

INSTRUCTION MANUAL

EASYVIEW™

TENSION INDICATOR

Model TI25
with Quik-Cal™



5 YEAR WARRANTY



217 Pickering Road

Rochester, NH 03867-4630 U.S.A.

For assistance, please call:

TECHNICAL SERVICE - Installations, Start-Up, Troubleshooting, Repairs, Field Service, Returns. **techsupport@dfc.com**

CUSTOMER SERVICE - Replacement Parts, Individual Products, Questions about Orders, Manuals. **customerservice@dfc.com**

SALES - Product Information, Systems Application Questions, and placing orders for standard products and special systems. **sales@dfc.com**

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NEW

QUIK-CAL™ PUSHBUTTON ZERO-SET AND CALIBRATION-SET

The new EasyView tension indicator/transducer interface is built with a new labor-saving technology called Quik-Cal. **It does not have potentiometers for zero and calibration settings.** Instead, it has pushbuttons. Push the button once, for one second, and you are done!

No tension display is needed. No screwdriver is needed. No second-person is needed.

ZERO SET

The weight of the transducer roll produces an output that is not caused by web tension. This is not desirable because it is not a tension measurement. To set the output of the indicator to zero when there is no web tension, just press the ZERO button for one second.

CAL SET

The weight you select for calibration determines the full-scale tension signal output. The indicator automatically multiplies the weight by the built-in calibration ratio (1:10) to calculate full output.

The calibration ratio is the ratio of the calibration weight to the tension at full output.

The calibration ratio is 1:10, or 10%. So if you hang a 15 lb. weight and push the CAL button, the indicator will produce full output at 150 lbs. tension.

Be sure the transducers are sized properly for the maximum tension you calibrate for.

STABILITY is another benefit of this technology. The zero and calibration settings are stored digitally, so there is no drift over time and temperature variations as there can be with potentiometers.

Read Section 3.3 for details.

The EasyView™ is CE marked in its Enclosure version

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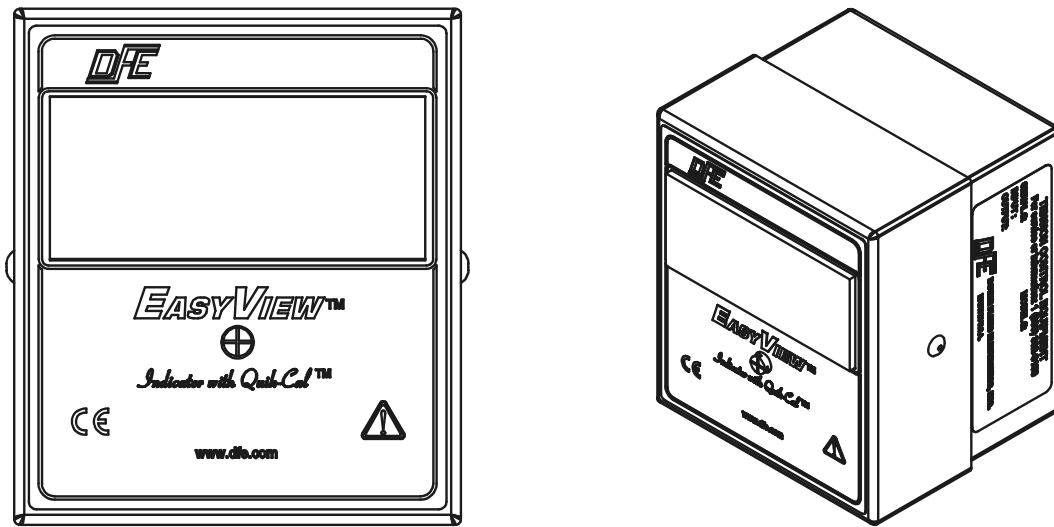
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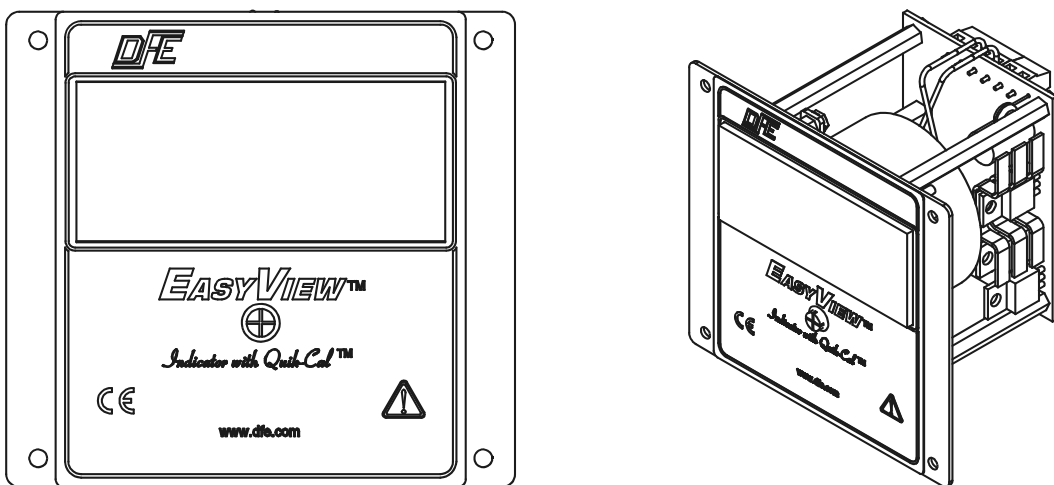
1.1 GENERAL DESCRIPTION

The EasyView™ is a small low cost, basic tension indicator for use anywhere tension needs to be displayed. It shows actual tension on an analog meter, or optional digital meter. An isolated 0-10Vdc output, which is proportional to tension, is provided for use with variable speed drives, computers, or recorders for tension control or display purposes. The EasyView is available in a full enclosure or a panel mount version for installation in a control panel. It can be used with any DFE tension transducer except the Low Tension model LT.

1.2 VIEWS OF THE EasyView



ENCLOSURE VERSION



PANEL MOUNT VERSION

Figure 1 - VIEWS OF EasyView ENCLOSURE AND PANEL MOUNT VERSIONS

1.3 SPECIFICATIONS

Power Input:	Voltage	.....	24 Vdc +/- 10%.
	Current	.....	0.1Adc typical. 0.3Adc internal fusing.
Tension Signal Outputs:		.....	0 to +10Vdc tension output, isolated from ground, 5mA maximum current.
Weight:		.....	2.0 lbs (0.91 kg)
Transducer Signal Input:		.....	0.5Vdc at rated load per pair.
Transducer Excitation:		.....	5Vdc.
Accuracy:		.....	Max error of 1% over temperature range. 0.1% Typical.
Zero (Tare) Range:		.....	Minimum 95% of transducer rating.
Calibration Range:		.....	Minimum 50 : 1.
Ambient Temperature Range:		.....	32°F to 113°F (0°C to 45°C).
Optional tension meter types:		.....	Digital (3 full Digit range).
Standard tension meter (analog) scales:		.....	0 to: 1, 5, 10, 25, 50, 100, 150, 250, 500, 1000.
Option Digital Tension Meter Scales		.....	0 to 1, 5, 10, 25, 50, 75, 100, 150, 200, 250, 300, 400, 500, 750

1.4 ENVIRONMENTAL CONDITIONS (Ref. Appendix E for further information)

This section applies to equipment designed to be safe at least under the following conditions:

- Indoor use.
- Altitude up to 6500 ft (2000 meters).
- Temperature range: 32° F to 113° F (0° C to 45° C).
- Maximum relative humidity 95% over the temperature range (non-condensing).
- Main supply voltage fluctuations not to exceed +/-10% of the nominal voltage.
- Pollution Degree 2 in accordance with EN61010-1:2001.

1.5 STANDARD FEATURES

- **Quik-Cal™** push-button zero and calibration eliminates pot adjustments to make calibrating simple and fast.
- **0 to 10Vdc Isolated Tension Output.** Proportional to tension. Used as an input to a controller or instrumentation system. Output is electrically isolated (standard). See Section 3.1 for installation and adjustment.

▲ 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 isolated circuit and chassis ground are more than **40Vpk** differential.

- **Easily serviceable.** The unit can easily be removed after disconnecting a few wires.
- **Small size.** Fits where many other products cannot.
- **Economical.** Provides many important features at a reasonable price.
- **Rugged.** Full metal enclosure, provides physical and electro-magnetic protection for amplifier circuits.
- **Output Isolated from Earth Ground.** Isolation is provided between the output circuit and transducer ground, simplifying installations.
- **Calibration LED.** Viewable only when unit is open for calibration. 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, LED will be on steady. LED will flash once to indicate acceptance of a ZERO or CALIBRATION button push.

1.5 STANDARD FEATURES continued...

- **Short Circuit Protection.** Unit automatically protects transducer excitation and tension output from short circuits or excessive loading. If a short circuit is detected, the unit will safely shut that portion of the circuit off until the fault is cleared. Unit automatically recovers when the fault is removed.
- **Self resetting fuse.** Product protects itself and connected equipment from more serious faults or fire hazard. Unit has an integrated fuse that automatically resets from tripped when unit is powered down.

1.6 OPTIONS

REFER TO SECTION 2.4 FOR INSTALLATION INSTRUCTIONS.

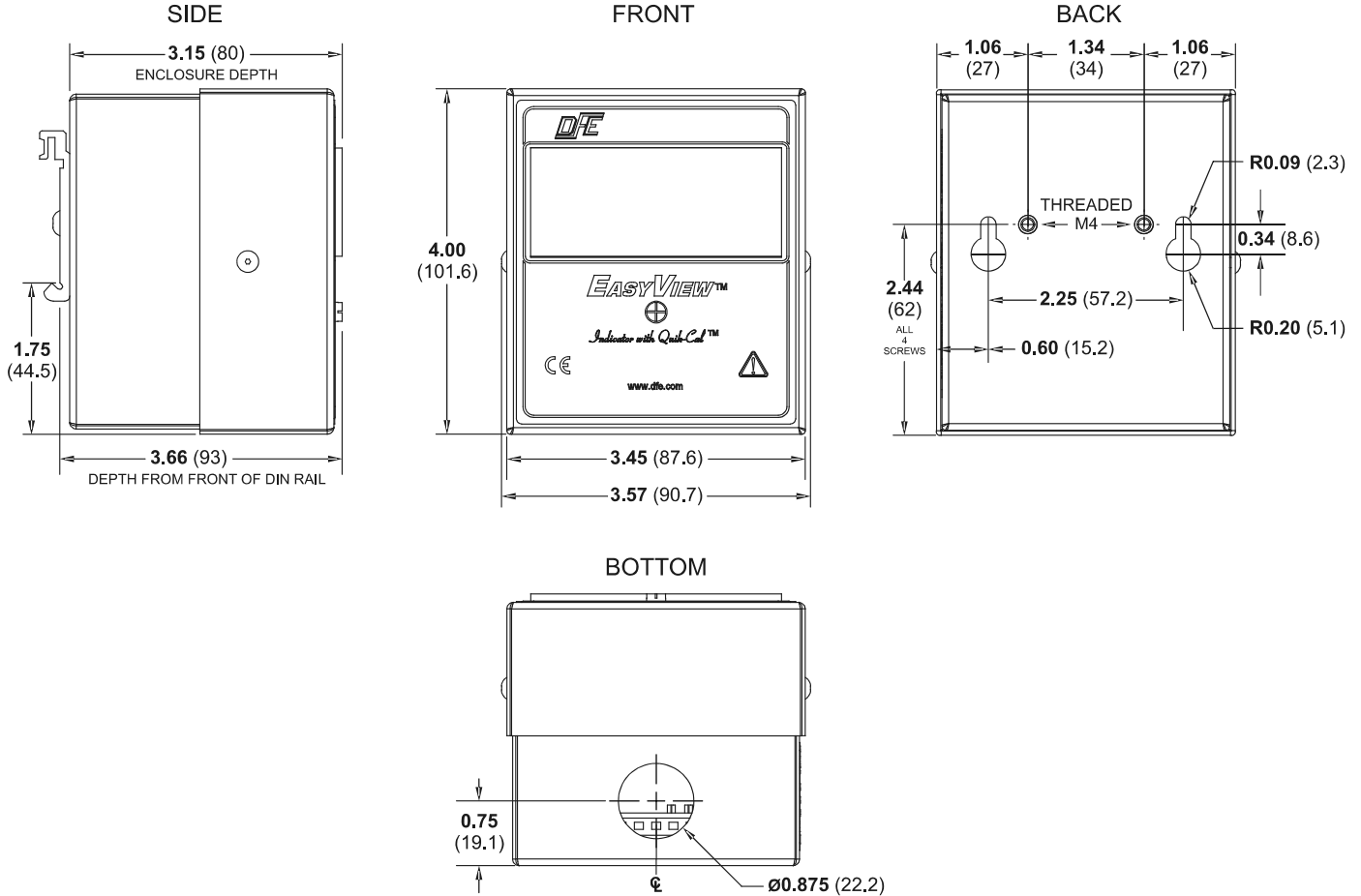
- **25% Calibration Ratio (25CW).** Calibration ratio of 25%.
- **DIN Rail Clip (DRC).** To be used with 35 mm DIN rail.
- **Digital Meter (DM)** for bright numeric readout of tension, 3 digits, allows viewing at a greater distance.
- **Hook & Loop (HL).** For easy fast mounting to most surfaces.
- **Non-Standard Meter Scale (NMS).** Custom scale other than standard scales listed.

SECTION 2

INSTALLATION

2.1 DIMENSIONS inches (mm)

ENCLOSURE VERSION:



PANEL MOUNT VERSION:

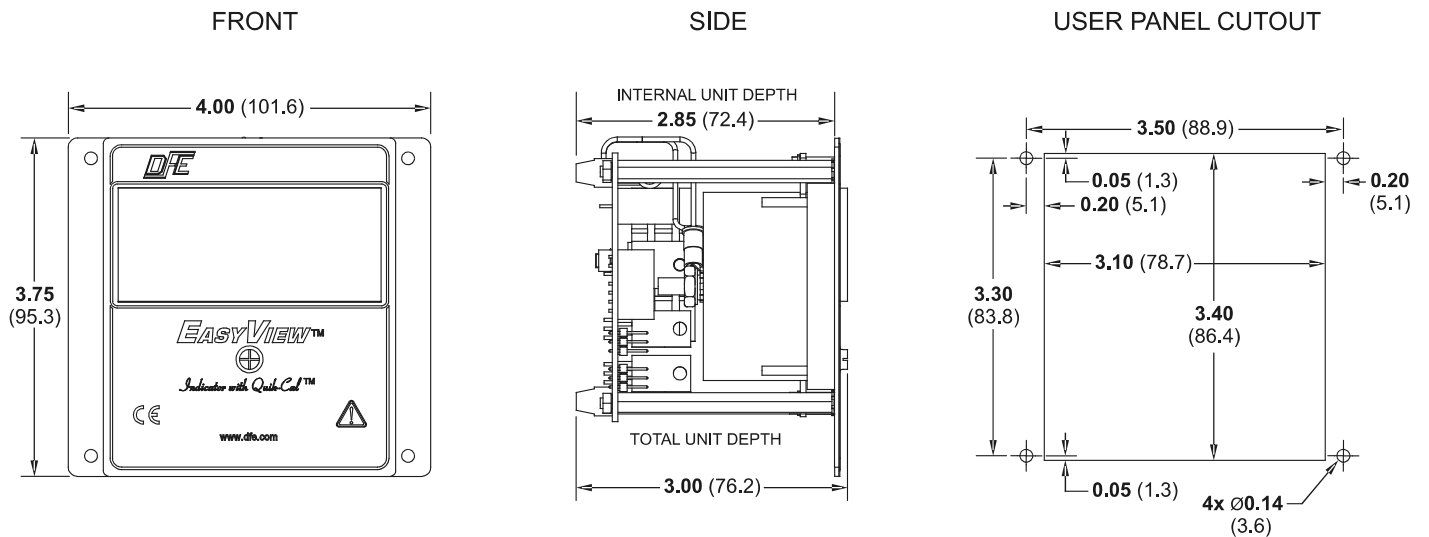


Figure 2 - DIMENSIONS

2.2 SELECTION OF MOUNTING LOCATION

The unit can be located in a machine cabinet or on an operator panel. It can also be mounted on the machine frame in the tension zone it indicates for. The unit should be secured to a wall or surface that can support in excess of 6 lbs. (2.75 kg).

2.3 SAFETY AND EMC REQUIREMENTS

▲ 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 isolated circuit and chassis ground are more than **40Vpk** differential.

! IMPORTANT: The DFE **EasyView** you have purchased has been tested and meets the European Union's Low Voltage Directive and EMC Directive only when installation is done correctly.

Secure all wiring to prevent inadvertent removal or strain.

In addition, to meet the EMC Directive, a proper transducer installation, including shielded cables (customer connection and transducer connection) must also be used.

The following is a list of **customer** connection cables available from DFE which meet the requirements for the EMC directive when properly used with EasyView: N-N indicates **N**o connector on either end.

EasyView			
721-2224	N-N	6-Conductor	15 ft.
721-2225	N-N	6-Conductor	20 ft.
721-2226	N-N	6-Conductor	25 ft.
721-2227	N-N	6-Conductor	30 ft.
721-2234	N-N	6-Conductor	“L” Specify length

! IMPORTANT: The customer connection cable has shield connections on both ends. Do not cut or leave the shields disconnected. The EasyView passes the customer shield connection through to the transducer cable. This creates a shield that extends from the customer connection shield end (where power and outputs are wired) all the way to the transducer (but not connecting to the transducer, to avoid ground loops).

The following is a list of **transducer** cables available from DFE which meet the requirements for the EMC directive when properly used with EasyView:

Other cables manufactured by DFE may also meet this requirement. Contact DFE for more information.

Cable shielding must be attached to the SHIELD connections on the terminal blocks.

TRANSDUCER MODEL	CABLE DESCRIPTION	DOVER PART NUMBER	QUANTITY NEEDED
C, F, UPB, RS	C-N 3 Conductor	721-1555, 15' 721-1542, 20' 721-1543, 25' 721-1544, 30' 721-0084, custom	2
RFA, VNW, TR1	C-N 6 Conductor	721-1558, 15' 721-1551, 20' 721-1552, 25' 721-1553, 30' 721-0964, custom	1
NW, TR2	C-N 6 Conductor	721-1610, 15' 721-1611, 20' 721-0984, custom	1

Note: C-N indicates connector at one end, no connector at the other end

If you wish to assemble your own cables, contact DFE for assembly instructions.

2.4 INSTALLATION INSTRUCTIONS

A. For Panel mount units:

1. Using the User Mount Cutout pattern in Figure 2, cut and drill the mounting holes.
2. Pull your wires out through the mounting hole to the unit.
3. Wire the unit as detailed below, then insert the unit through the hole and bolt in place.

B. For Enclosed units:

1. For standard wall mounting, find the center point of the bottom of the unit.
2. Make a line 2.44" long up from this point. Mark a horizontal line at this level.
3. Mark drill points 1.125" out on both sides of the vertical line along the horizontal line.
4. Drill and Tap 2 holes M4 or #8 diameter at these points. Screw your M4 or #8 screws into the holes completely, then back them off 3 full turns.
5. Position the unit over the screw heads and slide it down into position.
6. Remove the 2 M3 button head screw in the side of the enclosure. Carefully pull the unit out of the enclosure back. There is a strain relief connecting the 2 parts. You may let the unit hang from it.
7. Run the wiring up through the hole in the bottom of the enclosure back. Wire the unit as detailed below. Refer to the Calibration in section 3 or continue to close the unit for later.

C. Wiring:

1. Wire transducer cable(s) to terminal TB2. PCB labeling indicates terminal block number and appropriate pins.
2. Wire the customer connection cable to your tension controller or readout, or logger, and power supply as described below in Section 2.5. **Be sure to wire the customer shield lead to a proper chassis ground.**

2.4 INSTALLATION INSTRUCTIONS continued...

3. Wire the other end of the customer connection cable to the EasyView module (terminal TB1). PCB labeling indicates terminal block number and appropriate pins.
4. Calibrate the unit per Section 3
5. Close up:
 - a. For enclosed units; tuck the wiring into the unit and slide the unit back over the enclosure back. Slide the unit over the enclosure back section mounted in step 2 above, avoid pinching wires. Reinstall the 2 m3 button head screws. Do not over tighten them as they can be stripped out.
 - b. For Panel units; tuck wiring back through the hole, then insert the unit in the hole and bolt in place.

2.5 ELECTRICAL CONNECTIONS

Keep in mind that the indicator is designed to provide 0-10V output, isolated from input power.

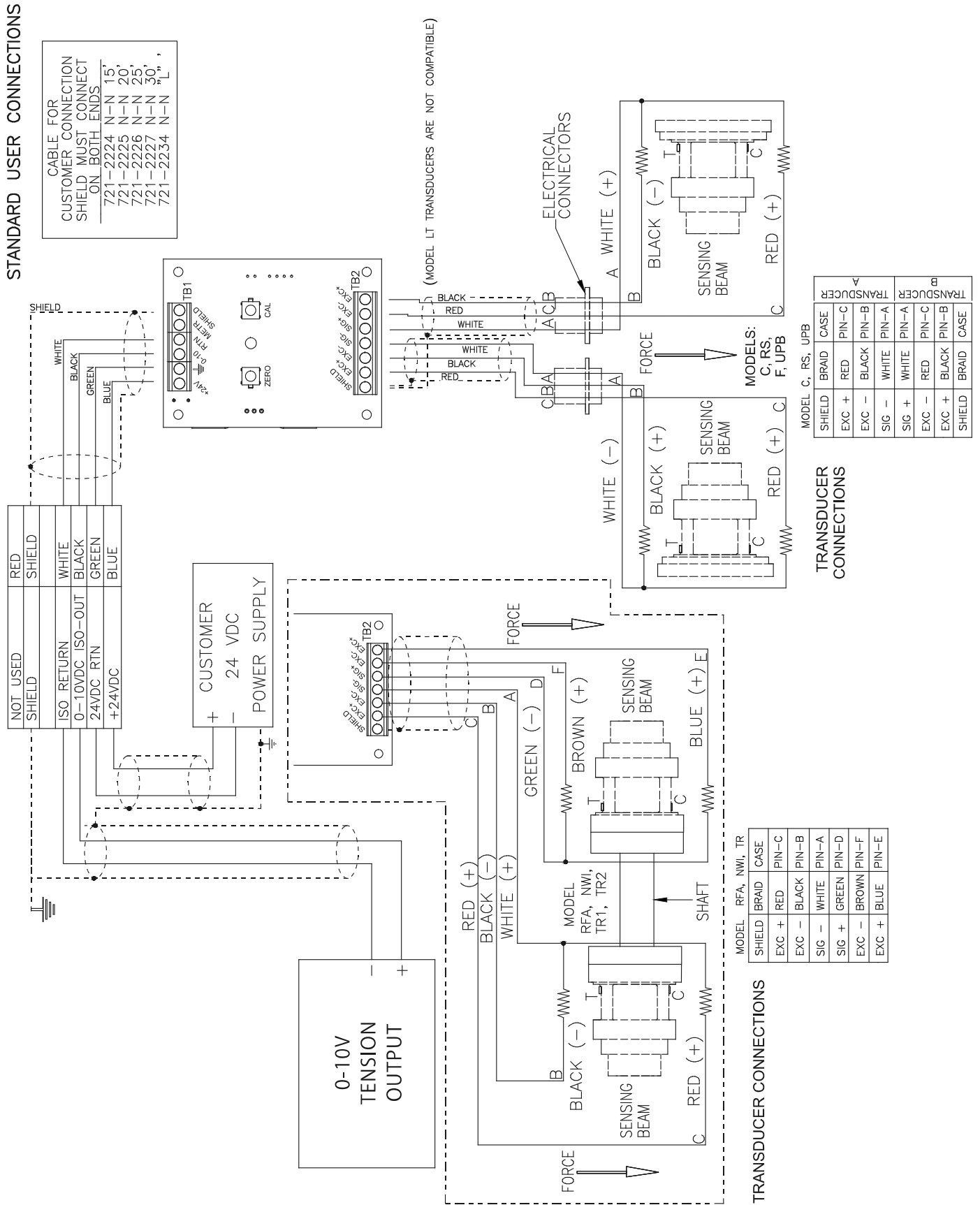


Figure 3 - ELECTRICAL CONNECTIONS FOR EasyView

3.1 PREPARATION

1. Select an appropriate calibration weight. Remember that the weight determines the value of web tension that will produce full output of the EasyView. A 15 lb. weight will result in full output at 150 lbs. tension. A spring scale can also be used, but absolute accuracy may be reduced.
2. Get a length of rope, wire, or cable of appropriate length. It must NOT be extensible (stretchy). This will cause inaccurate calibration.

3.2 MECHANICALLY ZERO THE TENSION METER

Turn off power to the EasyView and observe whether the tension meter needle rests at 0 when in the mounted position. If not, turn the adjustment screw on the front of the meter as required to set the meter needle at 0 on the scale.

Do not adjust the mechanical zero with power applied to the unit.

If the (DM) Digital Meter option is ordered, It will have been Zeroed and the scale (Range) set to match your order at the factory. To Re-zero or adjust the Scale consult the Digital Meter insert included in your order. Lost manuals are replaceable for a fee or you may download a PDF copy from our website at <http://www.dfe.com>

3.3 CALIBRATE THE OUTPUT FOR ACCURACY

Before you can Calibrate the unit, it must be opened (Enclosure) or pulled out (Panel).

To Open the Enclosure:

Remove the M3 screws in the sides of the enclosure. Pull the unit away from the Enclosure back. The unit will be limited in movement by a strain relief cable and the wiring. Turn the unit so you can see the circuit board from the back.

To Pull the Panel:

Remove the 4 corner mounting screws. Gently pull the panel out of the hole, tilting it up will help. The unit will be limited in movement by the wiring. Turn the unit so you can see the circuit board from the back.

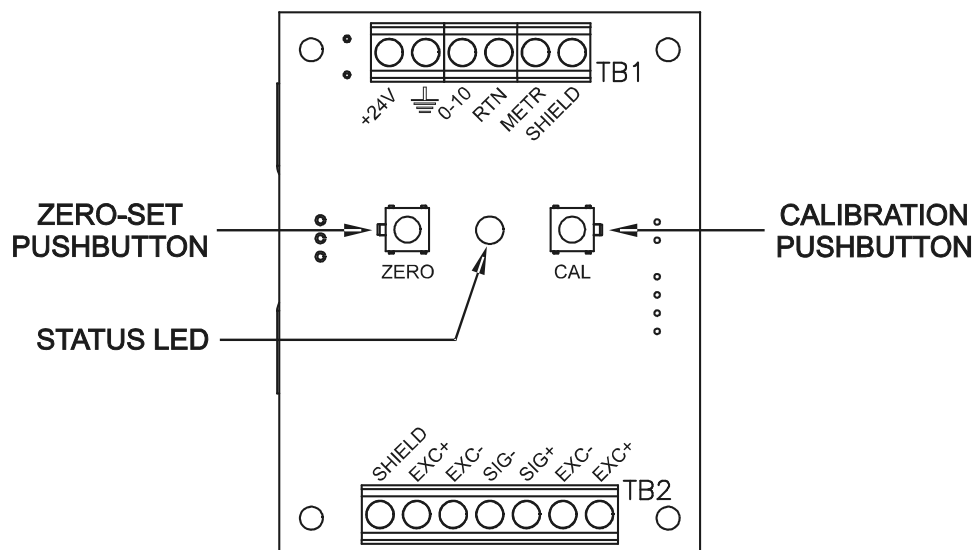


Figure 4 - CAL AND ZERO PUSHBUTTONS ON CIRCUIT BOARD

3.3 CALIBRATE THE OUTPUT FOR ACCURACY continued...

1. **ZERO:** Ensure nothing is hanging on or pressing on the transducer roll (including the calibration rope). Press the ZERO pushbutton on the units circuit board for at least 1 second. The unit will store the tension zero one second after the button is pressed. The unit will flash the green status LED (located between buttons on the circuit board) once to indicate the zero has been stored. Release the button. The output will read 0Vdc. The tension meter will read zero.
2. **CALIBRATION:** 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. Refer to Figure 5.
 1. Attach the weight to the free end of the rope as shown in Figure 5. The weight should not touch anything. Wait for the weight to stop swinging. Ideally, the rope will pass over the center of the transducer roll.

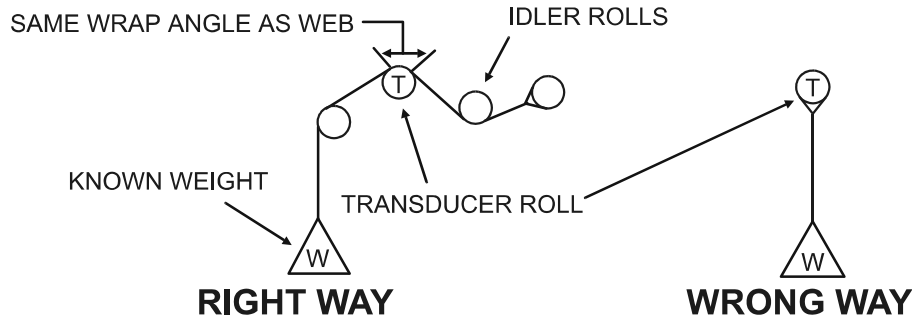


Figure 5 - WEB PATH

2. Press the CAL pushbutton on the units PC board for at least 1 second. The unit will store the calibration information one second after the button is pressed. The unit will flash the green LED **ONCE** (located between buttons on the circuit board) to indicate the calibration has been stored. The output will read 1.0Vdc after pressing calibration. The meter will read 10% of full scale.
3. Remove the weight and observe the output. It should read 0Vdc with nothing touching the tension sensing roller.
3. Re-zero can be performed at any time. Simply ensure nothing is touching the tension roller, and press ZERO until the green LED flashes, then release. The zero setting is updated, and the CALIBRATION is maintained.
!CAUTION: Do NOT press the ZERO or CAL pushbuttons while the web is running. The unit will store ZERO or CALIBRATION and the old settings can not be recovered. The only way to recover CALIBRATION is to perform this procedure starting at step 1.
The output calibration is now complete.

After Calibration the unit must be closed (Enclosure) or put back into panel (Panel).

To close the Enclosure:

Tuck the wires inside the unit and push the enclosure back onto the mounted back section. Re install the 2 M3 screws in the sides of the unit. Do not over tighten the screws, you will need to repeat this procedure occasionally.

To re-mount the panel:

Tuck extra wiring inside the panel. Slide the unit back into the hole and mount using the 4 corner mount holes.

Your tension indicator will display tension in your system without any further operator intervention. It is a good idea to make a check at roughly one month intervals to verify that no one has changed the calibration. See Section 3 for calibration and setup.

SECTION 5

CARE AND MAINTENANCE

It is not necessary to perform any type of maintenance on the unit. However, you may find it worthwhile to observe whether there is a buildup of dust, debris, or moisture on or near the unit after a period of time. If so, you may consider putting the unit in a more appropriate location.

Most problems are caused by incorrect installation and misapplication of the equipment. It is very important to be sure these factors are correct.

The green status LED (located between the CAL and ZERO pushbuttons on the amplifier circuit board) indicates the operating status of the unit. It should be steady green within one second of power application. The green status LED should not be flashing during operation except when pressing ZERO or CALIBRATION pushbuttons (LED will flash once indicating acceptance of ZERO or CAL). Continuous flashing is an indication of a problem, contact DFE technical support if this condition is observed.

- If the green status LED is not lit when power is applied, check power connection to unit. Also verify that the transducer excitation or outputs are not shorted.
- If status LED is still not lit after verifying power connection and outputs, disconnect power and let unit sit for at least 30 seconds. This will provide time for the internal self resetting fuse to reset if it has been tripped. Re-apply power and observe the status LED.
- If status LED is still not working, contact DFE technical support for assistance.

▲ WARNING: No user replaceable parts inside. Modifications to product internals (except under direction of DFE technical support) invalidates CE approval and warranty of the product. Do not attempt to replace or remove the internal fuse, it is self resetting and not replaceable by user. Attempts to bypass or replace the fuse **MAY CAUSE A FIRE HAZARD.**

If you have any problems with the functions on your EasyView, please call Technical Service at 603-332-6150 or Fax 603-332-3758. E-mail: techsupport@dfc.com.

DFE's experienced technicians are responsible to ensure that you are satisfied with your DFE equipment. They will be pleased to assist you.

1. CABLE LIST

To select the cables you will need, find the transducer model of interest, match it to the EasyView type you will be connecting to, and choose the desired cable length. Read across to obtain the correct part number and quantities for ordering. In all cases an output cable is required, but you may supply your own if desired.

TRANSDUCER MODEL	ACCESSORY DESCRIPTION	DOVER PART NUMBER	QUANTITY NEEDED
ALL	Output Cable 15' Lg	721-2224	1
ALL	Output Cable 20' Lg	721-2225	1
ALL	Output Cable 25' Lg	721-2226	1
ALL	Output Cable 30' Lg	721-2227	1
ALL	Output Cable "L" Lg	721-2234	1
C, UPB, RS	Input Cable 15' Lg	721-1555	2
C, UPB, RS	Input Cable 20' Lg	721-1542	2
C, UPB, RS	Input Cable 25' Lg	721-1543	2
C, UPB, RS	Input Cable 30' Lg	721-1544	2
C, UPB, RS	Input Cable "L" Lg	721-0084	2
RFA, TR1, VNW	Input Cable 15' Lg	721-1558	1
RFA, TR1, VNW	Input Cable 20' Lg	721-1551	1
RFA, TR1, VNW	Input Cable 25' Lg	721-1552	1
RFA, TR1, VNW	Input Cable 30' Lg	721-1553	1
RFA, TR1, VNW	Input Cable "L" Lg	721-0964	1
TR2, NWI	Input Cable 15' Lg	721-1610	1
TR2, NWI	Input Cable 20' Lg	721-1611	1
TR2, NWI	Input Cable "L" Lg	721-0984	1

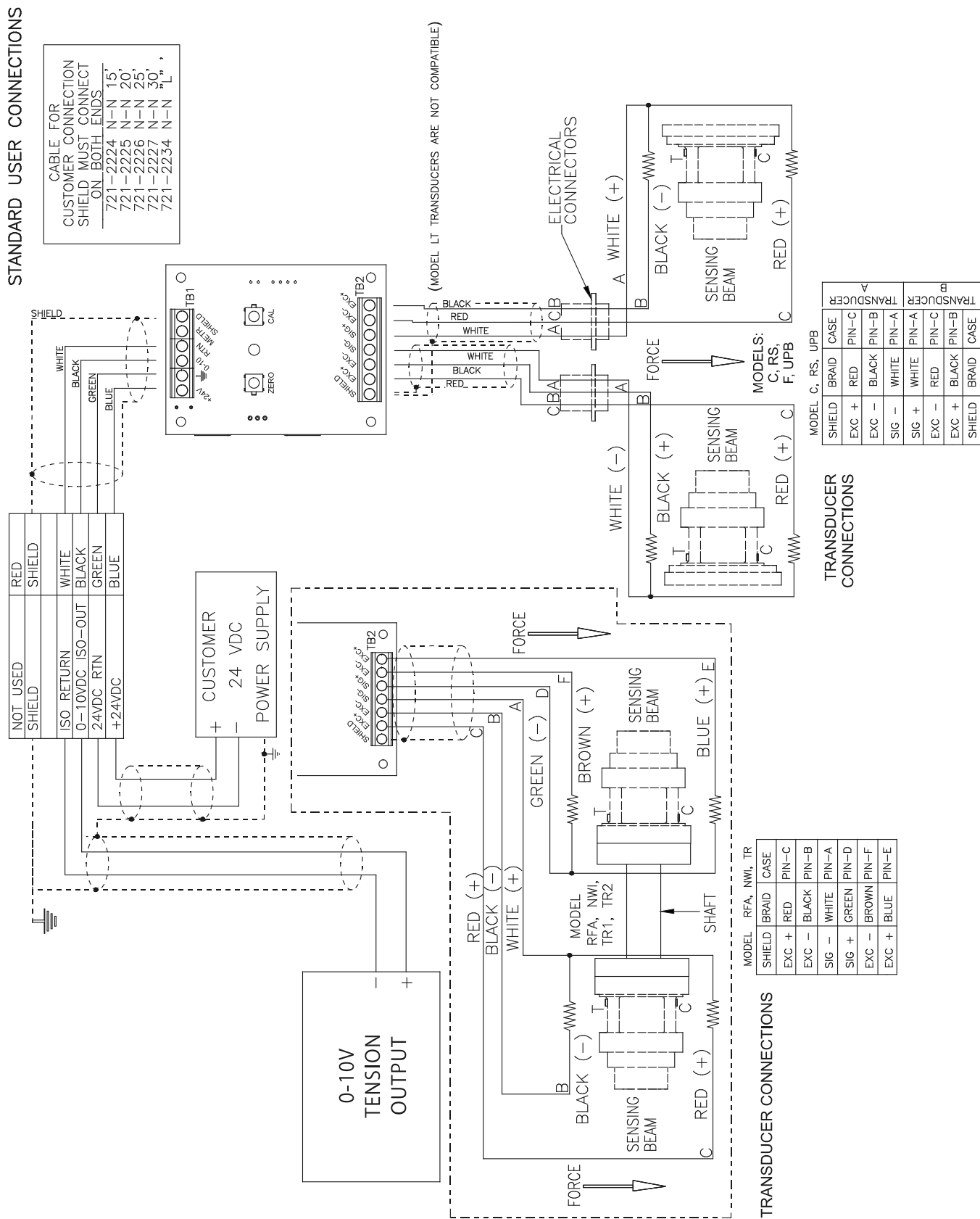


Figure 6 - ELECTRICAL CONNECTIONS

Appendix C: Typical Tensions for Various Materials

TYPICAL TENSIONS FOR WEB MATERIALS

ACETATE		0.5 lb. per mil per inch of width	
FOIL	Aluminum	0.5 lb. per mil per inch of width	
	Copper	0.5 lb. "	
CELLOPHANE		0.75 lb. per mil per inch of width	
NYLON		0.25 lb. per mil per inch of width	
PAPER 15 lb *		0.4 lb. per inch of width	
	20 lb	0.5 lb.	"
	30 lb	0.75 lb.	"
	40 lb	1.25 lb.	"
	60 lb	2.0 lb.	"
	80 lb	3.0 lb.	"
	100 lb	4.0 lb.	"
* based on 3000 sq. ft. ream			
PAPERBOARD	8pt	3.0 lb. per inch of width	
	12pt	4.0 lb.	"
	15pt	4.5 lb.	"
	20pt	5.5 lb.	"
	25pt	6.5 lb.	"
	30pt	8.0 lb.	"
POLYETHYLENE		0.12 lb. per mil per inch of width	
POLYESTER (Mylar)		0.75 lb. per mil per inch of width	
POLYPROPYLENE		0.25 lb. per mil per inch of width	
POLYSTYRENE		1.0 lb. per mil per inch of width	
RUBBER	<u>GAUGE</u>	<u>AT 25% STRETCH</u>	<u>AT 50% STRETCH</u>
	10 mil	1.75	3.68
	12 mil	1.10	2.03
	16.5 mil	4.09	8.17
	26 mil	2.47	4.97
SARAN		0.15 lb per mil per inch of width	
STEEL	<u>GAUGE - INS</u>	<u>UNWIND-PSI</u>	<u>REWIND-PSI</u>
	0.001 -0.005	1000	4000
	0.006 -0.025	850	3500
	0.026 -0.040	750	3000
	0.041 -0.055	650	2600
	0.058 -0.070	550	2200
	0.071 -0.090	450	1800
	0.091 -0.120	450	1400
	0.121 -0.140	400	1200
	0.141 -0.165	400	1000
	0.166 -0.200	400	900
	0.201 -0.275	400	800
	0.276 -0.380	300	700
	VINYL		0.05 lb. per mil per inch of width

*** For lam

inated webs, sum the tension for the individual webs and add 0.1 lb per inch of width.

OVERVOLTAGE CATEGORY: Classification of parts of installation systems or circuits with standardized limits for transient overvoltages, dependent on the normal line voltage to earth.

POLLUTION: Any addition of foreign matter, solid, liquid or gaseous (ionized gases), that may produce a reduction of dielectric strength or surface resistivity.

POLLUTION DEGREE 2: Normally only non-conductive POLLUTION occurs. Occasionally, however, a temporary conductivity caused by condensation must be expected.

TERMS AND CONDITIONS OF SALE AND SHIPMENT

1. THE COMPANY

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, 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 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. 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 must be obtained from the Company's factory before returning any material for which the original 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 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.

10. CANCELLATION, CHANGES, RESCHEDULING

Buyer shall reimburse Company for costs incurred for any item on order with the Company which is cancelled 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 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.

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