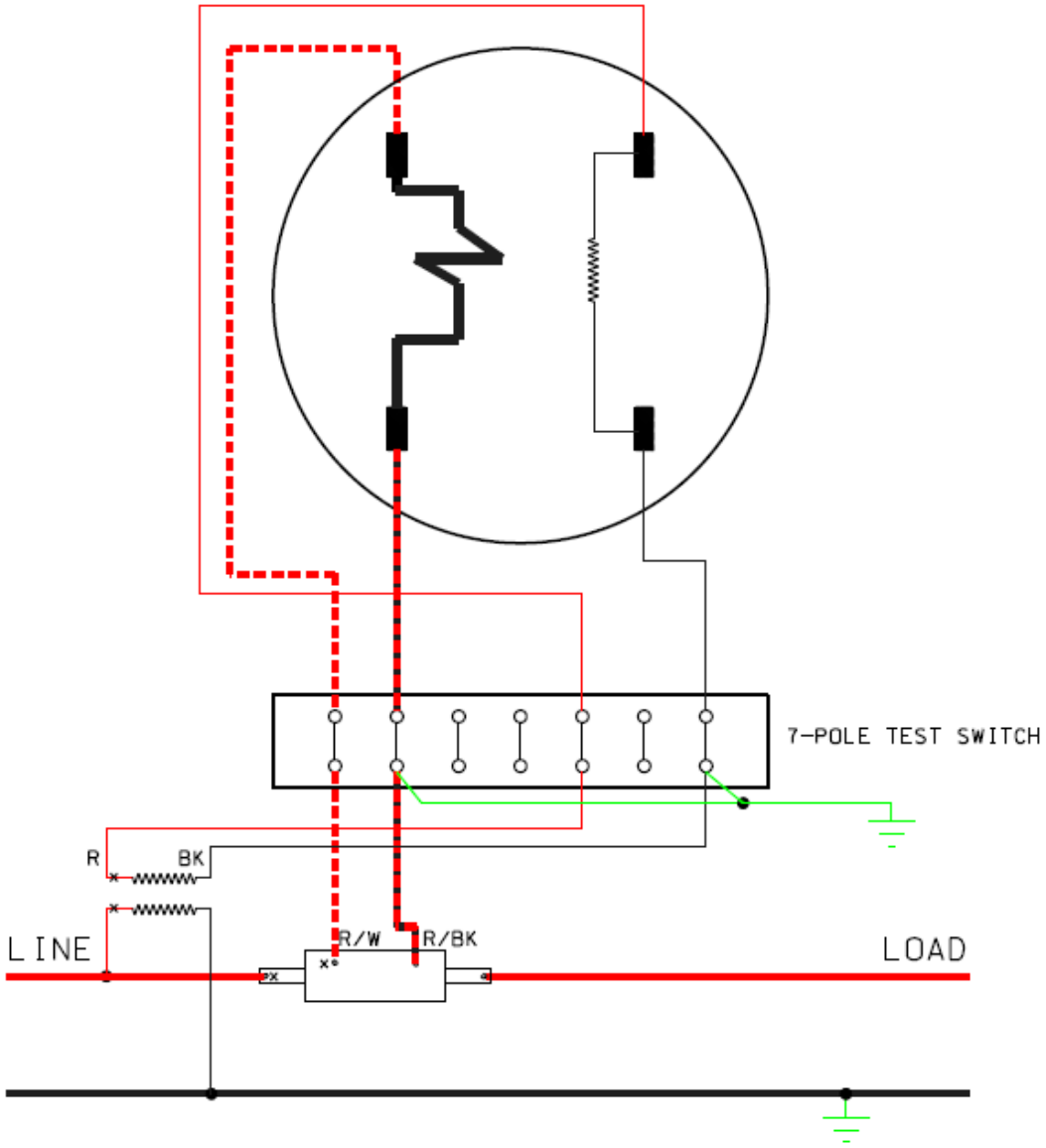
Nova Scotia POWER An Emera Company energy everywhere.	METERING STANDARD
2-WIRE, 240 VOLT, TRANSFORMER RATED A-BASE METER WITH 1 3-WIRE C.T.	
APPROVED DAVID STANFORD	
DATE 1996-01-01	STD 6.3



CIRCUIT: 1φ, 3-WIRE, 120/240V, 200 AMPS MAX
TRANSFORMER: 1 CT (DONUT TYPE)

BILLING MULTIPLIER IS ½ METER MULTIPLIER * CT RATIO

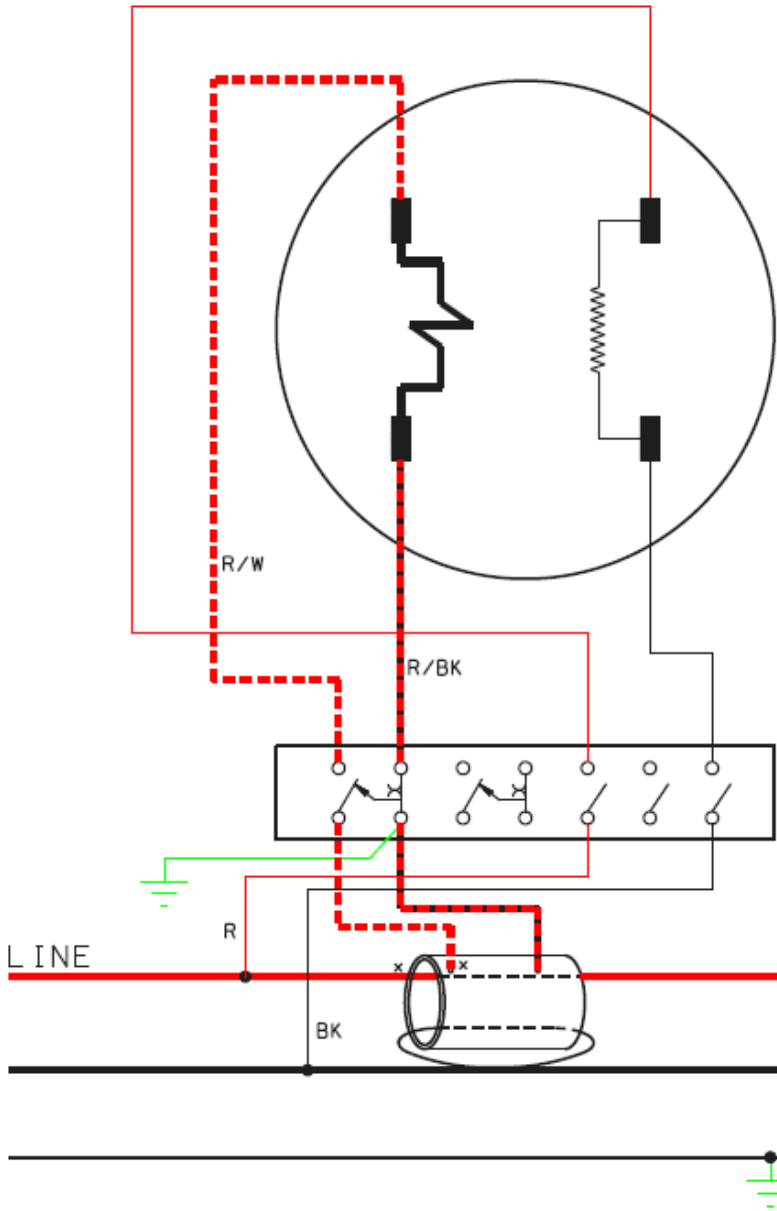
Nova Scotia POWER An Emera Company energy everywhere.			METERING STANDARD
2-WIRE, 240 VOLT, TRANSFORMER RATED A-BASE METER WITH 1 DONUT C.T.			
APPROVED DAVID STANFORD			
REV 01	2003-11-03	DATE 1996-01-01	STD 6.4



CIRCUIT: 1φ, 2-WIRE, ABOVE 240 VOLT.

BILLING MULTIPLIER IS METER MULTIPLIER * P.T. RATIO X C.T. RATIO

Nova Scotia POWER An Emera Company energy everywhere.	METERING STANDARD
2-WIRE, 120 VOLT, TRANSFORMER RATED S-BASE METER WITH 1-2 WIRE C.T. AND 1 P.T.	
APPROVED DAVID STANFORD	
DATE 2003-11-03	STD 6.5



CIRCUIT: 1, 3 WIRE, 120/240V, ABOVE 200 AMPS
TRANSFORMER: 1 CT (DONUT TYPE)

BILLING MULTIPLIER IS 1/2 METER MULTIPLIER * C.T. RATIO

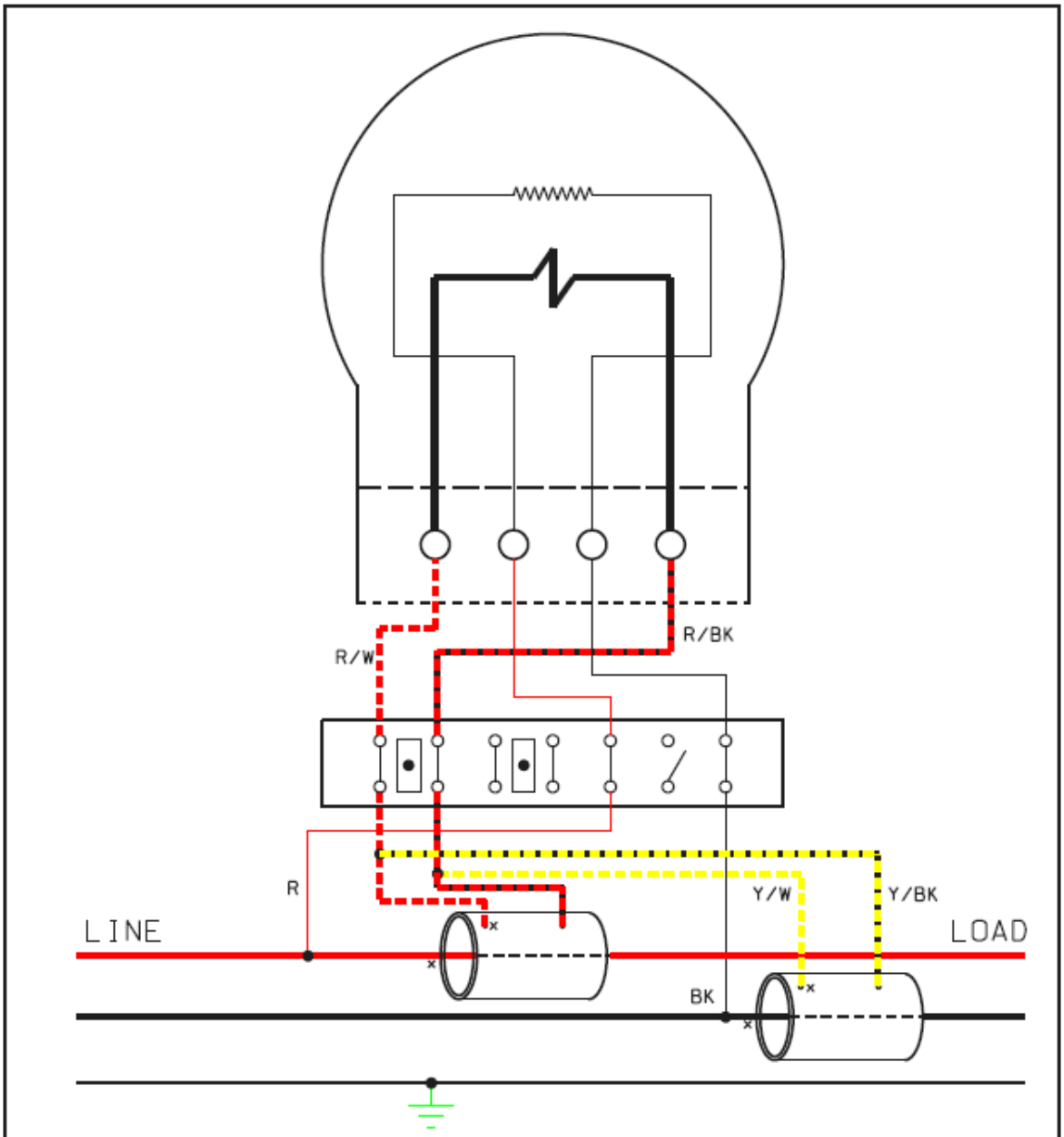
Nova Scotia POWER An Emera Company energy everywhere.

METERING STANDARD

2-WIRE, 240 VOLT, TRANSFORMER RATED S-BASE METER WITH 1 DONUT C.T.

APPROVED DAVID STANFORD

REV		DATE	
01	2003-11-03	1985-03-01	STD 6.6



CIRCUIT: 1 PHASE.3 WIRE.120/240 V

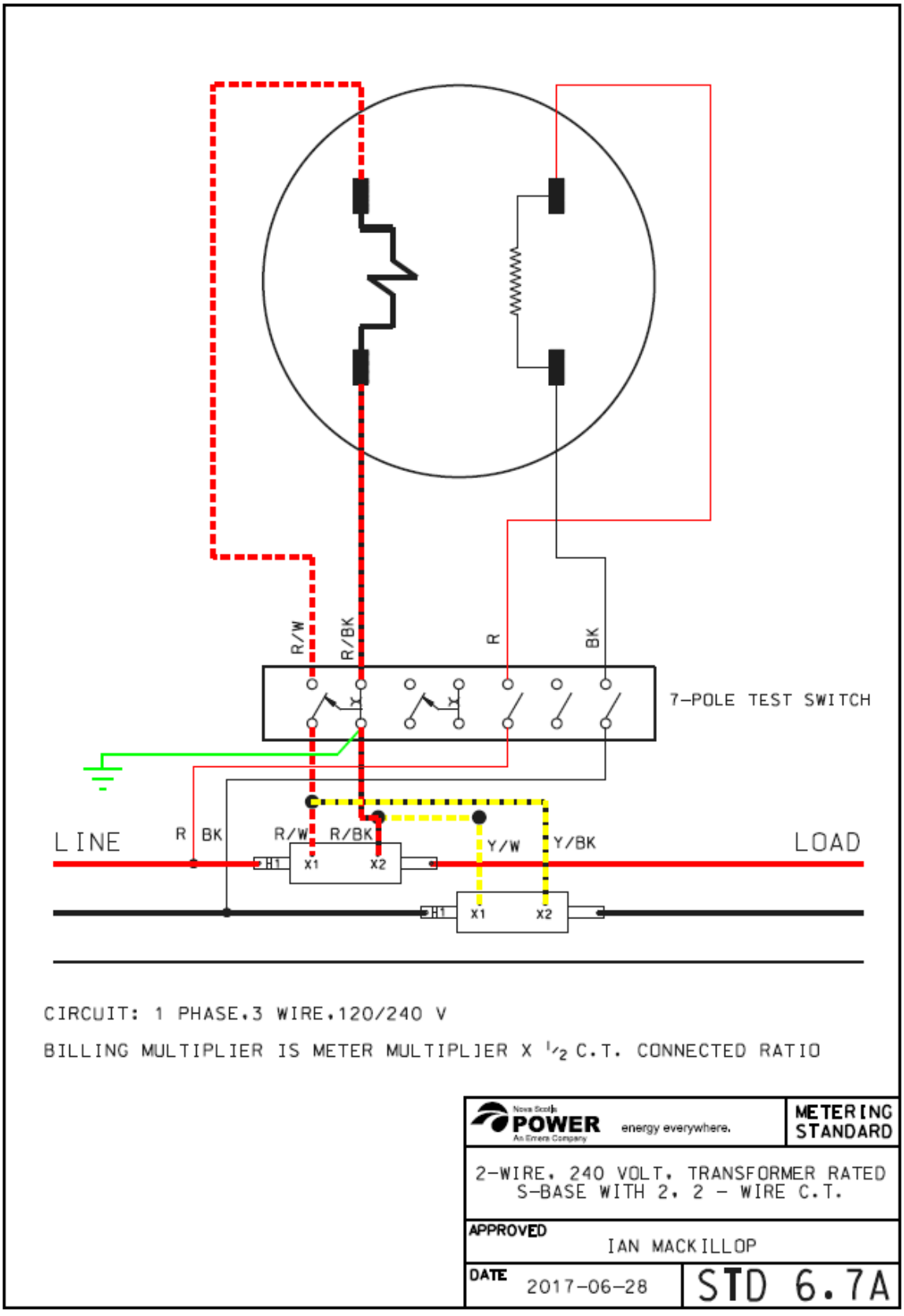
BILLING MULTIPLIER IS METER MULTIPLIER X $^{1}/_{2}$ C.T. CONNECTED RATIO

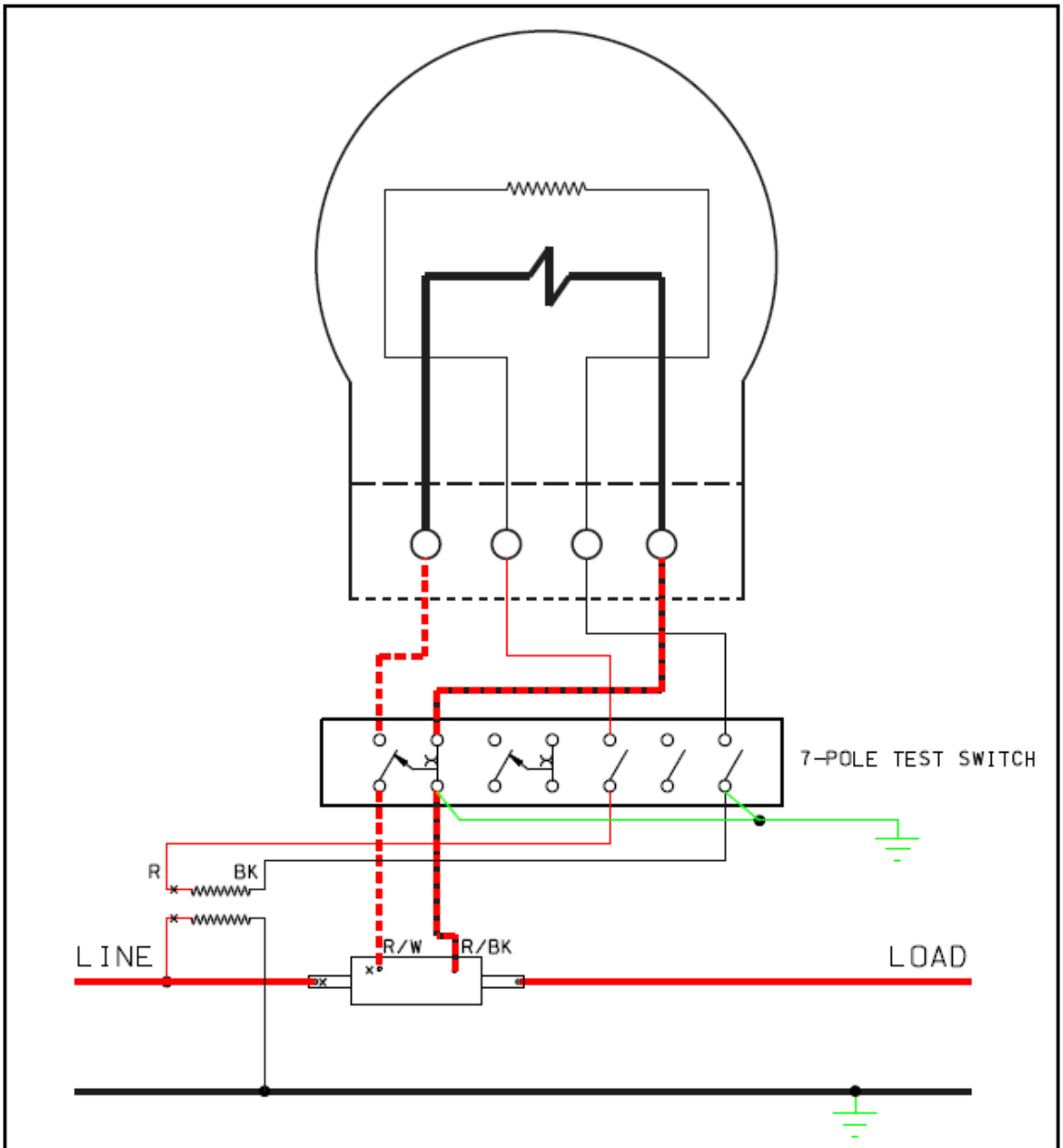
Nova Scotia POWER An Emera Company energy everywhere.

METERING STANDARD

2-WIRE, 240 VOLT, TRANSFORMER RATED
A-BASE WITH 2 DONUT C.T.'s
(C.T.'S HAVE SECONDARIES PARALLELED)

REV 02	2017-06-28 JM	APPROVED DAVID STANFORD	
REV 01	2009-05-22 DS	DATE 1985-03-01	STD 6.7

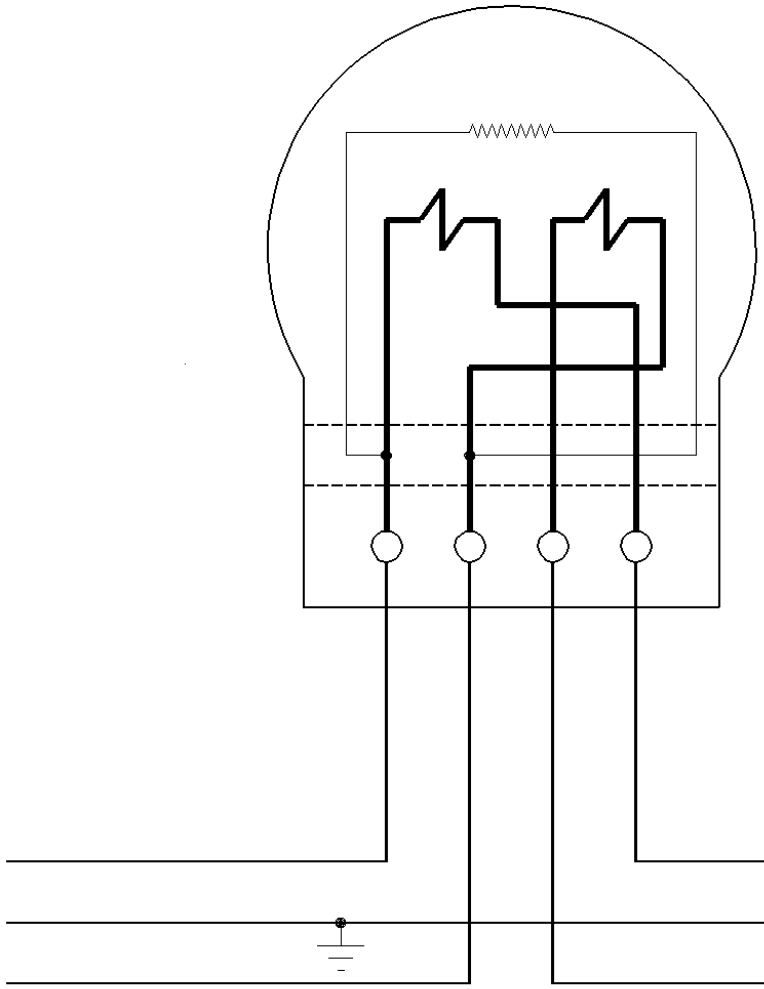

R/W
R/BK
R
BK
7-POLE TEST SWITCH
LINE
R
BK
R/W
R/BK
Y/W
Y/BK
LOAD
H1
X1
X2
H1
X1
X2
CIRCUIT: 1 PHASE.3 WIRE.120/240 V
BILLING MULTIPLIER IS METER MULTIPLIER X 1/2 C.T. CONNECTED RATIO
Nova Scotia POWER An Emera Company
energy everywhere.
METERING STANDARD
2-WIRE, 240 VOLT, TRANSFORMER RATED S-BASE WITH 2, 2 - WIRE C.T.
APPROVED
IAN MACKILLOP
DATE
2017-06-28
STD 6.7A



CIRCUIT: 1ϕ, 3-WIRE, 120/240V, ABOVE 200 AMPS
TRANSFORMER: 1 CT (DONUT TYPE)

BILLING MULTIPLIER IS ½ METER MULTIPLIER * CT RATIO

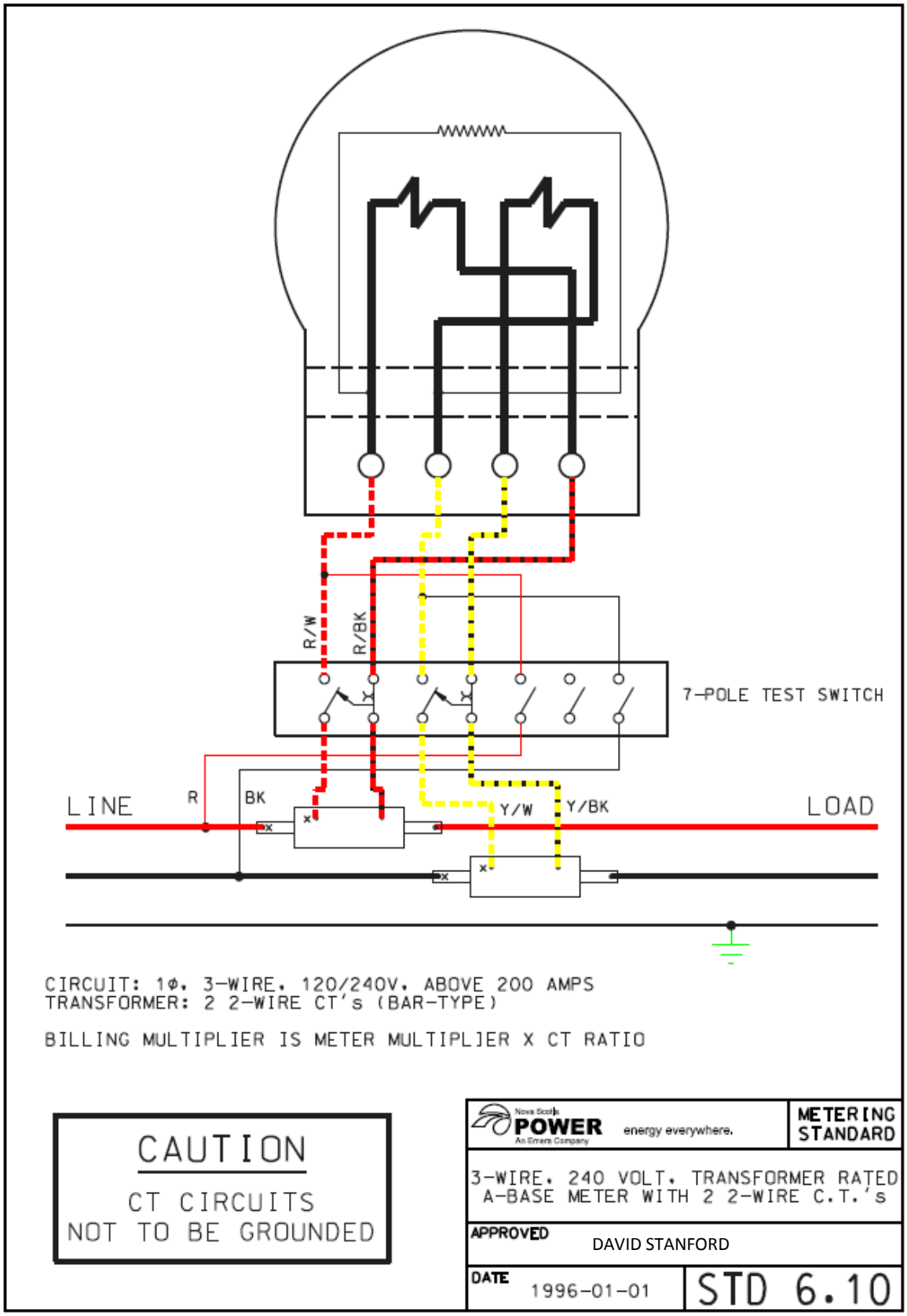
Nova Scotia POWER An Emera Company energy everywhere.	METERING STANDARD
2-WIRE, 240 VOLT, TRANSFORMER RATED S-BASE METER WITH 1 DONUT C.T.	
APPROVED DAVID STANFORD	
DATE 1996-01-01	STD 6.8

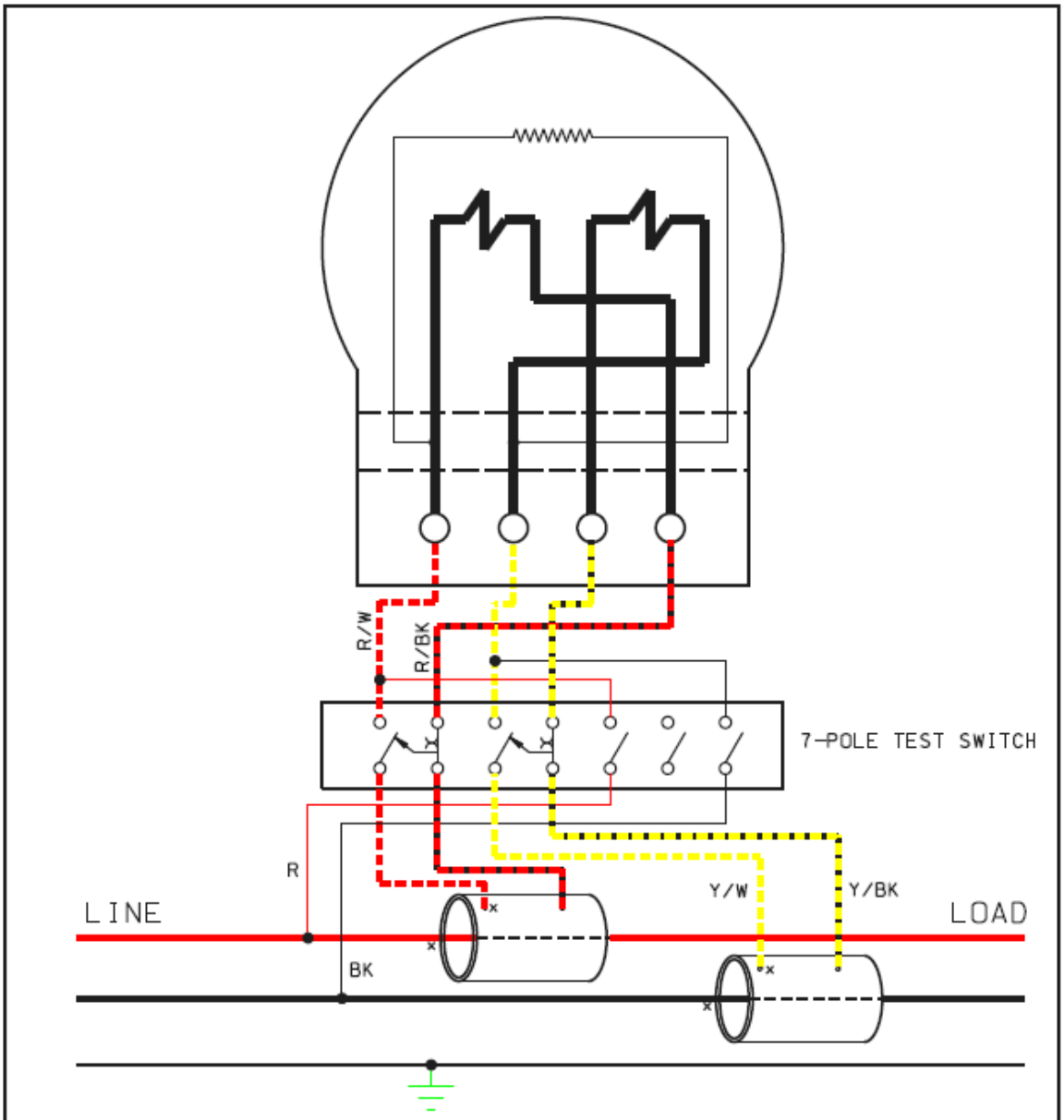


CIRCUIT: 1ϕ, 3-WIRE, 120/240V, 200 AMPS

BILLING MULTIPLIER IS METER MULTIPLIER

Nova Scotia Power Inc. Halifax, Nova Scotia, Canada	METERING STANDARD
3-WIRE, 240 VOLT A-BASE METER	
APPROVED DAVID STANFORD	
DATE 1996-01-01	STD 6.9


R/W
R/BK
7-POLE TEST SWITCH
LINE
R
BK
Y/W
Y/BK
LOAD
CIRCUIT: 1φ, 3-WIRE, 120/240V, ABOVE 200 AMPS
TRANSFORMER: 2 2-WIRE CT's (BAR-TYPE)
BILLING MULTIPLIER IS METER MULTIPLIER X CT RATIO
CAUTION
CT CIRCUITS
NOT TO BE GROUNDED
Nova Scotia POWER An Emera Company
energy everywhere.
METERING STANDARD
3-WIRE, 240 VOLT, TRANSFORMER RATED
A-BASE METER WITH 2 2-WIRE C.T.'s
APPROVED
DAVID STANFORD
DATE
1996-01-01
STD 6.10



CIRCUIT: 1φ, 3-WIRE, 120/240V, ABOVE 200 AMPS
TRANSFORMER: 2 CT's (DONUT TYPE)

BILLING MULTIPLIER IS METER MULTIPLIER X CT CONNECTED RATIO

CAUTION

CT CIRCUITS
NOT TO BE GROUNDED

Nova Scotia POWER An Emera Company energy everywhere.

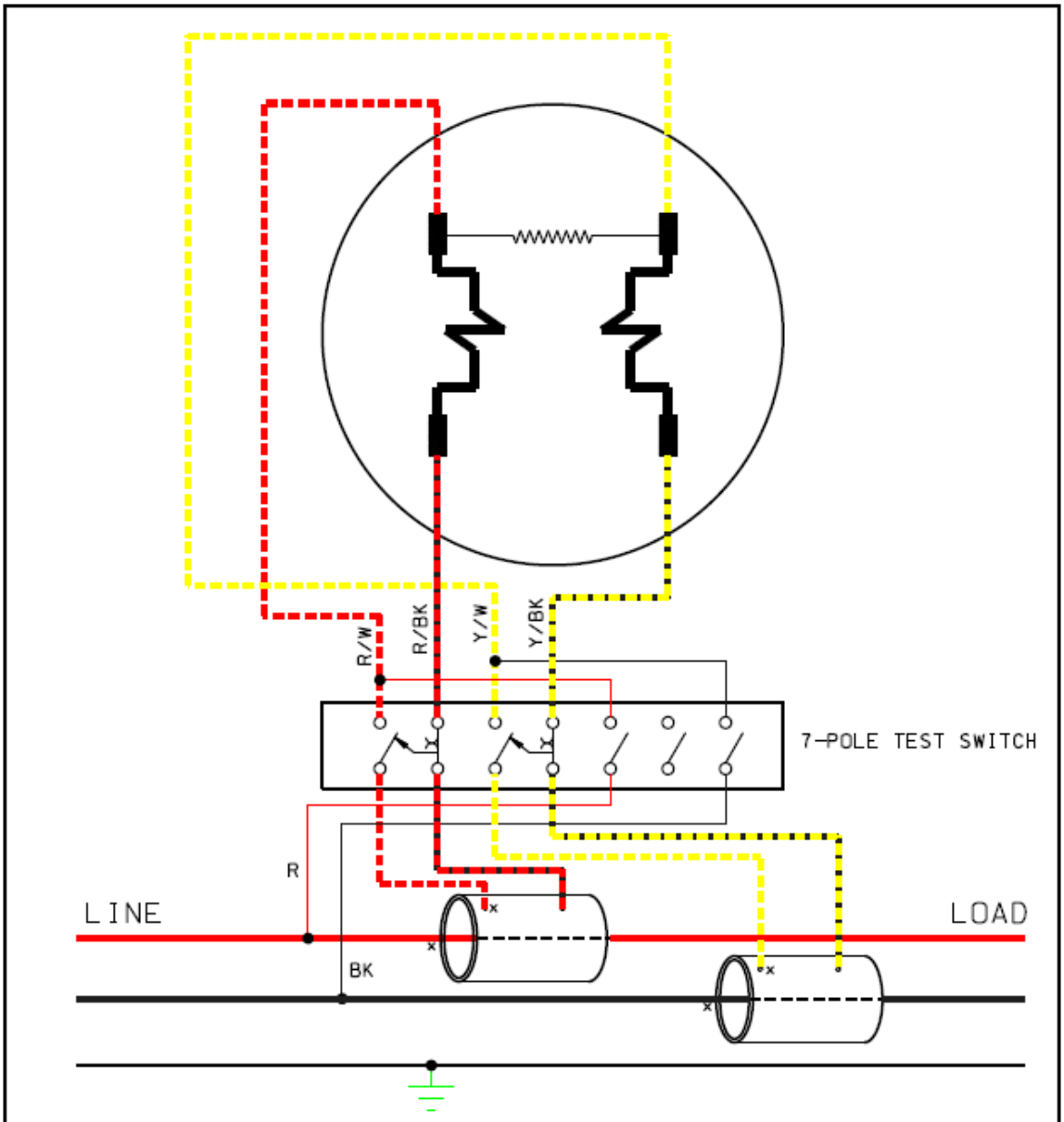
METERING STANDARD

3-WIRE, 240 VOLT, TRANSFORMER RATED A-BASE METER WITH 2 DONUT C.T.'s

APPROVED DAVID STANFORD

DATE 1996-01-01

STD 6.11



CIRCUIT: 1φ, 3-WIRE, 120/240V, ABOVE 200 AMPS
TRANSFORMER: 2 CT's (DONUT TYPE)

BILLING MULTIPLIER IS METER MULTIPLIER X CT CONNECTED RATIO

CAUTION

CT CIRCUITS
NOT TO BE GROUNDED

Nova Scotia POWER An Emera Company energy everywhere.

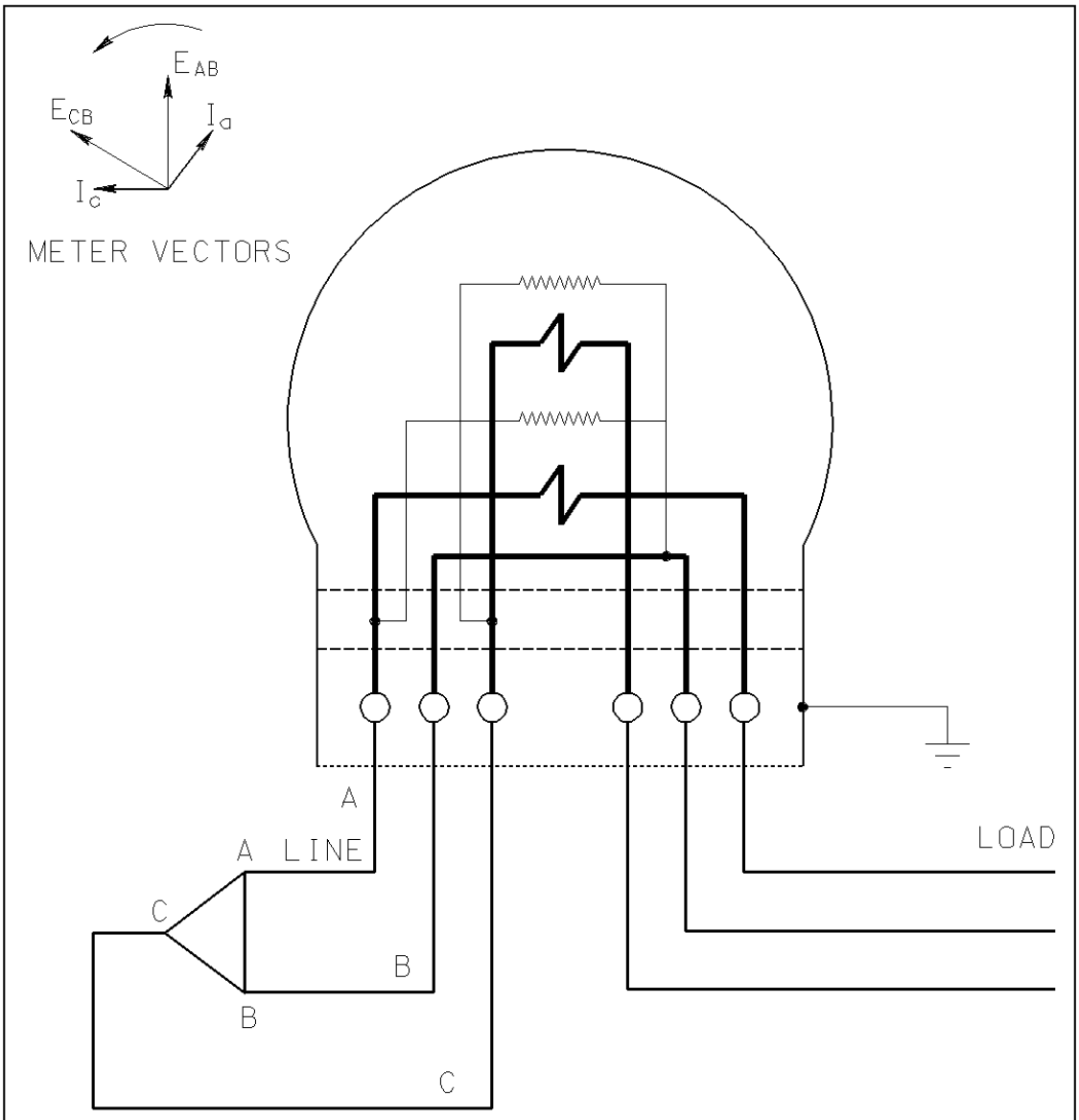
METERING STANDARD

3-WIRE, 240 VOLT, TRANSFORMER RATED S-BASE METER WITH 2 DONUT C.T.'s

APPROVED DAVID STANFORD

DATE 1996-01-01

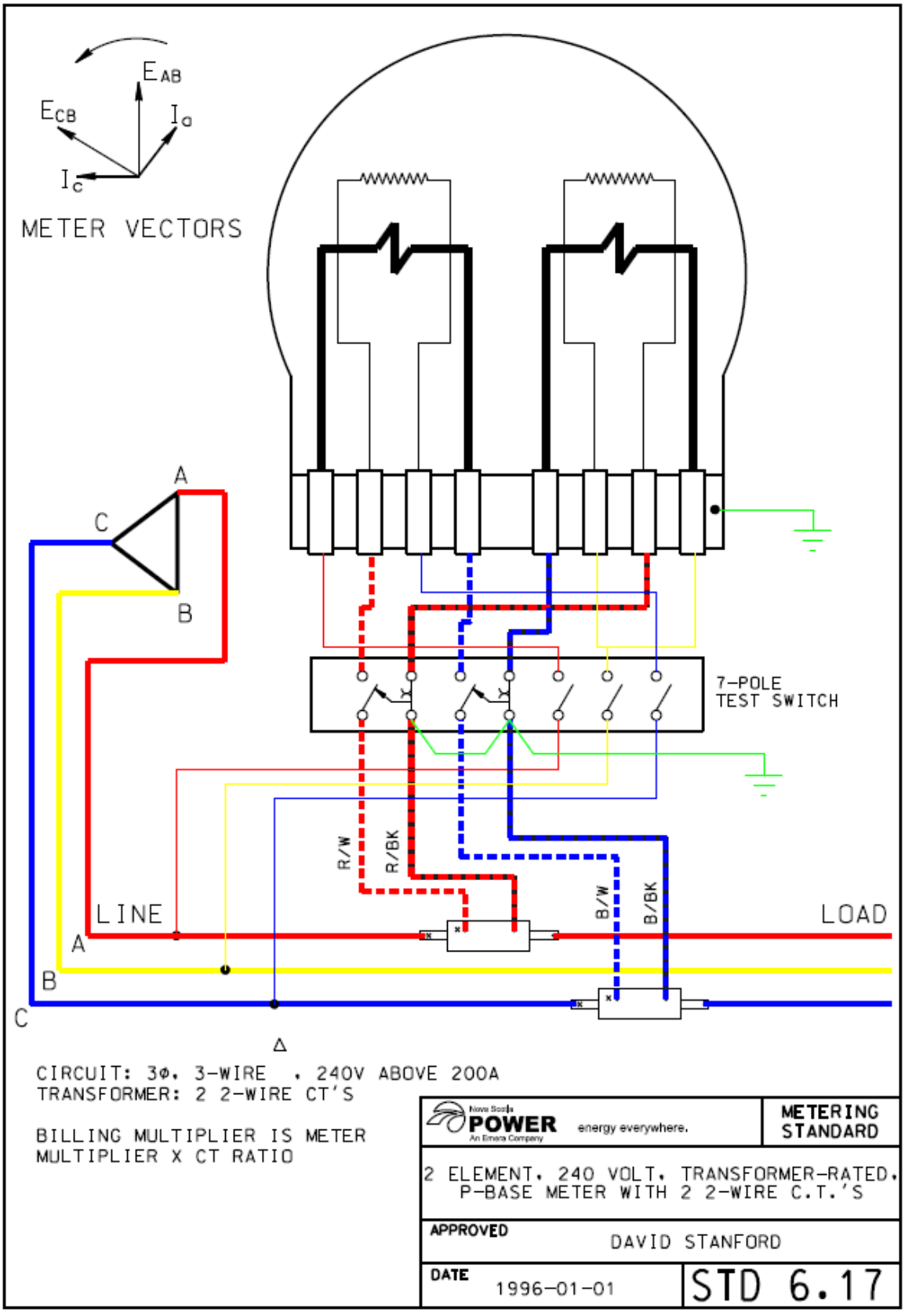
STD 6.12

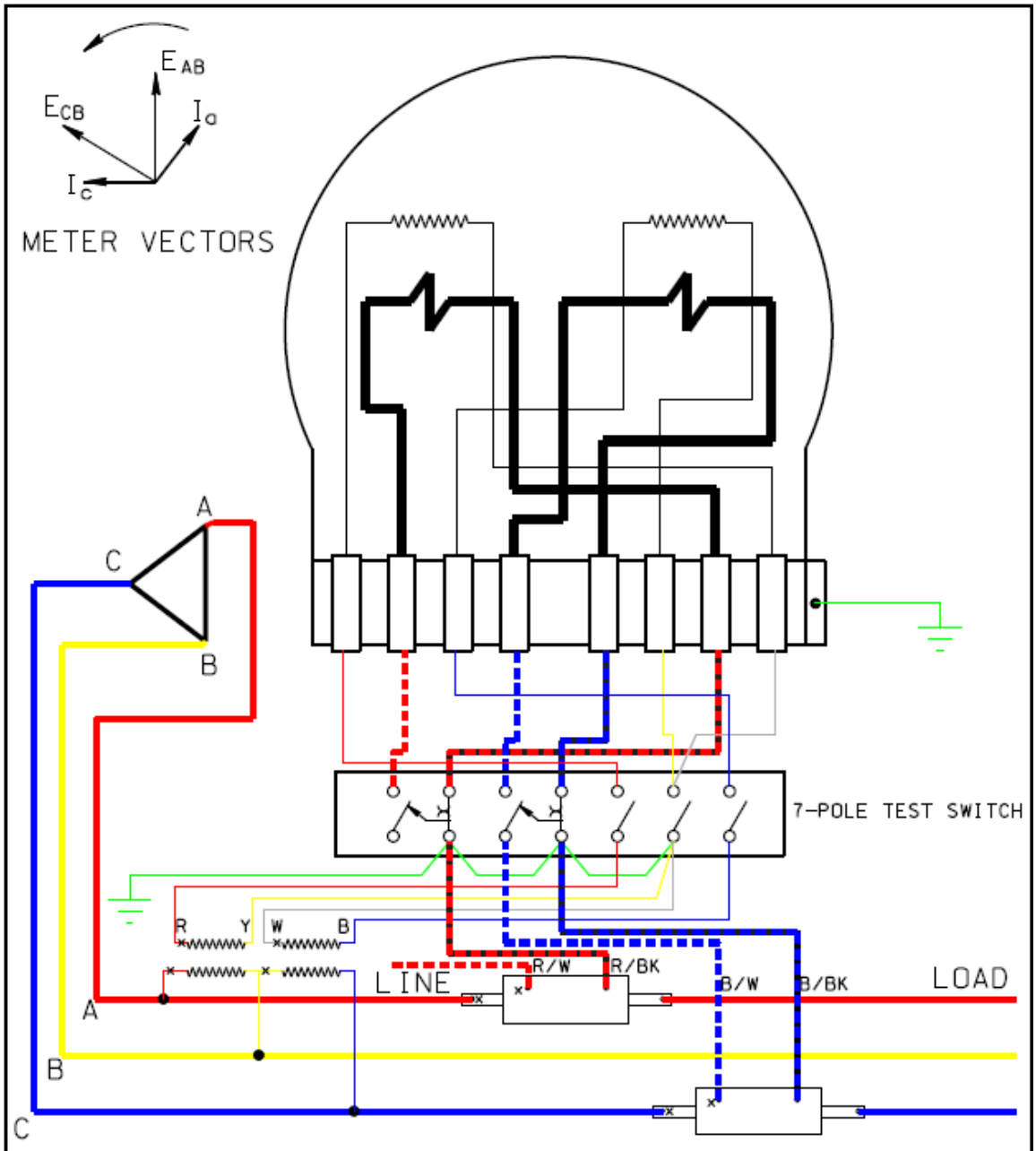


CIRCUIT: 3φ, 3-WIRE Δ, 240V OR 600V, 100A MAX

BILLING MULTIPLIER IS METER MULTIPLIER

Nova Scotia Power Inc. Halifax, Nova Scotia, Canada	METERING STANDARD
2 ELEMENT, 240 VOLT OR 600 VOLT, SELF-CONTAINED P-BASE METER	
APPROVED DAVID STANFORD	
DATE 1996-01-01	STD 6.16


E AB
E CB
I a
I c
METER VECTORS
A
C
B
7-POLE
TEST SWITCH
R/W
R/BK
B/W
B/BK
LINE
LOAD
A
B
C
Δ
CIRCUIT: 3φ, 3-WIRE , 240V ABOVE 200A
TRANSFORMER: 2 2-WIRE CT'S
BILLING MULTIPLIER IS METER MULTIPLIER X CT RATIO
Nova Scotia POWER An Emera Company
energy everywhere.
METERING STANDARD
2 ELEMENT, 240 VOLT, TRANSFORMER-RATED, P-BASE METER WITH 2 2-WIRE C.T.'S
APPROVED
DAVID STANFORD
DATE
1996-01-01
STD 6.17



CIRCUIT: 3φ, 3-WIRE Δ, 240V ABOVE 200A
TRANSFORMER: 2 2-WIRE CT's & 2 PT'S

BILLING MULTIPLIER IS METER MULTIPLIER X CT RATIO X PT RATIO

Nova Scotia POWER An Emera Company energy everywhere.

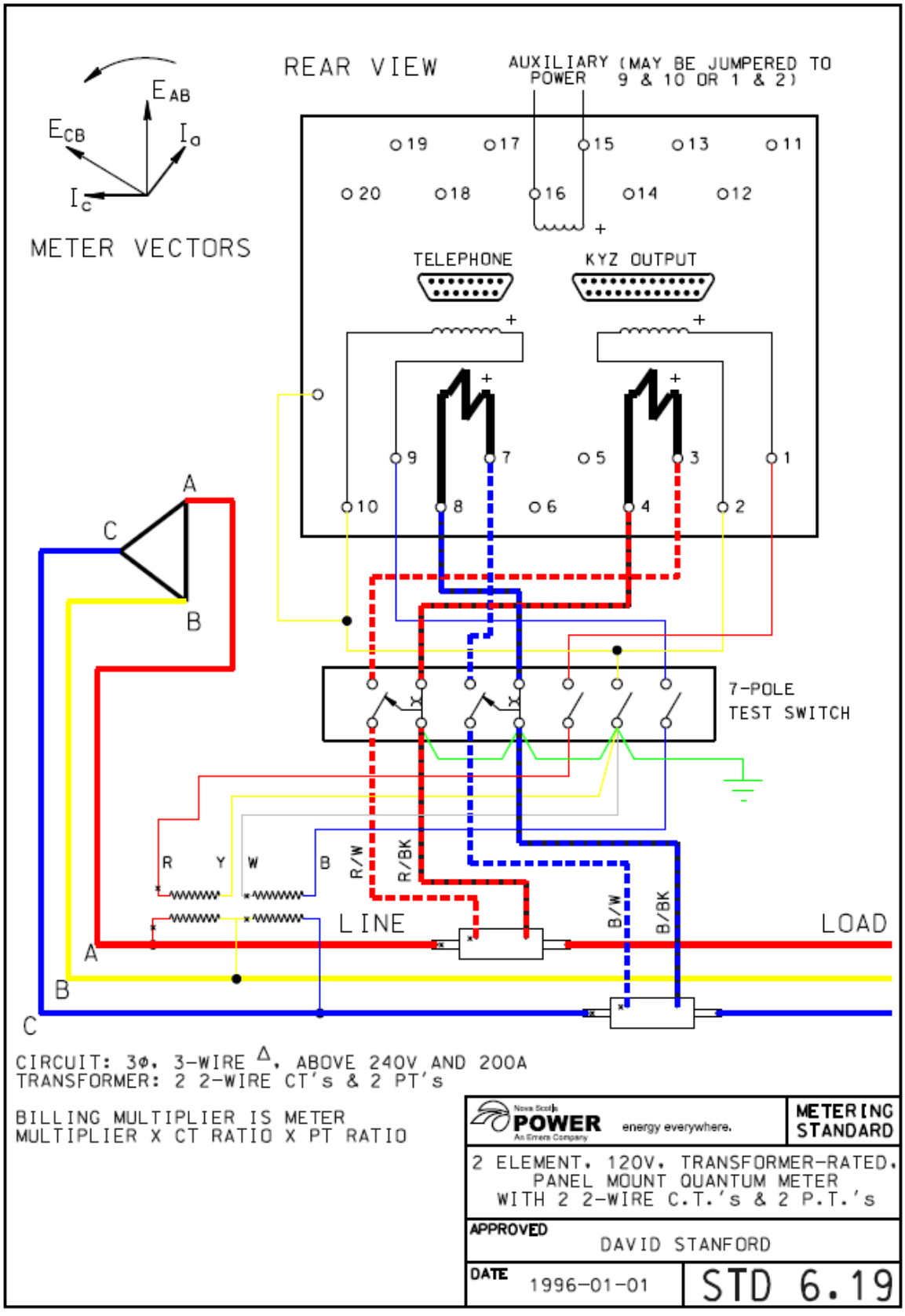
METERING STANDARD

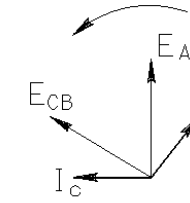
2 ELEMENT, 120V, TRANSFORMER-RATED, P-BASE METER WITH 2 2-WIRE C.T.'s & 2 P.T.'S

APPROVED DAVID STANFORD

DATE 1996-01-01

STD 6.18


REAR VIEW
AUXILIARY (MAY BE JUMPERED TO POWER 9 & 10 OR 1 & 2)
E AB
E CB
I a
I c
METER VECTORS
19 17 15 13 11
20 18 16 14 12
TELEPHONE
KYZ OUTPUT
9 7 5 3 1
10 8 6 4 2
A
C
B
7-POLE
TEST SWITCH
R Y W B R/W R/BK B/W B/BK
LINE
LOAD
A
B
C
CIRCUIT: 3φ, 3-WIRE Δ, ABOVE 240V AND 200A
TRANSFORMER: 2 2-WIRE CT's & 2 PT's
BILLING MULTIPLIER IS METER MULTIPLIER X CT RATIO X PT RATIO
Nova Scotia POWER An Emera Company
energy everywhere.
METERING STANDARD
2 ELEMENT, 120V, TRANSFORMER-RATED, PANEL MOUNT QUANTUM METER WITH 2 2-WIRE C.T.'s & 2 P.T.'s
APPROVED
DAVID STANFORD
DATE
1996-01-01
STD 6.19

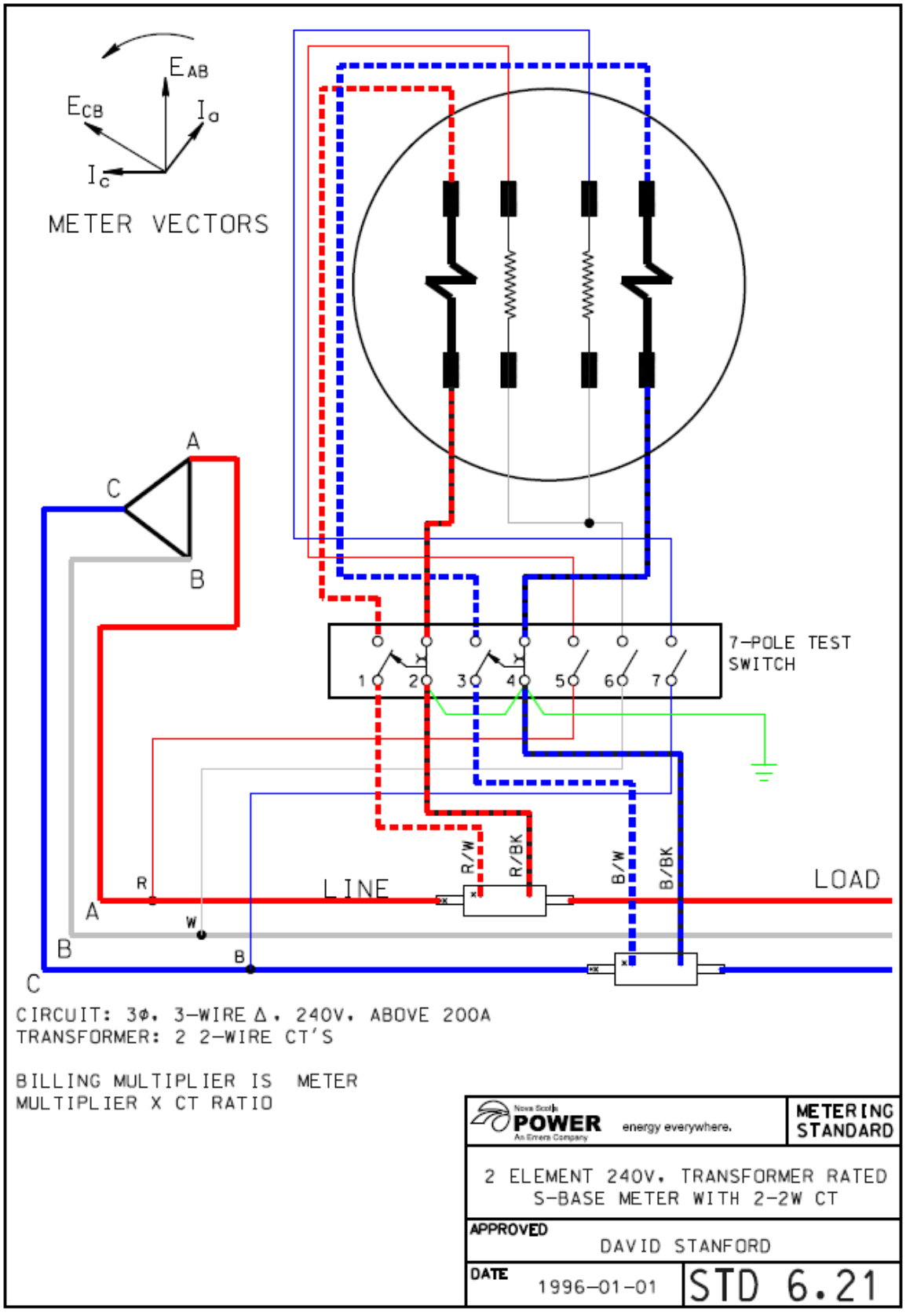


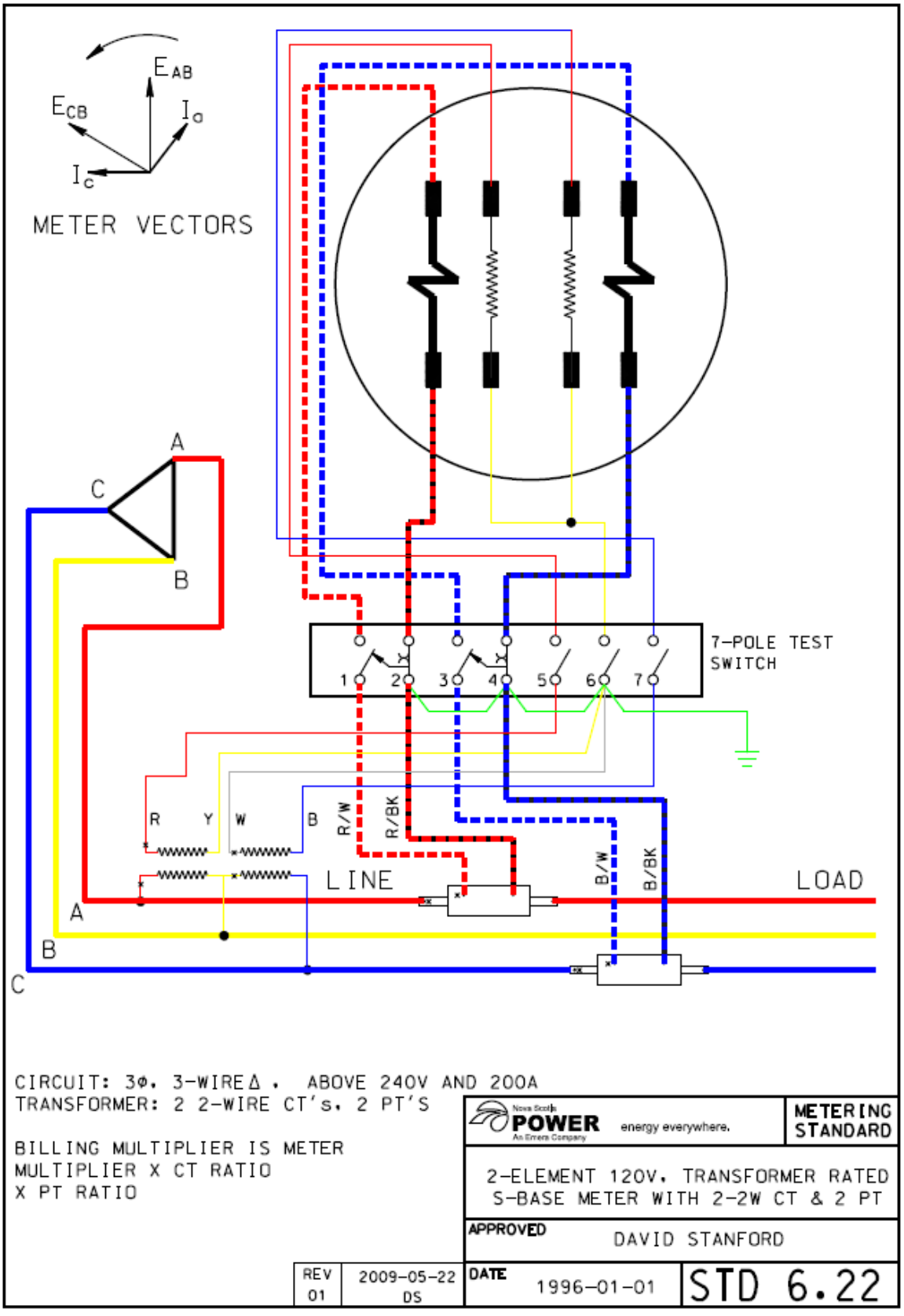
METER VECTORS

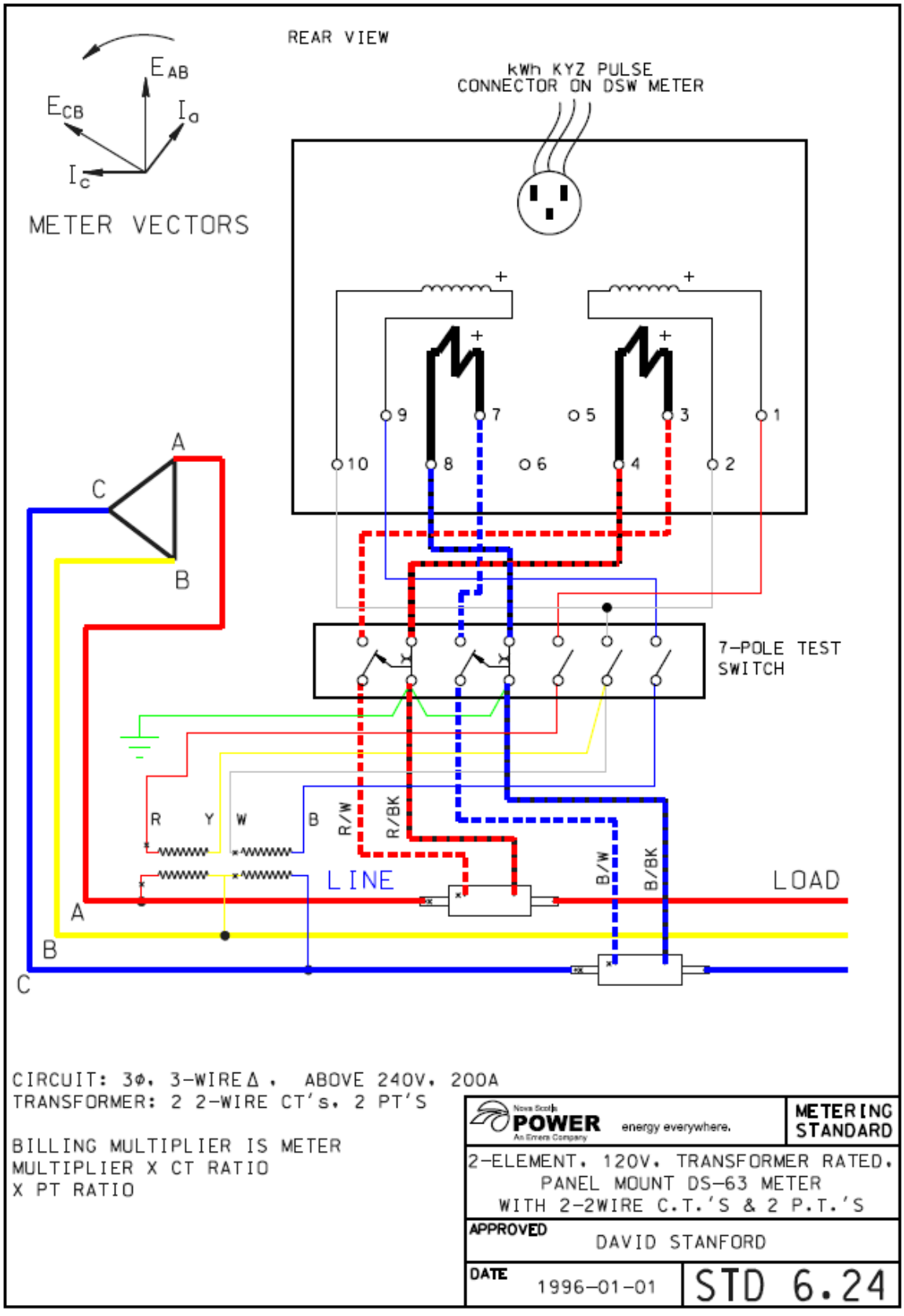
CIRCUIT: 3φ, 3-WIRE Δ, 240V, 200A MAX, 600V, 200A MAX
NOTE: ENSURE 5th JAW IS IN 9 O'CLOCK POSITION

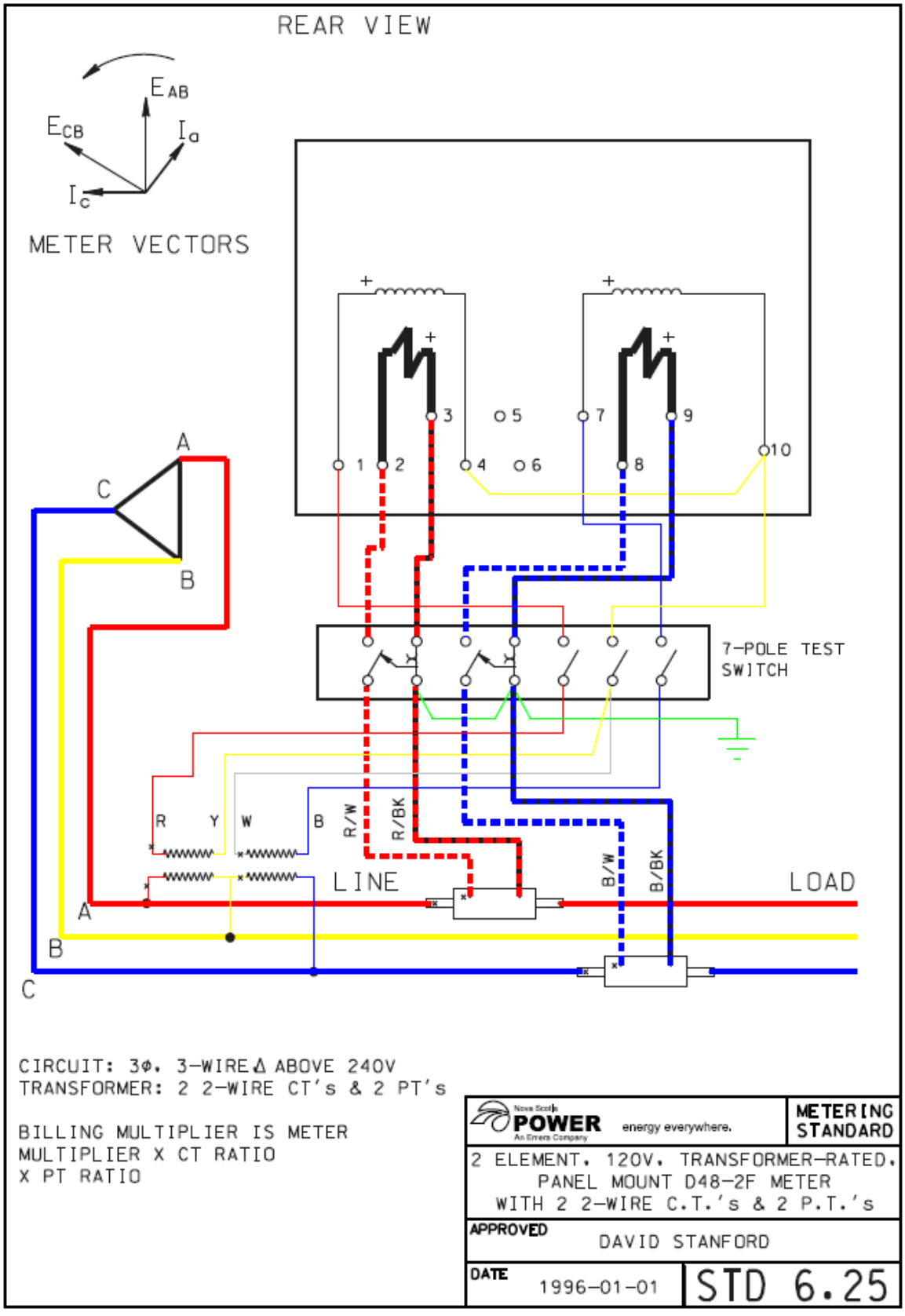
BILLING MULTIPLIER IS METER MULTIPLIER

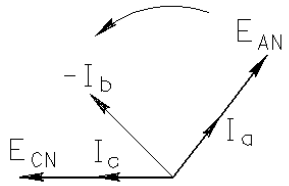
Nova Scotia Power Inc. Halifax, Nova Scotia, Canada	METERING STANDARD
2 ELEMENT 240V OR 600V, SELF CONTAINED S-BASE METER	
APPROVED DAVID STANFORD	
DATE 1996-01-01	STD 6.20


E AB
E CB
I a
I c
METER VECTORS
A
C
B
7-POLE TEST SWITCH
1
2
3
4
5
6
7
R/W
R/BK
B/W
B/BK
LINE
LOAD
R
W
B
A
B
C
CIRCUIT: 3φ, 3-WIRE Δ, 240V, ABOVE 200A
TRANSFORMER: 2 2-WIRE CT'S
BILLING MULTIPLIER IS METER MULTIPLIER X CT RATIO
Nova Scotia POWER An Emera Company
energy everywhere.
METERING STANDARD
2 ELEMENT 240V, TRANSFORMER RATED S-BASE METER WITH 2-2W CT
APPROVED
DAVID STANFORD
DATE
1996-01-01
STD 6.21

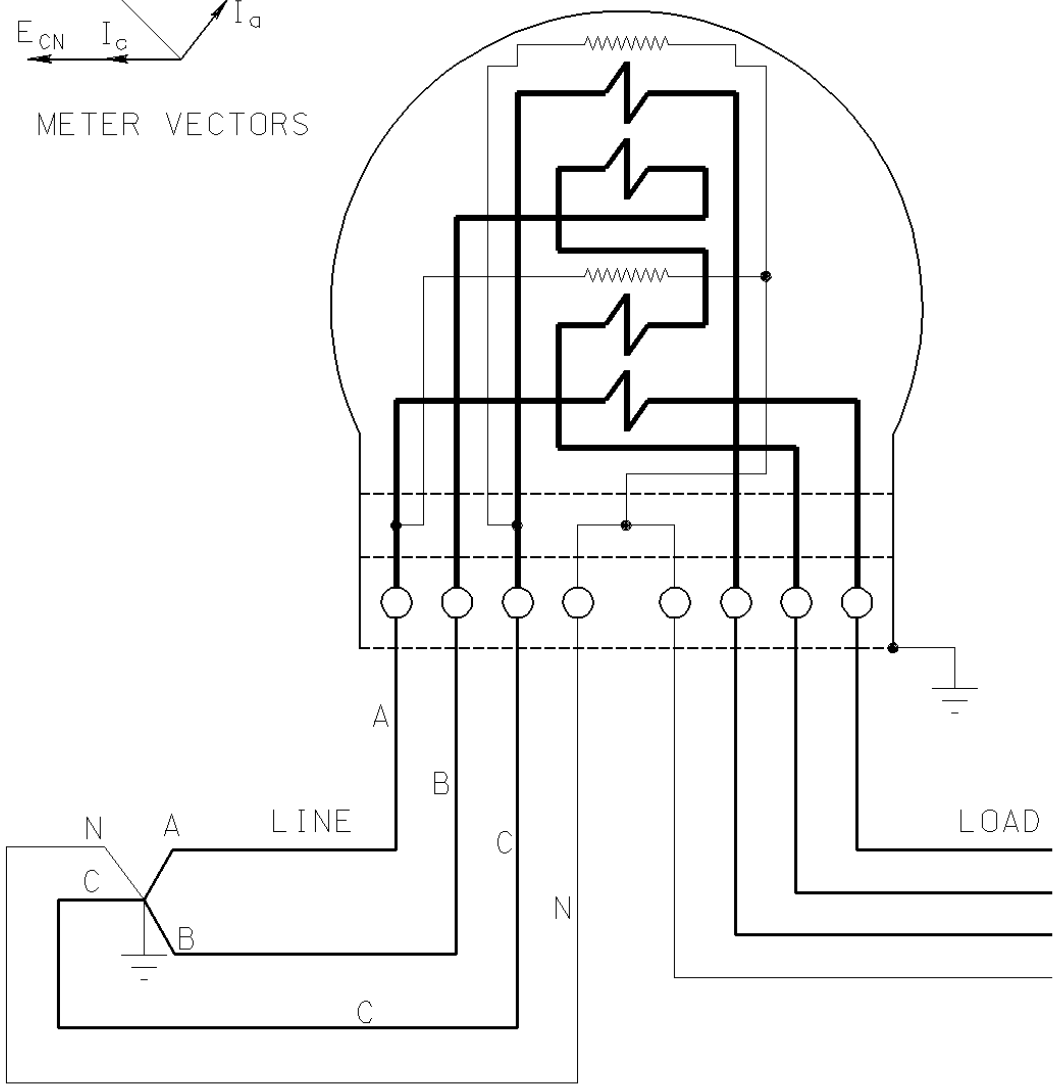

E AB
E CB
I a
I c
METER VECTORS
A
C
B
7-POLE TEST SWITCH
1
2
3
4
5
6
7
R
Y
W
B
R/W
R/BK
B/W
B/BK
LINE
LOAD
A
B
C
CIRCUIT: 3φ, 3-WIRE Δ, ABOVE 240V AND 200A
TRANSFORMER: 2 2-WIRE CT's, 2 PT'S
BILLING MULTIPLIER IS METER MULTIPLIER X CT RATIO X PT RATIO
Nova Scotia POWER An Emera Company
energy everywhere.
METERING STANDARD
2-ELEMENT 120V, TRANSFORMER RATED S-BASE METER WITH 2-2W CT & 2 PT
APPROVED
DAVID STANFORD
REV 01
2009-05-22 DS
DATE
1996-01-01
STD 6.22


REAR VIEW
kWh KYZ PULSE
CONNECTOR ON DSW METER
E AB
E CB
I a
I c
METER VECTORS
9
7
5
3
1
10
8
6
4
2
A
C
B
7-POLE TEST
SWITCH
R
Y
W
B
R/W
R/BK
B/W
B/BK
LINE
LOAD
A
B
C
CIRCUIT: 3φ, 3-WIRE Δ , ABOVE 240V, 200A
TRANSFORMER: 2 2-WIRE CT's, 2 PT'S
BILLING MULTIPLIER IS METER
MULTIPLIER X CT RATIO
X PT RATIO
Nova Scotia POWER An Emera Company
energy everywhere.
METERING STANDARD
2-ELEMENT, 120V, TRANSFORMER RATED,
PANEL MOUNT DS-63 METER
WITH 2-2WIRE C.T.'S & 2 P.T.'S
APPROVED
DAVID STANFORD
DATE
1996-01-01
STD 6.24


REAR VIEW
E AB
E CB
I a
I c
METER VECTORS
1
2
3
4
5
6
7
8
9
10
A
B
C
7-POLE TEST SWITCH
R
Y
W
B
R/W
R/BK
B/W
B/BK
LINE
LOAD
CIRCUIT: 3φ, 3-WIRE Δ ABOVE 240V
TRANSFORMER: 2 2-WIRE CT's & 2 PT's
BILLING MULTIPLIER IS METER MULTIPLIER X CT RATIO X PT RATIO
Nova Scotia POWER An Emera Company
energy everywhere.
METERING STANDARD
2 ELEMENT, 120V, TRANSFORMER-RATED, PANEL MOUNT D48-2F METER WITH 2 2-WIRE C.T.'s & 2 P.T.'s
APPROVED
DAVID STANFORD
DATE
1996-01-01
STD 6.25



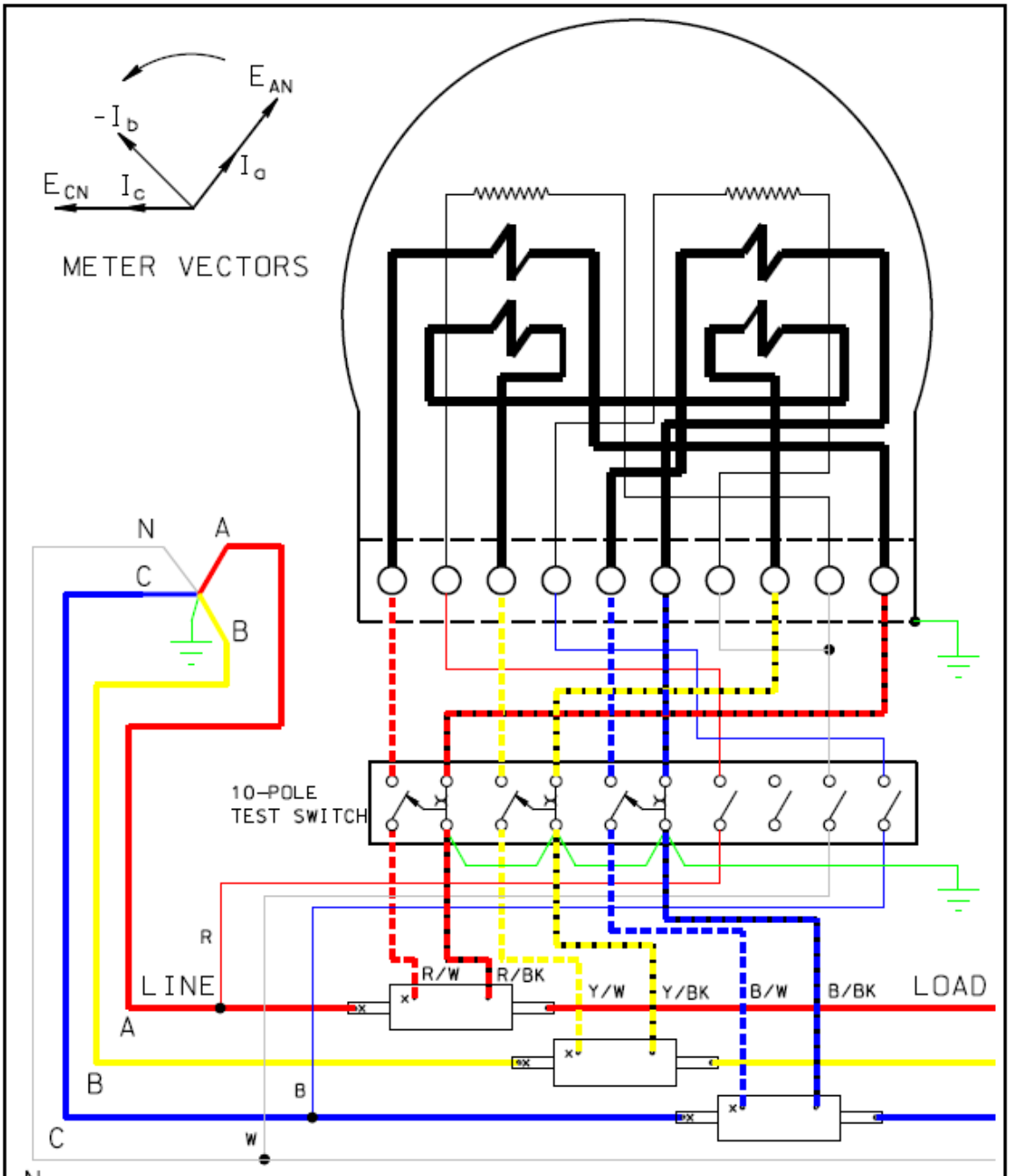
METER VECTORS



CIRCUIT: 3 Φ ,4 WIRE Y, 120/208V OR 347/600V, 100A MAX

BILLING MULTIPLIER IS METER MULTIPLIER

Nova Scotia Power Inc. Halifax, Nova Scotia, Canada	METERING STANDARD
2 1/2 ELEMENT, 120 VOLT OR 345 VOLT, SELF-CONTAINED P-BASE METER	
APPROVED DAVID STANFORD	
DATE 1996-01-01	STD 6.27



CIRCUIT: 3φ,4 WIRE Y, 120/208V, ABOVE 200A
TRANSFORMER: 3 2-WIRE CT'S

BILLING MULTIPLIER IS METER MULTIPLIER X CT RATIO

NOTE: DELTA STRAPS ON TEST SWITCH MUST BE REMOVED OF OLD TYPE TEST SWITCH IS USED.

Nova Scotia POWER An Emera Company energy everywhere.

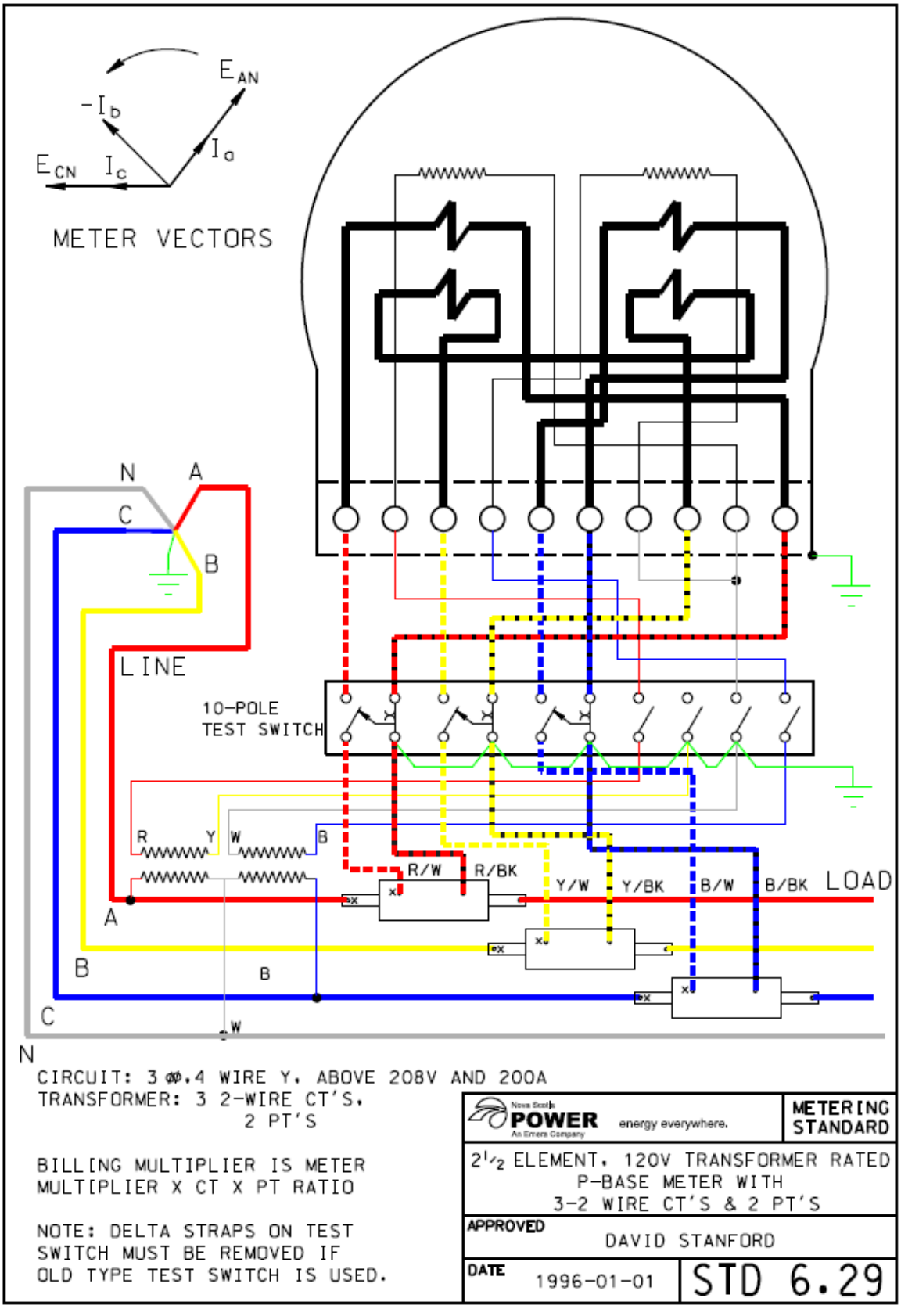
METERING STANDARD

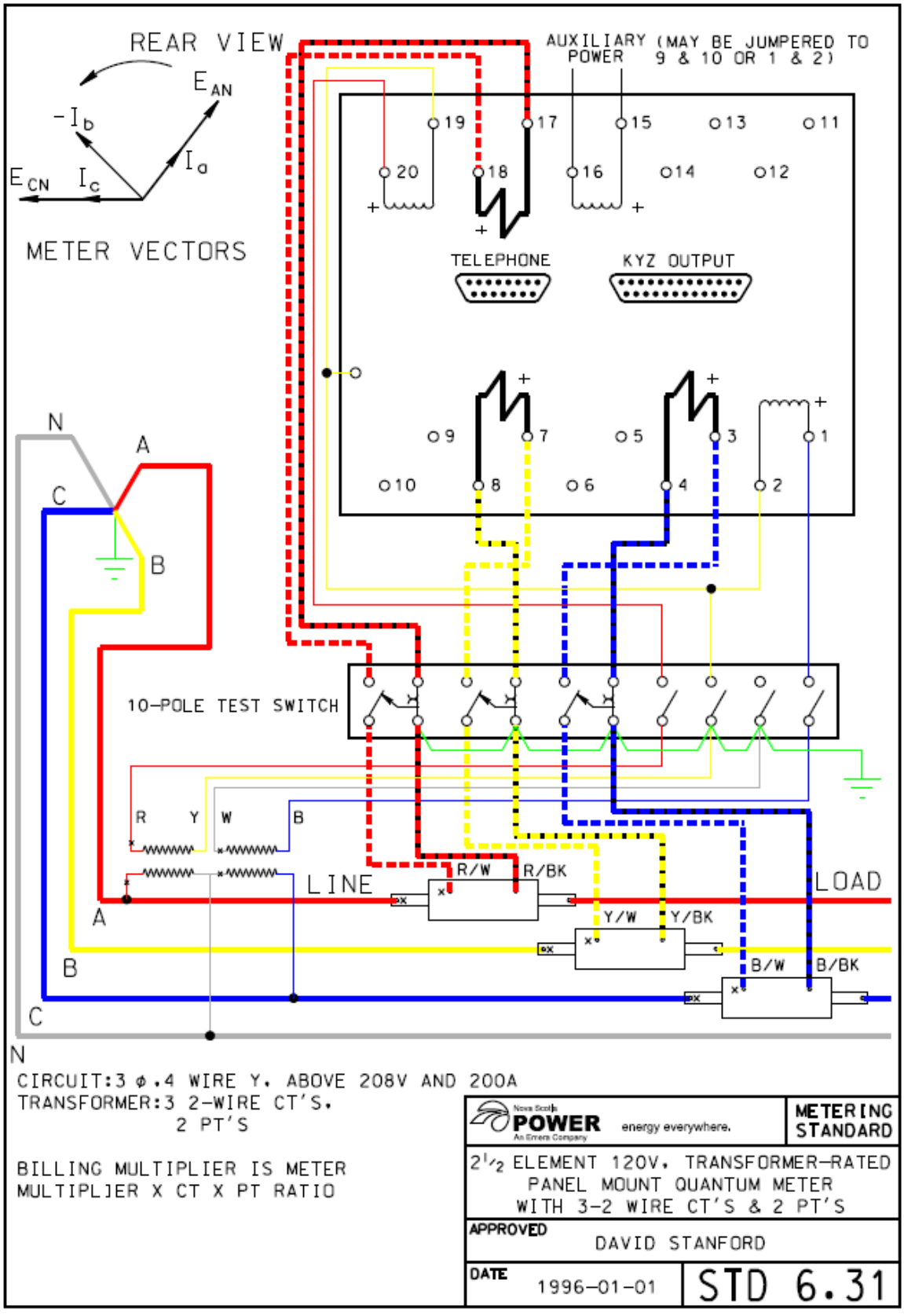
2 1/2 ELEMENT, 120V TRANSFORMER RATED P-BASE METER WITH 3-2 WIRE C.T.'S

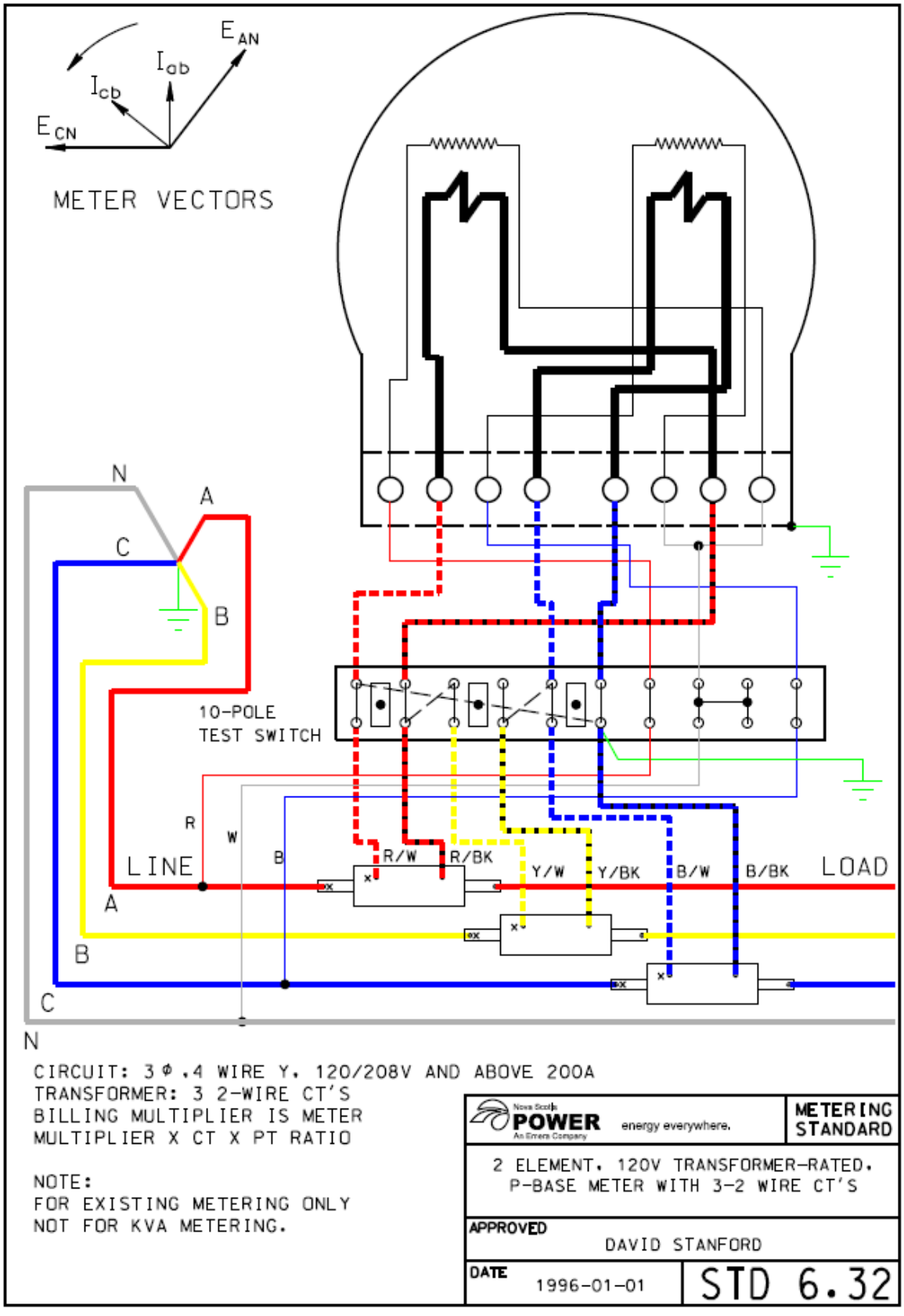
APPROVED DAVID STANFORD

DATE 1996-01-01

STD 6.28


E AN
-I b
I a
E CN
I c
METER VECTORS
N
A
C
B
LINE
10-POLE
TEST SWITCH
R
Y
W
B
R/W
R/BK
Y/W
Y/BK
B/W
B/BK
LOAD
A
B
B
C
W
N
CIRCUIT: 3 ØØ.4 WIRE Y. ABOVE 208V AND 200A
TRANSFORMER: 3 2-WIRE CT'S.
2 PT'S
BILLING MULTIPLIER IS METER
MULTIPLIER X CT X PT RATIO
NOTE: DELTA STRAPS ON TEST
SWITCH MUST BE REMOVED IF
OLD TYPE TEST SWITCH IS USED.
Nova Scotia POWER An Emera Company
energy everywhere.
METERING STANDARD
2 1/2 ELEMENT, 120V TRANSFORMER RATED
P-BASE METER WITH
3-2 WIRE CT'S & 2 PT'S
APPROVED
DAVID STANFORD
DATE
1996-01-01
STD 6.29


REAR VIEW
E AN
-I b
I a
E CN
I c
METER VECTORS
AUXILIARY (MAY BE JUMPERED TO POWER 9 & 10 OR 1 & 2)
19
17
15
13
11
20
18
16
14
12
TELEPHONE
KYZ OUTPUT
9
7
5
3
1
10
8
6
4
2
N
A
C
B
10-POLE TEST SWITCH
R
Y
W
B
LINE
R/W
R/BK
LOAD
Y/W
Y/BK
B/W
B/BK
CIRCUIT:3 ϕ .4 WIRE Y. ABOVE 208V AND 200A
TRANSFORMER:3 2-WIRE CT'S.
2 PT'S
BILLING MULTIPLIER IS METER
MULTIPLIER X CT X PT RATIO
Nova Scotia POWER An Emera Company
energy everywhere.
METERING STANDARD
2 1/2 ELEMENT 120V. TRANSFORMER-RATED
PANEL MOUNT QUANTUM METER
WITH 3-2 WIRE CT'S & 2 PT'S
APPROVED
DAVID STANFORD
DATE
1996-01-01
STD 6.31



CIRCUIT: 3 Φ ,4 WIRE Y, 120/208V AND ABOVE 200A
TRANSFORMER: 3 2-WIRE CT'S
BILLING MULTIPLIER IS METER MULTIPLIER X CT X PT RATIO

NOTE:
FOR EXISTING METERING ONLY
NOT FOR KVA METERING.

Nova Scotia POWER An Emera Company energy everywhere.

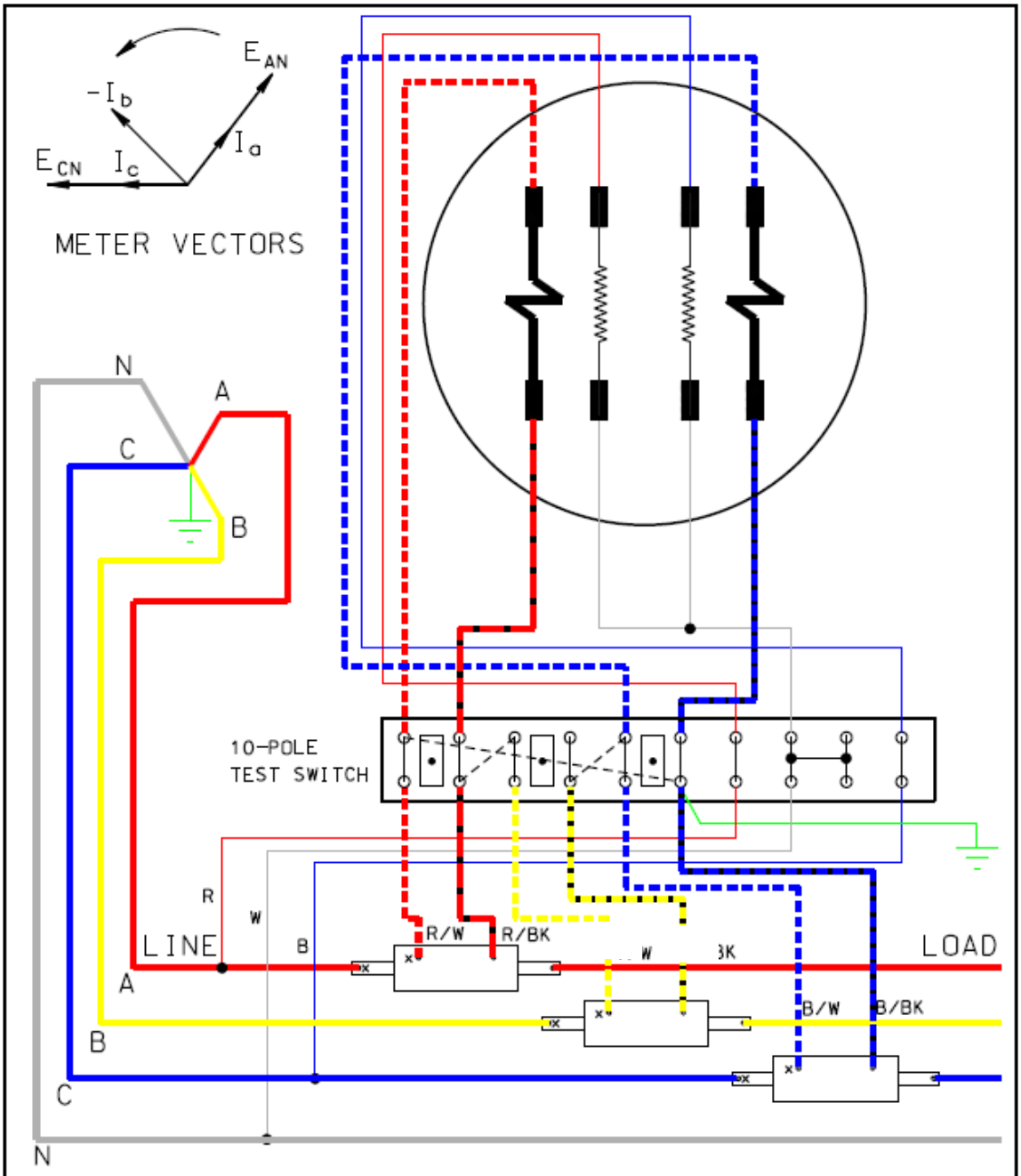
METERING STANDARD

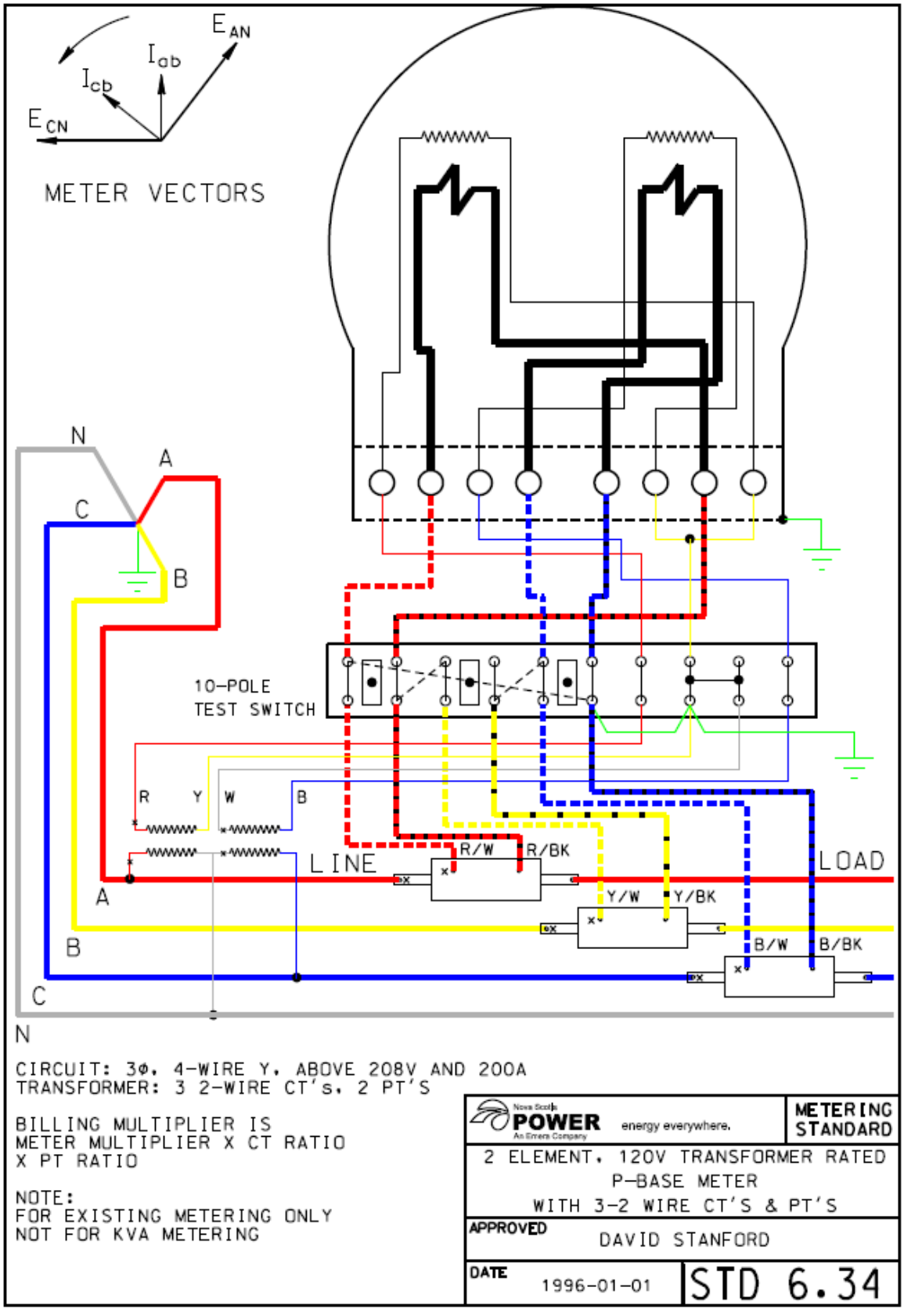
2 ELEMENT, 120V TRANSFORMER-RATED, P-BASE METER WITH 3-2 WIRE CT'S

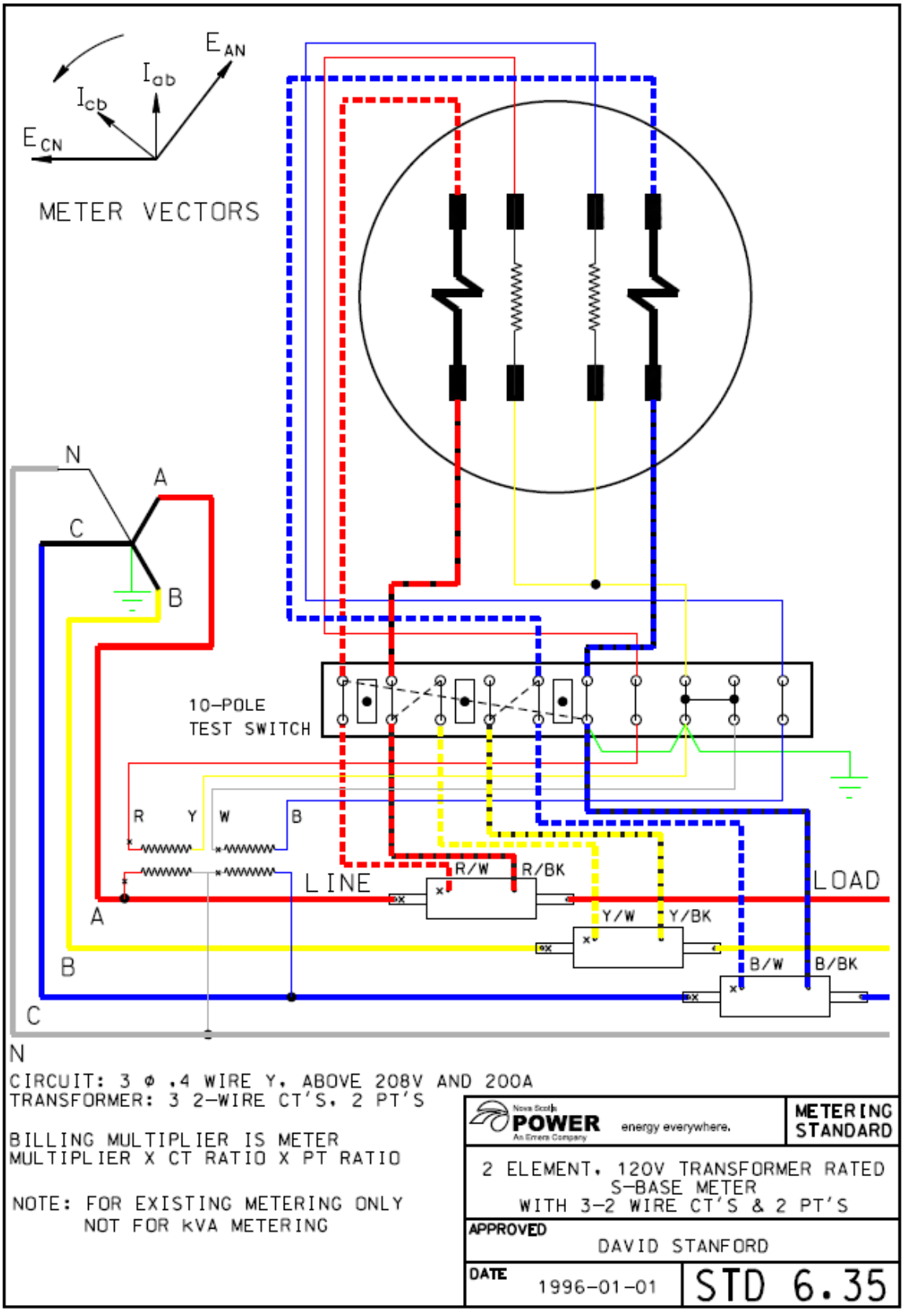
APPROVED DAVID STANFORD

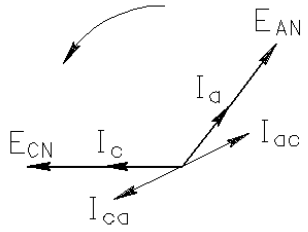
DATE 1996-01-01

STD 6.32

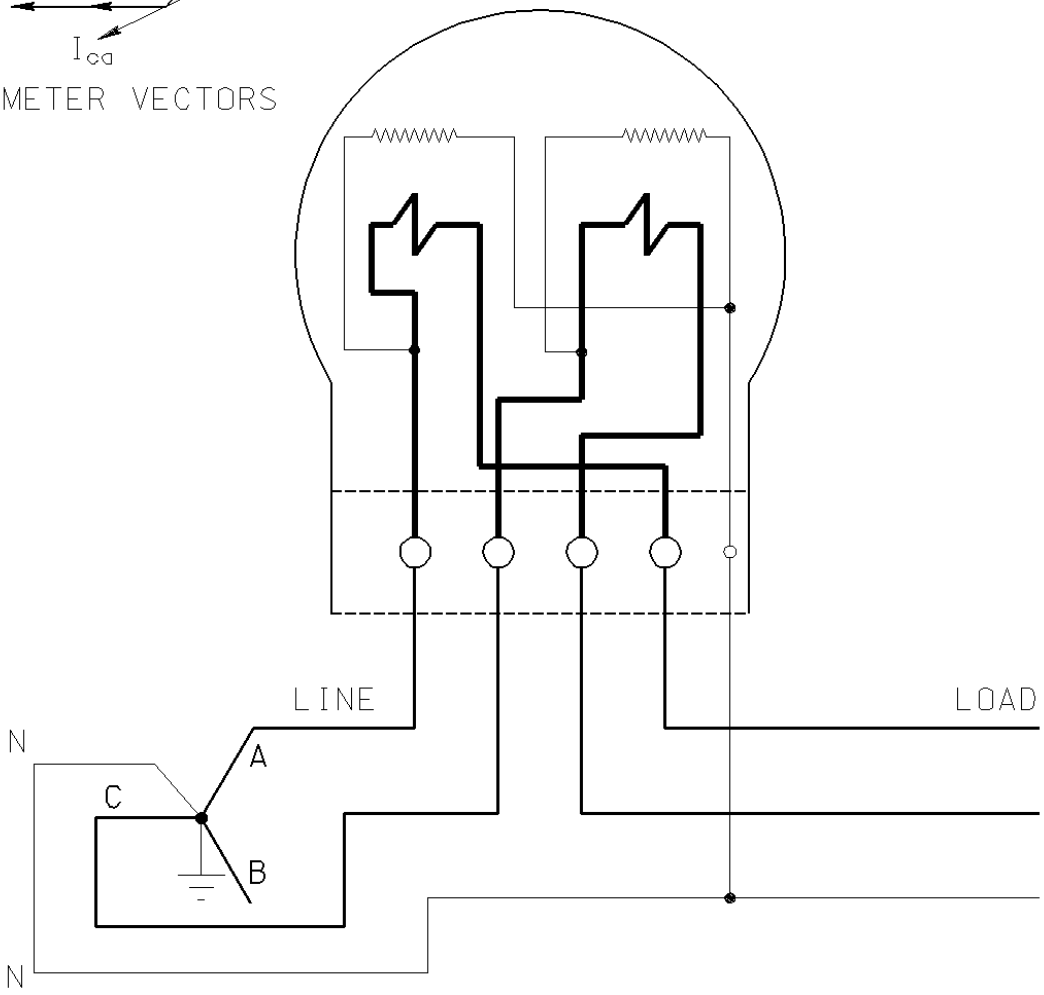

E AN
-I b
I a
E CN
I c
METER VECTORS
N
A
C
B
10-POLE
TEST SWITCH
R
W
B
LINE
A
B
C
N
R/W
R/BK
W
BK
LOAD
B/W
B/BK
CIRCUIT: 3 ,4 WIRE Y, 120/208V AND
ABOVE 200A
TRANSFORMER: 3 2-WIRE CT'S (BAR-TYPE)
BILLING MULTIPLIER IS METER
MULTIPLIER X CT RATIO
NOTE:
FOR EXISTING METERING ONLY
NOT FOR KVA METERING
REV 01
2017-06-28 IM
Nova Scotia POWER An Emera Company
energy everywhere.
METERING STANDARD
2 ELEMENT 120V, TRANSFORMER RATED
S-BASE METER WITH 3-2 WIRE CT'S
APPROVED
DAVID STANFORD
DATE
1996-01-01
STD 6.33


E AN
I ab
I cb
E CN
METER VECTORS
N
A
C
B
10-POLE
TEST SWITCH
R
Y
W
B
LINE
R/W
R/BK
LOAD
A
Y/W
Y/BK
B
B/W
B/BK
C
N
CIRCUIT: 3φ, 4-WIRE Y, ABOVE 208V AND 200A
TRANSFORMER: 3 2-WIRE CT's, 2 PT'S
BILLING MULTIPLIER IS
METER MULTIPLIER X CT RATIO
X PT RATIO
NOTE:
FOR EXISTING METERING ONLY
NOT FOR KVA METERING
Nova Scotia POWER An Emera Company
energy everywhere.
METERING STANDARD
2 ELEMENT, 120V TRANSFORMER RATED
P-BASE METER
WITH 3-2 WIRE CT'S & PT'S
APPROVED
DAVID STANFORD
DATE
1996-01-01
STD 6.34


E AN
I ab
I cb
E CN
METER VECTORS
N
A
C
B
10-POLE
TEST SWITCH
R
Y
W
B
LINE
R/W
R/BK
LOAD
Y/W
Y/BK
B/W
B/BK
A
B
C
N
CIRCUIT: 3 φ ,4 WIRE Y, ABOVE 208V AND 200A
TRANSFORMER: 3 2-WIRE CT'S, 2 PT'S
BILLING MULTIPLIER IS METER
MULTIPLIER X CT RATIO X PT RATIO
NOTE: FOR EXISTING METERING ONLY
NOT FOR kVA METERING
Nova Scotia POWER An Emera Company
energy everywhere.
METERING STANDARD
2 ELEMENT, 120V TRANSFORMER RATED
S-BASE METER
WITH 3-2 WIRE CT'S & 2 PT'S
APPROVED
DAVID STANFORD
DATE
1996-01-01
STD 6.35



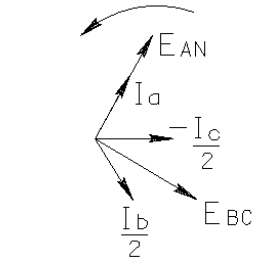
METER VECTORS



CIRCUIT: NETWORK (3-WIRE, 2Φ) 120/208V, 100A MAX

BILLING MULTIPLIER IS METER MULTIPLIER

Nova Scotia Power Inc. Halifax, Nova Scotia, Canada	METERING STANDARD
2 ELEMENT, 120 VOLT, SELF-CONTAINED A-BASE METER	
APPROVED DAVID STANFORD	
DATE 1996-01-01	STD 6.36

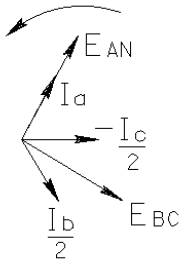


METER VECTORS

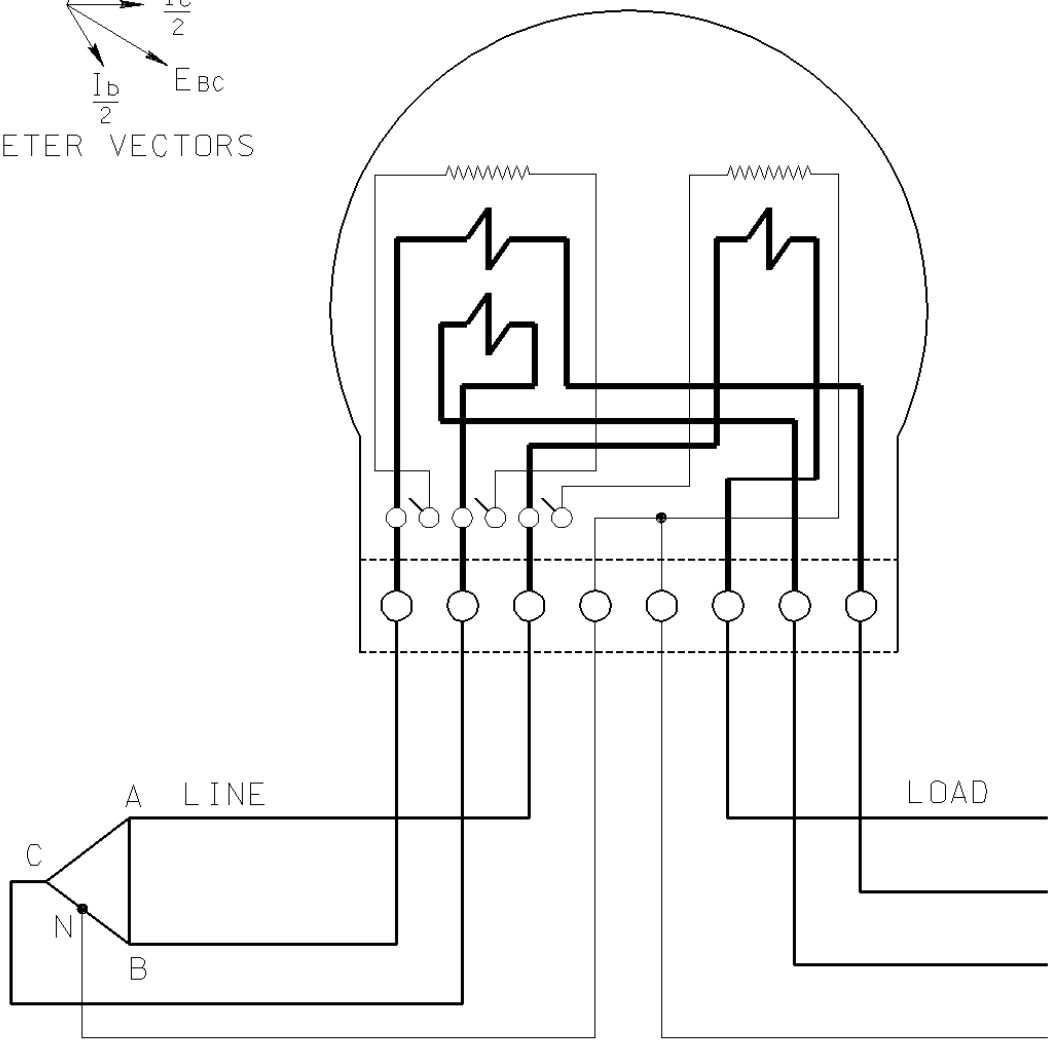
CIRCUIT: 3φ, 4-WIRE △, 240V, NEUTRAL IS MIDPOINT OF B-C TRANSFORMER
TRANSFORMER: NONE

NOTE:
FOR EXISTING INSTALLATIONS ONLY

Nova Scotia Power Inc. Halifax, Nova Scotia, Canada	METERING STANDARD
2½ ELEMENT 240V, SELF CONTAINED S-BASE METER	
APPROVED DAVID STANFORD	
DATE 1996-01-01	STD 6.37



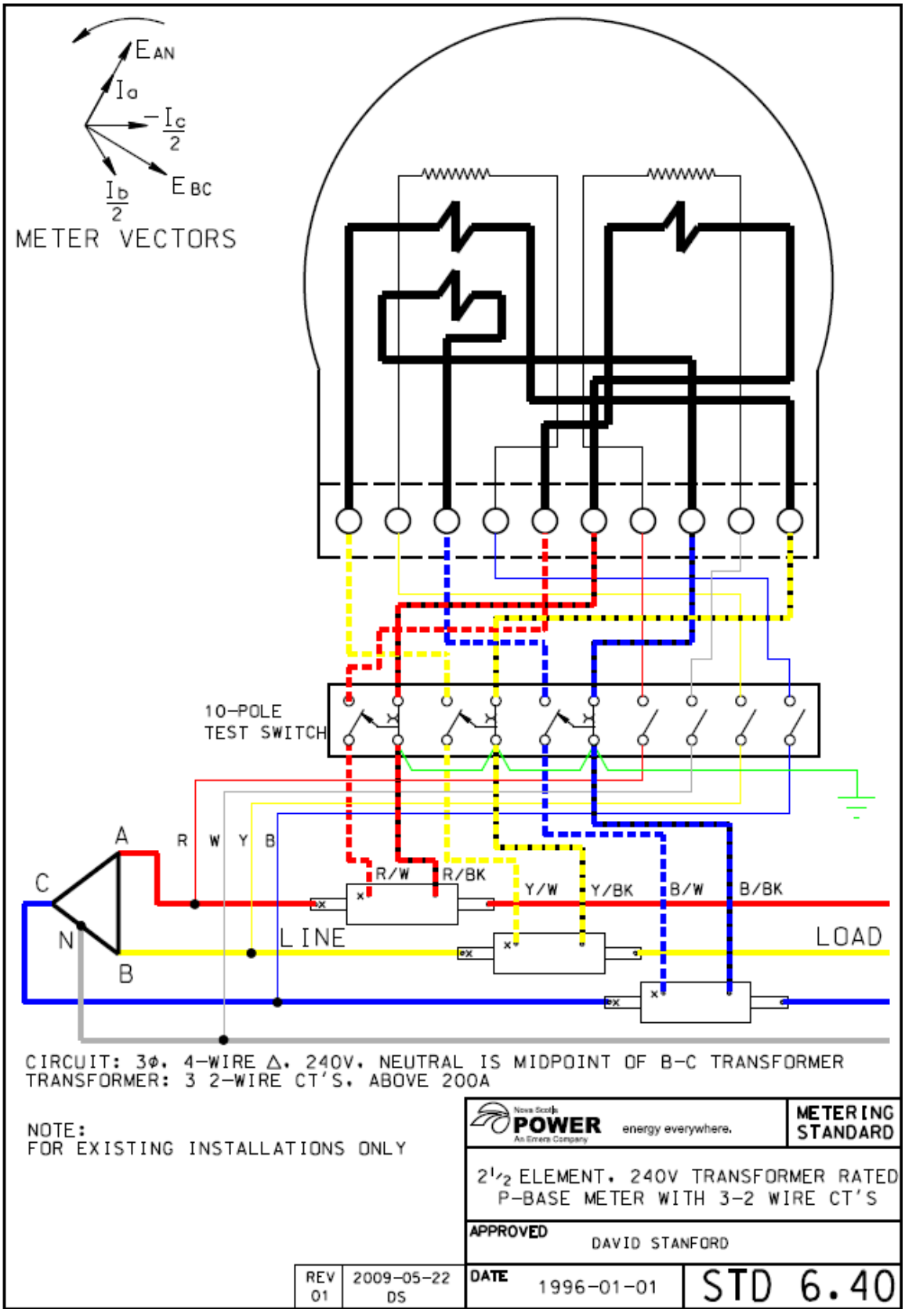
METER VECTORS

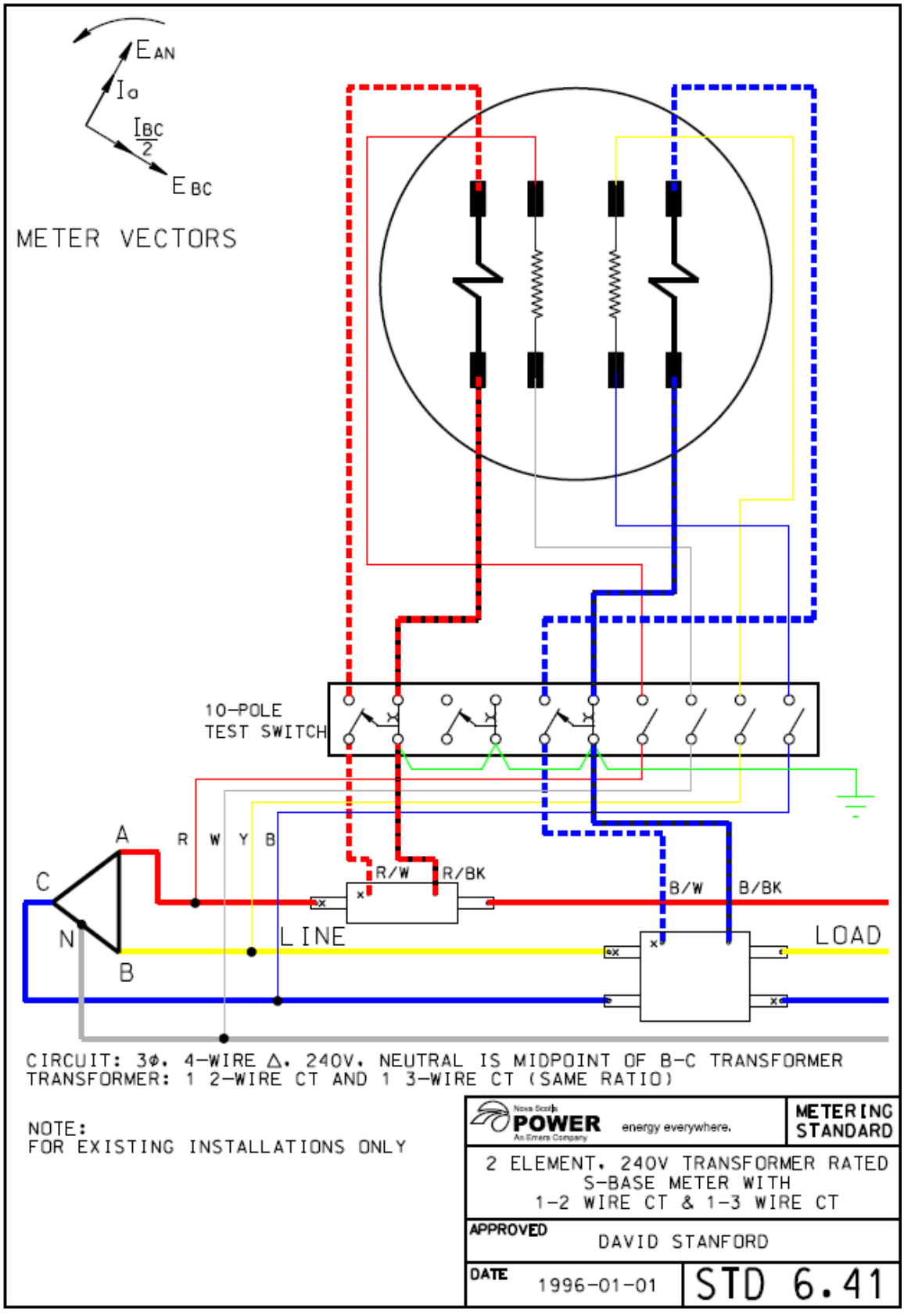


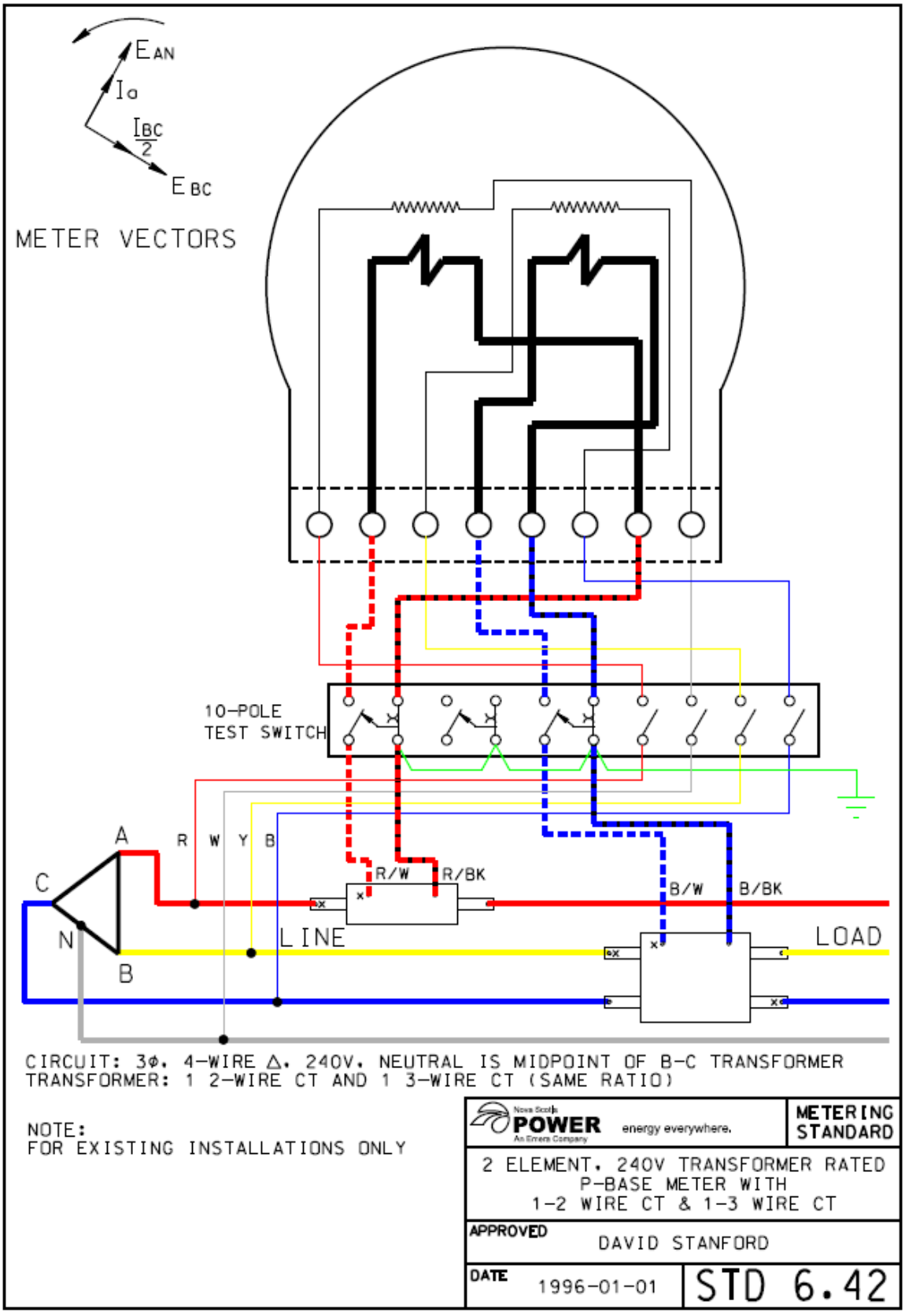
CIRCUIT: 3 ϕ, 4 WIRE △, 120V, NEUTRAL IS MIDPOINT OF B-C TRANSFORMER
TRANSFORMER: NONE

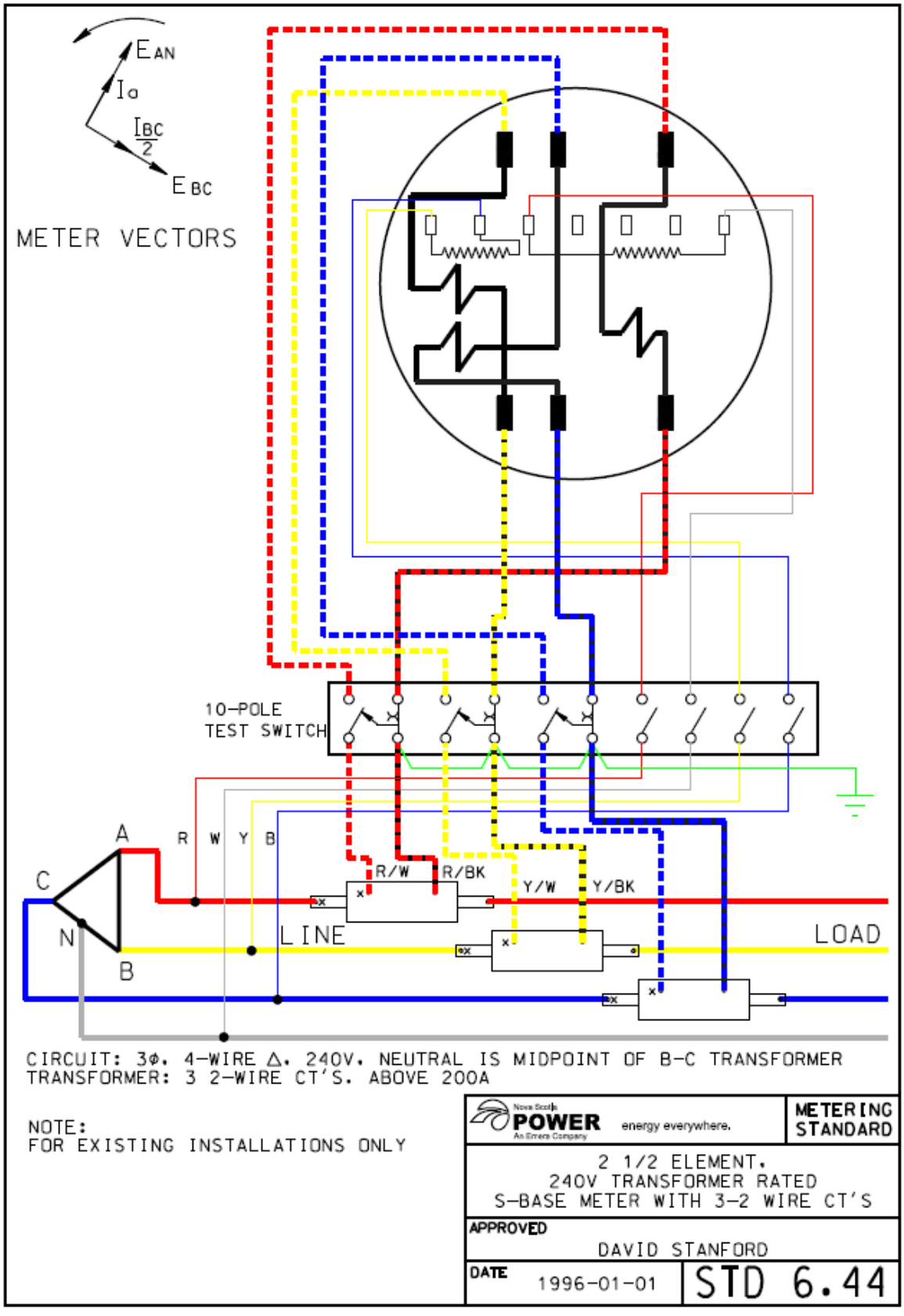
NOTE:
FOR EXISTING INSTALLATIONS ONLY

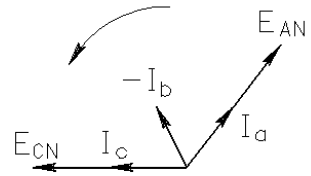
Nova Scotia Power Inc. Halifax, Nova Scotia, Canada	METERING STANDARD
2½ ELEMENT, 240V, SELF CONTAINED P-BASE METER	
APPROVED DAVID STANFORD	
DATE 1996-01-01	STD 6.38


EAN
Ia
−Ic/2
Ib/2
EBC
METER VECTORS
10-POLE
TEST SWITCH
A
C
N
B
R W Y B
R/W
R/BK
Y/W
Y/BK
B/W
B/BK
LINE
LOAD
CIRCUIT: 3φ, 4-WIRE Δ, 240V, NEUTRAL IS MIDPOINT OF B-C TRANSFORMER
TRANSFORMER: 3 2-WIRE CT'S, ABOVE 200A
NOTE:
FOR EXISTING INSTALLATIONS ONLY
Nova Scotia POWER An Emera Company
energy everywhere.
METERING STANDARD
2½ ELEMENT, 240V TRANSFORMER RATED
P-BASE METER WITH 3-2 WIRE CT'S
APPROVED
DAVID STANFORD
REV 01
2009-05-22
DS
DATE
1996-01-01
STD 6.40


EAN
Ia
IBC/2
EBC
METER VECTORS
10-POLE
TEST SWITCH
A
R W Y B
C
N
B
R/W
R/BK
B/W
B/BK
LINE
LOAD
CIRCUIT: 3φ, 4-WIRE Δ, 240V, NEUTRAL IS MIDPOINT OF B-C TRANSFORMER
TRANSFORMER: 1 2-WIRE CT AND 1 3-WIRE CT (SAME RATIO)
NOTE:
FOR EXISTING INSTALLATIONS ONLY
Nova Scotia POWER An Emera Company energy everywhere.
METERING STANDARD
2 ELEMENT, 240V TRANSFORMER RATED
S-BASE METER WITH
1-2 WIRE CT & 1-3 WIRE CT
APPROVED
DAVID STANFORD
DATE
1996-01-01
STD 6.41


E AN
Ia
IBC/2
E BC
METER VECTORS
10-POLE
TEST SWITCH
A
C
N
B
R
W
Y
B
R/W
R/BK
B/W
B/BK
LINE
LOAD
CIRCUIT: 3φ, 4-WIRE Δ, 240V, NEUTRAL IS MIDPOINT OF B-C TRANSFORMER
TRANSFORMER: 1 2-WIRE CT AND 1 3-WIRE CT (SAME RATIO)
NOTE:
FOR EXISTING INSTALLATIONS ONLY
Nova Scotia POWER An Emera Company
energy everywhere.
METERING STANDARD
2 ELEMENT, 240V TRANSFORMER RATED
P-BASE METER WITH
1-2 WIRE CT & 1-3 WIRE CT
APPROVED
DAVID STANFORD
DATE
1996-01-01
STD 6.42


EAN
Ia
IBC/2
EBC
METER VECTORS
10-POLE
TEST SWITCH
A
C
N
B
R W Y B
R/W
R/BK
Y/W
Y/BK
LINE
LOAD
CIRCUIT: 3φ, 4-WIRE Δ, 240V, NEUTRAL IS MIDPOINT OF B-C TRANSFORMER
TRANSFORMER: 3 2-WIRE CT'S, ABOVE 200A
NOTE:
FOR EXISTING INSTALLATIONS ONLY
Nova Scotia POWER An Emera Company energy everywhere.
METERING STANDARD
2 1/2 ELEMENT,
240V TRANSFORMER RATED
S-BASE METER WITH 3-2 WIRE CT'S
APPROVED
DAVID STANFORD
DATE 1996-01-01
STD 6.44



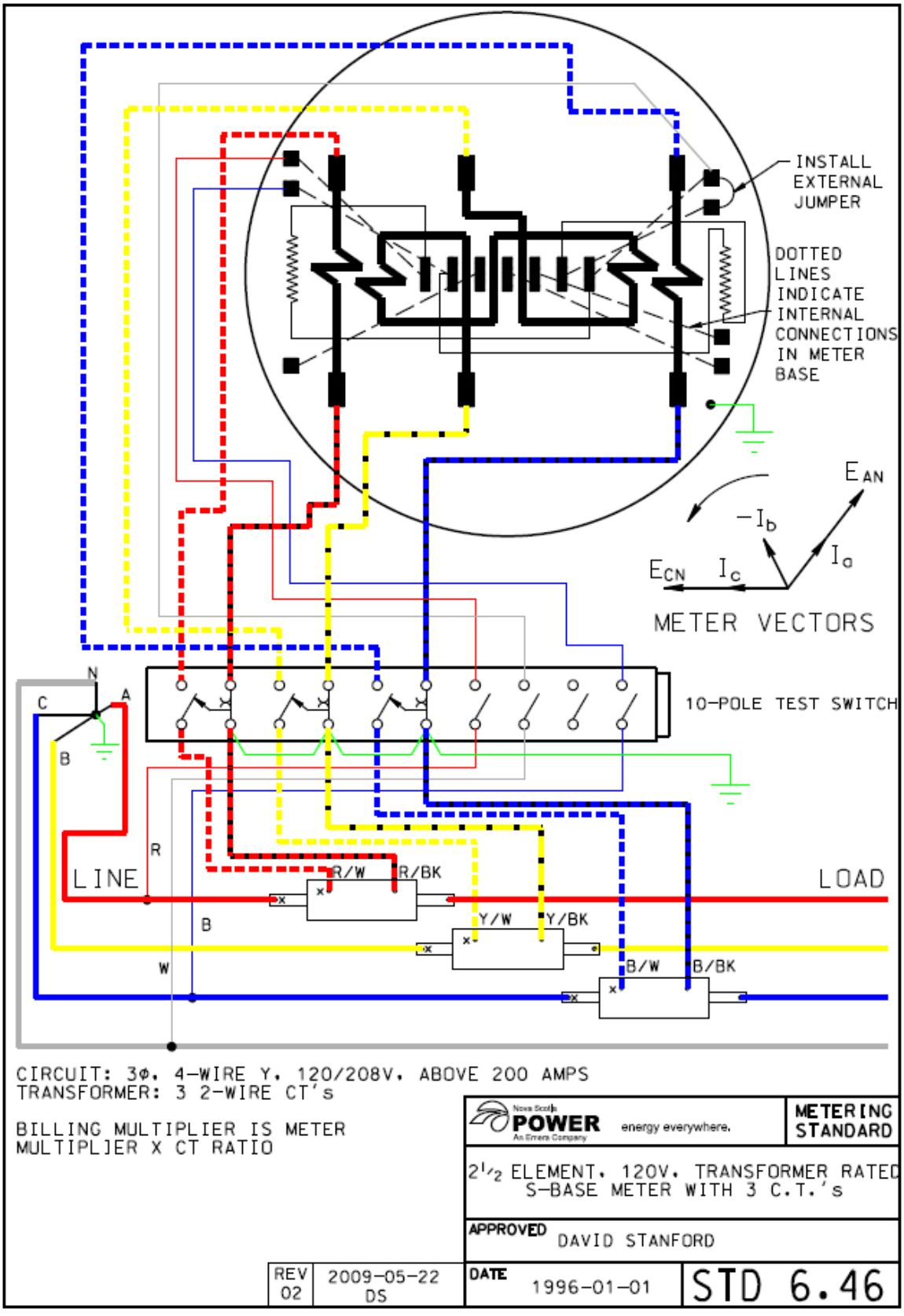
METER VECTORS

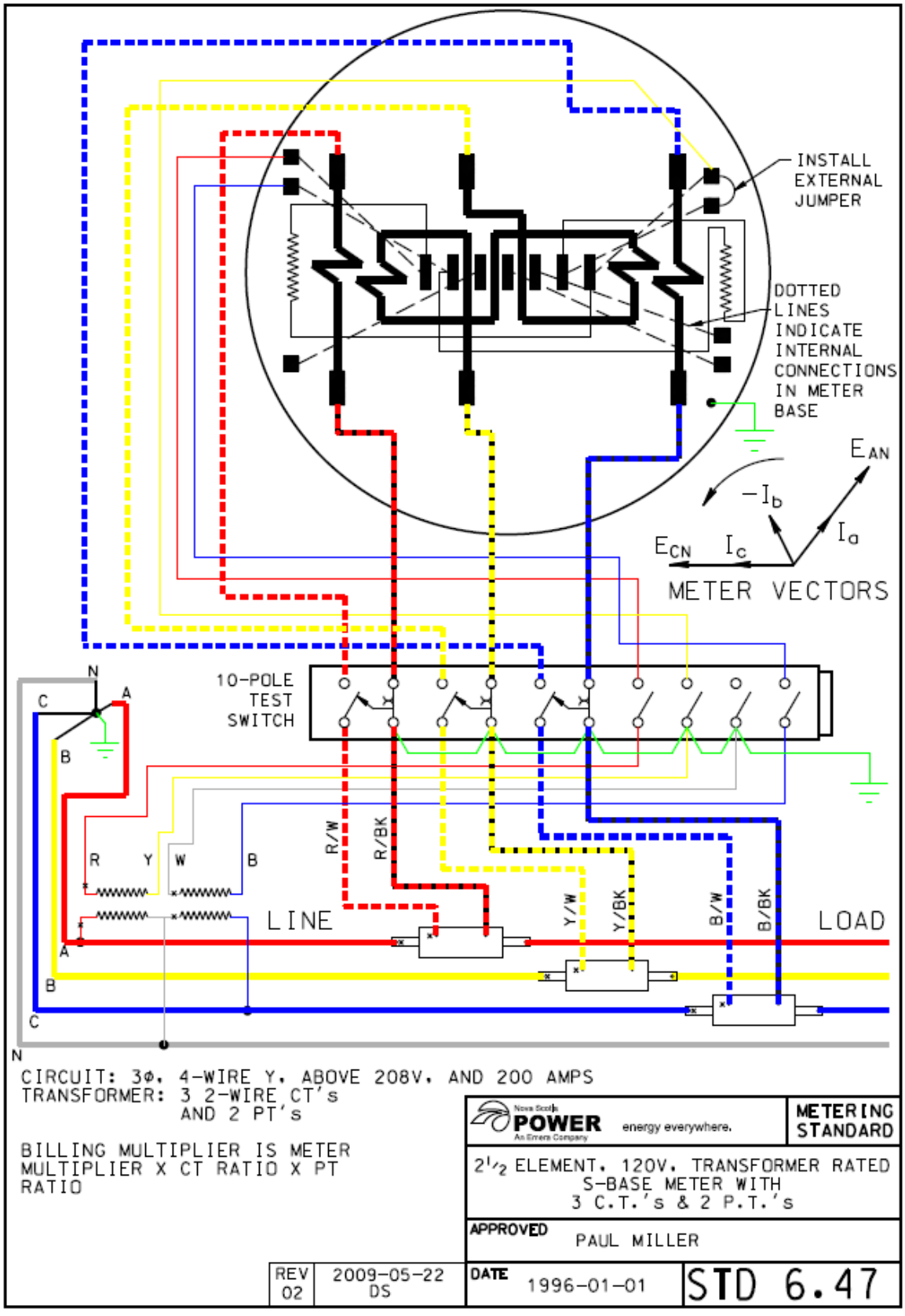
CIRCUIT: 3φ, 4-WIRE Y, 120/208V, 200 AMPS MAX OR
347/600V 200, AMPS MAX

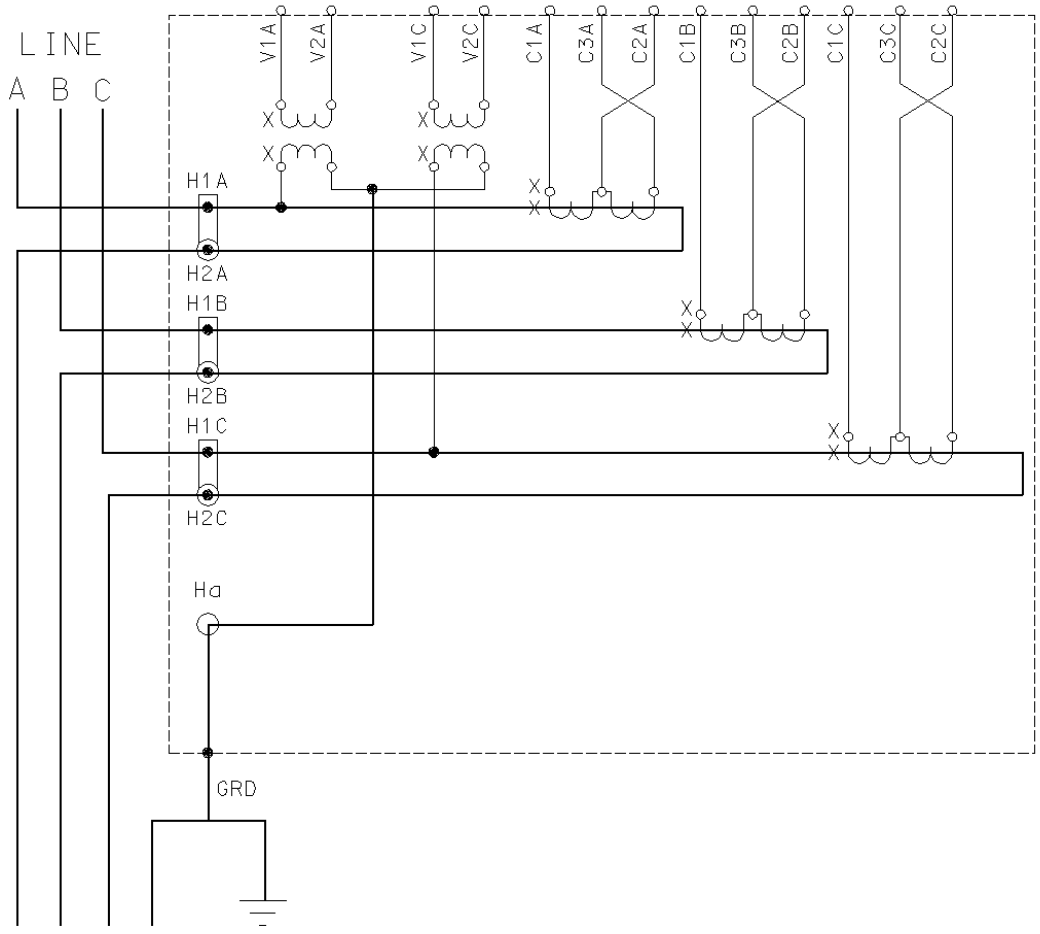
BILLING MULTIPLIER IS METER MULTIPLIER

NOTES:
1. DISCONNECT MUST BE ADJACENT TO OR INTEGRAL WITH THE METER BASE.

Nova Scotia Power Inc. Halifax, Nova Scotia, Canada	METERING STANDARD
2 1/2 ELEMENT, 120 VOLT OR 345 VOLT SELF-CONTAINED S-BASE METER	
APPROVED DAVID STANFORD	
REV 01 1997-10-28 / DATE 1996-01-01	STD 6.45


INSTALL EXTERNAL JUMPER
DOTTED LINES INDICATE INTERNAL CONNECTIONS IN METER BASE
E_{AN}
$-I_b$
I_a
E_{CN}
I_c
METER VECTORS
10-POLE TEST SWITCH
N
C
A
B
R
LINE
LOAD
R/W
R/BK
Y/W
Y/BK
B/W
B/BK
B
W
CIRCUIT: 3Φ, 4-WIRE Y, 120/208V, ABOVE 200 AMPS
TRANSFORMER: 3 2-WIRE CT's
BILLING MULTIPLIER IS METER MULTIPLIER X CT RATIO
Nova Scotia POWER An Emera Company
energy everywhere.
METERING STANDARD
2½ ELEMENT, 120V, TRANSFORMER RATED S-BASE METER WITH 3 C.T.'s
APPROVED DAVID STANFORD
REV 02
2009-05-22 DS
DATE 1996-01-01
STD 6.46


INSTALL EXTERNAL JUMPER
DOTTED LINES INDICATE INTERNAL CONNECTIONS IN METER BASE
E_{AN}
$-I_b$
I_a
E_{CN}
I_c
METER VECTORS
10-POLE TEST SWITCH
N
C
A
B
R
Y
W
B
R/W
R/BK
Y/W
Y/BK
B/W
B/BK
LINE
LOAD
CIRCUIT: 3φ, 4-WIRE Y, ABOVE 208V, AND 200 AMPS
TRANSFORMER: 3 2-WIRE CT's AND 2 PT's
BILLING MULTIPLIER IS METER MULTIPLIER X CT RATIO X PT RATIO
Nova Scotia POWER An Emera Company
energy everywhere.
METERING STANDARD
2½ ELEMENT, 120V, TRANSFORMER RATED S-BASE METER WITH 3 C.T.'s & 2 P.T.'s
APPROVED
PAUL MILLER
REV 02
2009-05-22 DS
DATE 1996-01-01
STD 6.47



DUAL RATIO CT CONNECTION	
LOW	HIGH
C1A & C2A	C1A & C3A
C1B & C2B	C1B & C3B
C1C & C2C	C1C & C3C

NOTE:
1. OPEN CT SHORTING LINKS AFTER METER IS CONNECTED AND BEFORE ENERGIZATION OCCURS.

Nova Scotia Power Inc.
Halifax, Nova Scotia, Canada

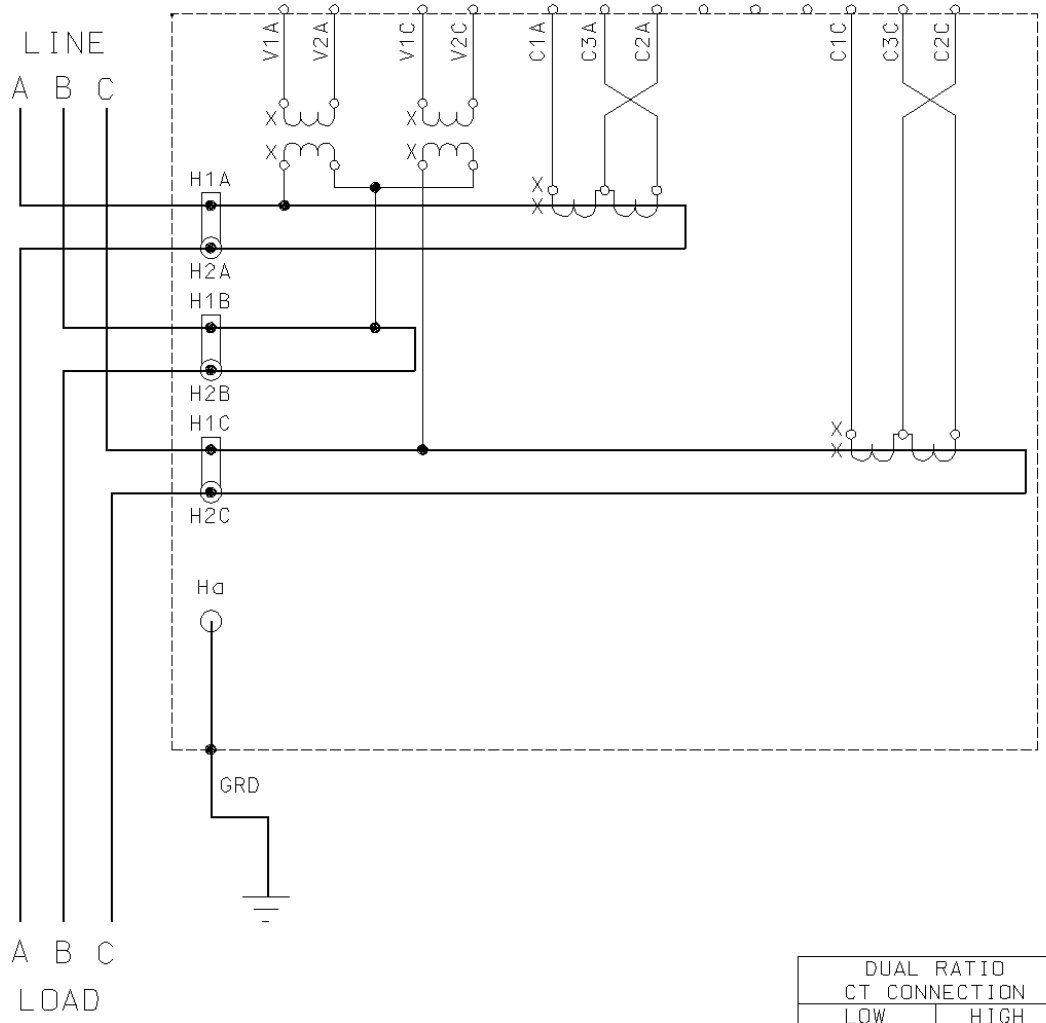
METERING STANDARD

PRIMARY METERING
3φ, 4-WIRE SERVICE,
2.5 ELEMENT GENERIC

APPROVED BILL HIRE

DATE 2003-05-13

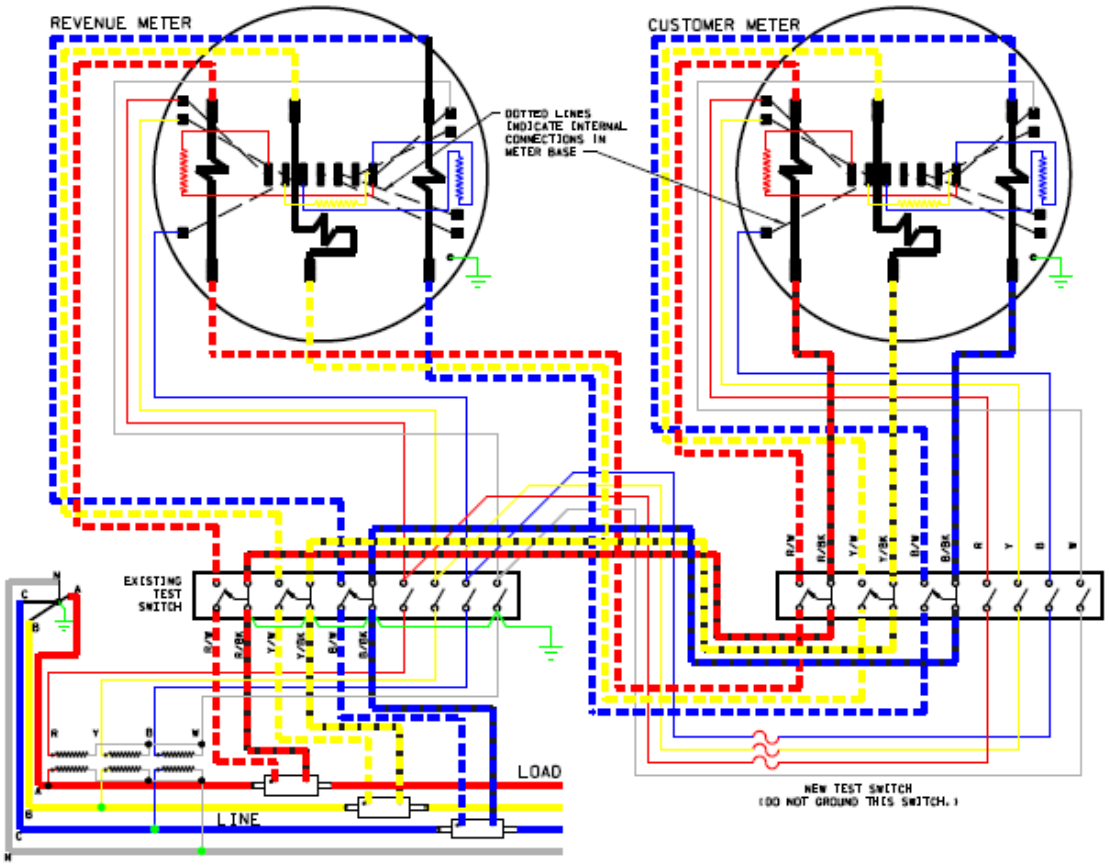
STD 6.48



DUAL RATIO CT CONNECTION	
LOW	HIGH
C1A & C2A	C1A & C3A
C1C & C2C	C1C & C3C

NOTE:
1. OPEN CT SHORTING LINKS AFTER METER IS CONNECTED AND BEFORE ENERGIZATION OCCURS.

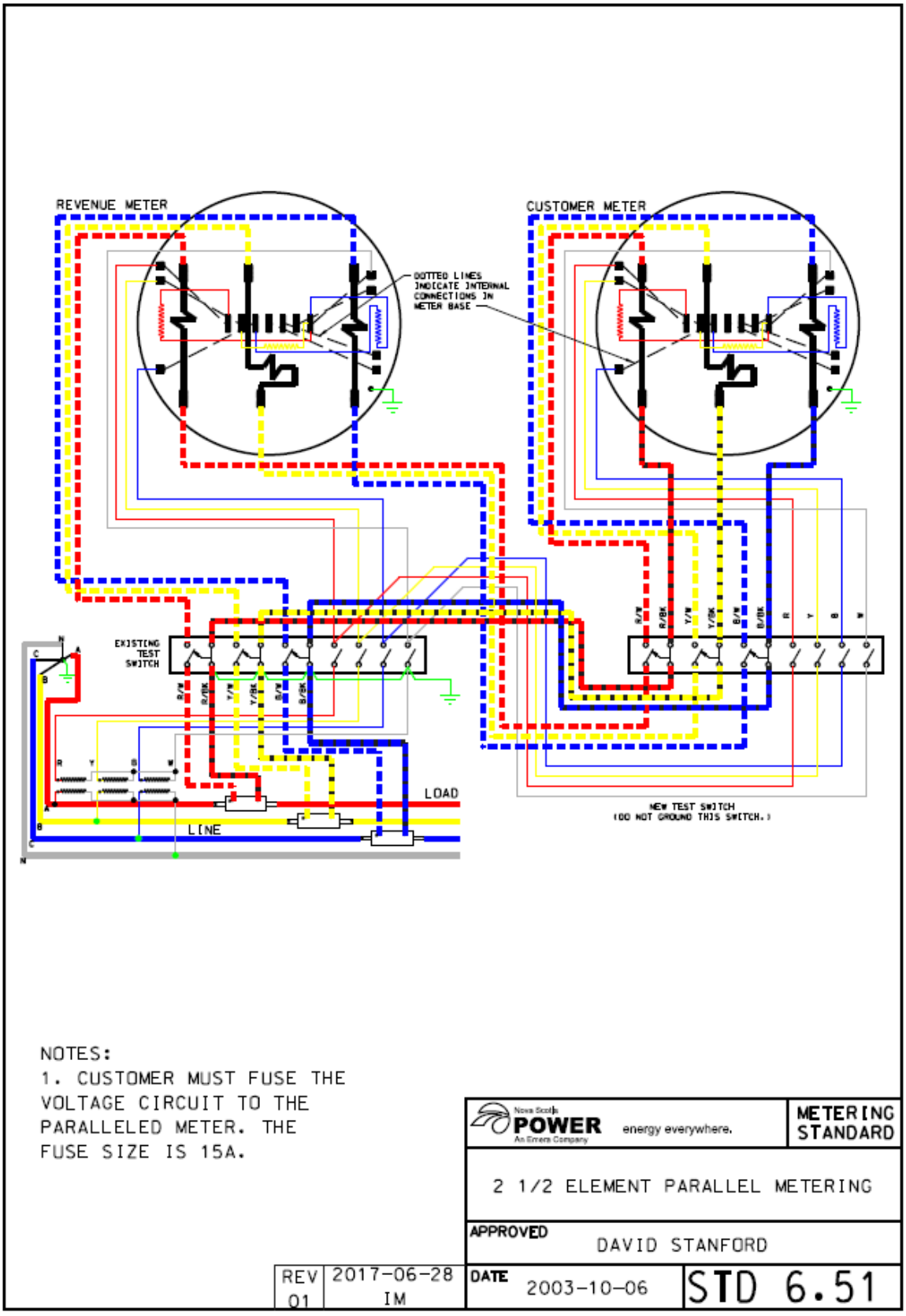
Nova Scotia Power Inc. Halifax, Nova Scotia, Canada	METERING STANDARD
PRIMARY METERING 3ϕ, 3-WIRE SERVICE, 2 ELEMENT GENERIC	
APPROVED BILL HIRE	
DATE 2003-05-13	STD 6.49

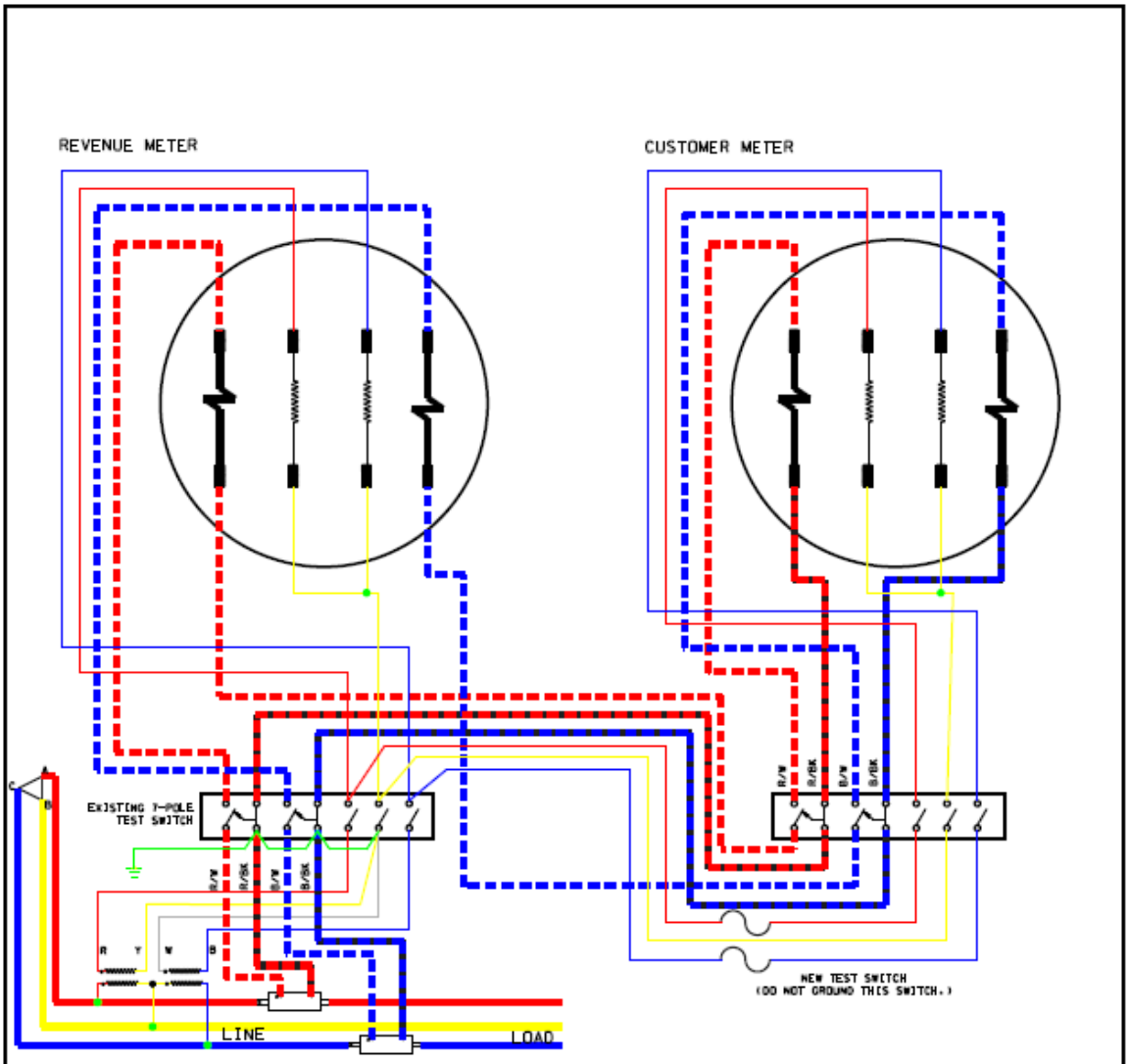


NOTES:
1. CUSTOMER MUST FUSE THE VOLTAGE CIRCUIT TO THE PARALLELED METER. THE FUSE SIZE IS 15A.

Nova Scotia POWER An Emera Company energy everywhere.	METERING STANDARD
3 ELEMENT PARALLEL METERING	
APPROVED DAVID STANFORD	
DATE 2003-10-06	STD 6.50

REV	
01	2017-06-28 IM


REVENUE METER
CUSTOMER METER
DOTTED LINES INDICATE INTERNAL CONNECTIONS IN METER BASE
EXISTING TEST SWITCH
LOAD
LINE
NEW TEST SWITCH (DO NOT GROUND THIS SWITCH.)
NOTES:
1. CUSTOMER MUST FUSE THE VOLTAGE CIRCUIT TO THE PARALLELED METER. THE FUSE SIZE IS 15A.
Nova Scotia POWER An Emera Company energy everywhere.
METERING STANDARD
2 1/2 ELEMENT PARALLEL METERING
APPROVED
DAVID STANFORD
REV 01
2017-06-28 IM
DATE 2003-10-06
STD 6.51



NOTES:
1. CUSTOMER MUST FUSE THE VOLTAGE CIRCUIT TO THE PARALLEL METER. THE FUSE SIZE IS 15A.

Nova Scotia POWER An Emera Company energy everywhere.

METERING STANDARD

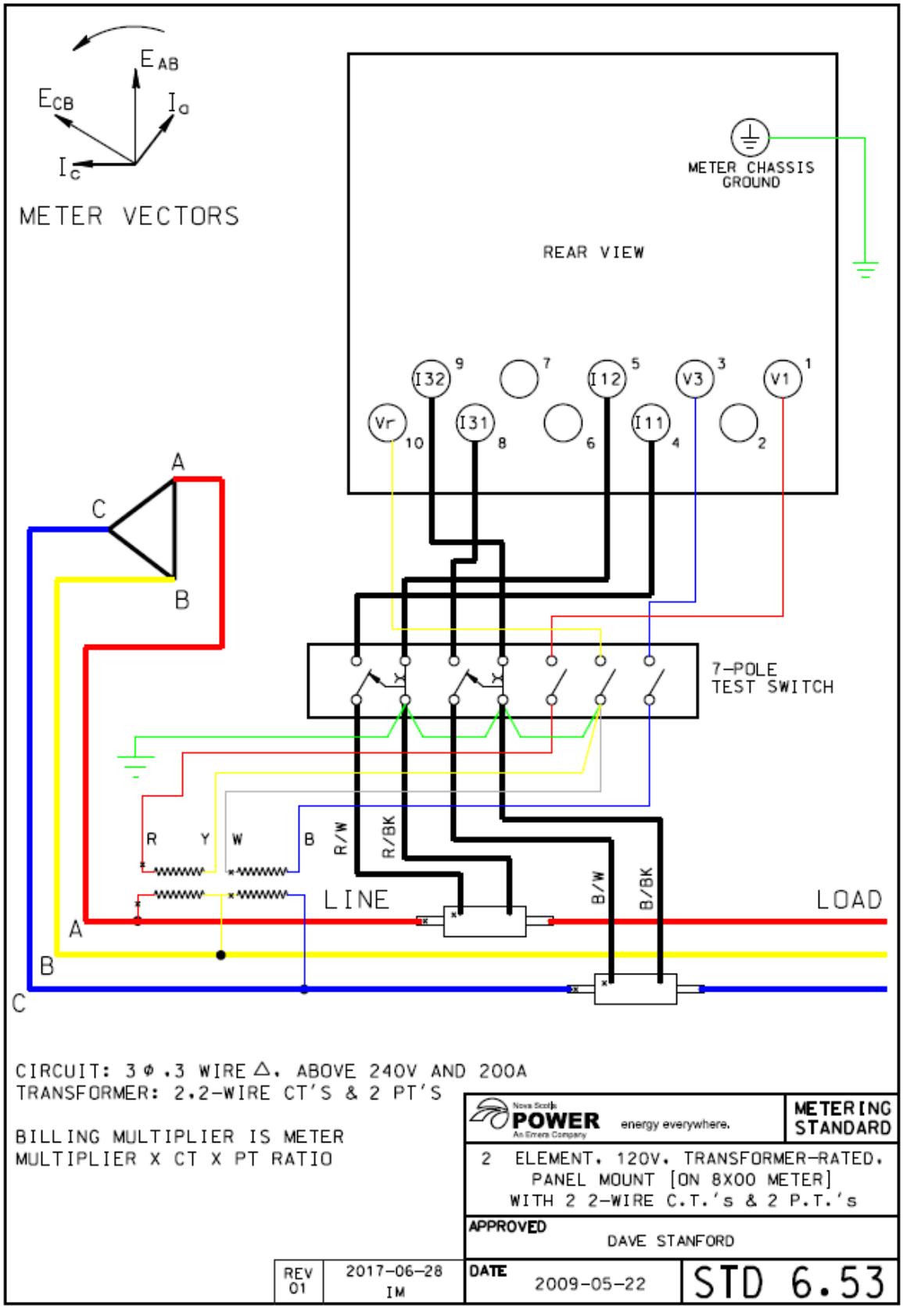
2 ELEMENT PARALLEL METERING

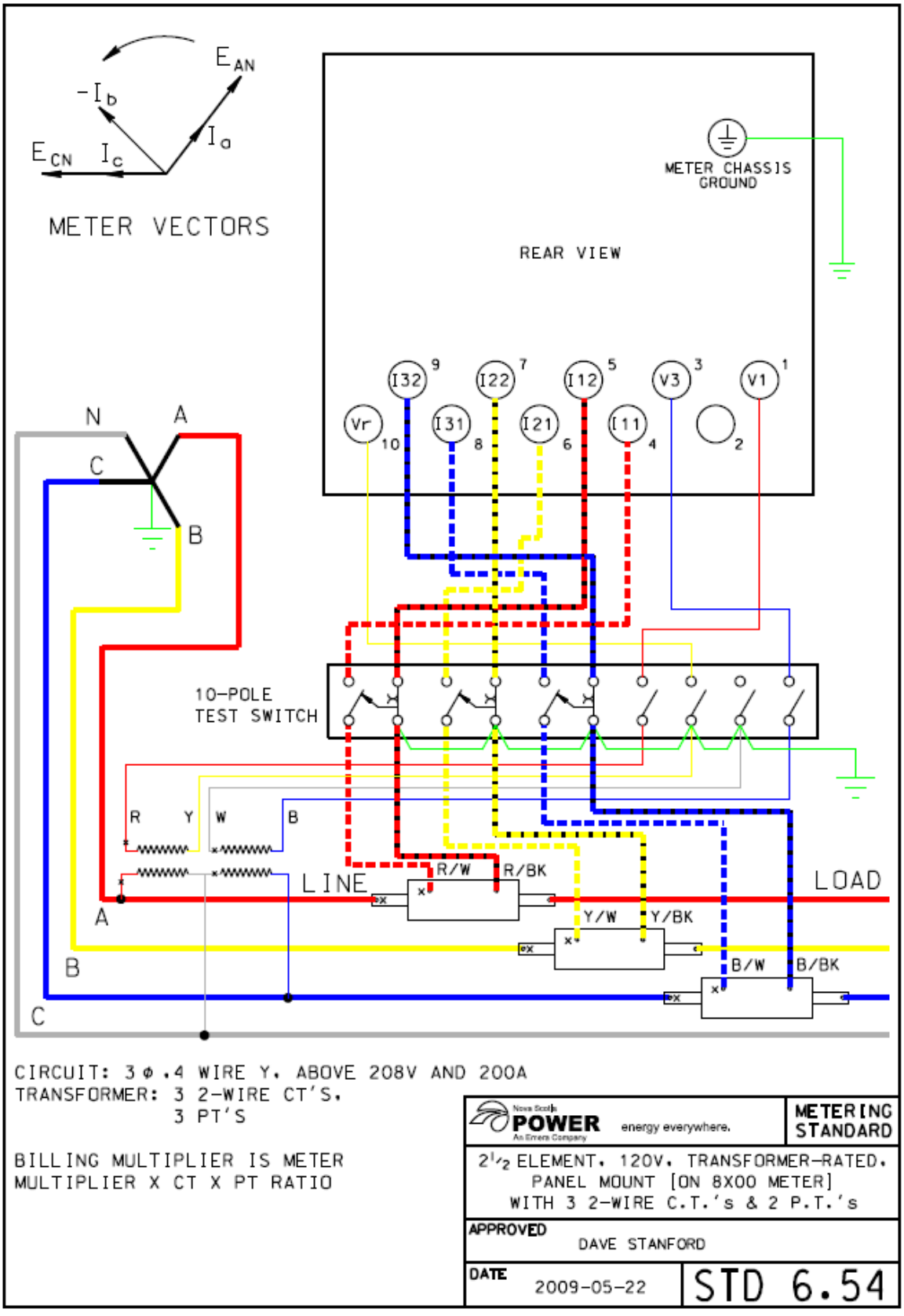
APPROVED DAVID STANFORD

DATE 2003-10-06

STD 6.52

REV	2017-06-28
01	IM


E AB
E CB
I a
I c
METER VECTORS
METER CHASSIS GROUND
REAR VIEW
I32 9
7
I12 5
V3 3
V1 1
Vr 10
I31 8
6
I11 4
2
A
C
B
7-POLE TEST SWITCH
R
Y
W
B
R/W
R/BK
B/W
B/BK
LINE
LOAD
A
B
C
CIRCUIT: 3 Φ .3 WIRE △. ABOVE 240V AND 200A
TRANSFORMER: 2.2-WIRE CT'S & 2 PT'S
BILLING MULTIPLIER IS METER MULTIPLIER X CT X PT RATIO
Nova Scotia POWER An Emera Company energy everywhere.
METERING STANDARD
2 ELEMENT, 120V, TRANSFORMER-RATED, PANEL MOUNT [ON 8X00 METER] WITH 2 2-WIRE C.T.'s & 2 P.T.'s
APPROVED
DAVE STANFORD
REV 01
2017-06-28 IM
DATE 2009-05-22
STD 6.53



CIRCUIT: 3 ϕ .4 WIRE Y. ABOVE 208V AND 200A
TRANSFORMER: 3 2-WIRE CT'S.
3 PT'S

BILLING MULTIPLIER IS METER MULTIPLIER X CT X PT RATIO

Nova Scotia POWER An Emera Company energy everywhere.

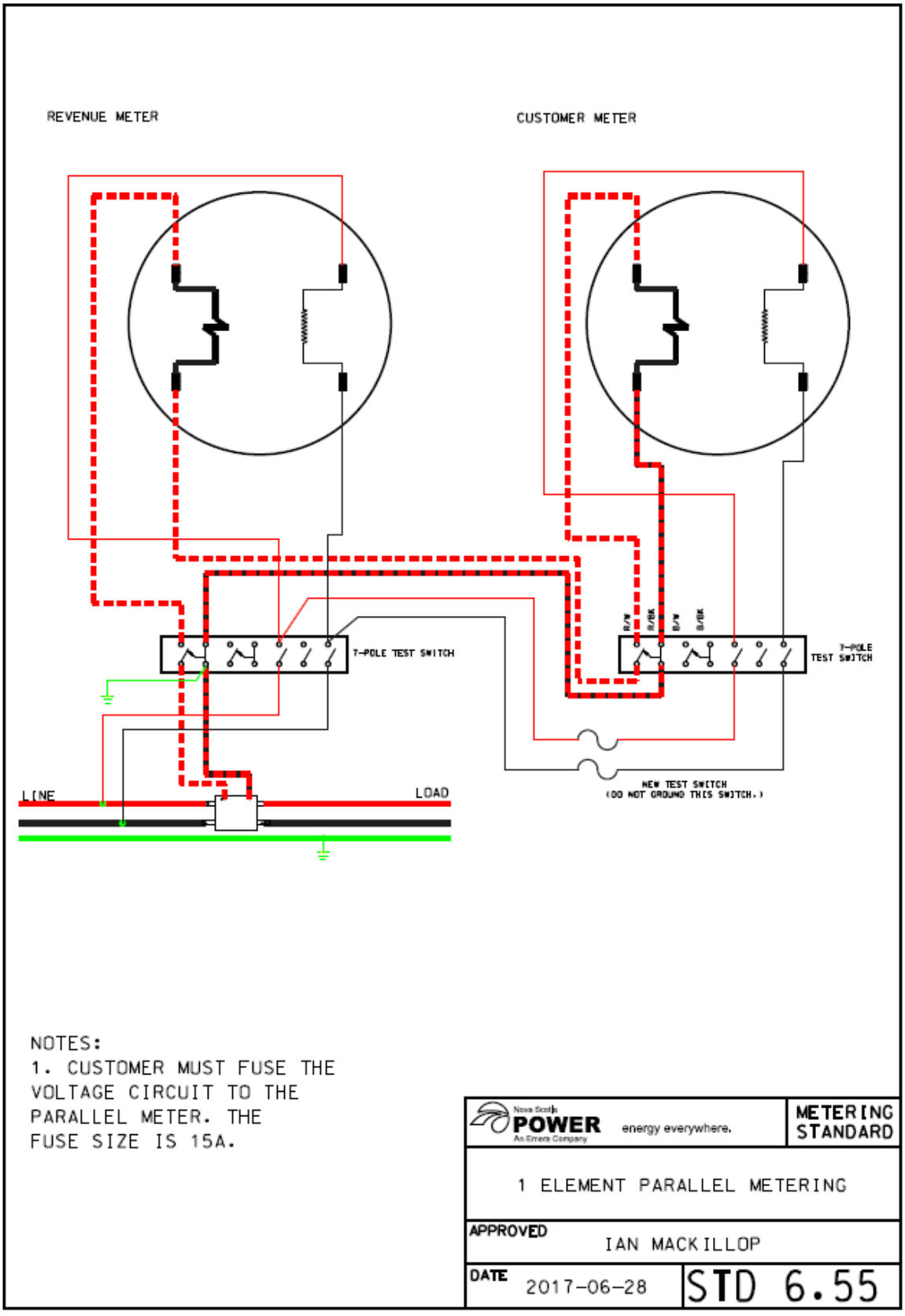
METERING STANDARD

2½ ELEMENT. 120V. TRANSFORMER-RATED.
PANEL MOUNT [ON 8X00 METER]
WITH 3 2-WIRE C.T.'s & 2 P.T.'s

APPROVED DAVE STANFORD

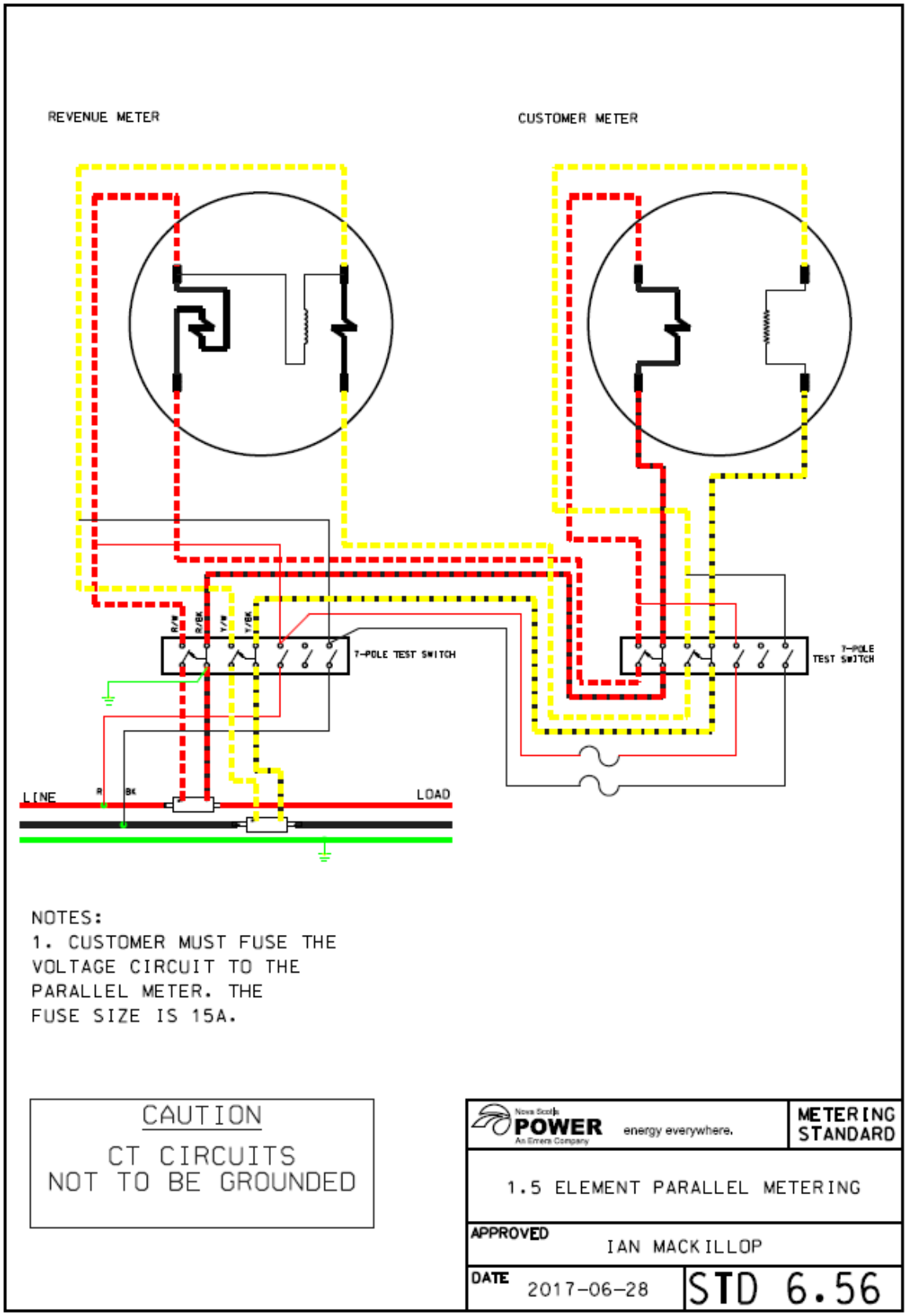
DATE 2009-05-22

STD 6.54



NOTES:
1. CUSTOMER MUST FUSE THE VOLTAGE CIRCUIT TO THE PARALLEL METER. THE FUSE SIZE IS 15A.

Nova Scotia POWER An Emera Company energy everywhere.	METERING STANDARD
1 ELEMENT PARALLEL METERING	
APPROVED IAN MACKILLOP	
DATE 2017-06-28	STD 6.55



NOTES:
1. CUSTOMER MUST FUSE THE VOLTAGE CIRCUIT TO THE PARALLEL METER. THE FUSE SIZE IS 15A.

CAUTION

CT CIRCUITS NOT TO BE GROUNDED

Nova Scotia POWER An Emera Company energy everywhere.

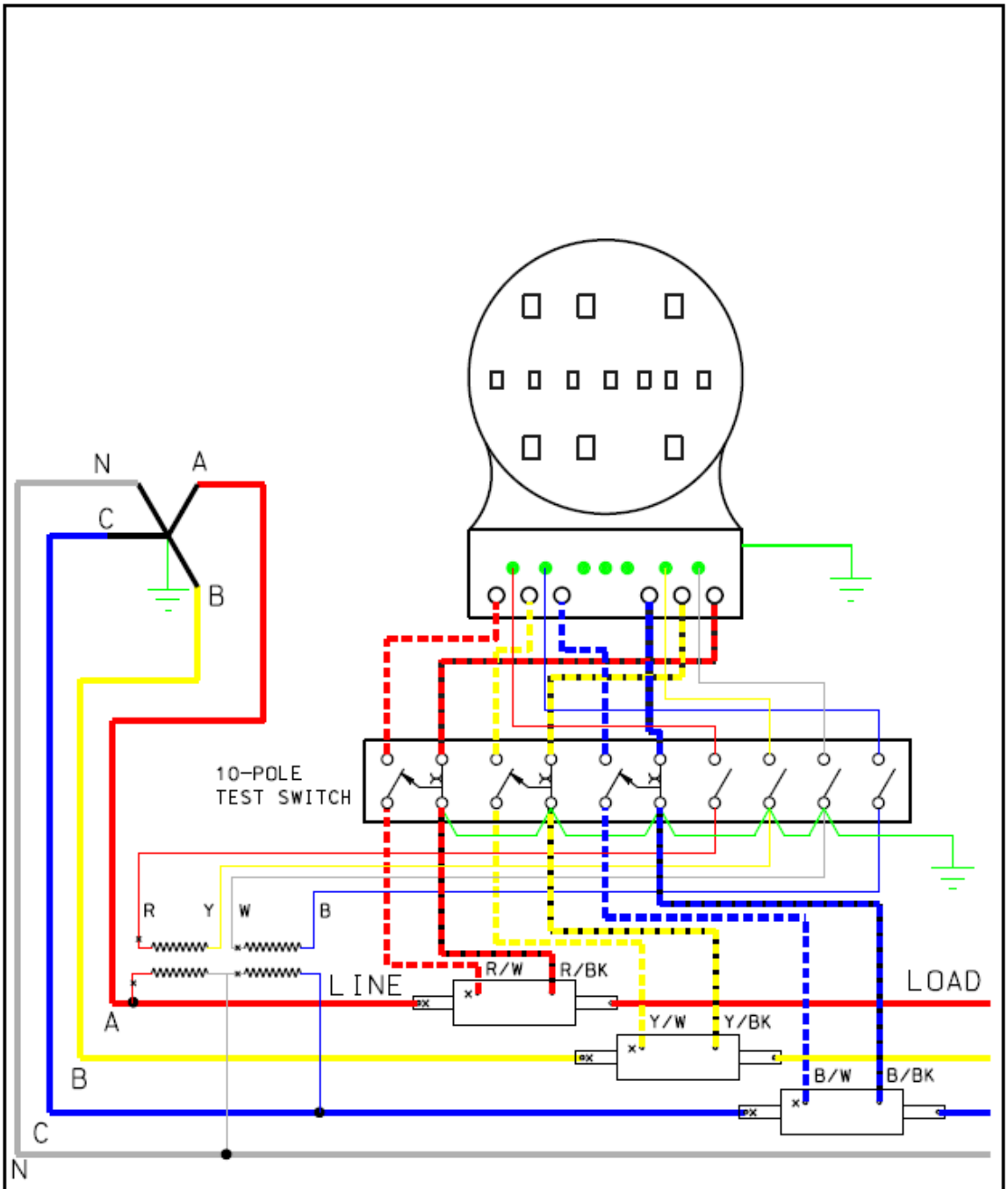
METERING STANDARD

1.5 ELEMENT PARALLEL METERING

APPROVED IAN MACKILLOP

DATE 2017-06-28

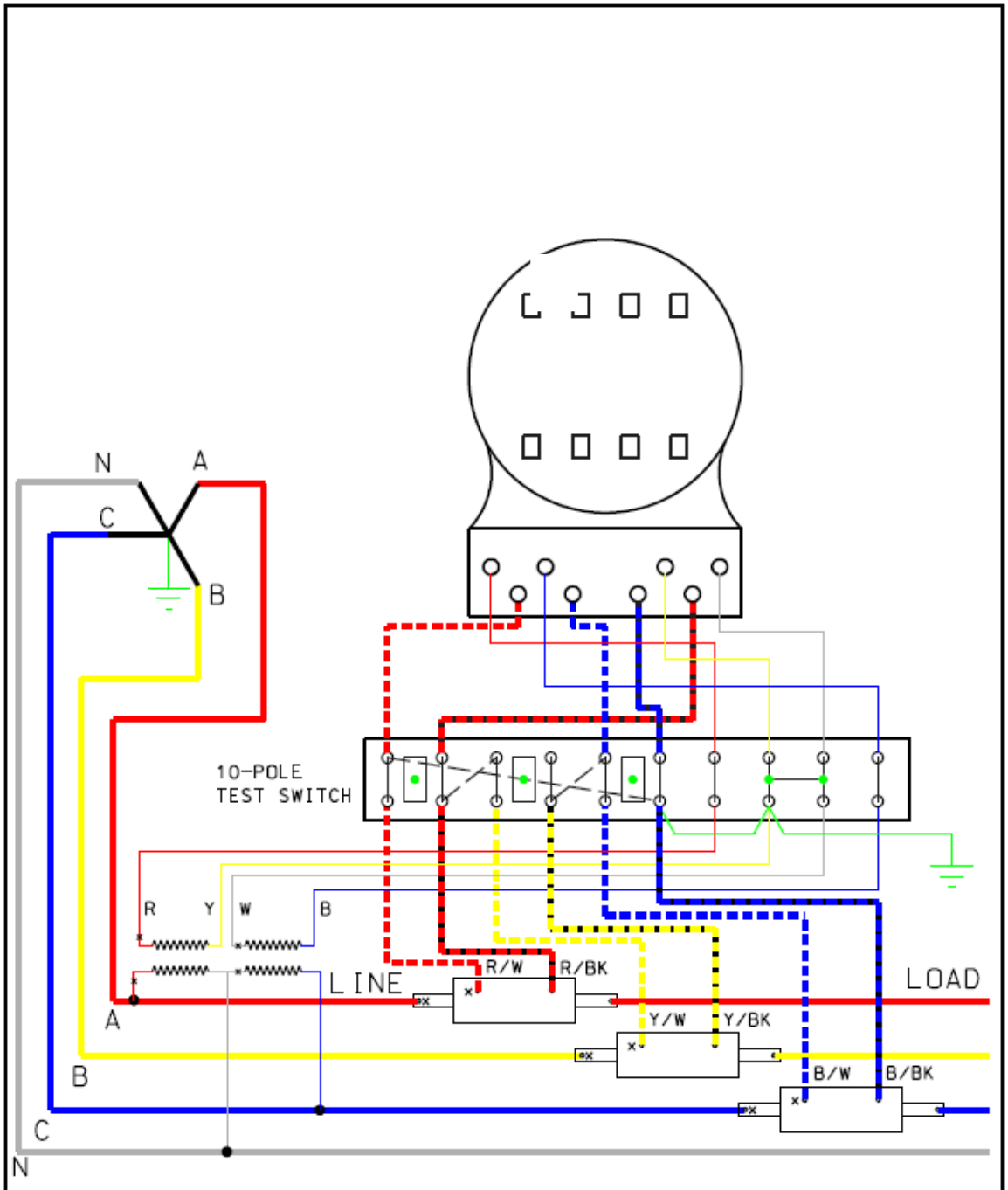
STD 6.56



NOTES:

USE A FORM 6S, 9S, 10S P-S ADAPTER.

Nova Scotia POWER An Emera Company energy everywhere.	METERING STANDARD
2.5 ELEMENT P-S ADAPTER CONNECTION	
APPROVED I AN MACKI LLOP	
DATE 2017-06-28	STD 6.57



NOTES:

USE A FORM 5S P-S ADAPTER.

Nova Scotia POWER An Emera Company energy everywhere.

METERING STANDARD

2.0 ELEMENT P-S ADAPTER CONNECTION

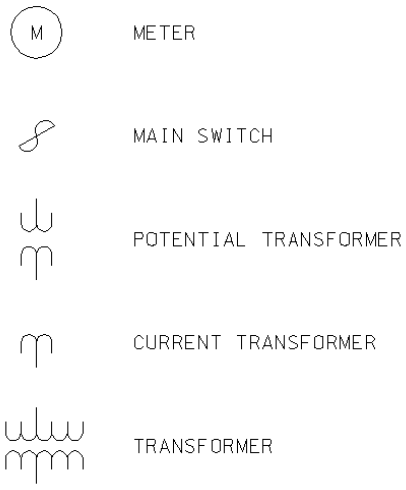
APPROVED I AN MACKI LLOP

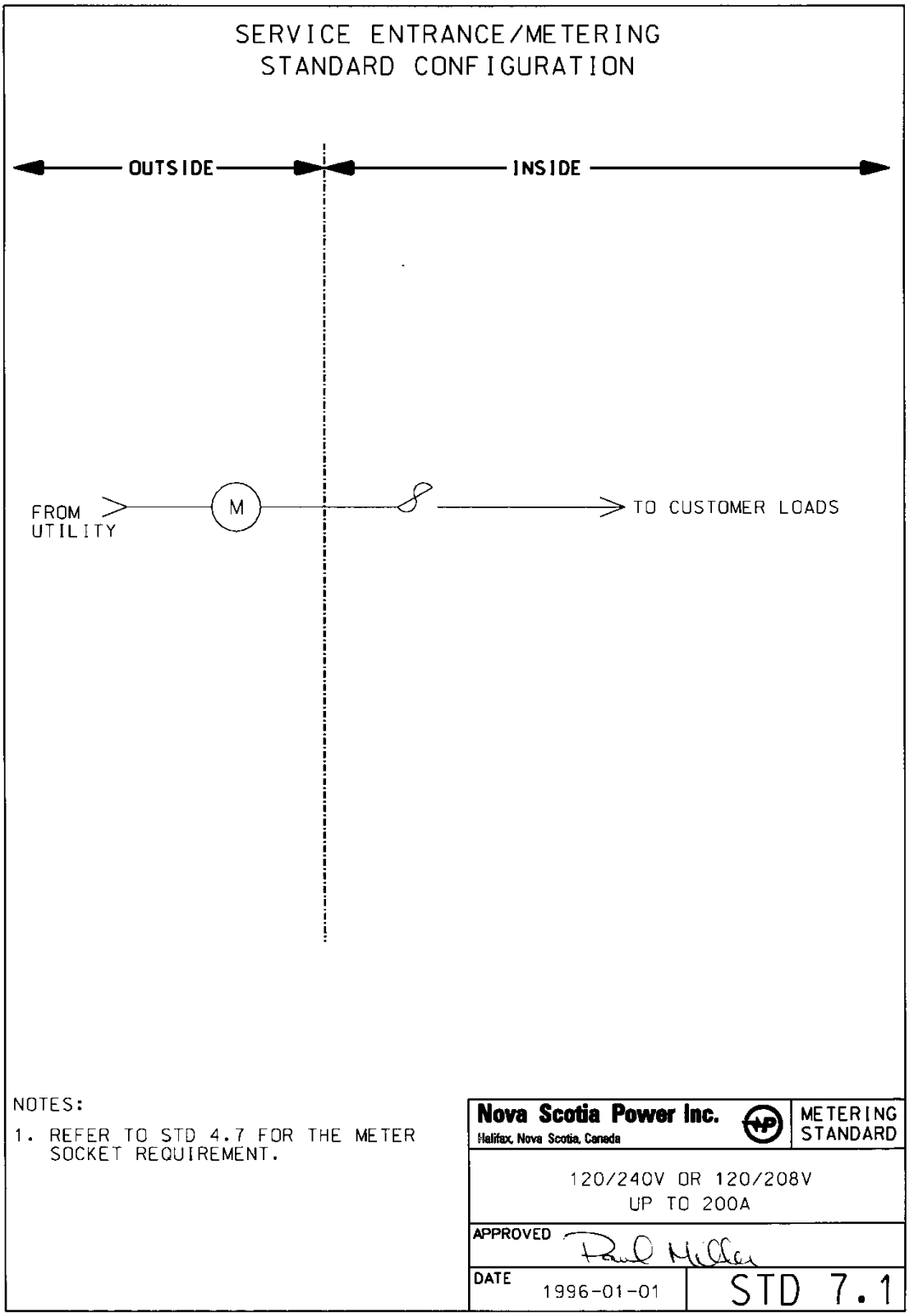
DATE 2017-08-28

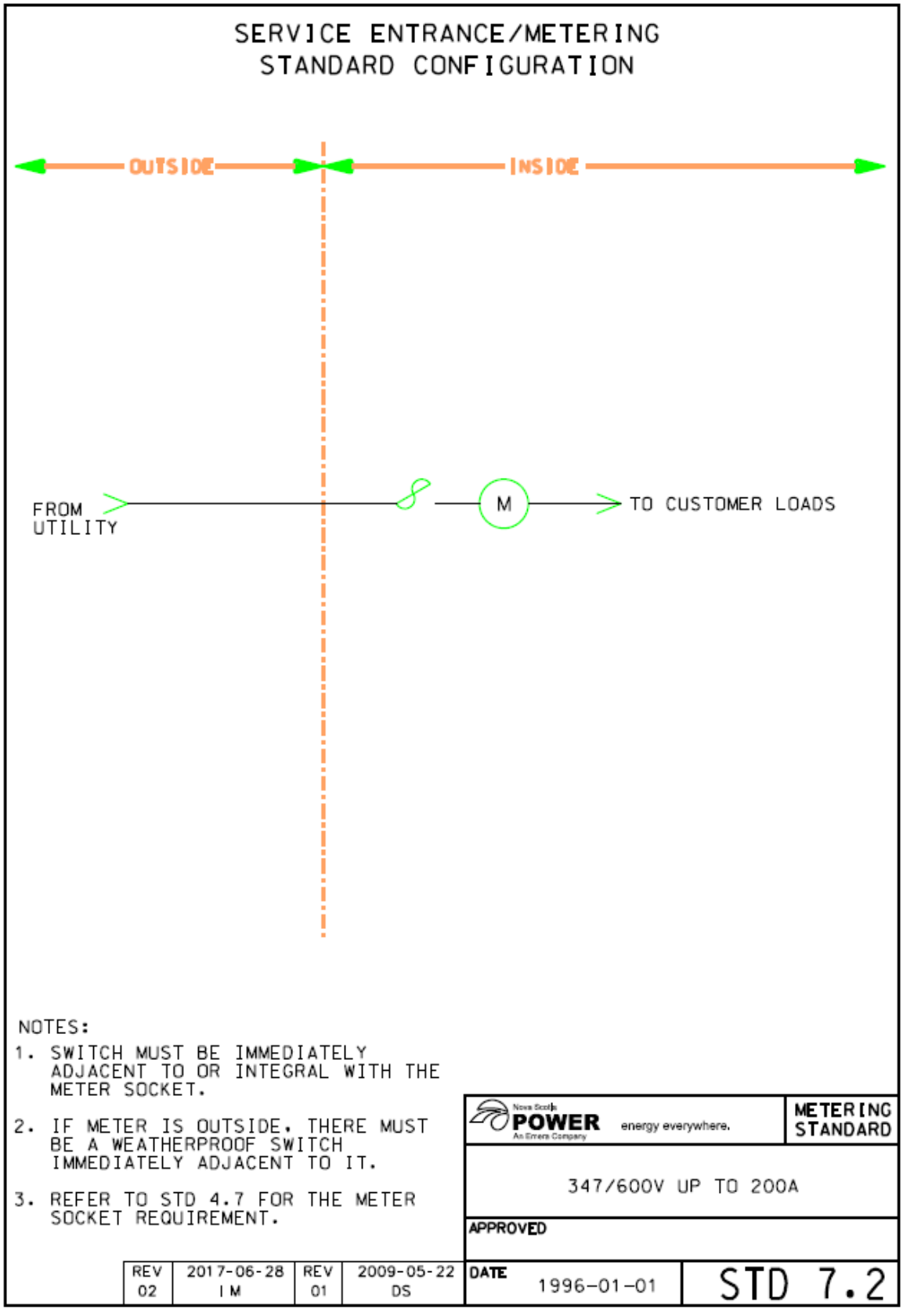
STD 6.58

STD 7.1 120/240 V or 120/208 V up to 200 A
STD 7.2 347/600 V up to 200 A
STD 7.3 120/240 V or 120/208 V or 347/600 V, above 200 A
STD 7.4 Indoor Primary Metering at 2.4 kV and above
STD 7.5 Outdoor Primary Metering at 2.4 kV and above
STD 7.6 Multiple Customers @ 120/240 V up to 200 A
STD 7.7 Multiple Customers @ 120/240 V or 120/208 V or 347/600 V up to 200 A
STD 7.8 Multiple Customers @ 120/240 V or 120/208 V or 347/600 V above 200 A
STD 7.9 Multiple Customers at Different Voltages

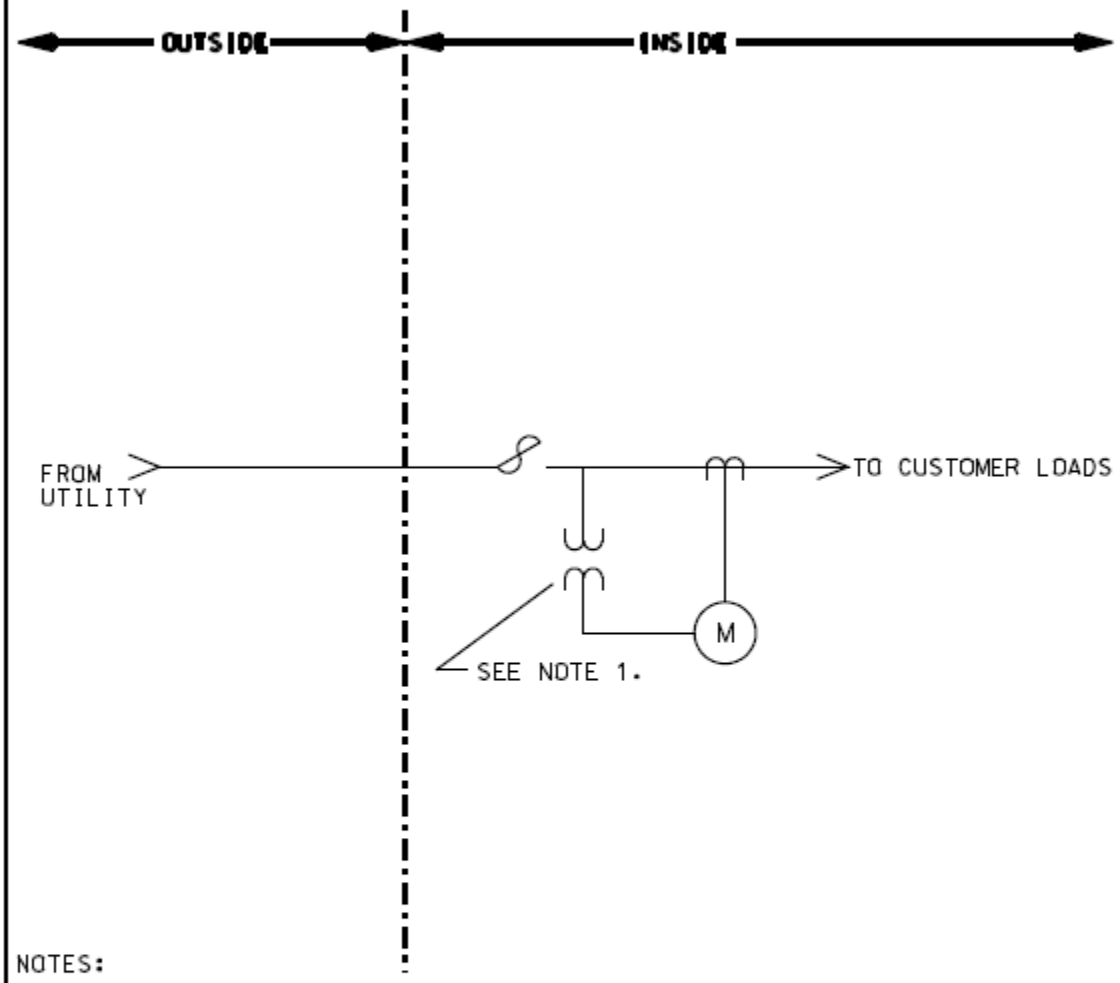
LEGEND:




SERVICE ENTRANCE/METERING
STANDARD CONFIGURATION
OUTSIDE
INSIDE
FROM UTILITY
M
TO CUSTOMER LOADS
NOTES:
1. REFER TO STD 4.7 FOR THE METER SOCKET REQUIREMENT.
Nova Scotia Power Inc.
Halifax, Nova Scotia, Canada
METERING STANDARD
120/240V OR 120/208V
UP TO 200A
APPROVED
DATE
1996-01-01
STD 7.1


SERVICE ENTRANCE/METERING
STANDARD CONFIGURATION
OUTSIDE
INSIDE
FROM
UTILITY
M
TO CUSTOMER LOADS
NOTES:
1. SWITCH MUST BE IMMEDIATELY ADJACENT TO OR INTEGRAL WITH THE METER SOCKET.
2. IF METER IS OUTSIDE, THERE MUST BE A WEATHERPROOF SWITCH IMMEDIATELY ADJACENT TO IT.
3. REFER TO STD 4.7 FOR THE METER SOCKET REQUIREMENT.
Nova Scotia POWER An Emera Company energy everywhere.
METERING STANDARD
347/600V UP TO 200A
APPROVED
REV 02 2017-06-28 I M
REV 01 2009-05-22 DS
DATE 1996-01-01
STD 7.2

SERVICE ENTRANCE/METERING STANDARD CONFIGURATION

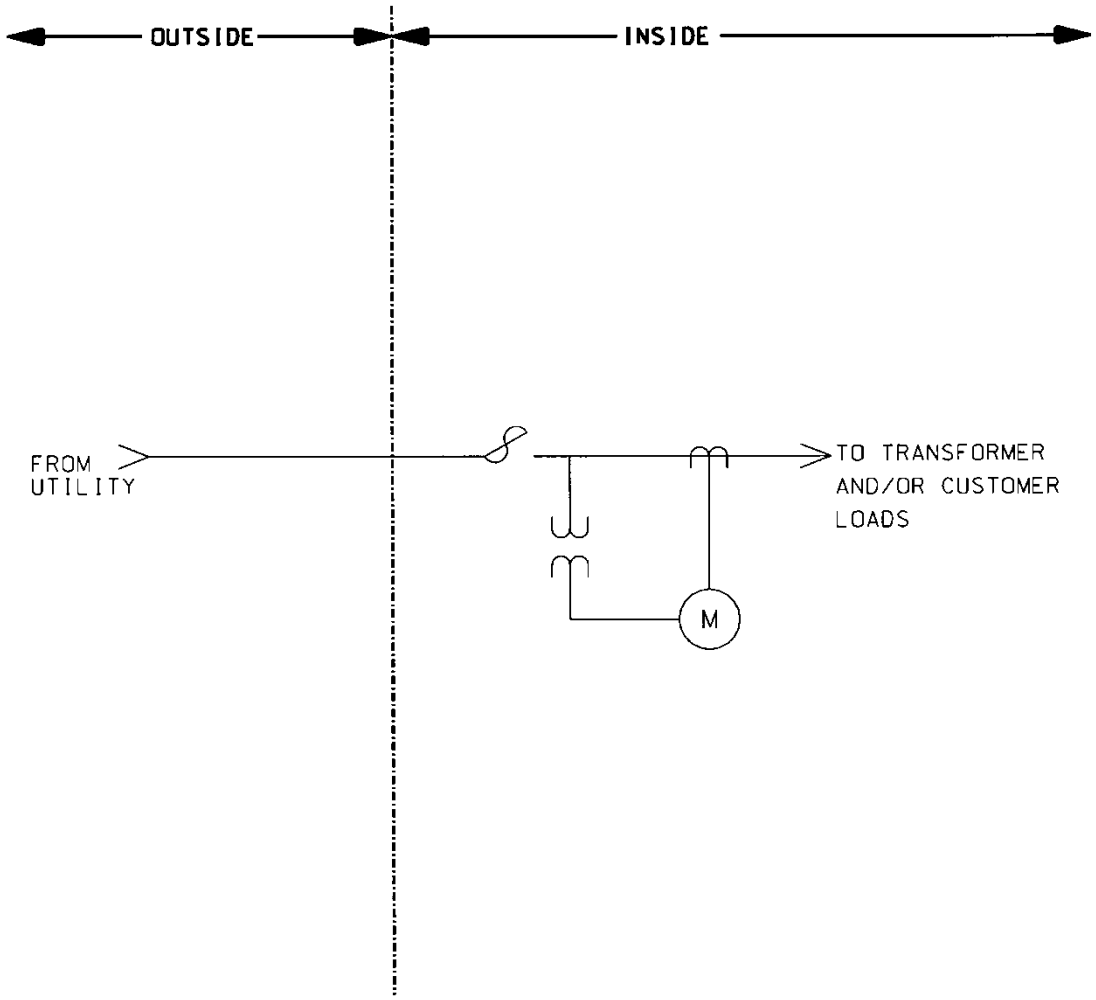


NOTES:

1. P.T.'S ARE REQUIRED FOR 347V AND 600V.
2. THE C.T.'S & P.T.'S SHALL BE LOCATED IN A SEPARATE CABINET OR IN A SWITCHBOARD CUBICLE.
3. REFER TO STD 4.7 FOR THE REQUIRED METERING ACCESSORIES.
4. FOR RESIDENTIAL CUSTOMERS, THE METER SHALL BE LOCATED OUTSIDE.
5. FOR 120/240V, 250-400A SERVICES, A 250V, 400A WEATHERPROOF METER SOCKET CAN BE INSTALLED OUTSIDE AND BEFORE THE SWITCH.

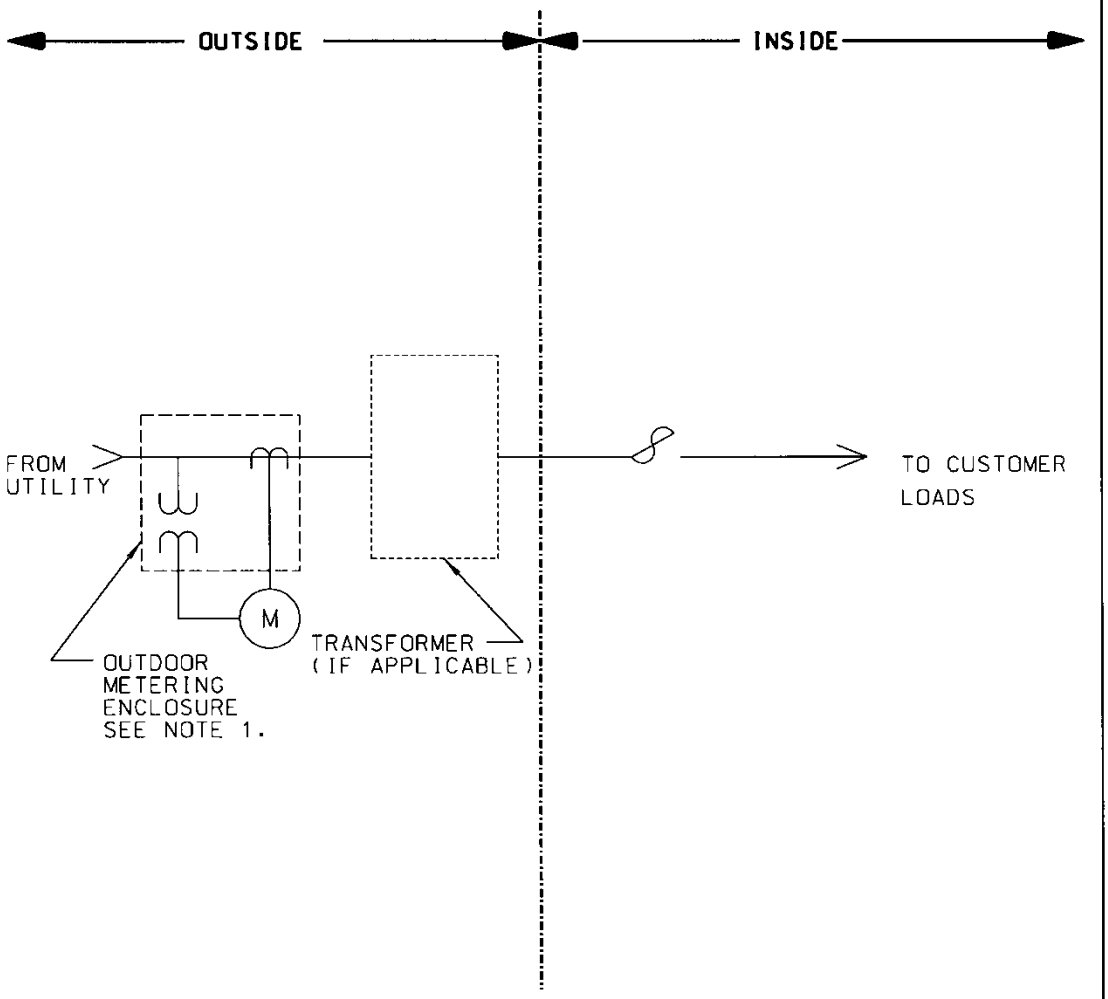
Nova Scotia Power Inc. Halifax, Nova Scotia, Canada	METERING STANDARD
120/240V OR 120/208V OR 347/600V ABOVE 200+	
APPROVED	
REV 02 — 2009-05-22 DS — DATE 1996-01-01	STD 7.3

SERVICE ENTRANCE/METERING
STANDARD CONFIGURATION



Nova Scotia Power Inc. Halifax, Nova Scotia, Canada	METERING STANDARD
INDOOR PRIMARY METERING AT 2.4kV AND ABOVE	
APPROVED Paul Miller	
DATE 1996-01-01	STD 7.4

SERVICE ENTRANCE/METERING STANDARD CONFIGURATION

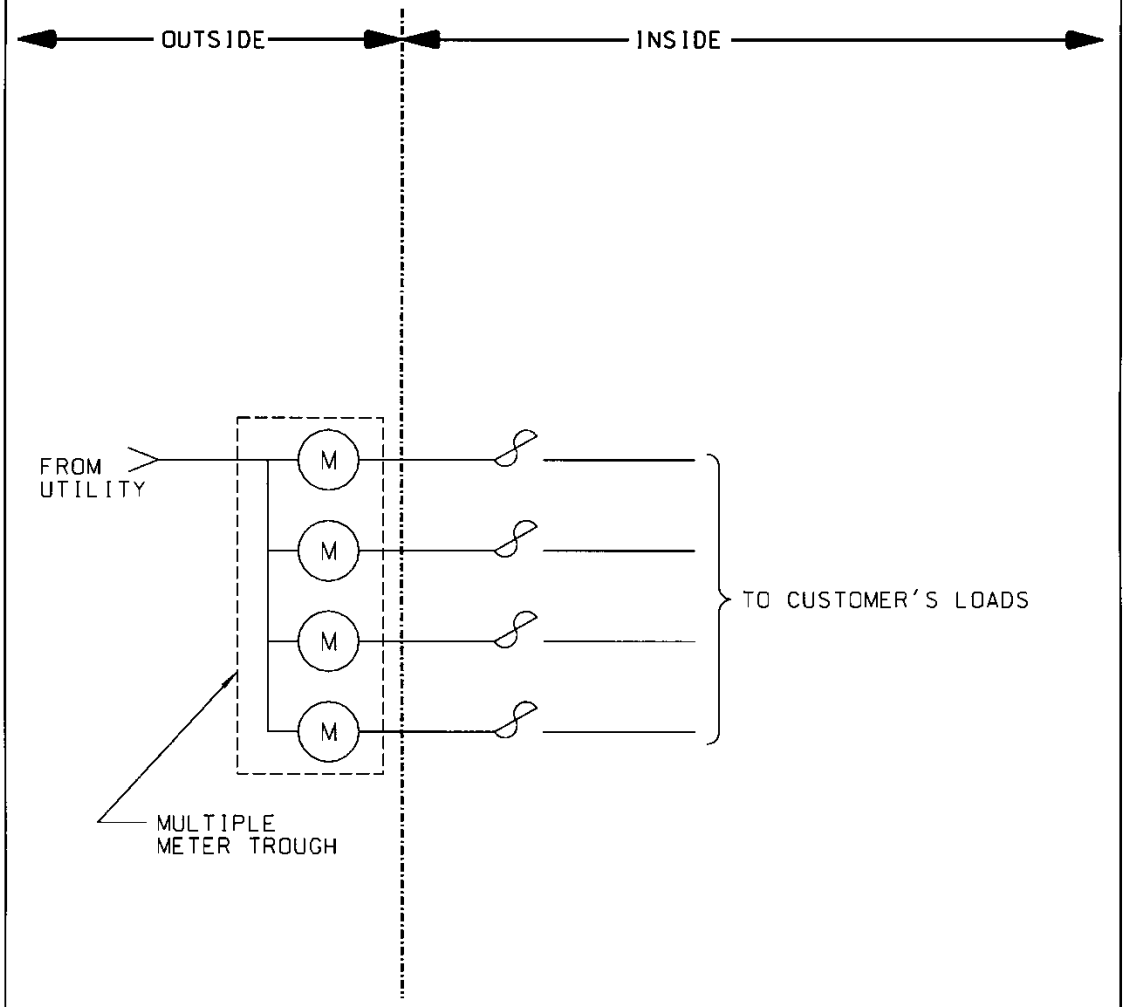


NOTES:

1. THIS ARRANGEMENT MAY ALSO BE ACCOMPLISHED WITH INDIVIDUAL C.T. AND P.T.

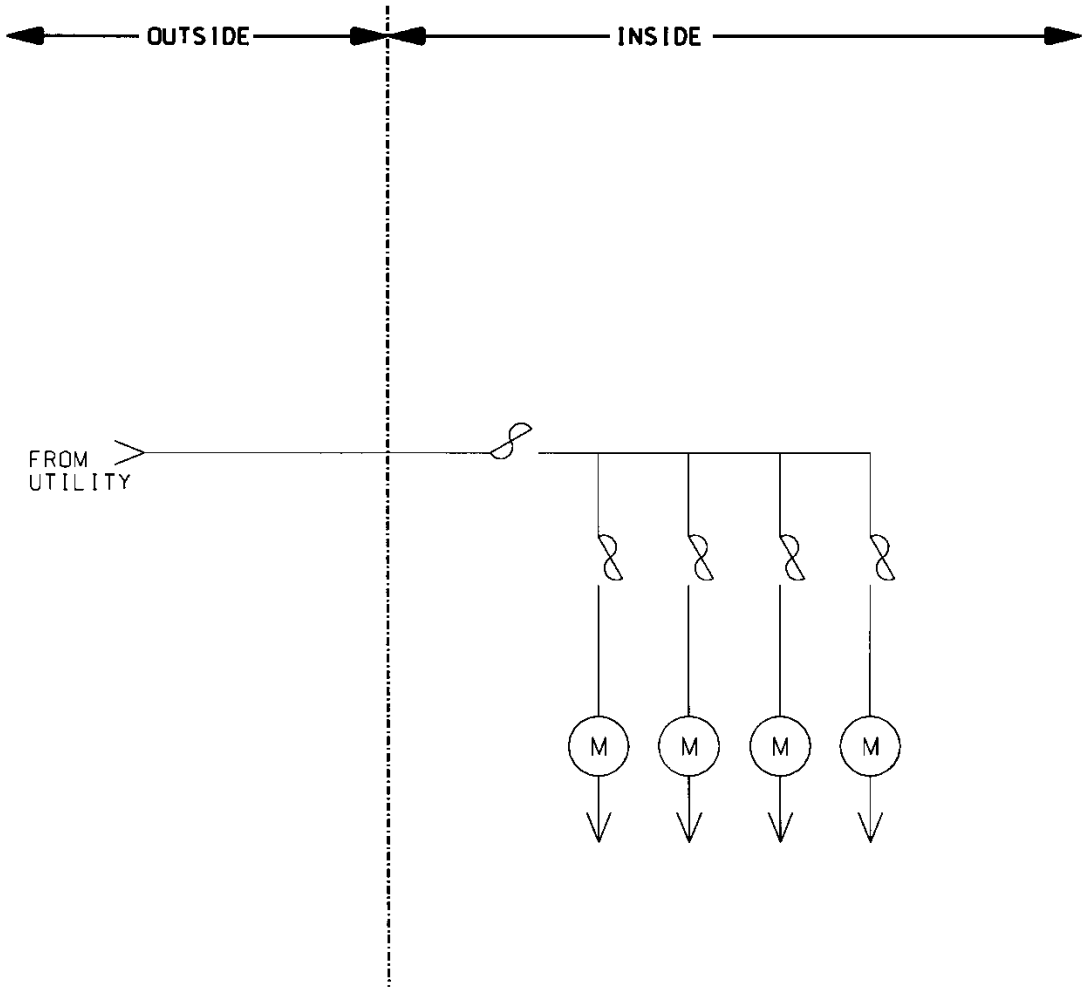
Nova Scotia Power Inc. Halifax, Nova Scotia, Canada	METERING STANDARD
OUTDOOR PRIMARY METERING AT 2.4kV AND ABOVE	
APPROVED	
DATE 1996-01-01	STD 7.5

SERVICE ENTRANCE/METERING STANDARD CONFIGURATION



Nova Scotia Power Inc. Halifax, Nova Scotia, Canada	METERING STANDARD
MULTIPLE CUSTOMERS @ 120/240V UP TO 200A EACH	
APPROVED Paul C Miller	
DATE 1996-01-01	STD 7.6

SERVICE ENTRANCE/METERING STANDARD CONFIGURATION

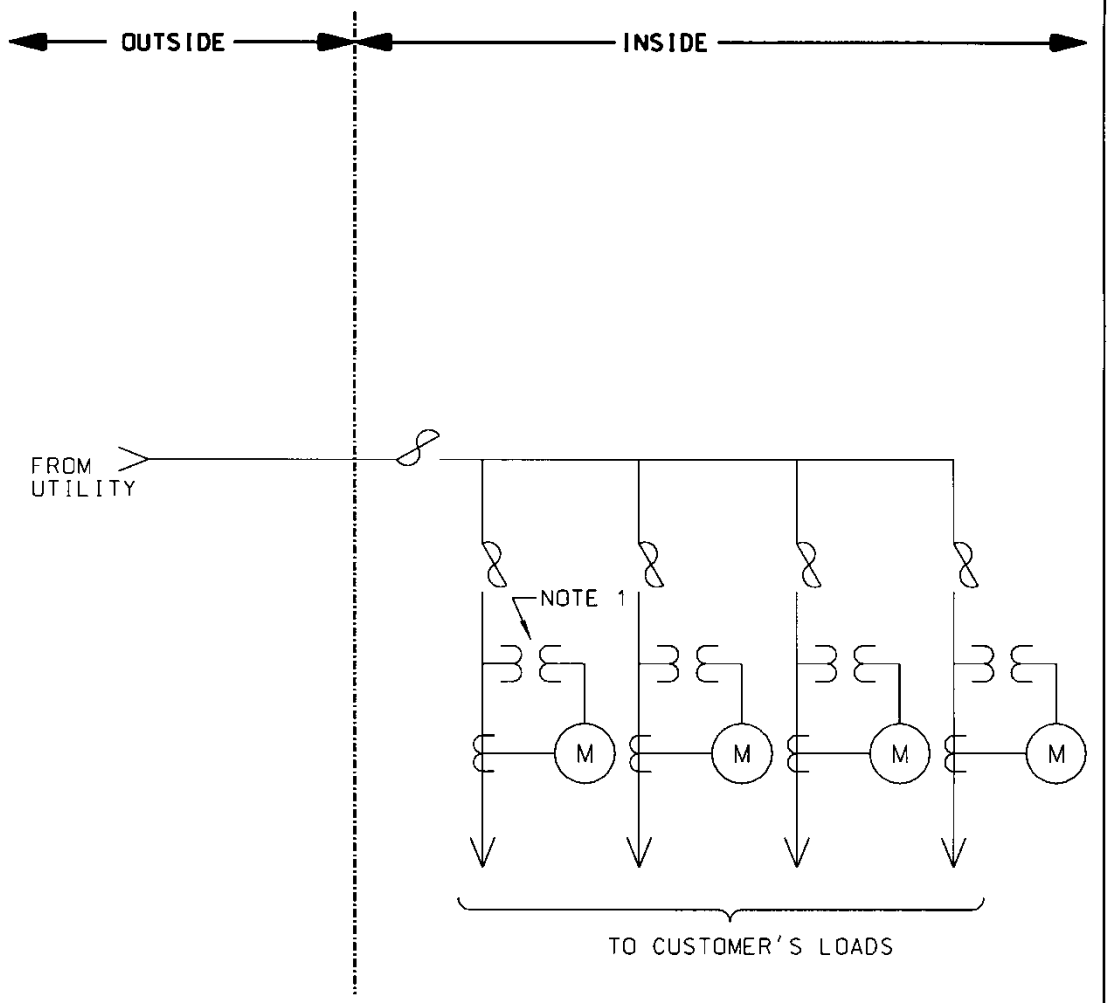


NOTES:

1. THE ARRANGEMENTS MAY BE REALIZED USING SEPARATE COMPONENTS (IE. SPLITTER, SWITCHES & METER BASE'S) OR A FACTORY ASSEMBLED INTEGRATED METER CENTER.
2. IF SEPARATE METER SOCKETS ARE USED, REFER TO STD 4.7

Nova Scotia Power Inc. Halifax, Nova Scotia, Canada	METERING STANDARD
MULTIPLE CUSTOMERS @ 120/240V OR 120/208V OR 347/600V UP TO 200A EACH	
APPROVED R.D. Miller	
DATE 1996-01-01	STD 7.7

SERVICE ENTRANCE/METERING STANDARD CONFIGURATION

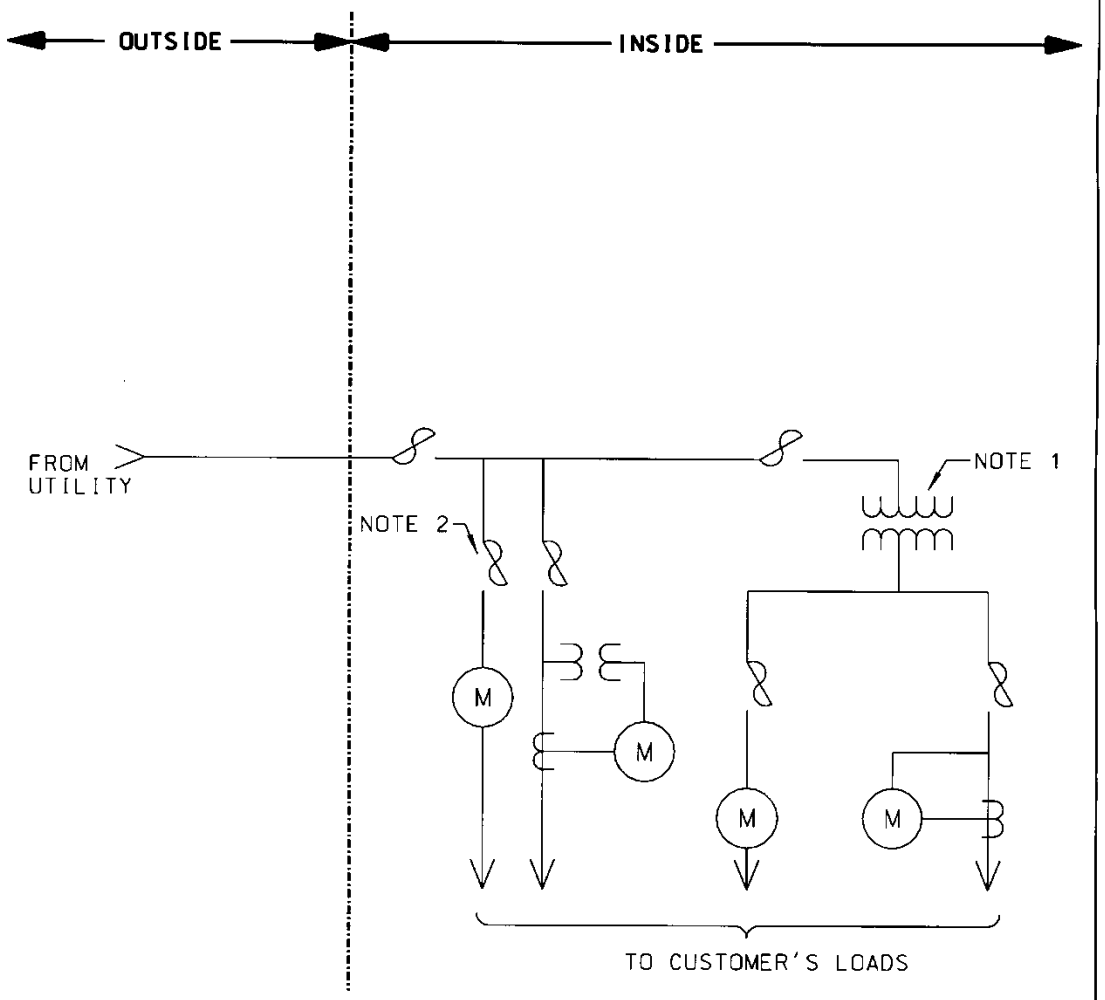


NOTES:

1. P.T.'S ARE REQUIRED FOR 347/600V SERVICES.
2. THE C.T.'S & P.T.'S MAY BE LOCATED IN SEPARATE CABINETS OR IN SWITCHBOARD CUBICLES.
3. REFER TO STD 4.7 FOR THE METER SOCKET REQUIREMENT.

Nova Scotia Power Inc. Halifax, Nova Scotia, Canada	METERING STANDARD
MULTIPLE CUSTOMERS @ 120/240V OR 120/208V OR 347/600 ABOVE 200A	
APPROVED Paul D. Miller	
DATE 1996-01-01	STD 7.8

SERVICE ENTRANCE/METERING STANDARD CONFIGURATION



NOTES:

1. IF TRANSFORMER IS 1Ø THEN METERING WILL BE ON THE LOW SIDE. IF TRANSFORMER IS 3Ø THEN METERING WILL BE ON THE HIGH SIDE UNLESS THERE IS MORE THAN ONE CUSTOMER FED FROM THE LOW SIDE.
2. SWITCH MUST BE IMMEDIATELY ADJACENT TO OR INTEGRAL WITH THE METER SOCKET.
3. THE ARRANGEMENT MAY BE REALIZED USING SEPARATE COMPONENTS OR A FACTORY ASSEMBLED SWITCHBOARD.

Nova Scotia Power Inc. Halifax, Nova Scotia, Canada	METERING STANDARD
MULTIPLE CUSTOMERS WITH A 347/600V SUPPLY AND 120/240 OR 120/208 AFTER TRANSFORMER	
APPROVED	
DATE 1996-01-01	STD 7.9