Short Form Work Paper PGECOPUM102

**Revision 8**

**Pacific Gas & Electric Company**

**Customer Energy Efficiency Department**

**Residential Variable Speed Pool Pumps**

**Measure Code PL001**

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# SCE Residential Variable Speed Pool Pumps

## Introduction

This short form workpaper documents (WP) the values adopted from SCE’s WP entitled “Residential Variable Speed Pool Pumps” (SCE17WP001.1 - Residential Pool Pump VFD\_Final.docx). PG&E adopts Measure A (PM-78394) under direct-install, down-stream incentive, and mid-stream incentive buy down methods for vintage type “Any” within the residential sector. Measure A (PM-78394) includes calculations for single family homes. Per CPUC memo dated 1/28/2019, SCE’s Pool pump WP SCE17WP001 Rev 1 is approved for normal replacement application type for claims starting 1/1/2018 with an expiration date of 12/31/2019.

This adoption also requires the retirement of PGECOPUM102 R7 measures:

* P107 – Variable Speed or Variable Flow Pool Pump
* P108 – Variable Speed Pool Pump Motor

## Document Revision History

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| --- | --- | --- | --- |
| **Rev** | **Date** | **Author** | **Summary of Changes** |
| 0 | 03/31/08 | Gary Fernstrom (PG&E) | Variable Speed Pool Pump PGECOPUM107 R0.doc |
| 1 | 4/27/09 | Lianne Williams (PG&E) | Variable Speed Pool Pump PGECOPUM102 R1.doc |
| 2 | 3/15/10 | Alina Zohrabian (PG&E) | Variable Speed Pool Pump PGECOPUM102 R2.doc |
| 3 | 6/21/10 | Alina Zohrabian (PG&E) | Variable Speed Pool Pump PGECOPUM102 R3.doc |
| 4 | 5/29/12 | Alina Zohrabian (PG&E) | Residential Variable Speed Pool Pump PGECOPUM102 R4.doc   * Updated NTG * Updated EUL |
| 8/29/12 | Alina Zohrabian (PG&E) | For Building type changed BCR to RES, For Vintage AV is changed to ANY and For Climate Zone All is changed to ANY |
| 5 | 7/1/2014 | Alina Zohrabian (PG&E) | Updated the data to the Ex-Ante format, no changes to savings or any other factors |
| 6 | 4/1/2016 | Alina Zohrabian (PG&E) | Updated ID’s with 2016 format |
| 7 | 1/1/2017 | Alina Zohrabian (PG&E) | Cost updates |
| ~~8~~ | ~~12/18/2017~~  ~~01/12/2018~~ | ~~Danielle Dragon, P.E., CEM, CDSM (PG&E)~~ | ~~Short form to adopt SCE17WP001.0 - Residential Pool Pump VFD\_Final.docx.~~  ~~Short form update to include direct-install and down-stream incentive methods.~~  *This submission was not approved.* |
| 8 | 1/28/2019 | Jia Huang (PG&E) | Short form to adopt SCE17WP001.1 – Residential Pool Pump VFD\_Final.docx  Short form to include direct install, downstream, and midstream incentive methods (ROB measure application type). |

# Measure Summary

Table 1: Measure Summary Table

| **Section** | **Value** |
| --- | --- |
| **Summary & Purpose** | This short form workpaper documents SCE’s “Residential Variable Speed Pool Pumps”. The base energy consumption and measure energy consumption values are from SCE’s workpaper, SCE17WP001, Revision 1. |
| **1.1 Measure & Baseline Data** | Measures:   |  |  |  | | --- | --- | --- | | SCE Codes | PG&E  Codes | Description | | PM-78394 | PL001 | Commissioned Variable Speed Drive on Pool Pump Controls | |
| **1.2 Technical Description** |  |
| Measures | **Measure A (PM-78394):**  Commissioned Variable Speed Drive on Pool Pump Controls replacing Two Speed Pool Pump.  The measure case is variable speed swimming pool pumps that are programmed to operate outside peak hours (2:00 pm to 5:00 pm) as part of a contractor driven offer. This measure is only for single family building types. |
| Code for All Measures | Per SCE workpaper SCE17WP001, Rev 1. |
| Requirements | **Eligibility Requirements:**  The following eligibility requirements apply to all measures in this workpaper as per SCE17WP001.1.:   * Variable speed pool pump must replace existing single or two speed pool pump. For models that require an automatic control system capable of controlling both high and low speeds, a controller must be installed. * Only main filtration pumps are eligible. Booster pumps which are solely used for added spa jet circulation or secondary pumps used for cleaning purposes are not eligible. * It is recommended for the variable speed (VS) pool pump to match the capacity of the pump being replaced. For this work paper, horsepower rating refers to the nameplate horsepower before service factor is applied. * All climate zones are eligible. * Must be configured to meet program pump configuration requirements (see implementation requirements below). * The following product types are not eligible:   + Rebuilt, refurbished, or reconditioned products   + Rented or leased products   + Products won as prizes, or   + New parts installed in existing units. * All AR/RET measures require third party baseline verification and data gathering in full compliance with established POE requirements – Attachment 5.   Single family  The following additional eligibility requirements apply to only Single Family Building types:   * Rebates are available for existing single-family properties which include in-ground pools for private, residential properties. * Single Family properties with an active service account(s) served by the utility offering rebate are eligible to participate in the program. The property must be occupied and the existing pool must not already have a Variable Speed Pool Pump. * The existing pool pump must be a single or two speed type unit. * Only swimming pool pumps are eligible. Spa, wading pool or Jacuzzi pumps are not eligible for single family residences.   Multifamily  The following additional eligibility requirements apply to only Multifamily Family Building types:   * Property Owners and Managers of residential multifamily property with an active service account(s) served by rebating utility may be eligible to participate in the programs. * The following residential properties are eligible for Multi-family pool pump rebates: apartment house pools, residential community pools, townhouse pools, condominium pools, mobile home park pools, and homeowner association pools. * The following pool types are eligible for Multi-family pool pump rebates: swimming pool, wading pool and spa. |
| **1.3 Installation Type and Delivery Mechanisms** |  |
| Installation Type | Replace on Burnout (ROB) |
| Delivery Mechanisms | Direct-Install, Down-stream, Mid-stream |
| **1.4.1 DEER Data** |  |
| Net-to-Gross Ratio | Res-Default>2yrs |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Effective and Remaining Useful Life | |  |  |  |  | | --- | --- | --- | --- | | EUL ID | Description | Sector | UseCategory | | OutD-PoolPump | High Efficiency Pool Pump | Res | Recreation | |  | | | | |
| **Section 2. Calculation Methodology** | Non-DEER |
| Energy Savings/Peak Demand Reduction – All Measures | **As cited in SCE’s workpaper the Savings are:**  All Climate Zones (Except for CZ15)   |  |  |  |  | | --- | --- | --- | --- | | SCE Product Code | PG&E Product Code | KWh/yr Savings | KW  Savings | | PM-78394 | PL001 | 1,092.93 | 0 | |
| **Section 3. Load Shapes** | Residential Pool Pumps |
| **Section 4. Costs** | The costs are obtained from costs documented by SCE work paper “SCE17WP001.1 - Residential Pool Pump VFD\_Final.docx” Section 4- Costs. |
| **Section 4.1 Base and Measure Costs** | Note: PG&E’s database does not allow separate fields for base case labor cost and measure case labor cost. Therefore, in PG&E ex ante data, for non-DI measures, the programming cost of $65.85 is added to the measure case material cost ($1,071 + $65.85 = $1,136.85) rather than the measure case labor cost. |
| Base Cost | As cited per SCE workpaper (includes labor cost) |
| PL001 | $591.24 (material) + $613.59 (labor) = $1,204.83 |
| Measure Cost | As cited per SCE workpaper (includes labor cost) |
| PL001 | $1,071.00 (material) + $679.44 (labor) = $1,750.44 |
| Incremental Cost |  |
| PL001 | $545.61 (mid-stream and down-stream) |
| Full Measure Cost |  |
| PL001 | $1,750.44 (direct-install) |

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