

Incident Summary #II-1313279-2022 (#25769) (FINAL)

SUPPORTING INFORMATION	Incident Date	January 5, 2022	
	Location	Duncan, BC.	
	Regulated industry sector	Electrical - Low voltage electrical system (30V to 750V)	
	Impact	Qty injuries	0
		Injury description	None
			Injury rating
	Damage	Damage description	Electrical arcing caused smoke and melting damage to electrical metering equipment.
		Damage rating	Minor
	Incident rating	Minor	
Incident overview	An individual was installing a seven-jaw meter into a meter module located in a new electrical three phase meter centre. As the meter module was incorrectly installed, it pivoted in the meter centre causing a phase to ground arcing fault. Fault occurred within the meter centre and was contained within the enclosure.		
INVESTIGATION CONCLUSIONS	Site, system and components	<p>New commercial building with self contained electrical room located in the southwest corner of the building. 1200 Amp underground service and metering equipment is installed in this room.</p> <p>Components:</p> <ul style="list-style-type: none"> • Main 1200 Amp 208 Volt circuit breaker • 1200 Amp tap box • 3 X 800 Amp meter centre • 7 jaw meter socket module with a 3 pole 60 Amp circuit breaker installed • 7 jaw meter (supply authority equipment) • 3 X 4.3" wide meter stack fillers <p>Normal Operation:</p> <p>Main 1200 Amp 208 Volt circuit breaker feeds 1200 Amp tap box which feeds the three 800 Amp meter centres. Meter socket modules are installed in various locations within the meter centres. These locations vary depending on ampacity and phase of the electrical system installed. Meter modules have circuit breakers installed allowing for isolation and de-energization of the meter socket module(s). Supply authority provides and installs meter(s) into the meter module(s). Meter modules have mounting slots that align with mounting fins located within the meter centre. (Image 1)</p>	

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<p>Failure scenario(s)</p>	<p>A seven-jaw meter module was installed within the meter centre enclosure in a location that was not approved for that specific type of module. The module was installed at approximately 890 mm from the bottom of the meter centre to the centre of the meter socket. The manufacture specifies this 7 jaw meter socket module to be installed at either 661mm or 999mm. The incorrect installation of the meter module allowed the module to shift to the right contacting the mounting fins within the enclosure (Image 4). The module was installed prior to the system being energized by the supply authority. The main service was energized with the meter module overcurrent device de-energized. As the meter was being pressed into position. The module not being properly supported, the meter socket module was able to pivot and or flex causing an arcing fault between the module's energized buss system the meter centre enclosure. (Images 2,3,4)</p>
<p>Facts and evidence</p>	<p>Witness statement:</p> <ul style="list-style-type: none"> • An Individual was installing a seven jaw meter and had de-energized the meter base with the breaker as per procedure. As individual was pressing on the meter to seat the meter into the jaws a short circuit and arc fault occurred in the cabinet. No injuries sustained as crew had on appropriate arc flash protection. <p>Electrical contractor interview:</p> <ul style="list-style-type: none"> • Contractor indicated to the Safety Officer the location of the meter module in the meter centre where it was installed at the time of the incident • Contractor stated they had installed three meter stack fillers two below the meter module and one above • Contractor indicated where the meter module energized buss had contacted the meter centre enclosure <p>Safety Officer observation:</p> <ul style="list-style-type: none"> • Meter module 'B' phase buss system melted • Meter module 100 Amp 3 phase overcurrent device damaged • Meter module (images 2,3,5) and meter enclosure cover (Image 4) with smoke damage, molten metal and pitting directly beside the overcurrent device location. • Documentation from the manufacture of the electrical equipment installed showing exact location heights of each type of meter module to be installed within the meter centre enclosure. (Image 6) • All electrical equipment installed was approved for use in BC.
<p>Causes and contributing factors</p>	<p>The cause of this incident was very likely due to the 7 jaw 3 phase meter module being installed in the incorrect location. This location allowed the energized parts of the meter module to have contacted the meter centre enclosure.</p> <p>It is very likely because the module installed has four support slots (two on left side and two on the right) these slots align with horizontal support fins located left and right side within the meter centre enclosure. When the module is installed in the correct location the support fins align with slots supporting the module on both sides</p>

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(image 1). This prevents pivoting or movement of the module and ensures correct clearances around energized electrical equipment. The module was installed at approximately 890 mm from the bottom of the meter centre to the centre of the meter socket. The manufacture specifies this 7 jaw meter socket module to be installed at either 661mm or 999mm (image 6). The incorrect installation of the meter module allowed the module to shift to the right making contact with the energized 'B' phase buss of the meter module and the arcing fault to occur.

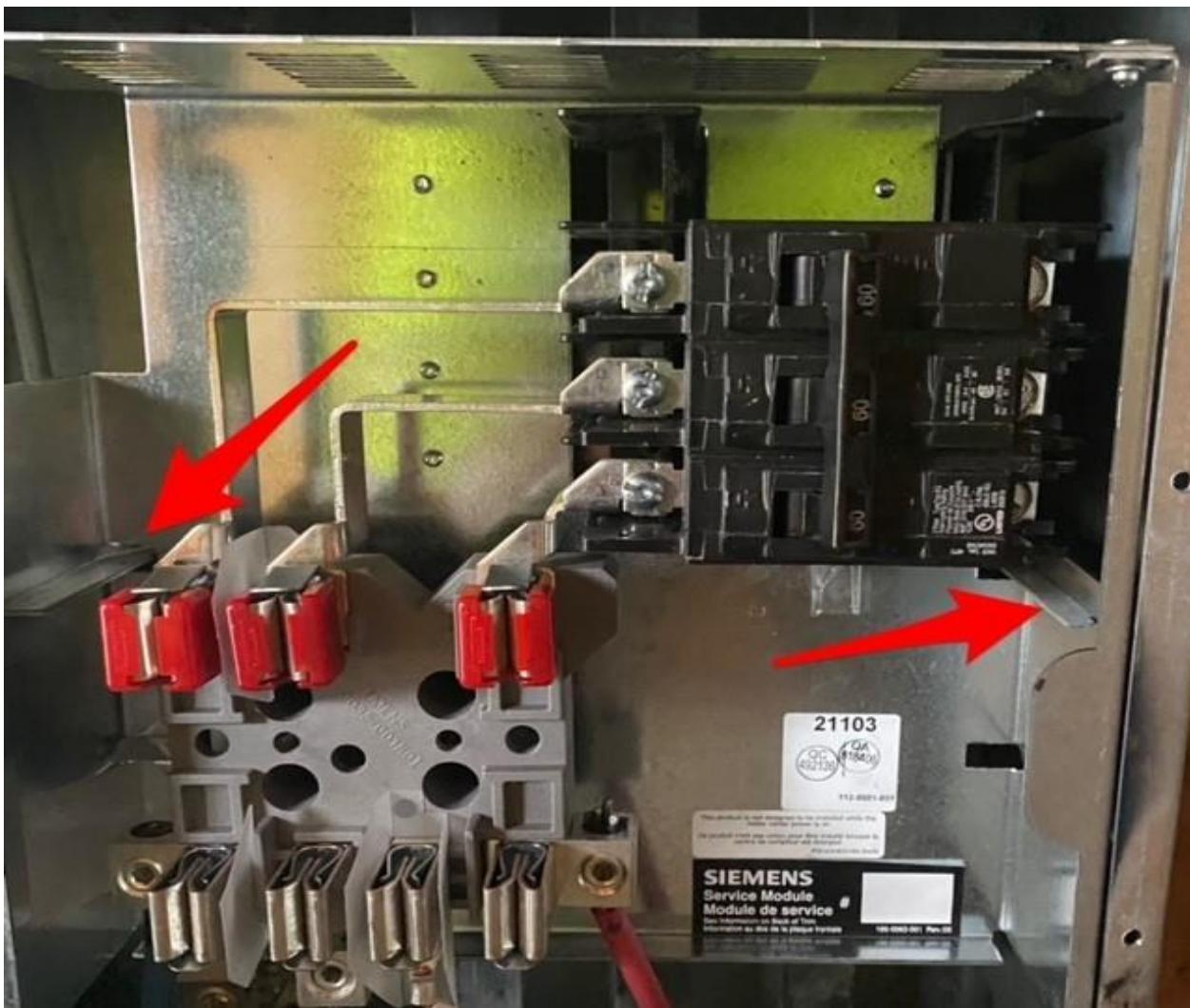


Image 1.

Three phase 100 Amp meter module correctly installed.

Red arrows indicate mounting fins in meter centre aligned with mounting slots in meter module



Image 2.

B phase meter module buss (close up)

Red arrow indicates location of arcing fault



Image 3.

Three phase meter module red arrow indicates location of arcing fault



Image 4. Back side of meter cover



Image 5.

Meter module located in incorrect position. Red arrows indicate B phase buss on meter module and mounting fin on meter centre

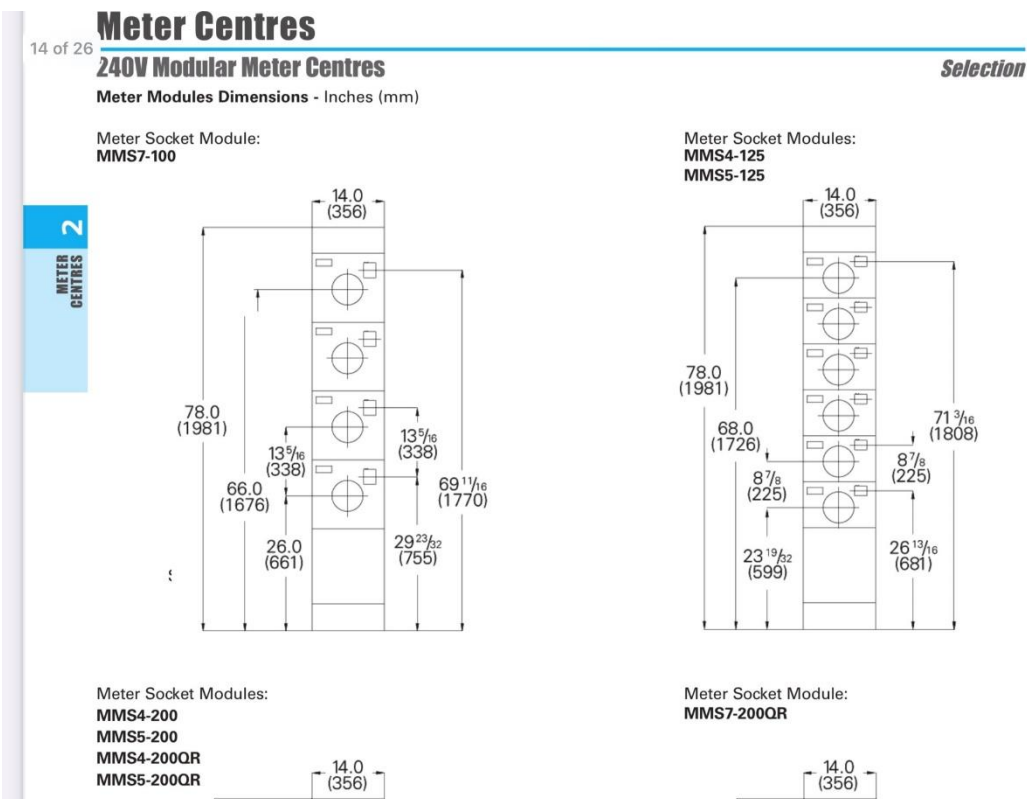


Image 6. Manufacturers installation specification sheet (MMS7-100 installed)