



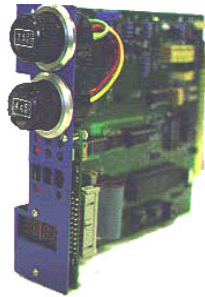
Electronics Upgrade/Update

As part of Mansco Products continuing effort to provide the most effective and reliable instrument available, an electronics upgrade was released in June 2004 with a featured change of a new model Slide Chassis model. The current model Transducer is now TOVM 1.4, which incorporates the changes included in model TOVM 1.3 from the older TOVE model Transducers.

TOVM 1.3 Upgrades from Model TOVE Transducers

New J11M Board features include:

- In-line Probe Performance Tests:
 - T $\frac{1}{2}$ (measures functionality)
 - Frequency
 - Count (measures probe's reliability)
- Built-in Simulator
- Built-in Calibrations features
- More user-friendly start-up features with complete front panel access
- Microprocessor controlled diagnostic system with storing capabilities
- LED display of Probe performance tests
- Improved stability



New J13M Board features include:

- User-friendly Gain and Compensation Adjustment Pots
- Push Button Automatic Compensating Temperature Balance
- Broad Range Temperature Output
- LED Readout of direct Process Temperature
- Improved stability



J14 BOARD

The J14 DC-DC Converter Board that utilizes the new 5-volt power supply and converts it to +15 volts and -15 volts outputs that are utilized by the J11M and J13M Boards for optimum performance.

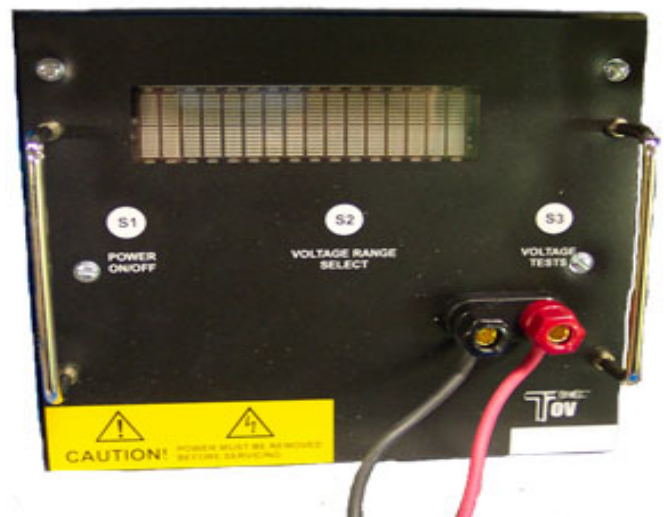
Upgraded Slide Chassis features:

- Improved 15V Power Supply.
- Improved 24V Power Supply.
- 5-Volt Power Supply.
- Provides more reliability and accuracy.

Upgrade to TOVM 1.4

New SC-03 features include:

- On-line Power Tests:
 - Automatic at start-up
 - Can be performed manually during TOV System operation
- Built-in true differential VOM
- LCD display of voltages and voltage checks
- Easier disconnect from Transducer
- Microprocessor controlled



Feature	TOVM 1.4	TOVM 1.3	TOVE
Outputs	4	4	4
Compensated Viscosity	√	√	√
Uncompensated Viscosity	√	√	√
Broad Temperature Output	√	√	Not Available
Compensating Temperature	√	√	√
Frequency Balance ("Elasticity")	Not Available	Not Available	√
Backplane Wiring Configuration	TOVM 1.4	TOVM 1.4	TOVE
Pressure Compensation Over 50Kg/cm ² (700PSI) range	Standard	Standard	Optional
Linear Temperature Compensation: within +/- 14°C (57.2°F) from setpoint	Standard	Standard	Standard
In-line Probe Performance Tests for testing Probe operating parameters: <ul style="list-style-type: none"> • T½ (Probe's functionality) • Frequency • Count (Probe's reliability) 	Standard	Standard	Not Available
Built-in Simulator feature	Standard	Standard	Not Available
Push Button Compensating Temperature Balance	Standard	Standard	Not Available
LED Readout of Direct Process Temperature	Standard	Standard	Not Available
Differential Voltage Meter	√	Not Available	Not Available
Power Supply Checks	ALL	+/-15V Out ONLY	+/-15V Out ONLY
LCD Meter Display	√	Not Available	Not Available

Upgrading Your TOV Viscometer Transducer

To Upgrade from TOVE to TOVM 1.4, backplane wire changes are required and must be performed by certified Mansco Products engineers. New J11M, J13M, and J14 Boards will be installed and the Slide Chassis will be replaced with a new SC-03 model. This upgrade may be performed at a customers site or at Mansco Product's facility.

Requirements for upgrading From TOVE to TOVM 1.4	
Requires Transducer wire changes by a Mansco Products certified engineer	v
Requires new J11M Board	v
Requires new J13M Board	v
Requires new J14 Board	v
Requires new Slide Chassis Model SC-03	v

To upgrade from TOVM 1.3 to TOVM 1.4, a new Model SC-03 Slide Chassis must be purchased and installed in place of the existing Model SC-02 Slide Chassis.

Requirements for upgrading From TOVM 1.3 to TOVM 1.4	
Requires Transducer wire changes by a Mansco Products certified engineer	
Requires new J11M Board	
Requires new J13M Board	
Requires new J14 Board	
Requires new Slide Chassis Model SC-03	v

*Terms, delivery, and conditions vary. If these options do not meet your particular needs or if you have any questions, please contact Mansco Products at +215.674.4395 or your local sales agent.

For more information, please contact
Mansco Products:
+215.674.4395
or visit our web site at:
<http://www.manscoproducts.com>