



### Moloney Electric Vision Statement

To be recognized as a reliable supplier of transformers, whose committed team of knowledgeable employees consistently meets the expectations of our customers and shareholders



[www.moloneytx.com](http://www.moloneytx.com)  
**MOLONEY ELECTRIC INC.**

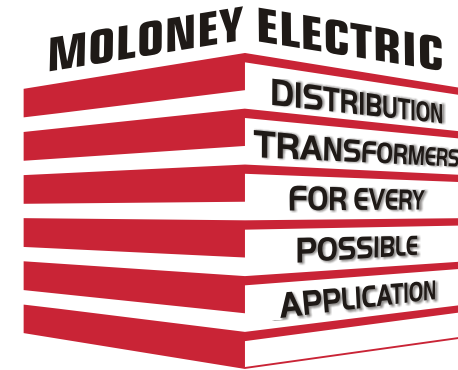
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# MOLONEY ELECTRIC INC.



## COMPACT PADMOUNTED 3-PHASE SUBSTATIONS

- ◆ MINIMIZES YOUR SPACE REQUIREMENTS
- ◆ REDUCES YOUR OVERALL OPERATING COSTS
- ◆ CUSTOM DESIGNED TO YOUR SPECIFIC NEEDS

Moloney Electric has been manufacturing distribution transformers since 1908 and padmounted transformers since 1970. One of the reasons for our ongoing success is the fact that we offer durable products that provide many years of reliable service, supported by our Quality Assurance program and our R&D team. All designs undergo complete type testing and we do routine testing to support our production quality. Through the years, we have continued to expand our product range to meet the ever changing needs of the market, and one of

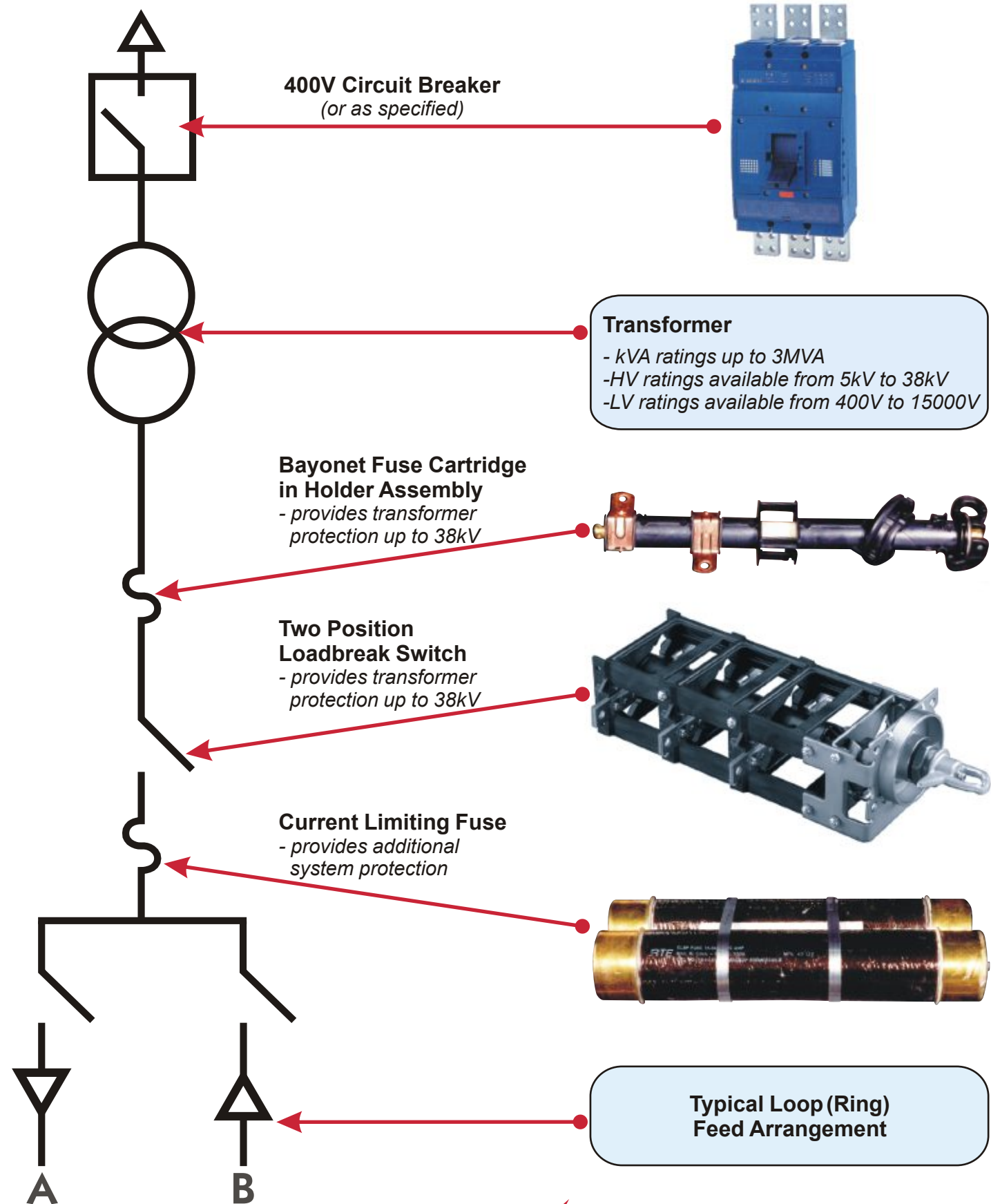
the many quality products that we have developed is our **Three Phase Compact Padmounted Substation (CPS)**.

Moloney Electric's CPS was developed as an affordable solution for clients who need to reduce their space requirements and overall operating costs. Because of its compact design, the CPS can eliminate the large expense of major structural changes, and it allows for more cost efficient use of your space. It is also designed to save money by providing you with many years of trouble free service with minimum maintenance.



Here you see the CPS installed in a small out-of-the-way spot in the rear of an urban townhouse complex where space is at a premium

# TYPICAL SINGLE LINE DIAGRAM & COMPONENTS



# TYPICAL CPS SITES



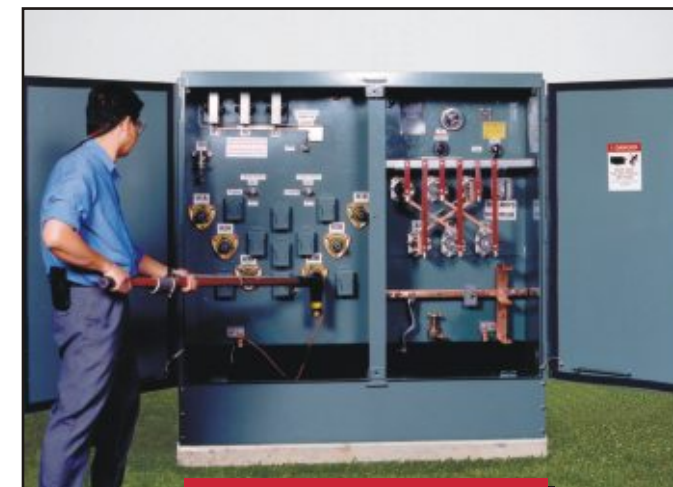
On a small island between a fast food drive-thru & the road



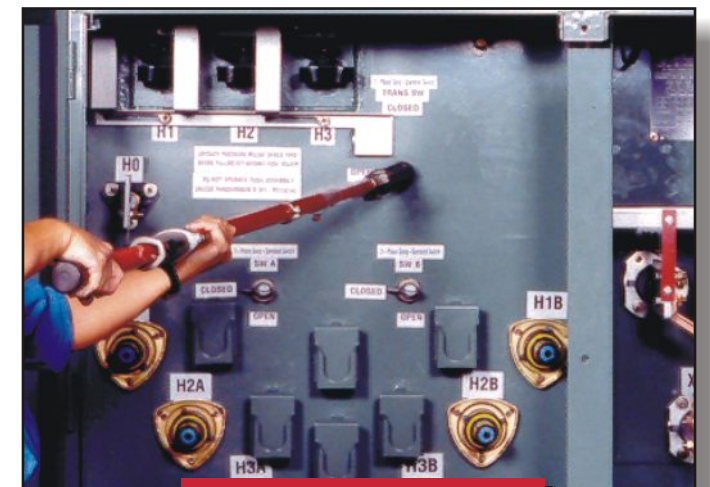
In the parking lot at the back of a shopping mall



At the rear of a downtown townhouse complex



Demonstration of on-site adjustments to CPS unit



Close-up of switch being turned from open to closed

# PRODUCT STANDARDS & TESTING

Moloney's Three Phase CPS is built to the following standards:

- ◆ Transformer section in accordance with IEC 76 standard ◆ All components are in accordance with industry recognized standards
- ◆ Tamperproof enclosure, with compartment locking by means of two pentahead bolts plus provision for recessed padlock, is in accordance with ANSI standard C57.12.29 ◆ Our facilities feature ISO 2001 Quality Control Programs
- ◆ Core & coils are design-optimized for most economical total ownership cost

Three Phase Compact Padmounted Substation Data Sheet	
Company Name: _____	Contact Name & Title: _____
Telephone: _____	Fax: _____ Email: _____
Quantity Required: _____	Type: <input type="checkbox"/> Radial Feed <input type="checkbox"/> Loop Feed
Temperature Rise (based on 30°C average ambient over 24 hr period, max. of 40°C): <input type="checkbox"/> 65°C	
<input type="checkbox"/> Other: based on _____°C average ambient over 24 hour period and maximum of _____°C	
Hertz: <input type="checkbox"/> 60 <input type="checkbox"/> 50 Primary Voltage Connection: <input type="checkbox"/> Delta <input type="checkbox"/> Grounded Wye <input type="checkbox"/> Series Multiple Connection <input type="checkbox"/> BIL (other than std)	
Taps in HV: <input type="checkbox"/> Yes <input type="checkbox"/> No Details _____	
Low Voltage Connection: <input type="checkbox"/> Delta <input type="checkbox"/> Grounded Wye <input type="checkbox"/> BIL (other than standard)	
Specification: <input type="checkbox"/> Customer's or other Specification _____	
Loss Evaluation: <input type="checkbox"/> Yes <input type="checkbox"/> No Loss Calculation: No Load \$ _____/watt @ _____100%V _____105%V Load Loss \$ _____/watt	
Impedance Value: _____% (other than industry std)	
<b>OPTIONS</b> (std pkg includes pressure relief valve, 1" drain valve with sampling device, top filter press connection, magnetic liquid level indicator and top oil thermometer)	
Cooling Liquid: <input type="checkbox"/> Std Transformer Oil <input type="checkbox"/> Other (state special requirements) _____	
Fusing: Bayonet and Backup Current Limiting Fuse std. <input type="checkbox"/> Other Special Requirements _____	
Loadbreak Inserts Required: <input type="checkbox"/> Yes <input type="checkbox"/> No - Qty. _____	
Cable Elbows (complete cable details required at time of order): <input type="checkbox"/> Yes <input type="checkbox"/> No HV Lightning Arresters: <input type="checkbox"/> External <input type="checkbox"/> Under Oil	
Conductor Diameter _____ Type _____ Diameter over Insulation _____	
<input type="checkbox"/> Other HV Requirements: _____	
Testing (standard tests are included & test data from typical units can be provided) Customer requires the following additional tests:	
<input type="checkbox"/> Resistance <input type="checkbox"/> Temp. Rise <input type="checkbox"/> Impulse (HV) <input type="checkbox"/> Sound Level <input type="checkbox"/> Other _____	
Nameplate (anodized aluminum is std): <input type="checkbox"/> Stainless Steel <input type="checkbox"/> Special Data Required on Plate _____	
Markings: <input type="checkbox"/> Special Marking are Required - Details _____	
LV - Special Connectors Required: Details- No. per Phase _____ Conductor Size _____ Conductor Type _____	

Tests are performed in accordance with the applicable standards. For electrical tests, the units are tested in accordance with IEC Standard 76-1 for oil immersed transformers. a) The following tests are performed in accordance with the standard, and with standard Moloney Electric procedures:

- ◆ Measurement of winding resistance ◆ Measurement of voltage ratio on each voltage connection, including tap connections
- ◆ Measurement of phase displacement ◆ Measurement of load loss at rated voltage & impedance at rated current
- ◆ Measurement of no load losses and current ◆ Dielectric routine tests including applied & induced voltage
- ◆ Pressure test on the complete transformer assembly at 50 kPa ◆ Mechanical tamperproof inspection on complete enclosure

b) The following Type Tests can be performed as requested by the customer or when the transformer is not similar to a previous unit and the equivalent data is not available:

- ◆ Temperature rise test ◆ Impulse test on the HV winding

# TRANSFORMER PROTECTION



Typical Cable Elbow

The units can be provided with either a loop or radial feed system. Both systems incorporate dead front terminations, including bushing wells and inserts. The cable is then terminated in cable elbows which plug into the inserts. This entire termination assembly is based on the customer's voltage and current requirements. The cable elbows can be provided with the unit, but complete cable information is required at the time of the order so that the elbow will be matched to the correct cable size for proper termination.



Switching Arrangement

Loop feed substations are provided with three 2-position loadbreak under oil on/off switches which are operated by hook stick. One switch is provided to sectionalize the transformer, while the other two switches are used to sectionalize either feeder A or B. For radial feed transformers, only one switch is required.

Each feeder switch also has a safety latch which can prevent the operation of the switch, especially in the open position, when operating personnel are near the unit. To increase worker safety, the HV and LV sections are separated by a metal barrier, and a mechanical interlock is provided to prevent withdrawal of the bayonet fuses while the transformer is energized.

Loadbreak Switch Characteristics			
Voltage Ratings & Characteristics		Current Ratings & Characteristics	
Description		Description	Amps
Maximum Rating Phase-to-Phase	38.0	Continuous Current Rating up to 550A	
Maximum Rating Phase-to-Ground	21.9	Momentary rms symmetrical-10 Cycle	12,000
ac, 60 Hz, 1 Minute Withstand	70.0	rms asymmetrical-10 Cycle	19,200
BIL and Full Wave Crest	150.0	Make and Latch rms symmetrical-10 Cycle	12,000
Corona or Minimum Voltage Discharge Extinction	26.0	rms asymmetrical-10 Cycle	19,200
dc, 15 Minute Withstand	103.0	Switching Current Rating up to 550A	
		Magnetizing Interrupting Current	10.5
		Cable Charging Current	20.0

Bayonet Fuse Ratings & Characteristics			
Electrical Ratings	kV	Maximum Single-Phase Interrupting Ratings	kV
BIL and Full Wave Crest	150.0	3,500 A rms symmetrical Sidewall Mount	8.3
60 Hz, ac, 1 minute withstand	50.0		
Loadbreak Ratings (phase-to-phase at 80% p.)		kV	2,500 A rms symmetrical Sidewall Mount
160 A	10.0	15.5	
150 A	15.5	23.0	
80 A	26.7		
50 A	34.5	1,000 A rms symmetrical Sidewall Mount	23.0

The protection system incorporates components that have been field proven to be effective for over 50 years. The primary protection consists of a 2-fuse system - bayonet fuses in series with ELSP current limiting backup fuses which have a maximum interrupting current of 50,000A rms symmetrical. The bayonet fuse holders allow for easy removal and replacement of the fuses. The fuse is a current sensing fuse that protects the transformer from system problems. The ELSP current limiting backup fuse is mounted internally under oil and it protects the system should a fault occur in the transformer. The fuses are rated based on the specific transformer design. Fuse curves can be provided after the order is placed and the design is completed.

The LV section features four spade-type bushings. The three line bushings are connected to an LV breaker whose rating is based on the transformer's kVA and its low voltage rating. Special requirements in the LV section can be met and they must be detailed at the time of the initial inquiry. In addition, details regarding the outgoing cable are required to provide the correct size and number of cable connectors. The LV neutral bushing is connected to a ground spade. The LV circuit breaker is designed and tested to meet IEC Standards. It incorporates high quality components and will provide short circuit, overcurrent and single phasing protection. The circuit breaker provided is based on the specific voltage and current requirements needed to match the transformer. Additional options can be provided to meet any special requirements.

