

State of California
Department of Food and Agriculture
Division of Measurement Standards

Certificate Number: 5110(a)-03
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California Type Evaluation Program
Certificate of Approval
for Weighing and Measuring Devices

For:

Water Meter
Positive Displacement - Nutating Disc
Models: SM20, 25, SM25, 35, SM35, 40, and SM40
Sizes and Min/Max Flow Rates: See Table on Page 2

Submitted by:

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Standard Features and Options

Unit of measure: Gallon or Cubic Feet

Minimum resolution: 0.1 gal. or 0.01 cu. ft. except Register Style "Read-O-Matic" 0.2 gal. or 0.02 cu. ft.

Water meter components:

Magnetic ceramic drive register with sealable lens covering
Thermoplastic or cast brass measuring chamber with thermoplastic chamber and nutating disc
External threaded pipe connections
Thermoplastic strainer

Option: Electronic pulse output (not evaluated)

NOTE: Approved for use when installed in a "HORIZONTAL" or "VERTICAL" position according to the manufacturer's instructions only.

These devices are to be installed where they are protected from excessive heat and freezing conditions.

This device was evaluated under the California Type Evaluation Program (CTEP) and was found to comply with the applicable technical requirements of California Code of Regulations for "Weighing and Measuring Devices." Evaluation results and device characteristics necessary for inspection and use in commerce are on the following pages.

Effective Date: June 11, 2003



Mike Cleary, Director

Badger Meter, Inc.
Water Meter
Positive Displacement – Nutating Disc
Models: SM20, 25, SM25, 35, SM35, 40, SM40

Application: Approved for use as a domestic cold-water meter only when installed in a “**HORIZONTAL**” or “**VERTICAL**” position. The flow direction indications are cast into the single pipe connector main case.

NOTE: Written installation instructions shall be included with each meter order. Additionally, field installations should be verified according to the manufacturer’s installation requirements.

Models	Size	Register Style					Flow Rate (gpm)
		Recordall	Recordall Transmitter Register	Read-O-Matic	Digital Submeter Interface	DSI-1L	
SM20	1/2" 3/4"	X		X	X	X	1/4 to 20
25	5/8" 3/4"	X	X	X			1/4 to 25
SM25					X	X	
35	3/4"	X	X	X			1/2 to 35
SM35					X	X	
40	1"	X	X	X			3/4 to 50
SM40					X	X	

NOTE: Remote readout capability was not evaluated. Additionally, the measuring chamber is stamped with either 20, 25, 35, or 40 which indicates the measuring chamber is designed for a specific model register. (Example: A number 25 on the measuring chamber is only applicable for the Model SM25 and Model 25.)

Identification: The manufacturer has approval to use a label for the required identification information on a conditional basis (see note below). After that period of time, the required information will be as follows: The preface model designation “Model” appears permanently on the register’s indicating face, and the serial number preface “S/N” or “SN” appears permanently on the measuring chamber.

Note: Temporary conditional uses of a “tamper evident” label with clear overlay.

1. “SN XXXXXX” on the measuring chamber - not to exceed “SN 000200”.
2. “Model” on the register glass - not to exceed “SN 002500”.

Sealing: The water meter can be sealed with a wire security seal threaded through a drilled screw head on the side of the register device to hole(s) on the bottom of the thermoplastic measuring chamber or through a bolt hole on the bottom of the cast brass measuring chamber.

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Water Meter
Positive Displacement – Nutating Disc
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Operation: The water meter utilizes a positive displacement nutating disc with strainer, magnetically driven register, and pipe connection with external thread. Water flows through the meter's strainer and into the measuring chamber where it causes the disc to nutate. The disc nutates on its own ball, guided by a thrust roller. A drive magnet transmits the motion of the disc to a follower magnet located within the permanently sealed register. The follower magnet is connected to the register gear train. The gear train translates the disc nutations into volume totalization units displayed on the register's dial face. Water flow should be free of foreign material that may become lodged in the meter's inlet screen and affect its accuracy. Additionally, an electronic pulse output for interface with a remote meter reading system may be used if the primary indicator affixed to the meter casing is accessible. The magnetic sensor output was not evaluated.

Test Conditions: This certificate supersedes Certificates of Approval Numbers 5110-00, 3311-90, and 3569-91 and is issued to combine these certificates based on testing at the Division of Measurement Standards and information provided by the manufacturer. This certificate also includes a new Model SM35 and 35 meter size. It also addresses the manufacturer's temporary use of approved labels to use up some pre-inventory and to allow time for retooling to accommodate the California Code of Regulations identification requirement change, as of January 1, 2003 (see Identification above). Previous test conditions are listed below for reference.

Certificate of Approval Number 5110-00: The Models SM20, SM25, SM40, Model 25, and Model 40 with various register configurations were submitted for evaluation. The emphasis of the evaluation was on device design, marking requirements, and performance. The devices were tested with normal, intermediate, and minimum flow rates; and with various register configurations. After a successful initial flow rate test, a permanence test was conducted which consisted of approximately 160 000 gallons of throughput (recirculation) over 60 days. The meters were retested at the normal, intermediate, and minimum flow rate.

Results of the evaluation indicate the devices comply with applicable requirements.

Type Evaluation Criteria Used: Title 4, California Code of Regulations, 2003 Edition

Tested By: Sam Chan (CA) and Dan Reiswig (CA) 5110-00; Dan Reiswig (CA) 5110(a)-03