



THE TENSION CONTROL SPECIALISTS

INSTRUCTION MANUAL



Model TA1 TrueTension™ Amplifier

DOC 801-2568 R3

Dover Flexo Electronics
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U.S.A.

FOR ASSISTANCE:

TECHNICAL SERVICE - Installations, Start-Up, Troubleshooting, Repairs, Field Service or Returns. **Call (603) 332-6150 and ask for Technical Support or email us at: techsupport@dfc.com**

CUSTOMER SERVICE - Replacement Parts, Individual Products, Questions about Orders, Manuals. **Call (603) 332-6150 and ask for Customer Service or email us at: customerservice@dfc.com**

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SAFETY



This label indicates: “Read the manual”

Make sure you read and understand all instructions and safety precautions listed in this manual before installing or operating your TA1 True Tension Amplifier. If you have any questions concerning the operation of your device or the information in this manual, please contact us.

Email: techsupport@dfc.com
Telephone: (603) 332-6150

- **Observe all warning labels.**
- **Never remove warning labels.**



WARNING: If this equipment is not connected or operated in the manner specified, the operating safety of this unit or of connected equipment cannot be guaranteed.



WARNING: The isolated output is designed to prevent ground loops and noise. It is not intended or approved for safety isolation of hazardous voltages. Do not install unit where the isolated circuit and chassis ground are more than **40 Vpk** differential.

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1 OVERVIEW / DEVICE DESCRIPTION

1.1 GENERAL DESCRIPTION

The TA1 TrueTension™ Amplifier with Quik-Cal™ push-button zero and calibration is a compact, versatile single-channel tension transducer interface. It can be used with DFE tension transducers to monitor tension in any zone on web or filament processing machinery.

The TA1 amplifier is powered by 24 VDC and supplies an excitation signal to connected tension transducers installed in a machine's web path. The amplifier boosts the millivolt-level tension-signal input from a DFE tension transducer (or transducer pair) to output a proportional 0-10 VDC (isolated) and 4-20 mA signal to a PLC, drive or display meter.

The standard configuration for the TA1 is a 3.9"H x 4.41"D x 0.89"W enclosure with connector terminals that mounts in a vertical orientation onto a DIN rail. The unit can also be screw mounted. The TA1 is CE marked.

1.2 SPECIFICATIONS

Power Input: 24 VDC +/- 10%, Current: 0.1 ADC typical, internal fusing PTC resettable

Temperature Range: 32°F to 122°F (0°C to 50°C)

Tension Amplifier Accuracy: +/- 1/2% drift at ambient maximum

Tension Outputs:

Output 1: 0-10 VDC isolated from 24 VDC input GND

Output 2: 4-20 mA isolated from 24 VDC input GND

Calibration Range: Up to 50:1

Processor: 32 Bit

Weight: 0.25 lbs (114g)

Resolutions: ADC - 16,777,216(24 Bit), DAC - 4,096 (12 Bit)

1.3 FEATURES

Quik-Cal: Push-button Zero and Calibration eliminates pot adjustments to make calibrating simple, fast and reliable.

10% or 25% Calibration Ratio: Full output when tension is at 10 or 4 times the calibration weight.

DIN Rail Clip: Compatible with 35 mm DIN rail. Can be converted to screw mount.

Dual Tension Outputs: Outputs a 0-10 VDC and 4-20 mA proportionate signal to a PLC, drive, or display meter.

Dual Calibration: Allows two calibration settings. Dual calibration example applications:

1. One set of transducers operating in a wide tension range. Dual calibration and dual meter scale is used to enhance the resolution of indicated tension.
2. One set of transducers that may be subject to two different wrap angles or web paths. In this case a dual meter scale may, or may not, be required.

Status LED: Green LED flashes to verify ZERO and CALIBRATION and indicates presence of power and proper circuit operation. If power is on and no faults are detected, the LED will be on solid. LED will flash momentarily to indicate acceptance of a ZERO or CALIBRATION button push.

2 INSTALLATION

2.1. DIMENSIONS inches (mm)

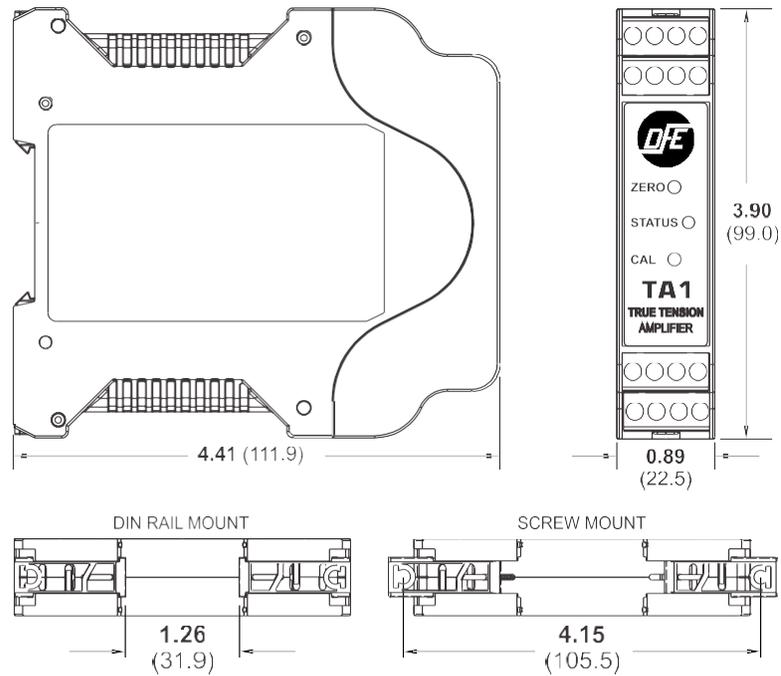


FIGURE 1 - Dimensions

2.2 MOUNTING THE UNIT

The unit is DIN rail mountable, compatible with DIN35mm rail. Snap on to mount. To remove from the DIN rail, use a screwdriver and release the clamp as shown below.

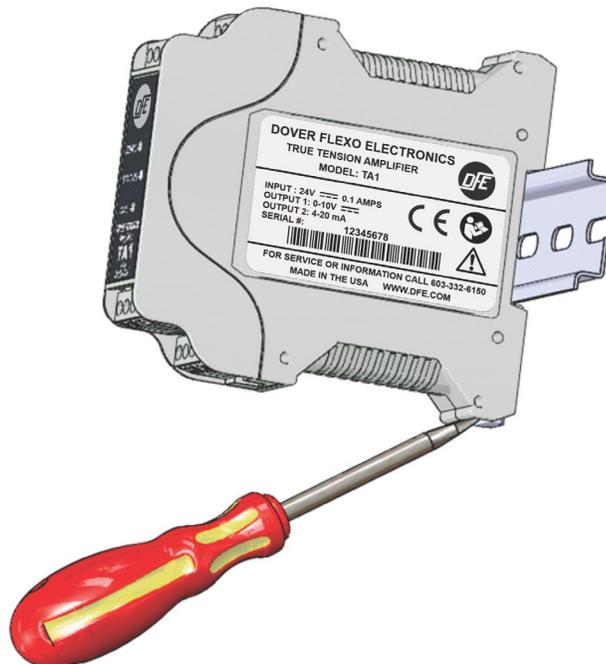


FIGURE 2 - Removing from DIN Rail

2.2 MOUNTING THE UNIT CONTINUED...

The unit can also be screw mounted. By adjusting the top and bottom clips to the outer positions.

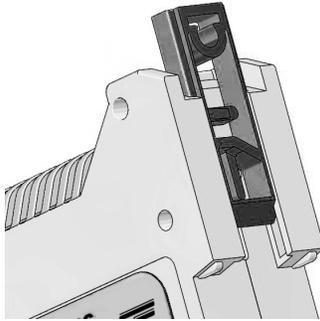


FIGURE 3 - Convert to Screw Mount

2.3 STANDARD ELECTRICAL CONNECTIONS

1. Power Input

Power should be sourced to the TA1 on Pins 1 (GND) and 2 (+24 VDC)

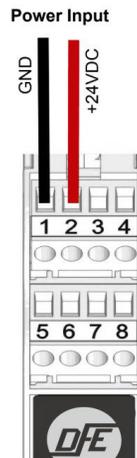


FIGURE 4 - Power Input Connections

2. Tension Output

The tension output signal is provided in two options:

1. 0-10 V is available on Pins 5 (Return) and 7 (0-10 V)
2. 4-20 mA is available on Pins 5 (Return) and 8 (4-20 mA)

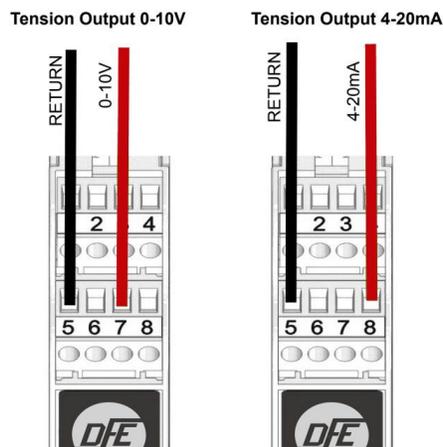


FIGURE 5 - Tension Output Electrical Connections

2.3 STANDARD ELECTRICAL CONNECTIONS CONTINUED....

3. Transducers / Load Cells

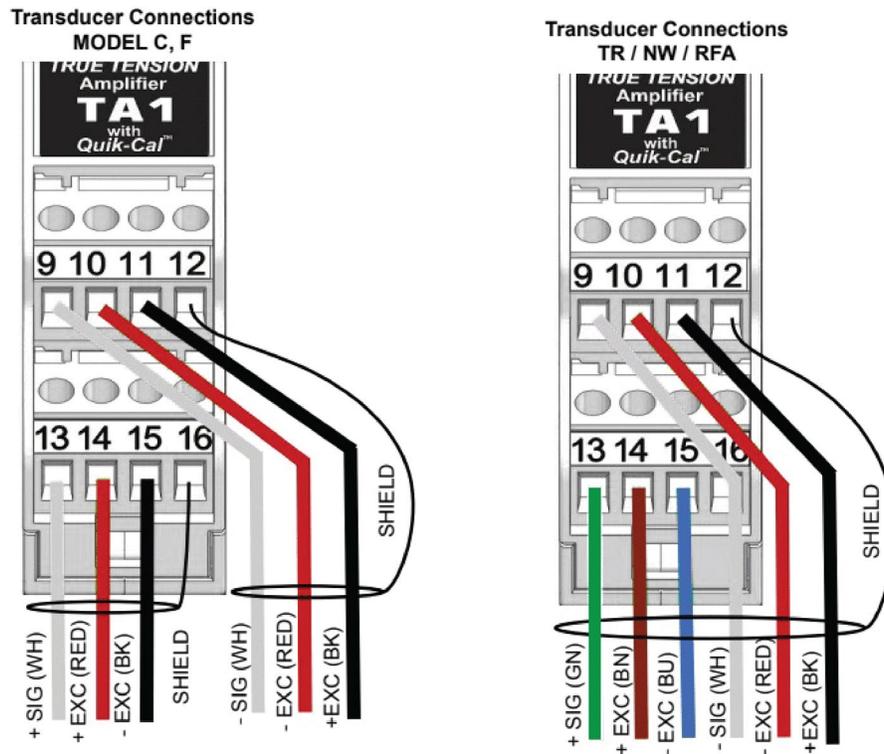
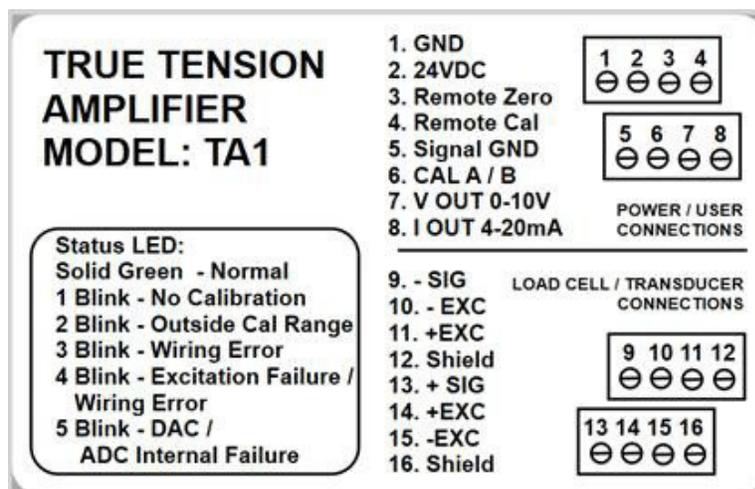


FIGURE 6 - Transducer Electrical Connections (See Appendix A for full Electrical Connections)

Below is label on left side of unit:



2.3 OPTIONAL ELECTRICAL CONNECTIONS

1. CAL A/B (Dual Calibration)

Dual Calibration allows two calibration settings. To operate the TA1 amplifier in the Calibration A configuration the connection to PIN 6 must be left open.

To operate the TA1 in the Calibration B configuration the 24V must be applied to PIN 6. A switch can be used as shown below. If a PLC or alternate source for 24V is utilized be sure that the source has a common Ground with PIN 1. If you do not need dual calibration no connection needs to be made to PIN 6.

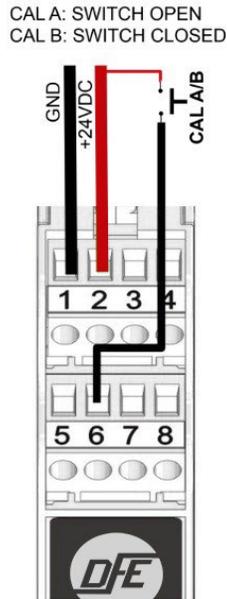


FIGURE 7 - Cal A/B Electrical Connections
(See Appendix A for full Electrical Connections)

2. Remote Zero and Calibrate

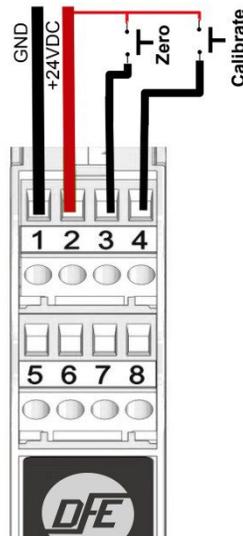


FIGURE 8 - Remote Zero and Calibrate Connections
(See Appendix A for full Electrical Connections)

3 OPERATION

3.1 HARDWARE IDENTIFICATION

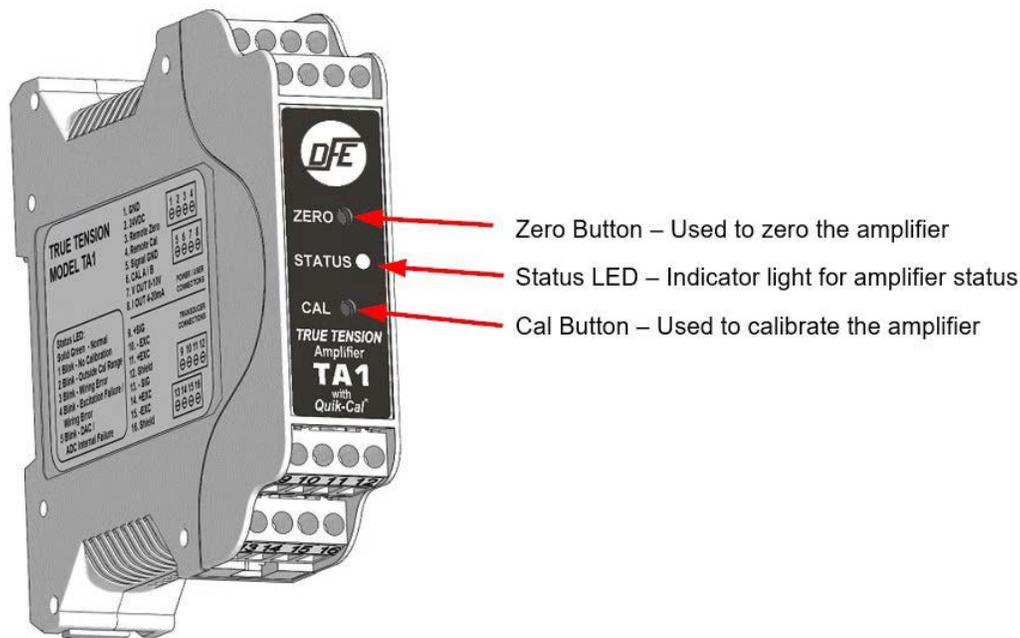


FIGURE 9 - Location of Zero, Cal Buttons and Status LED

3.2 CALIBRATION

A calibration process must be performed before your amplifier is ready to indicate tension. Select an appropriate calibration weight. The weight determines the value of web tension that will produce full output of the TA1. For example: A 15 lb weight will result in full output at 150 lbs tension if the 10% calibration is performed. If a calibration of 25% is used, a calibration weight of 15 lbs will result in a full output at 60 lbs tension).

The first step of any calibration is Zeroing out the amplifier.

- ZERO:** Ensure nothing is hanging on or pressing on the transducer roll (including the calibration rope). Press the ZERO pushbutton on the unit front panel for at least 1 second. The unit will automatically adjust and store the tension-zero value one second after the button is pressed. The unit will rapid flash the green status LED to indicate the zero has been stored. Release the button. The Output1 will read 0 VDC and Output2 will read 4 mA.
- CALIBRATION:** During the calibration the transducer(s) should be loaded. Fasten one end of the rope in the machine and thread the other end around the transducer roll in exactly the same path the web will take. Be sure the rope does not pass around any driven rolls, drag bars, or anything else that can affect tension. Ideally the rope should hit an idler roll immediately before and after the tension sensing roll. It does not have to pass over any other rollers once these three are strung. Attach the weight to the free end of the rope as shown in Figure 10. The weight should not touch anything. **Wait for the weight to stop swinging.**

3.2 CALIBRATION CONTINUED...

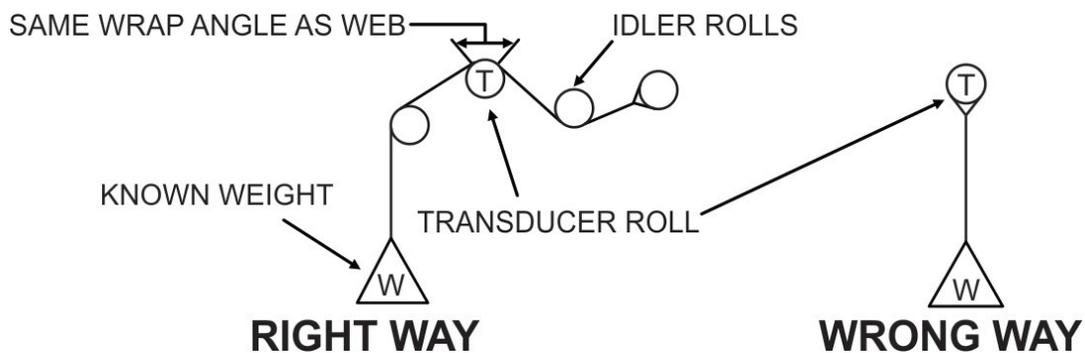


FIGURE 10 - Web Path

To calibrate at 10%:

Push and Hold the Cal Button (About 1 Second) until confirmation blinks, then release the button. The output will read 10% of full scale after calibration.

To calibrate at 25%:

Push and Hold Cal Button (About 10 Seconds) until you see two sets of confirmation blinks. Then release the button. The output will read 25% of full scale after calibration. If no blink, inadequate Cal weight used. Remove the weight and observe the output. It should read 0 VDC or 4 mA with nothing touching the tension sensing roller. Calibration weight percentage is 25% of full scale.

Your TA1 is now calibrated and ready for operation.

4 TROUBLESHOOTING

4.1 TROUBLESHOOTING

The TA1 is running normally when the status LED is showing a solid green. If it is not staying on and is blinking, refer to the list of blink sequences indicating errors. Perform the action required to clear them. Contact Technical Support if you need additional help.

Normal Operation = Solid Green

1 Blink = No Calibration Performed

Action Required: Perform Calibration. TA1 is not factory calibrated. A calibration must be performed at the customer's site. Each calibration is specific to the installation configuration. If using CAL B – a separate calibration must be performed.

2 Blinks = Outside Cal Range

Once calibrated the TA1 will indicate an over range or under range condition by setting the error code to 'Outside Cal Range'. The error is active once -20% or 120% tension is exceeded.

Action Required: To clear this error the tension must be brought back into range, or a new calibration will need to be performed to do so.

3 Blinks = Wiring Error

Will alert until the load cells are wired correctly.

Action Required: Check wiring and retry. Refer to page 4. Check for loose wires at the terminal blocks, check for shorts, and be sure the load cells are connected. If the transducers need troubleshooting – contact tech support for assistance.

Overload Condition (LT Transducer):

Will intermittently alert if overload is reached.

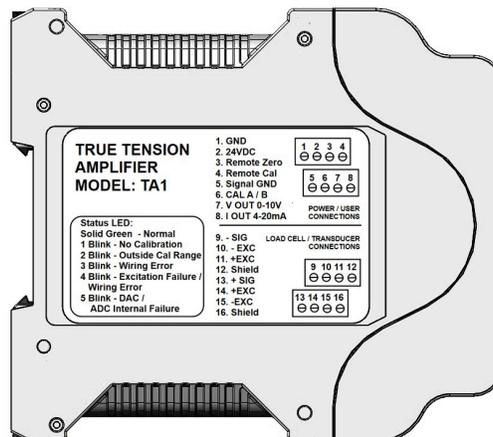
Action Required: Check that the tension range does not exceed the transducer load rating. Reduce wrap angle to reduce effective net force exerted on load cell.

4 Blinks = Excitation Failure or Wiring Error

Action Required: Check for shorts in the transducer / load cell wiring. If the transducers need troubleshooting – contact tech support for assistance.

5 Blinks = DAC/ADC Internal Failure

Action Required: Contact DFE for replacement.



APPENDIX A: TRANSDUCER CONNECTIONS

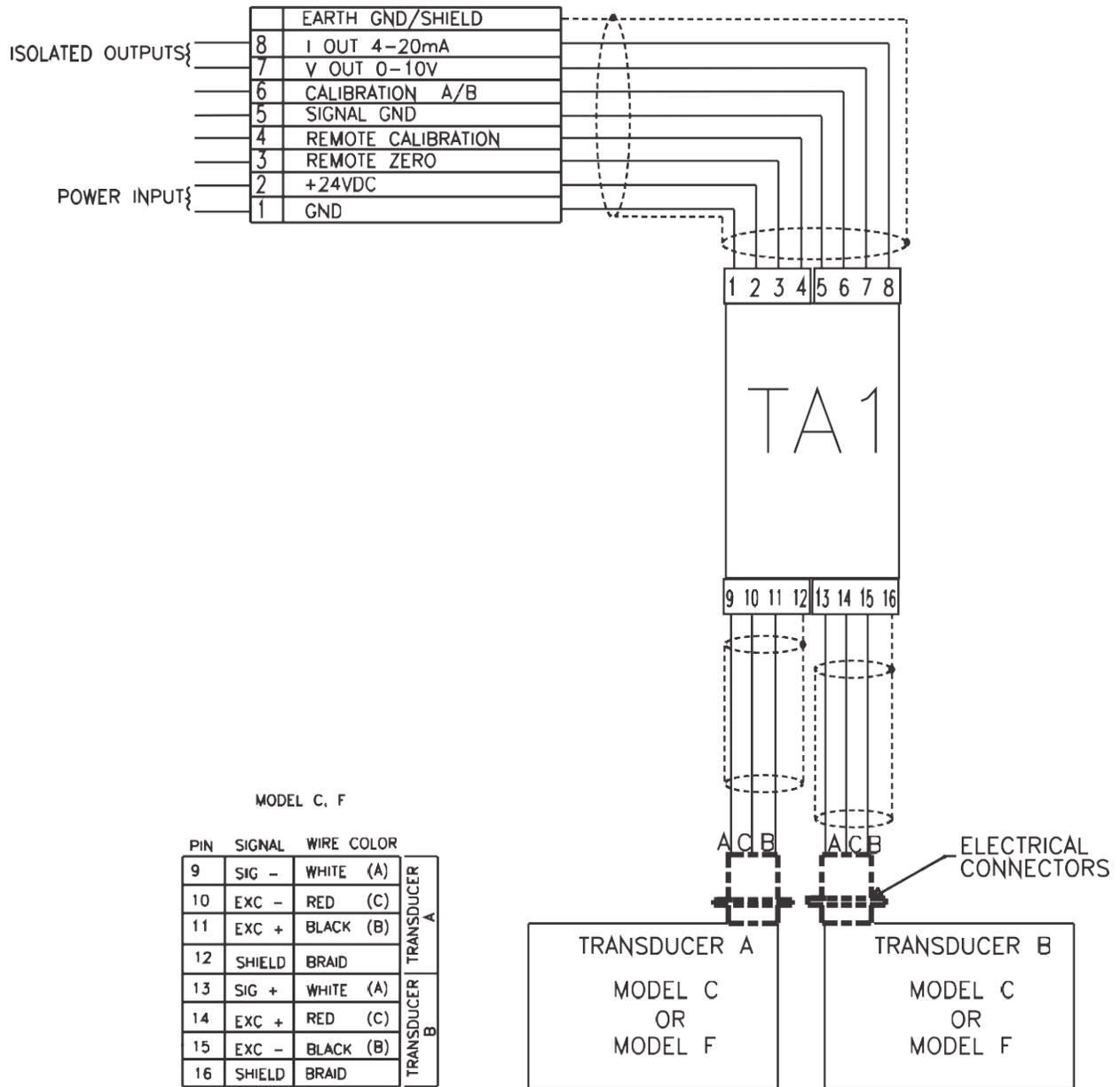


FIGURE 11 - Electrical Connections for Models C & F Transducers

APPENDIX A: TRANSDUCER CONNECTIONS CONTINUED...

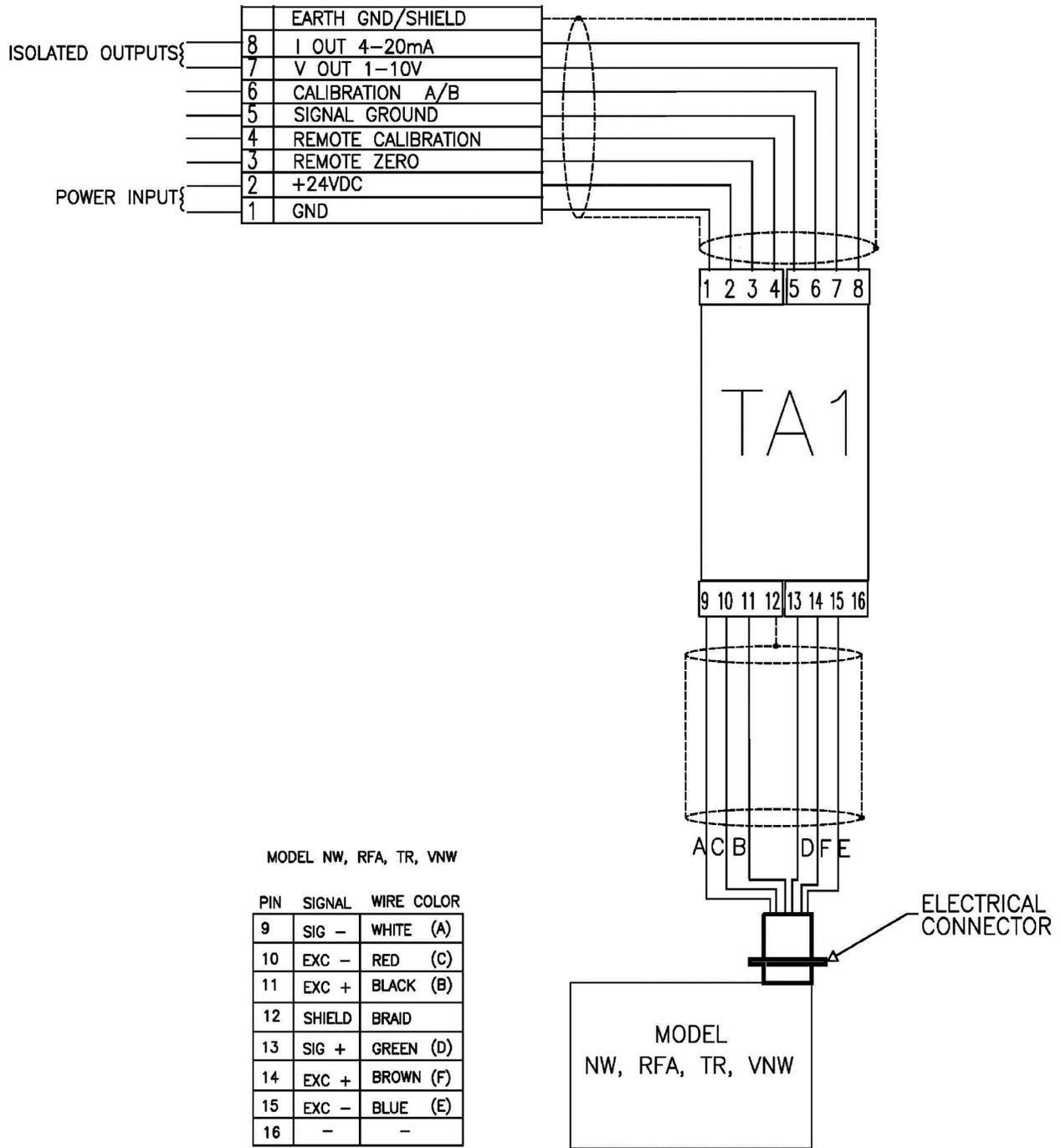


Figure 12 - Electrical Connections for NW, RFA, TR, LT & VNW Transducers

TERMS AND CONDITIONS OF SALE AND SHIPMENT

1. THE COMPANY

Dover Flexo Electronics, Inc. is here in after 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, to the original Buyer, its' products to be free of defects in material and workmanship for five years from date of original shipment. Repairs on products are warranted for 90 days from date of shipment. 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 misuse. Normal wear is not warrantied. 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 cannot 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. The warranty is void if the serial number tag is missing or not readable.

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 (MRA) must be obtained from the Company's factory before returning any material for which the original Buyer expects credit, exchange, or repairs. Material returned for credit must be unused, received back within 30 days of original ship date and shall be subject to a re-stocking charge of 15%. Special Product Requests (SPRs), product manufactured specially to customer specifications, and non-DFE product purchased on customer behalf 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 EXW 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. Claims of items missing from a shipment must be received, in writing, within 30 days of original shipment

10. CANCELLATION, CHANGES, RESCHEDULING

Special Product Requests (SPRs), product manufactured specially to customer specifications, and non-DFE product purchased on customer behalf shall not be returnable for any reason. Buyer will be subject to a 15% fee for any standard item on order with the Company which is cancelled by the Buyer. 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 cancelled 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 will apply to any letter of credit. There will also 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.

Rev.10 10/15/19



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