NATIONAL TYPE EVALUATION PROGRAM

Certificate of Conformance

for Weighing and Measuring Devices

For:
Retail Motor-Fuel Dispenser
Analog Computing and volume only
Electronic Computing and volume only
Model: 3XXX
Flow Rates: 1 – 24 gpm (Bennett SB-100 Meter)
6 – 40 gpm (Tuthill FPP TS 10 A Meter or Tuthill FPP TS15A Meter)
6 – 60 gpm (Tuthill FPP TS15A Meter)

Submitted By:
Bennett Pump Co.
1218 E. Pontaluna Rd.
Spring Lake, MI 49456
Tel: 231-798-1310
Fax: 231-799-6200
Contact: Steve Bar
Email: sbar@bennettpump.com
Web site: www.bennettpump.com

Standard Features and Options

Standard Features (Electronic):
210 or 1028 Electronic computer, money & volume, LCD display
531 Electronic computer, volume only, LCD display
X19 Electronics Computer
Post pay, prepay and stand alone transactions
Programmable units of measurement
Remote price setting
Non-resettable electronic totalizer
Remote console interface
2 Tier Prices

Capacities (Electronic):
Unit Price $9.999
Total Money $9999.99
Total Volume 999.999

Capacities (ElectronicX19):
Unit Price $99.999
Total Money $999999.99
Total Volume 99999.999

Options:
Local preset volume or money
Programmable pulser output
High hose configuration
Electronic meter calibration
Card reader
Side Mounted DEF

Standard Features (Mechanical):
Veeder-Root, money & gallons display
Veeder-Root, gallons only display
Electric reset and Cam-Ac mechanical reset
Remote console interface
Stand alone transactions

Capacities (Mechanical)

	Standard Veeder-Root Display:		Optional Veeder-Root Display
	VR10/4	VR101	VR10
Unit Price	$3.999	N/A	$9.99
Total Money	$99.99	N/A	$999.99
Total Volume	999.9	999.9	999.9

Options:
Postpay, prepay transactions
High hose configuration

This device was evaluated under the National Type Evaluation Program and was found to comply with the applicable technical requirements of "NIST Handbook 44: Specifications, Tolerances and Other Technical Requirements for Weighing and Measuring Devices." Evaluation results and device characteristics necessary for inspection and use in commerce are on the following pages. *Editorial changes, not affecting the type or metrological content, corrected this certificate.

Kristin Maeey
Chairman, NCWM, Inc.

Jerry Buendel
Committee Chair, National Type Evaluation Program Committee
Issued: July 12, 2017

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Application: For use with approved and compatible equipment in dispensing gasoline, diesel and gasoline blends at retail service station operations. Dispensers using the SB-100 Meter (Certificate of Conformance Number 91-095) may also be used for dispensing blends up to E-85 and biodiesel blends up to B-99. Dispensers employing the Tuthill FPP TS meter are for dispensing diesel and biodiesel blends up to B-20.

Dispenser models 31XX, 32XX, and 37XX are used in applications such as fleet, construction sites, and airports where volume only indications are suitable. These models utilize a volume only display.

Dispenser models 33XX through 36XX and model 38XX are used in retail motor fuel sales. These models are computing type devices. (Note: Some devices have a limited computing ability and may not be used beyond those abilities)

Identification: The identification plate is inside the upper housing attached to the computer deck. It may be accessed by opening the upper door. This plate contains the following information; the name of the manufacturer, model number, serial number, NTEP Certificate of Conformance number, and if required the maximum and minimum discharge rates. The model number on this plate is a multi-digit alphanumeric sequence, which identifies the total construction of the dispenser (see table below). The first one or two digits of the serial number represents the month manufactured, (1 = January, 2 = February, 3 = March..... 12 = December). The letter that follows, A through Z represents the year manufactured; starting with the letter F = 2004, G =2005, H = 2006, etc. excluding the letters I, O and Q followed by six numbers.

For devices manufactured prior to April 1, 2013, (serial numbers before 4R000001) the model designation is shown below:

Model Designation Chart		
Position No.	**Description**	**Suffixes**
1	Series	3 = Series designation
2	Computer type	1 = VR-101 Volume only with electric reset 2 = VR-101 Volume only with Cam-Ac reset 3 = VR-10/4 Computer with electric reset 4 = VR-10/4 Computer with Cam-Ac reset 5 = VR-10 Computer with electric reset 6 = VR-10 Computer with Cam-Ac 7 = 531 Electronic Computer, volume only 8 = 210 or 1028 Electronic Computer, money & volume
3	No. of Grades	1 or 2
4	No. of hose outlets	1 or 2 for island oriented 1, 2 or 4 for lane oriented
5	Flow rate	S = Standard H = Heavy duty suction pump B = Big Squirt 60 (Tuthill FPP TS15A meter) L = Little Squirt 40 (Tuthill FPP TS15A meter)
6	Big Squirt 60 and Little Squirt 40	N = Not applicable M = Master S = Satellite C = Combo (Master & Satellite) L = Master with satellite-in-use light D = Combo with satellite-in-use light on master side
7	Hydraulics	R = Remote S = Suction pump P = Suction pump w/ pre pay valves M = Master remote with satellite piping kit
8	Fuel	S = Standard

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Identification (Continued):

Model Designation Chart

9	Unit of measure	Mech. pump Mechanical meter G = US gal. L = Liters I = Imperial gal.	Elec. pump E-cal meter G = US gal. L = Liters I = Imperial gal.	Elec. pump Mechanical meter A = US gal. B = Liters C = Imperial gal.
10	Valance	Non-metrological feature		
11	Nozzle position	F = Front mount S = Side mount		
12	Fueling position	1 = One side 2 = Two sides		
13	Electrical	Non-metrological feature		
14	Local preset	N = None L = Local preset without printer		
15	Card reader	N = None C = Fiscal card reader F = Fleetscan card reader V = Verifone card reader		
16	Vapor recovery	N = None A = Active Healy System B = Balanced (No NTEP testing has been performed on the device equipped with vapor recovery option or equipment to determine compliance with the Air Resources Board requirements.)		
17	Pulser	N = No pulse output P = Pulse output (electronic dispenser only) T = 10:1 (VR10/4 and VR101 only) H = 100:1 (VR10/4 and VR101 only)		
18 - 37	Non-metrological features			

For devices manufactured after April 1, 2013, (serial numbers 4R000001 and later) the model designation is shown below: For Devices manufactured after August 1, 2017 the payment options have changed and are shown in the table below. These labels will also have the text “Spec 200” printed.

Model Designation Chart		
Position No.	**Description**	**Suffixes**
1	Series	3 = Series designation
2	Computer type	1 = VR-101 Volume only with electric reset 2 = VR-101 Volume only with Cam-Ac reset 3 = VR-10/4 Computer with electric reset 4 = VR-10/4 Computer with Cam-Ac reset

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		5 = VR-10 Computer with electric reset 6 = VR-10 Computer with Cam-Ac 7 = 531 or X19 Electronic Computer, volume only 8 = 210, 1028 or X19 Electronic Computer, money & volume 9 = X19 Electronic Computer, Money & Volume 2 Price Tiers
3	No. of Grades	1 or 2

Identification (Continued):

4	No. of hose outlets	1 or 2 for island oriented 1, 2 or 4 for lane oriented
5	Flow rate	S = Standard H = Heavy duty suction pump B = Big Fueler L = Little Fueler
6	Big Fueler 60 and Little Fueler 40	N = Not applicable M = Master S = Satellite C = Combo (Master & Satellite) L = Master with satellite-in-use light D = Combo with satellite-in-use light on master side
7	Hydraulics	R = Remote S = Suction pump P = Suction pump w/ pre pay valves M = Master remote with satellite piping kit
8	Fuel	S = Standard A = Alcohol (E-85) B = Biodiesel (Note: Cannot have A and B options in the same dispenser)
9	Unit of measure	Mech. pump Mechanical meter: G = US gal., L = Liters Elec. pump E-cal meter: G = US gal., L = Liters Elec. pump Mechanical meter: A = US gal., B = Liters
10	Valance	Non-metrological feature
11	Nozzle position	F = Front mount S = Side mount
12	Fueling position	1 = One side 2 = Two sides 4 = Two Sides with 4 Fueling Positions
13	Electrical	Non-metrological feature
14	Payment Options**	N = None C = Credit D = Debit E = Debit with color screen F = Fleet System Ready L = Local preset without printer M = Equipped with Verifone MX760
15	Vapor recovery	N = None A = Active Healy System B = Balanced

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		(No NTEP testing has been performed on the device equipped with vapor recovery option or equipment to determine compliance with the Air Resources Board requirements.)
16	Pulser (Pump Communication)	N = Current Loop E = Ethernet Cat 5E P = Pulse Output board R = RS485 Interface T = Two wire Current Loop
17-35	Non-metrological features	

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Payment Options	
A = EMV Ready 7” No Audio	J = EMV Ready 7” NFC
B = EMV 7” No Audio	K = EMV 7” NFC
C = Credit 7” No Audio	L = Local Preset
F = Fleet Ready	M = EMV Ready 7” NFC w/ Audio
G = Alpha Numeric Credit	O = EMV 7” NFC w/ Audio
H = EMV Ready 7” w/ Audio	S = Credit 7”
I = EMV 7” w/ Audio	

Sealing: This series may have mechanical calibration, electronic calibration or both types of calibrations. Sealing is as follows:

Mechanical Calibration: The Bennett SB100 meter is accessed by opening the hinged lower door. The device is adjusted by removing a metal pin and turning the calibrator wheel to increase or decrease the delivery amounts. A wire security seal can be threaded through a hole in the metal pin to prevent removal of the pin.

Dispensers using the Tuthill FPP TS meters have two bolts which may be sealed with a wire security seal on the meter. These bolts hold secure a plate which allows access to a linearization board. If the settings on this board are changed meter accuracy will be affected.

Electronic Calibration: The X19, 1028, 531 and 210 electronic computers incorporate event counters with 999999 events for sealable parameters that are accessible only through the audit trail. The event counters count anytime there is a change to the calibration or unit of measure. Dispensers using the Tuthill FPP TS meters have two bolts which may be sealed with a wire security seal on the meter. These bolts hold secure a plate which allows access to a linearization board. If the settings on this board are changed meter accuracy will be affected. The dispensers are not capable of remote calibration.

To access the audit trail, the pump handle must be off. Using the magnet supplied with each dispenser by the manufacturer, touch and hold on the glass at a spot ½ inch below the lower right hand digit of the gallons display until the audit trail shows then remove the magnet. The display will automatically cycle through the electronic totalizer and audit trail counters (audit trail information is described as below). It will then return to a normal operation mode in 30 seconds.
** On the X19 CPU, hold the magnet to the left of the “TOTAL SALE” text on the main display.

1028 computers (money & gallons) will show Product 1 (the product on the left side) Audit trAiL” then “ECALCh 00000X” (X is the number of calibration changes), then “UnitCh 00000Y” (Y is the number of changes to configuration parameters such as from gallons to liters to imperial gallons). It will then show Product 2 (the product on the right side) and the ECAL and UnitCh for that product.

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531 computer (gallons only) will show "Audit", then "ECALCh", "00000X" (X is the number of calibration changes), "UnitCh", then "00000Y" (Y is the number of changes to configuration parameters such as from gallons to liters to imperial gallons).

210 computer (money & gallons) will show: "Audit trAiL" then "ECALCh 00000X" (X is the number of calibration changes), then "UnitCh 00000Y" (Y is the number of changes to configuration parameters such as from gallons to liters to imperial gallons).

X19 CPU will show "Audit trAiL" then "ECALCh1b 00000X (X is the number of calibration changes) (1b is the fuel position and the product, and will vary), then "UnitCh 00000Y" (Y is the number of changes to configuration parameters such as from gallons to liters to imperial gallons), then it will show VolrES (Volume Resolution is the change to the quantity of digits on the decimal point.)

Operation: The 3000 series dispensers may be used as a stand-alone device or with an approved and compatible controller.

Test Conditions: This Certificate supersedes Certificate of Conformance Number 05-069A2 and was issued to include the Tuthill TS10, 1028 electronics and add E-85 and B-99. The emphasis of the evaluation was on the design, performance and operation of the device. A Bennett model 3821LMSSGLFS1 (using the Tuthill TS10 meter) was evaluated at the manufactures facility using Varsol as the test liquid. Tests were performed at the following flow rates: Five tests at 36 gpm, three tests at 21 gpm, three tests at 13 gpm and five tests at 7 gpm. Based on previous testing of the Tuthill TS10 meter (Certificate of Conformance Number 99-210A9) the throughput requirement was waved. A Bennett model 3711SNPALF1 was also evaluated using an SB-100 meter (Certificate of Conformance Number 91-095) using E-85 as the test liquid. Tests were performed at the following flow rates: Five tests at 19 gpm, three tests at 11 gpm and five tests at 3 gpm. After dispensing 20 076 gallons the tests were repeated using the same criteria. Biodiesel up to B-99 was granted based on the testing of the SB-100 (see Certificate of Conformance Number 91-095) no additional testing was performed. Tolerances applied were as provided for in the NIST Handbook 44 Liquid-Measuring Device Code. Previous test conditions are listed below for reference.

Certificate of Conformance 05-069A2: This Certificate supersedes Certificate of Conformance Number 05-069A1 and was issued to include the X19 Electronics. This test was performed on a 3811SNS-SGLF1-AANCN1NNHSN. The unit was tested with the Bennett SBC 7" EMV Ready Payment system. It was interfaced with a Verifone Ruby Point of Sale.

Certificate of Conformance 05-069A1: This Certificate supersedes Certificate of Conformance Number 05-069 and was issued to include a card reader. A Bennett dispenser model 3812SMSSGLF2ANNNNN was interfaced with a Verifone OP4100 card reader. The emphasis of the evaluation was on the operation, receipt format, performance and agreement of indicated and recorded values. The evaluation was performed in a lab environment using Varsol as the test liquid. Five tests were performed at 12 gpm, 3 tests were performed at 7 gpm and five tests were performed at 3 gpm. After 30 days the tests were repeated using the same criteria. Tolerances applied were 3 cubic inches as provided for in the Liquid-Measuring Device Code, National Institute of Standards and Technology (NIST) Handbook 44, 2008 edition

Certificate of Conformance 05-069: The emphasis of the evaluation was on the design, operation, receipt format, agreement of indicated and recorded values, and performance of the 3000 series.

A Bennett model 3712BMRSGCF2ANNNNN (gallons only) with a satellite hose was interfaced with an OPW Fuel Management Systems controller (Certificate of Conformance Number 93-135A1) using diesel fuel as the test liquid. Tests were performed as follows with the master hose; five tests at 32 gpm, two tests at 24 gpm, two tests at 18 gpm and five tests at 6 gpm. Tests on the satellite hose were performed, five tests at 29 gpm and five tests at 6 gpm. Additionally tests were performed using the master and satellite hoses, five tests at 48 gpm. After 30 days and dispensing more then 26 000 gallons the tests were repeated using the same criteria.

A Bennett model 3711HNSSGLS2ANNNNN (gallons only) was tested using varsol as the test liquid. Tests were performed as follows; five tests were performed at 14 gpm, three tests at 8 gpm and five tests at 1.3 gpm. After 35 days the tests were repeated using the same criteria (the throughput requirement was waived based on the previous testing of the SB100 meter (Certificate of Conformance Number 91-095A2)).

A Bennett model 3822BLRSG1F2ANNNNN (money and gallons) with a satellite hose was tested using diesel fuel as the test liquid. Tests were performed on the master hose as follows; five tests at 29 gpm, two tests at 22 gpm, two tests at 14 gpm

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and five tests at 6 gpm. Tests on the satellite hose were also performed five tests at 27 gpm, two tests at 15 gpm and five tests at 6 gpm. Additionally, tests were performed using both the master and the satellite hoses, five tests at 36 gpm. After 68 days and dispensing more than 22 000 gallons the tests were repeated using the same criteria.

A Bennett model 3824HNPSGCF2ANNNNN (money and gallons) was interfaced with a Bennett 405-8 console (Certificate of Conformance Number 90-162A1) and was tested using varsol as the test liquid. Five tests were performed at 13 gpm, two tests at 8 gpm and five tests at 5 gpm. After 68 days and dispensing more then 21 000 gallons the tests were repeated using the same criteria.

A Bennett model 3322HNPSGLS2ANNNNN (Mechanical Indicating Element) was tested using varsol as the test liquid. Five tests were performed at 13 gpm, two tests at 8 gpm, and five tests at 5 gpm. After 112 days and more than 20 000 gallons the tests were repeated using the same criteria.

Tolerances applied were 3 cubic inches for all tests utilizing a 5 gallon test measure, or .2% for normal tests and 0.5% special tests for all other tests, as provided for in the National Institute of Standards and Technology (NIST) Handbook 44 2005 edition.

Evaluated By: Michael Frailer (MD) Jim Brown (MI) 05-069; Michael Frailer (MD) David Bliss 05-069A1; Michael Frailer (MD) 05-069A2; H. Hairr, J. Wethington (NC) 05-069A3

Type Evaluation Criteria Used: *NIST Handbook 44 Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices*, 2017 Edition. *NCWM Publication 14 Measuring Devices*, 2017 Edition.

Conclusion: The results of the evaluation and information provided by the manufacturer indicate the device complies with applicable requirements.

Information Reviewed By: S. Patoray (NCWM), L. Bernetich (NCWM) 05-069A1; J. Truex (NCWM) 05-069A2, 05-069A3

Example of Device:

Example of a Bennett 3XXX with DEF side mount