



INSTRUCTION MANUAL

**MODEL TI8 / TI-10
TENSION INDICATOR**

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- TECHNICAL SERVICE -** Installations, Start-Up, Troubleshooting, Repairs, Field Service, Returns.
- CUSTOMER SERVICE -** Replacement Parts, Individual Products, Questions about Orders, Manuals.
- SALES -** Product Information, Systems Application Questions, Placing orders for standard products and special systems.

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INSTALLATION

1. Install the tension transducers. Refer to the Transducer Instruction Manual you received with your transducers. When the Extended Range option is used, ensure that the transducers are also Extended Range transducers.

NOTE: Using +10V excitation for other than Extended Range transducers, will damage your transducers!

2. Mount the Interface Card in a convenient location away from heat and vibration.
3. Connect a transducer cable to each transducer. Use the longer cable on the one farthest away from the Interface Card.
4. Connect the other end of the cable to the Terminal Block TB2 as specified on the TI8 schematic (E1165C).
5. Connect 120 Volts, 60 Hz. AC (240 Volts, 50 Hz is optional) to terminals 1 and 2 on TB1. Connect the ground wire to TB1-3 to reference circuit common to earth ground. To isolate the output, do not connect the ground wire.

TARE (ZERO) ADJUSTMENT

1. Turn the power "off" to the Interface Card. Observe the tension meter. If the needle is not on zero, adjust the screw on the meter face until the needle rests on zero.
2. Turn on power and allow the Interface Card to warm up for five minutes.
3. Using a small screwdriver, turn the Zero pot. until the meter reads zero. The needle moves upscale when the pot. is turned clockwise (CW).

CALIBRATION ADJUSTMENT

4. Thread a length of rope over the *center* of the tension sensing roll following the *exact* same path the web will take. Do NOT pass the rope over dead-bars, driven rolls, braces, or any other non-free wheeling member. The sliding friction introduced by these members will cause inaccurate calibration. Fasten one end of the rope securely.
5. Attach a weight of known value to the other end of the rope. Its weight should be about half the maximum scale reading of the tension meter. A spring scale can also be used to apply the required force.
6. Turn the Cal pot. until the tension meter reads the same as the weight.
7. Remove the load from the sensing roll and observe the tension meter. If it does not read zero, repeat Step 3.
8. Apply the load to the sensing roll again and repeat Step 6.
9. Repeat Steps 6, 7, and 8 until the tension meter reads the same as the applied weight *and* returns to zero when the weight is removed.

THIS COMPLETES THE CALIBRATION PROCEDURE

1. 100 mV output - Terminals 12(-) and 13(+) on TB2. This output is usually fed to a tension recorder for permanent record of tension patterns and levels. Output is 100 mV when tension meter reads full scale and varies directly with meter. Minimum input resistance of recorder should be 10,000 Ohms.
2. Voltage Output, adjustable - Terminals 14(+) and 15(-) on TB2. Normal adjustment range is 4 V to 13 V, measured when tension meter reads full scale. This output varies directly with total tension, and can be used for display or control purposes. Minimum load resistance should be 10,000 Ohms. The standard output is positive-going. A negative-going output is optional. The output is factory set for 10 V. Adjust the V-OUT pot. to vary the voltage.

PREVENTIVE MAINTENANCE

Preventive maintenance for electronic equipment consists of keeping it clean. Layers of dust cause overheating of electronic components. If the dust is conductive, it can cause short circuits and produce all kinds of strange behavior.

Check the equipment at least once a month. It does not take long and could prevent costly down-time.

**DO NOT USE COMPRESSED AIR FOR CLEANING!
DAMAGE COULD RESULT!**

Use a dry, soft brush to remove dust. If a solvent is necessary, use Denatured Alcohol.

SECTION 5

SPECIFICATIONS

T18 Transducer Interface card specifications:

Power Input:	Voltage: 120 V, 60 Hz Current: 0.25 Amp
Outputs (proportional to tension):	
Low voltage:	0-100 mVDC @ 10mA
High voltage:	Adjustable 0-3.5 to 0-13 VDC @ 2mA, 5k Ohm, min. load resistance.
Transducer voltage supply:	5 VDC regulated (10 VDC Extended Range Option)
Transducer input signal:	500 mVDC (nominal) at rated load of transducers
Zero range:	95% of transducer rating (min.)
Calibration range:	25:1
Temperature range:	32°F to 104°F (0°C to 40°C)
Weight:	1 lb. (0,5 kg)

Available Options:

	Order Code
Remote tension meter in 6 x 8 x 4 enclosure	RMA
Loose tension meter for remote mounting	RTM
Digital meter - 3 1/2 digit, red LED 1/2" high, includes 5V power supply (install in non-hazardous area)	DM
Non-standard meter scale (single or dual scale- specify range)	NMS
220 Volt, 50 Hz AC power supply	220
Single transducer operation (except Narrow Web [NW] and Tension Roll® [TR] Transducers)	ST
Negative 10 Volt output, proportional to tension	N10
Extended Range (+10V transducer excitation)	XRE

TERMS AND CONDITIONS OF SALE AND SHIPMENT

1. THE COMPANY

5/1/00

Dover Flexo Electronics, Inc. is hereinafter referred to as the Company.

2. CONFLICTING OR MODIFYING TERMS

No modification of, additions to or conflicting provisions to these terms and conditions of sale and shipment, whether oral or written, incorporated into Buyer's order or other communications are binding upon the Company unless specifically agreed to by the Company in writing and signed by an officer of the Company. Failure of the Company to object to such additions, conflicts or modifications shall not be construed as a waiver of these terms and conditions nor an acceptance of any such provisions.

3. GOVERNING LAW

This contract shall be governed by and construed according to the laws of the state of New Hampshire, U.S.A. The parties agree that any and all legal proceedings pursuant to this contract shall take place under the jurisdiction of the courts of the State of New Hampshire in the judicial district of Strafford County.

4. PENALTY CLAUSES

Penalty clauses of any kind contained in orders, agreements or any other type of communication are not binding on the Company unless agreed to by an officer of the Company in writing.

5. WARRANTY

Dover Flexo Electronics, Inc. warrants its' products to be free of defects in material and workmanship for five years from date of original shipment. Warranty is valid on products purchased on or after April 2, 1999. During the warranty period the Company will repair or replace defective products free of charge if such products are returned with all shipping charges prepaid and if, upon examination, the product is shown to be defective. This warranty shall not apply to products damaged by abuse, neglect, accident, modification, alteration or mis-use. Normal wear is not warranted. All repairs and replacements under the provisions of this warranty shall be made at Dover Flexo Electronics or at an authorized repair facility. The Company shall not be liable for expenses incurred to repair or replace defective products at any other location or by unauthorized persons or agents. This warranty contains all of the obligations and warranties of the Company. There are no other warranties, either expressed or implied. No warranty is given regarding merchantability or suitability for any particular purpose. The Company shall not be liable in either equity or law for consequential damages, losses or expenses incurred by use of or inability to use its' products or for claims arising from same. No warranty is given for products of other manufacturers even though the Company may provide these products with its' own or by themselves. The provisions of this warranty can not be changed in any way by any agent or employee of the Company. Notice of defects must be received within the warranty period or the warranty is void.

6. PAYMENTS

Standard terms of credit are net 30 days from date of shipment, providing satisfactory credit is established with the Company. Amounts past due are subject to a service charge of 1.5% per month or portion thereof or 18% per annum. The Company reserves the right to submit any unpaid late invoices to a third party for collection and Buyer shall pay all reasonable costs of such collection in addition to the invoice amount. All quoted prices and payments shall be in U.S. Dollars.

If the Company judges that the financial condition or payment practices of the Buyer does not justify shipment under the standard terms or the terms originally specified, the Company may require full or partial payment in advance or upon delivery. The Company reserves the right to make collection on any terms approved in

writing by the Company's Finance Department. Each shipment shall be considered a separate and independent transaction and payment therefore shall be made accordingly. If the work covered by the purchase order is delayed by the Buyer, upon demand by Company payments shall be made on the purchase price based upon percentage of completion.

7. TAXES

Any tax, duty, custom, fee or any other charge of any nature whatsoever imposed by any governmental authority on or measured by any transaction between the Company and the Buyer shall be paid by the Buyer in addition to the prices quoted or invoiced.

8. RETURNS

Written authorization must be obtained from the Company's factory before returning any material for which the Buyer expects credit, exchange, or repairs under the Warranty. Returned material (except exchanges or repairs under the Warranty) shall be subject to a minimum re-stocking charge of 15%. Non-standard material or other material provided specially to the Buyer's specification shall not be returnable for any reason. All material returned, for whatever reason, shall be sent with all freight charges prepaid by the Buyer.

9. SHIPPING METHOD AND CHARGES

All prices quoted are F.O.B. the Company's factory. The Company shall select the freight carrier, method and routing. Shipping charges are prepaid and added to the invoice of Buyers with approved credit, however the Company reserves the right to ship freight-collect if it prefers. Shipping charges will include a charge for packaging. Company will pay standard ground freight charges for items being returned to Buyer which are repaired or replaced under the Warranty.

10. CANCELLATION, CHANGES, RESCHEDULING

Buyer shall reimburse Company for costs incurred for any item on order with the Company which is canceled by the Buyer. Costs shall be determined by common and accepted accounting practices. A one-time hold on any item ordered from the Company shall be allowed for a maximum of 30 days. After 30 days, or upon notice of a second hold, Company shall have the right to cancel the order and issue the appropriate cancellation charges which shall be paid by Buyer. Items held for the Buyer shall be at the risk and expense of the Buyer unless otherwise agreed upon in writing. Company reserves the right to dispose of canceled material as it sees fit without any obligation to Buyer. If Buyer makes, or causes to make, any change to an order the Company reserves the right to change the price accordingly.

11. PRICES

Prices published in price lists, catalogs or elsewhere are subject to change without notice and without obligation. Written quoted prices are valid for thirty days only.

12. EXPORT SHIPMENTS

Payment for shipments to countries other than the U.S.A. and Canada or to authorized distributors shall be secured by cash in advance or an irrevocable credit instrument approved by an officer of the Company. An additional charge of 10% will apply to any letter of credit. There will be an extra charge for packaging and documentation.

13. CONDITION OF EQUIPMENT

Buyer shall keep products in good repair and shall be responsible for same until the full purchase price has been paid.

14. OWNERSHIP

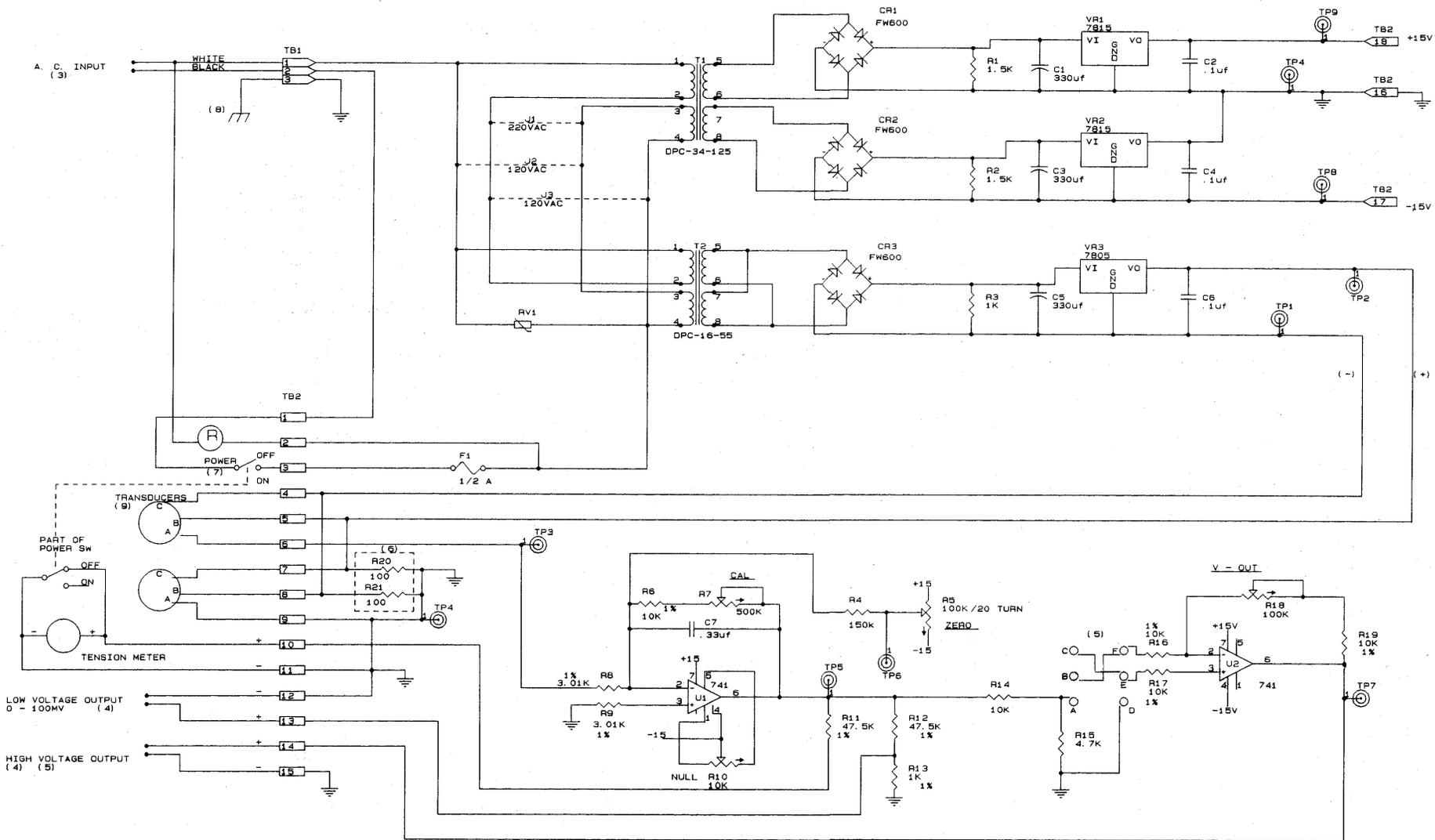
Products sold are to remain the property of the Company until full payment of the purchase price is made.

DOVER FLEXO ELECTRONICS

Transducer Interface Card

MODEL: TI-8
 DIAGRAM:
 REF:

	DES	PART	DESCRIPTION	QTY		MFR
1		TI8	TI8- Standard Circuitry	1		
2		T18-A	220 VAC Power Supply with Standard Circuitry	1		
3		T18-B	-10 V Output with Standard Circuitry	1		
4		T18-C	Single Transducer Option with Standard Circuitry	1		
5		TI8-XRE	+10V Transducer Excitation	1		
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7			DIAGRAMS			
8		833-0194	TI8 Schematic	1		
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NOTES:

- (1) UNLESS OTHERWISE NOTED
A) ALL CAPACITOR VALUES ARE IN MICROFRADS (uf)
B) ALL RESISTORS ARE 1/2 WATT 5% TOLERANCE
- (2) NO STATEMENT
- (3) 120VAC INPUT: INSTALL JUMPERS J2 AND J3
RV1 USE TNR23G201KM OR EQUIVALENT.
220VAC INPUT: INSTALL JUMPER J1.
RV1 USE TNR23G391KM OR EQUIVALENT.
- (4) MEASURED WHEN TENSION METER READS FULL SCALE
- (5) HIGH VOLTAGE OUTPUT STANDARD CONNECTION IS POSITIVE GOING (JUMPER J4 FROM A TO C AND J5 FROM D TO F) NEGATIVE GOING OUTPUT IS OPTIONAL (JUMPER J4 FROM A TO B AND J5 FROM D TO E). MINIMUM LOAD RESISTANCE IS 10K OHMS. OUTPUT IS FACTORY SET FOR 10VDC. ADJUSTABLE FROM 4 - 13 IF SELECTED AT TIME OF PURCHASE.
- (6) R20 AND R21 ARE INSTALLED WHEN A SINGLE TRANSDUCER IS USED WITH A PANEL ONLY INDICATOR. CONNECT THE TRANSDUCER TO TB2-4, 5, 6.

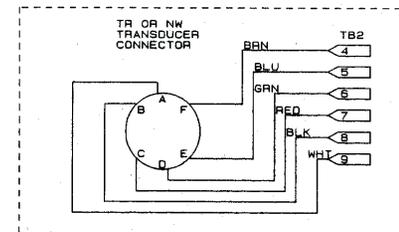
- (7) IF POWER ON/OFF SWITCH IS NOT USED, JUMPER TB2-1 TO TB2-3.
- (8) IF ISOLATED OUTPUT IS DESIRED, DO NOT CONNECT TB1-3 TO EARTH GROUND. CAUTION: FLOATING GROUND MAY BE HAZARDOUS!
- (9) USE SHIELDED CABLE ON TRANSDUCER CONNECTIONS. USE TB3-1 FOR GROUND
- (10) IF (XRE) EXTENDED RANGE OPTION IS ORDERED VR3 WILL BE A 7810 AND T2 SECONDARY WILL BE WIRED, PIN 5 TO CR3, PIN 6 TO PIN 7.

OPTIONS:

- A) 240VAC
- B) NEGATIVE 10VDC OUTPUT
- C) SINGLE TRANSDUCER

REFERENCE DRAWINGS:

843-0195 FOR P. C. B.
723-0375 FOR P. C. B. ASSEMBLY



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