

TS-301  
Rev. B

Mechanical Registers  
Models: 157, 600 Series  
and 800 Series



## neptune<sup>®</sup> MECHANICAL REGISTERS

### MODELS:

**800 Series (Reset, Preset, Ticket Printing)**

**600 Series (Reset)**

**157 (Non-Resettable Totalizer)**

## SPECIFICATIONS

Mechanical Registers record the volume of liquid passing through flowmeters. They may record, display, document, and control quantities for batching and blending. There are three types of mechanical registers available:

**Model 157:** Non resettable totalizer

**600 Series:** Resettable register with a totalizer

**800 Series:** Printer, preset and register unit combined in one housing

### MODEL 157 REGISTER

#### GENERAL

The Model 157 Register is a “non-resettable” totalizer that provides an increasing cumulative reading. An input shaft connected to the register change gear drives the register. There is a 1:1 ratio between the input shaft and the first wheel. To measure in increments of more than a single unit (i.e., 10 gallons or 100 pounds), the Model 157 uses “fixed zeros” to the right of the first wheel. A Model 157 Register reading in gallons or pounds is a function of the flowmeter’s gear train ratio and the ratio of the two change gears. For each complete revolution of the pointer, the right hand wheel on the totalizer will rotate one complete revolution.

#### FEATURES

- Seven (7) digit direct reading register with six (6) odometer wheels and a sweep hand (“pointer”) for the least significant digit
- Approximately 3” in diameter and is enclosed in a bronze housing
- Easy to attach and remove from the flowmeter
- The perfect register style for inventory control because of the inability to reset the totalizer. The register is read once a day, week, month or year. The operator records the reading each time and subtracts the previous reading from the current reading to determine the usage for the particular time period



Model 157 Register

**CALIBRATION OF THE MODEL 157 REGISTER**

Calibration of the flowmeter is accomplished by locating the "S" (driving) gear upon the output drive of the gear train, while the "R" (driven) gear fits to the register input shaft. Easy removal of the change gears is obtained by closing the split end of the spindle with a pair of pliers, pulling off the old gear, slipping on the new gear, then slightly spreading the ends of the spindle. Refer to Form TSG310 for a complete listing of available change gears.

**ACCESSORIES**

Installation of the Actaris Neptune/VR Dry Reed Switch and Solid State-Hall Effect pulsers between the Model 157 Register and the flowmeter is possible with the use of a Model 30 Adapter.

**OPTIONS**

Options available are in units of measure and registration.

## 600 SERIES REGISTER

### GENERAL

The 600 Series Register is mechanically driven. It was specifically designed to compliment Models 831/841 for uses in applications where the end user required a simpler mechanical reset and totalizer. It was also designed for easy adaptation to a local or remote batching and recording system.

The 600 Series Register offers a 5 digit delivery quantity reset similar to the Models 831/841 and an 8 digit non-resettable totalizer. It is fully mechanical and does not offer mechanical preset or ticket printing options.

### FEATURES

- Five (5) digit roller type reset wheels, with 3/4" (19.05 mm) numerals for ease in reading (up to 10-15 feet/3-5 meters). The large size of the wheels of the 600 Series Register allows the operator to perform other tasks while watching the flow situation at the flowmeter.
- Five (5) large reset wheels can be reset to zero by pushing in and rotating reset handle mounted on the right side of the register.
- Eight (8) small non-resettable totalizing wheels mounted at the top right of the register front serve as an odometer.
- Approximately 8" wide by 4" tall and 6" deep.
- Low profile for ease in retro fit installations.
- Light weight (6.4 lb./2.9 kg.), heavy gauge steel outer casing
- Ability to mount all digital and analog pulse transmitters, calibrated output
- Available in all practical units of measure - US and Imperial Gallons, Litres, Decalitres, Pounds and Kilograms
- Can be used for manual batching applications. The operator resets the register to "zero" and starts flowing product through the meter. The operator then watches the amount flowing through the meter as shown on the register. The operator stops the flow as the delivery reaches the desired quantity; therefore, manually batching the amount of product needed. This is very difficult with non-resettable, totalizing registers (i.e., Model 157).



Type S Flowmeter with 600 Series Register

### CALIBRATION

The 600 Series Register change gears are conveniently located inside the register, directly beneath a cover plate on top of the register. When a pulse transmitter accompanies a 600 Series Register, the pulse transmitter and the Model 45 Adapter must be removed in order to access the calibration gears. The 600 Series Register does not have a gear shifter mechanism as the Models 833/834 Registers. Easy removal of the change gears is obtained by closing the split end of the spindle with a pair of pliers, pulling off the old gear, slipping on the new gear, then slightly spreading the ends of the spindle. Refer to Form TSG310 for a complete listing of available change gears.

### OPTIONS

The 600 Series Register is used on the following flowmeters: 1", 2" and 3" MP, all Type S, the 1-1/2" Type 40, and the 1" Type 4D-MD.

### ACCESSORIES

An adapter mounted to the top of the 600 Series Register allows mounting of a digital or analog transmitter to the register. Simply remove the cover plate and attach the adapter to the same screw holes.

## 800 SERIES REGISTER

The 800 Series Register is the latest of four multi-function devices specifically designed for petroleum refining, distribution, and industrial process industries.

### FEATURES

- Standard eight (8) digit non-resettable totalizer, five (5) digital delivery display, four (4) digit preset, and five (5) or six (6) digit printer
- Measurement in gallons, tenths of gallons, litres, dekalitres, pounds and kilograms
- High visibility 3/4" (19.05 mm) wheels
- Long life, precision die cast Zamac printer wheels provide clear, sharp, easy to read tickets
- Rugged Zamac housing and durable heavy gauge steel shroud prolongs the life of 800 Series Registers and allows their use in all types of weather
- Acetal resin register wheels, totalizer wheels, and preset wheels assures smooth operation, lower torque and higher speeds

### MODELS

The 800 Series Registers consist of the Model 830 Series and the Model 840 Series. Model 830 Series registers are in tenths and the Model 840 Series registers are in units.

**Models 831 and 841** are direct reading resettable registers with the basic non-resettable totalizer.

**Models 832 and 842** are the basic 830 and 840 features plus a preset register that provides automatic deliveries. The operator sets the register for the desired quantity from the front panel. The flow will cut off automatically at the exact volume desired when used in conjunction with either a mechanical valve or a solenoid actuated valve. There are two preset models available, a single trip for one stage shutoff or a double trip for two stage shutoff (delivery decreases, then the final shutoff stops the delivery).

**Models 833 and 843** are the basic 830 and 840 features plus a printer register that prints a receipt or ticket



Model 831 Register



Model 832 Register

showing the readings before and after delivery. The register locks the ticket during delivery to prevent fraud. Providing two letter wheels in the register makes it possible to print a letter code on the ticket to identify the flowmeter or truck. These letter wheels can print any single letter or combination of two letters from A to J, omitting I. Additionally, three serial number wheels are provided in the register to number each ticket consecutively from 000 to 999. There are four printer models available:

- **Accumulative Face Up** (for larger deliveries): Prints beginning reading and the final reading
- **Accumulative Face Down:** Prints beginning reading and the final reading
- **Zero Start Face Up** (most commonly used): Prints all zeros and the actual delivery
- **Zero Start Face Down** (most commonly used): Prints all zeros and the actual delivery

**Models 834 and 844** are printer-preset registers that combine the features of the other registers. They contain the preset quantity control plus the printed ticket features.



Model 833 Register



Model 834 Register

## CALIBRATION OF THE 800 SERIES REGISTER

### Gear Shifter

A patented Gear Shifter is built into the Model 833 and 834 (843 & 844) Series Registers and permits easy calibration adjustments. Once set, the gear shifter's positive action ensures that calibration cannot drift or vary. Calibration is obtained in steps of 0.15%. The gear shifter is available for Model 831 and 832 custody transfer flowmeter units. The gear shifter can be sealed internally. Calibration cannot be changed without first breaking sealing wires.

### Change Gears

Greater changes in calibration are accomplished with change gears which are located in the bottom of the register. The change gears contain shear keys which provide protection to the gearing and to the register in the event of a jammed mechanism. They are easily accessed by removing the register from the flowmeter. Refer to Form TSG310 for a complete listing of available change gears.

## ACCESSORIES

A **Flexi-Drive Adapter** provides a calibrated mechanical drive that allows the mounting and operation of pulse transmitters on the rear of an 800 Series Register housing. The Flexi-Drive Adapter is supplied as a factory installed option; however, it may be installed in the field by a qualified distributor repair technician.

An **Auto-Switch** feature provides a single or double stage switch mounted on the rear of the register to extend the preset feature to electrically operated systems for the remote actuation of valves, pumps, and other equipment.

### MODEL 157 SPECIFICATIONS

<b>Number of Figures:</b>	Odometer: Seven (7)
<b>Color of Figures:</b>	Black on white
<b>Operating Temperature Range:</b>	-40°C to 70°C (-40°F to 160°F)
<b>Gearing:</b>	1:1
<b>Weight:</b>	Approximately 0.7kg (1.6 lb)
<b>Mounting:</b>	The Model 157 Register mechanism fits into an internally machined register housing. The register housing attaches to the flowmeter maincase cover. Two screws secure the register box to the meter.

### 600 SERIES REGISTER SPECIFICATIONS

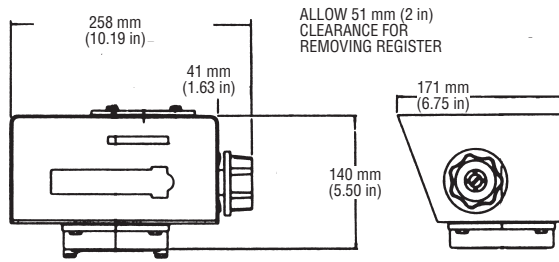
<b>Number of Figures:</b>	Reset wheels: five (5); Non-resettable totalizer: Eight (8)
<b>Color of Figures:</b>	Reset (delivery display) tenths: White on red Number 2-5 wheels: White on black Units and units with 1/10 subdivisions: White on black Totalizer (all): Black on white
<b>Operating Temperature Range:</b>	-40°C to 70°C (-40°F to 160°F)
<b>Gearing:</b>	1:1 (1 revolution of the register input shaft = 1 revolution of the first register wheel) Overall ratio of first wheel is a function of the calibration gears.
<b>Weight:</b>	2.9 kg (6.4 lb)
<b>Mounting:</b>	The 600 Series Register is secured to the flowmeter (by any one of 4 adapter assemblies) by 4 screws which will accommodate a seal wire.

### 800 SERIES REGISTER SPECIFICATIONS

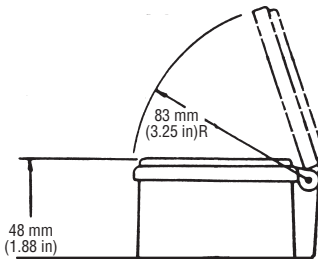
<b>Number of Figures:</b>	Delivery display: five (5); Totalizer: eight (8); Preset: four (4); Printer: five (5) or six (6)
<b>Color of Figures:</b>	Model 83X: Number 1 wheel: White on red Number 2-5 wheels: White on black Model 84X (all): White on black Totalizer (all): Black on white Preset (all): White on black
<b>Operating Temperature Range:</b>	-40°C to 70°C (-40°F to 160°F)
<b>Gearing:</b>	1:1 (1 revolution of the register input shaft = 1 revolution of the first register wheel) Overall ratio of first wheel is a function of the calibration gears.
<b>Weight:</b>	Models 831 & 841: 9kg (20lb) Models 832 & 842: 10kg (22lb) Models 833 & 843: 11kg (24lb) Models 834 & 844: 12kg (26lb)
<b>Mounting:</b>	The 800 Series Register is secured to the flowmeter by 2 clamp screws which will accommodate a seal wire.

## DIMENSIONAL DATA

### Model 600 Register

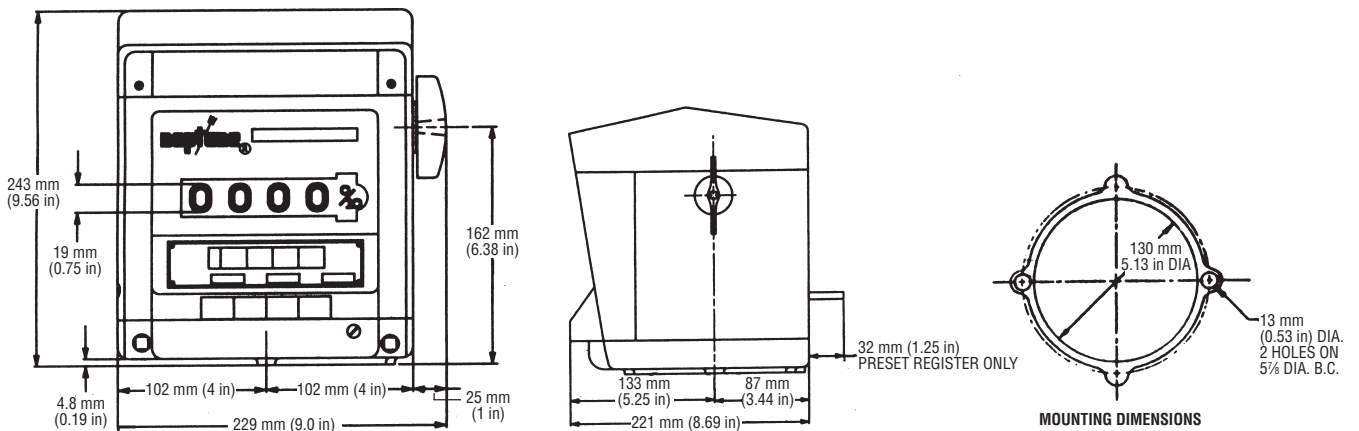


### Model 157 Register



REGISTERS				
Model	Totalizer	Reset Count	Preset	Print
157	YES	NO	NO	NO
600	YES	YES	NO	NO
831/841	YES	YES	NO	NO
832/842	YES	YES	YES	NO
833/843	YES	YES	NO	YES
834/844	YES	YES	YES	YES

### 800 Series Register





**U.S.A./International**

1310 Emerald Road  
Greenwood, SC 29646-9558  
Tel.: Toll-Free (800) 833-3357  
(864) 223-1212  
Fax: (864) 223-0341

© 2003 Actaris Neptune Liquid Measurement Division 500 10/03

Specifications subject to change without prior notification.

