User's Manual: Series 350T
Model 350T Millivolt/Thermocouple DC Powered Transmitters

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List of Drawings

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IMPORTANT SAFETY CONSIDERATIONS
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It is very important for the user to consider the possible adverse effects of power, wiring, component, sensor, or software failures in designing any type of control or monitoring system. This is especially important where economic property loss or human life is involved. It is important that the user employ satisfactory overall system design. It is agreed between the Buyer and Acromag, that this is the Buyer's responsibility.

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INSTRUCTIONS: SERIES 350T
Millivolt/Thermocouple DC Powered Transmitters

INTRODUCTION:

These instructions cover the model types listed in Table 1 below. Supplementary sheets are attached for units with special options or features.

Table 1:

A. Model Number Format: 350T-Input-Output-Mtg-Certification-Calibration
B. Typical Model Number: 350T-TC1-Y-DIN-NCR-C

Series	-Input	-Output	-Mounting	-Certification	-Calib. *
350T	-MV1 -MV2 -MV3 -TC1 -TC3 -Jlxx -Klxx -Tlxx -Elxx -Rlxx -Slxx -BLxx	-Y -V0 -V5	-DIN	-NCR Approval**	(Blank) -C

Notes (Table 1):

* The MV1, MV2 and TC1 can be ordered with or without factory calibration ("-C" option). All other input types except custom linearizer ranges automatically include calibration to the customer's specification (no "-C" needed). Any customer specified calibration information will be included on a separate calibration label on the unit. For thermocouple units, the TC type, input calibration, and TC Break Detection (UP, DOWN or NONE) must be specified.

** Consult the factory for current information on agency (e.g. Canadian Standards Association, etc.) approvals.

xx Range Code Number: Standard range code will have a number (01, 12, etc.). Consult the selection and ordering guide for standard range codes. If the unit requires a custom range for the linearizer a "00" will be used and the unit's label will indicate the range.

DESCRIPTION:

These DC powered transmitters condition millivolt or thermocouple input signals and convert the signal to a process current or voltage output. Input circuit isolation is standard. The unit also provides high input impedance, thermocouple reference junction compensation, upscale or downscale thermocouple break detection, and wide-range zero and span adjustments. Optionally, a five segment linearizer is available to correct for thermocouple non-linearity over a customer-specified calibration range. The transmitters are RFI and EMI protected, operate over large temperature ranges, and feature excellent temperature coefficients, which minimize effects from the harsh plant environment.

The 350T Series are DIN-rail mounted transmitters designed to be used as functional components that provide the user with a modular approach to the varied applications in the field. The Series 350T complements the Acromag Series 250T two-wire transmitter line, providing the same input conditioning for three-wire applications. That is, Series 350T transmitters require a separate power supply connection, while the output signal and DC power share a common lead. The small package size, low power requirements, and wide supply range offers maximum flexibility to the system designer. As a three-wired DC powered device, it can also be used in critical applications that require the use of redundant supplies. The Series 350T includes reverse polarity protection, current limiting, and operates from a single 10V to 36V DC supply. In applications requiring only a single transmitter, the 350T can use available DC power, or it can be wired to an optional Series 35PS power supply module. The Series 35PS power supply module receives it's power from either 115V AC or 230V AC. Applications requiring multiple transmitters at a single location can more efficiently share a single DC supply. The modular approach of this design and companion Acromag flat-pack modules allows additional transmitters, input modules, isolators, and alarms to be easily integrated, as required. See Drawing 4501-249 for a simplified Series 350T schematic.

Input wiring is inserted in the bottom of the unit, while output and power wiring is inserted at the top of the unit. Screws to secure the wiring are located on the front panel. Connectors are screw-clamp type and accept wire size up to 14 AWG.

SPECIFICATIONS:

Function: This family of isolated, DC Voltage powered, transmitters condition either a millivolt or thermocouple signal, have input circuit isolation and convert the input signal to a process current or voltage output. The output and DC power share a common terminal (3-Wire connection). Wide-range zero and span adjustments utilize 22-turn potentiometers which are accessible from the front of the unit. Transmitter is DIN-rail mounted.

MODEL/SERIES: 350T- (Color coded with a white label)

INPUT: Millivolt and Thermocouple. Input span and zero ranges are adjustable as specified below, except for linearized thermocouples and special ranges which are factory calibrated per customer specifications. Both the span and zero adjustment capability are covered in two ranges, and are configured by internal jumpers on the circuit board. The narrow span units (-MV3 & -TC3) are configured and calibrated per customer requirements.

-MV1: Millivolt - Standard Span: Span: 5 to 55mV; Zero: -5 to +25mV.
-MV2: Millivolt - Wide Span: Span: 25 to 250mV; Zero: -25 to +125mV.
-MV3: Millivolt - Narrow Span (Custom Calibration): Unit handles millivolt spans from 3 to 5mV with the range factory calibrated to customer specifications.

-TC1: Thermocouple - Standard Span: TC Types J, K, T, E, R, S and B (Non-linearized): The TC Type is field selected via an Internal jumper.
J: ISA Type J, Iron/Constantan:
Span: 100 to 760°C Zero: -100 to 450°C
K: ISA Type K, Chromel/Alumel:
Span: 100 to 1200°C Zero: -100 to 600°C
T: ISA Type T, Copper/Constantan:
Span: 100 to 400°C Zero: -150 to +300°C
E: ISA Type E, Chromel/Constantan:
Span: 100 to 700°C Zero: -100 to +350°C
R: ISA Type R, Plat/Plat 13% Rhod:
Span: 550 to 1750°C Zero: 0 to 1200°C.
S: ISA Type S, Plat/Plat 10% Rhod:
Span: 550 to 1750°C Zero: 0 to 1200°C.
B: ISA Type B, Plat 6% Rhod/Plat 30% Rhod:
Span: 1000 to 1820°C Zero: 0 to 1000°C.

-TC3: Thermocouple - Narrow Span (Custom Calibration): Unit handles temperature equivalent millivolt spans from 3 to 5mV with the range factory calibrated to customer specifications. NOTE: The Thermocouple type and TC-Break (UP, DOWN or NONE) must also be specified. The linearization option is not available (or needed).

The following group of input types include the linearization circuit. The standard span transmitter is linearized per the customer specified calibration range. The range code (xx in Input field below) is used to represent the input range required. Consult the Selection and Ordering Guide for standard range codes. Custom range codes are also available --consult the factory.

-JLxx: ISA Type J, linearized.
-KLxx: ISA Type K, linearized.
-TLxx: ISA Type T, linearized.
-ELxx: ISA Type E, linearized.
-RLxx: ISA Type R, linearized.
-SLxx: ISA Type S, linearized.
-BLxx: ISA Type B, linearized.

Isolation: The input circuit is electrically isolated from the output and power circuits, allowing the input to operate at up to 250V AC, or 354V DC off ground, on a continuous basis (will withstand 1500V AC dielectric strength test for one minute without breakdown). This complies with test requirements outlined in ANSI/ISA-S82.01-1988 for the voltage rating specified.

OUTPUT: Process Current or Voltage output. The output shares a common with the power supply. Voltage outputs are designed to provide true voltage output, with zero volts included, and to be stable with capacitive loads.

-Y : 4 to 20mA DC (see Load Resistance Range Equation below)
-V0: 0 to 10V DC into 10,000 ohms or greater
-V5: 0 to 5V DC into 5,000 ohms or greater

Load Resistance Range Equation (-Y output option): The maximum load resistance for 20mA compliance is a function of input supply voltage as follows:

R-Load (Maximum) = (Minimum VDC supply - 2.5V) / 0.02A
At 10.0V DC supply, R-Load = 0 to 375 ohms
At 12.5V DC supply, R-Load = 0 to 500 ohms
At 15.0V DC supply, R-Load = 0 to 625 ohms
At 24.0V DC supply, R-Load = 0 to 1075 ohms

Output Limiting: Voltage units: 150% of full scale output, nominal; Current units; 125% of full-scale output, nominal.

Output Ripple: Less than +/-0.1% of the maximum output span.

Power: An external DC power supply is required between the output (P) and (-) terminals. Transmitter current is for rated supply inputs, full-scale output, and no-load on voltage output units. Diode on transmitter provides reverse polarity protection. CAUTION: Do not exceed 36V DC peak, to avoid damage to the transmitter.

A. Process Current Output (-Y): +10.0V to 36.0V DC, 30mA (35mA at current limit).
B. Voltage Output (-V0): +12.5V to 36.0V DC, 9mA maximum.
C. Voltage Output (-V5): +10.0V to 36.0V DC, 9mA maximum.

Power Supply Effect:
DC Volts: less than +/-0.001% of output span per volt DC, for rated power supply variations (+/-0.003% per volt for narrow span units).
60/120 Hz ripple: less than +/-0.01% of span per volt peak-to-peak of power supply ripple.

Input Impedance:

A. Millivolt and Thermocouple Inputs (Without TC Break Detection): 1.0M ohm at 10mV span, typical; input current, +/-10nA, typical.

B. Thermocouple Inputs (Utilizing TC Break Detection): 400K ohm at 10mV span; input current, +/-25nA, typical (+/-30nA, maximum).

Thermocouple Models:

A. Thermocouple Reference Junction Compensation: standard on all thermocouple units and functional over the entire operating temperature range. Includes unique circuitry to correct for reference junction non-linearity over ambient temperature. Reference Junction Compensation Ambient Temperature Effect: +/- 0.02^{o}C/^{o}C, typical.

B. Thermocouple Break Detection: user-selectable for Upscale, Downscale, or None. Up or downscale break detection is selectable via an internal jumper and activated via an external jumper.

Reference Test Conditions: Input: 0-10mV with a 100 ohm resistive source; Output (-Y units): 4-20mA DC (500 Ohm load); Output (-Vx units): 0-10V DC into 10K ohms or greater; Ambient 77^{o}F (25^{o}C); +15V DC supply.

Accuracy: Better than +/-0.1% of calibrated span or +/-0.01 mV, whichever is greater. This error includes the combined effects of transmitter repeatability, hysteresis, terminal point linearity (conformity instead of linearity for thermocouple inputs, non-linearized), and adjustment resolution. Does not include sensor error.

Linearization (-xLxx) Option: Optional linearized thermocouple units contain a five segment linearizer to correct for thermocouple non-linearity. This option offers low cost linearization and provides a minimum 10 to 1 improvement +/-0.1% in the linearity curve for the specified range of type J, K, T, R, S, E, and B ISA rated thermocouples.

Ambient Temperature Range: -13^{o}F to 185^{o}F (-25^{o}C to 85^{o}C).

Ambient Temperature Effect: Less than +/-0.01% of output span per ^{o}F (+/-0.018% per ^{o}C) over the ambient temperature range for reference test conditions; +/-0.025% of output span per ^{o}F (+/-0.045% per ^{o}C) for narrow span units at 5mV span. Specification includes the combined effects of zero and span over temperature.

Bandwidth: -3dB at 3 Hz, typical.

Response Time: For a step input, the output reaches 98% of output span in 300ms, typical.

Noise Rejection:

Common Mode: 130dB at 60 Hz, 100 ohm unbalance, typical.
Normal Mode: 30dB at 60 Hz, 100 ohm source, typical.

RFI Resistance: Less than +/-0.5% of output span with RFI field strengths of up to 10V/meter at frequencies of 27, 151 and 467 MHz.

EMI Resistance: Less than +/-0.25% of output span effect with switching solenoids or commutator motors.

Surge Withstand Capability (SWC): Input/Output terminations rated per ANSI/IEEE C37.90-1978. Unit is tested to a standardized test waveform that is representative of surges (high frequency transient electrical interference), observed in actual installations.

Construction:

Printed Circuit Boards: Military grade FR-4 epoxy glass circuit board.
Terminals: Compression type, wire size 14 AWG maximum.
Case: Self-extinguishing NYLON Type 6.6 polyamide thermoplastic UL94 V-2, color black. General Purpose, NEMA Type 1 enclosure.
Printed Circuit Board Coating: Fungus resistant acrylic conformal coat.
Mounting Position: Position insensitive.

MOUNTING:

-DIN: General Purpose Housing, DIN-Rail Mount - "G" & "T" rails. "G" Rail (32mm), Type EN50035; "T" Rail (35mm), Type EN50022. Refer to Drawing 4501-252 for outline and clearance dimensions.
Shipping Weight: 1 pound (0.45Kg) packed.

CERTIFICATION: Consult the factory for current information on the availability of agency (e.g. Canadian Standards Association, Factory Mutual, etc.) approvals.

-NCR: No Certification Required.

INSTALLATION:

The transmitter is packaged in a general purpose type of enclosure. Use an auxiliary enclosure to protect against unfavorable environments and locations. Maximum operating ambient temperatures should be within -13 to 185^{o}F (-25 to 85^{o}C) for satisfactory performance. If the unit is factory calibrated, it is ready for installation. Connect as shown in the connection diagram of Drawing 4501-249. If the unit is not factory calibrated, refer to the "CALIBRATION" section.

Mounting: Mount transmitter assembly - refer to Drawing 4501-252 for mounting and clearance dimensions.

DIN Rail Mounting: Using suitable fastening hardware, secure the DIN rail to the designated mounting surface. A transmitter, can be mounted to either the "T" or "G" Rail. Installation of the transmitter to the rail depends on the type of DIN rail used. Units can be mounted side by side on 1.0 inch centers, if required.

"T" Rail (35mm), Type EN50022: To attach a transmitter to this style of DIN rail, angle the top of the unit towards the rail and locate the top groove of the adapter over the upper lip of the rail. Firmly push the unit towards the rail until it snaps solidly into place. To remove a transmitter, insert a screwdriver into the lower arm of the connector and pull downwards while applying outward pressure to the bottom of the unit.

"G" Rail (32mm), Type EN50035: To attach a transmitter to this style of DIN rail, angle the unit so that the upper groove of the adapter hooks under the top lip of the rail. Firmly push the unit towards the rail until it snaps solidly into place. To remove a transmitter, pull the lower part of the unit outwards until it releases from the rail, lift unit from rail.

Electrical Connections:

Regardless of the mounting configuration employed, the electrical connections are basically identical. The wire size used to connect the unit to the control system is not critical. All terminal strips can accommodate wire from 14-26 AWG. Strip back the insulation 1/4-inch on each lead before installing it into the terminal block. Input wiring may be either shielded or unshielded twisted pair. Output wires should be twisted pair. Since common mode voltages can exist on signal wiring, adequate wire insulation should be used and proper wiring practices followed. It is recommended that the output and power wiring be separated from the signal wiring for safety as well as for low noise pickup.

1. **Power:** Connect DC power supply per connection diagram, refer to Drawing 4501-249. These transmitters operate from DC power supplies only. Power supply voltage is not critical and normally should be from 10.0V to 36V DC. The supply voltage must not exceed 36 Volts, even instantaneously, and must be adequate to furnish full-scale current or voltage to the load. Variations in power supply voltage, above the minimum required, or load resistance have negligible effect on transmitter accuracy. Refer to "POWER" in the preceding SPECFICATIONS section for current requirements. The minus (-) power supply lead and the minus (-) output lead share a common terminal. This device includes input current limiting and reverse polarity protection. Refer to Drawing 4501-254 for other power supply configurations.

Ripple and Noise: Power supply ripple at 60Hz/120Hz is reduced at the load by the transmitter. The ripple at the load will be less than +/-0.01% of span per volt peak-to-peak of power supply ripple.

2. **Output:** Connect output per connection diagram, refer to Drawing 4501-249. Load range is a function of the module's output type; refer to "Output" in the preceding "SPECIFICATIONS" section. The output shares a common with the power supply.

3. **Grounding:** The transmitter housing is plastic and does not require an earth ground connection.

4. **Input:** Connect input per connection diagram, observe proper polarity, see label for input type. If unit is factory calibrated, the calibration label indicates range of input. NOTE: The input circuit is electrically isolated from the output/power circuit allowing the input to operate up to 250V AC or 354V DC off ground on a continuous basis. If your input is a thermocouple, the thermocouple break circuit will be activated by placing a short jumper wire between the input "+" and "L" terminals of the transmitter. The type of Break Detection, UP or DOWN, is configured internal to the transmitter - see CALIBRATION Section.

CALIBRATION:

A. TRANSMITTER:

This section provides information for configuration and calibration. If the unit was factory calibrated, jumpers have been placed in their proper positions and verification of the calibration can be made per the Adjustment Procedure. If the calibration of the unit is to be changed, first go to the "Shunt Block Configuration Procedure" before going to the Transmitter Adjustment Procedure."

1. Transmitter - Shunt Block Configuration Procedure:

The Thermocouple transmitter is quite universal in that it can be configured for any of the standard Thermocouple types. The Zero and Span adjustment range and the Thermocouple Break, UP or DOWN, can be configured. Before the adjustment procedure can proceed, the jumpers have to be configured to the requirements of the application (refer to Drawing 4501-251 for details). To gain access to the Configuration Jumpers, first remove transmitter from the installation. Second, remove the circuit boards from the plastic enclosure as described in the Disassembly Procedure below. Third, configure jumpers (shunt blocks) as described in the Jumper Configuration procedure below. NOTE: calibration per the Adjustment Procedure should be performed before the circuit boards `re reassembled within the plastic enclosure.

Disassembly Procedure for the 350T Plastic Housing:

The plastic housing has no screws, it "snaps" together. A flat-head screwdriver (Acromag 5021-216 or equivalent) is needed to pry the housing apart as described in the following steps.

CAUTION: Do not push the screwdriver blade into the housing more than approximately 0.1 inches while prying it apart. Handling of the printed circuit boards should only be done at a static-free workstation, otherwise, damage to the electronics could result.

1. To begin disassembly (refer to Drawing 4501-251) place the screwdriver at point A (left side of the transmitter). While pressing the blade into the seam, use a twisting motion to separate the sides slightly. Repeat this operation at point B.
2. Now that the two pieces have been partially separated, use the screwdriver blade to work the left side of the package loose by working around the transmitter and carefully prying the sides further apart. Repeat this action until it is easy to remove the left side from the plastic pins holding the pieces together.
3. Repeat this operation for the right side starting at points C and D.

CAUTION: If the two pc boards become separated while taking the package apart, re-align the boards making sure that the two headers (pins) and sockets at locations E and F are properly aligned and carefully push the boards back together.

Jumper Configuration (Shunt Blocks):

Shunt blocks are provided to accommodate in-field configuration changes. In case of misplacement, additional shunt blocks may be ordered from the factory. When ordering additional shunt blocks, refer to Acromag Part Number 1004-332.

1. Thermocouple Input: Determine the thermocouple type that you want to configure the transmitter for. Refer to table on Drawing 4501-251 for proper jumper (shunt) position.
2. Zero/Span Range: The Zero and Span shunt blocks should initially be placed in their default position, "IN" for each case, see Drawing 4501-251. During the process of Calibration, the need to change these jumper positions will be determined.

3. Thermocouple Break Detection: Determine whether Up, Down, or No
4. Break detection is required in your application, refer to Drawing 4501-162 for proper jumper (shunt) position. NOTE: This break circuit is activated by a small jumper wire connected between the (+) and (L) input terminals; if TC break detection is not desired, do NOT install the jumper. On millivolt units, this jumper wire is not installed.

   NOTE: For TC units, it is important to calibrate the transmitter with the TC-break configured per your requirements. Changing the TC break configuration afterward will affect your calibration.
5. Important: Mark the Transmitter's Configuration on the calibration label located on the enclosure. For Example: IN: Type J, UP, 100 to 400^{o}C.

Jumper Configuration Example:

The following is the configuration for the example below, configure as required by your application:

Configure internal jumpers as follows:
- A. Thermocouple Type: Type J.
- B. Zero/Span Range: Zero & Span Jumpers both "IN".
- C. Thermocouple Break: Set Upscale (an external jumper is required between the input (+) and (L) also, to activate).

2. Transmitter - Adjustment Procedure:

The calibration example below is for a thermocouple input, which requires an ice-point temperature reference. Calibration of millivolt units is similar, but a reference is not required. To simulate a thermocouple input, an Acromag Series 320 Reference, an ice-bath, or other suitable reference must be used. Refer to Drawing 4501-250. Narrow span and linearized units are already factory calibrated for best performance.

Connect transmitter as shown in the connection diagram Drawing 4501-249. For best results, the input signal source should be adjustable from -5mV to +80mV DC, settable to an accuracy of 0.1% or better, and have a source resistance of 100 ohms or less. The power supply voltage must be greater than 12.5V DC at the terminals of the transmitter. The output voltage must be measured to 0.1% accuracy or better for proper results.

The Zero and Span adjustments are accessible on the front panel of the transmitter, see Drawing 4501-249 for their location. The screwdriver blade used to adjust the potentiometers should not be more than 0.1 inch (2.54mm) wide. For optimum performance the span and zero capability of the unit is covered in two ranges, which are programmed by internal jumpers on the circuit board.

The Span (S) and Zero (Z) jumpers change the range of adjustment of the span and zero potentiometers. If the zero potentiometer range is found to be inadequate during calibration, move the Zero Shunt from "IN" (Default Position) to "OUT". If the span potentiometer range is found to be inadequate during calibration, move the Span Shunt from "IN" (Default Position) to "OUT". Only move this jumper when it is required. For Shunt Block location refer to Drawing 4501-251.

The voltage representing the temperatures at Zero and at Full-Scale are set on the millivolt source to obtain the two calibration points. Use Table 2 to convert each temperature to its equivalent millivolts (Reference = 0°C) for the thermocouple type used.

TABLE 2: Thermocouple Voltages vs. Temperature:
(Reference: National Bureau of Standards Thermocouple Tables)

Temp. °C	Thermoelectric J	Voltage in Millivolts K	T	E	(Ref. Junction at 0°C) R	S	B
-250		-6.404	-6.181	-9.719			
-200	-7.890	-5.891	-5.603	-8.824			
-150	-6.499	-4.912	-4.648	-7.279			
-100	-4.632	-3.553	-3.378	-5.237			
-50	-2.431	-1.889	-1.819	-2.787			
0	0.000	0.000	0.000	0.000	0.000	0.000	0.000
+50	2.585	2.022	2.035	3.047	0.296	0.299	
+100	5.268	4.095	4.277	6.317	0.647	0.645	
+150	8.008	6.137	6.702	9.787	1.041	1.029	
+200	10.777	8.137	9.286	13.419	1.468	1.440	
+250	13.553	10.151	12.011	17.178	1.923	1.873	
+300	16.325	12.207	14.860	21.033	2.400	2.323	
+350	19.089	14.292	17.816	24.961	2.896	2.786	
+400	21.846	16.395	20.869	28.943	3.407	3.260	
+450	24.607	18.513		32.960	3.933	3.743	1.002
+500	27.388	20.640		36.999	4.471	4.234	1.241
+550	30.210	22.772		41.045	5.021	4.732	1.505
+600	33.096	24.902		45.085	5.582	5.237	1.791
+650	36.066	27.022		49.109	6.155	5.751	2.100
+700	39.130	29.128		53.110	6.741	6.274	2.430
+800		33.277		61.022	7.949	7.345	3.154
+900		37.325		68.783	9.203	8.448	3.957
+1000		41.269		76.358	10.503	9.585	4.833
+1200		48.828			13.224	11.947	6.783
+1400					16.035	14.368	8.952
+1600					18.842	16.771	11.257
+1700					20.215	17.942	12.462
+1750					20.878	18.504	13.008
+1800							13.585

Transmitter - Calibration Example:

MODEL: 350T-TC1-Y-DIN-NCR
Input: 100 to 400^{o}C., Type J Thermocouple, TC Break: Upscale
Output: 4 to 20mA DC

NOTE: To obtain the most accurate calibration of thermocouple transmitters, apply power to the unit and allow several minutes for thermal stabilization before completing calibration.

1. Set the input source to 5.268mV (100^{o}C). Adjust the Zero (Z) pot until the output reads 4.000mA DC.
2. Set the input source to 21.846mV (400^{o}C). Adjust the Span (S)pot until the output reads 20.000mA DC.
3. Repeat steps 1 and 2 above, until the readings converge. The instrument is now calibrated. Several mid-point values should also be checked to verify proper operation of the transmitter. Remember that the transmitter will be linear with millivolts and not temperature, unless the transmitter includes a linearizer, only then will it will be linear with temperature. NOTE: If a transmitter is linearized, the transmitter can only be trimmed to the range specified on the label - no other range of calibration will give acceptable results.
4. After the above calibration procedure is complete, install the transmitter PC Board assembly back into its case as described in the assembly procedure below.

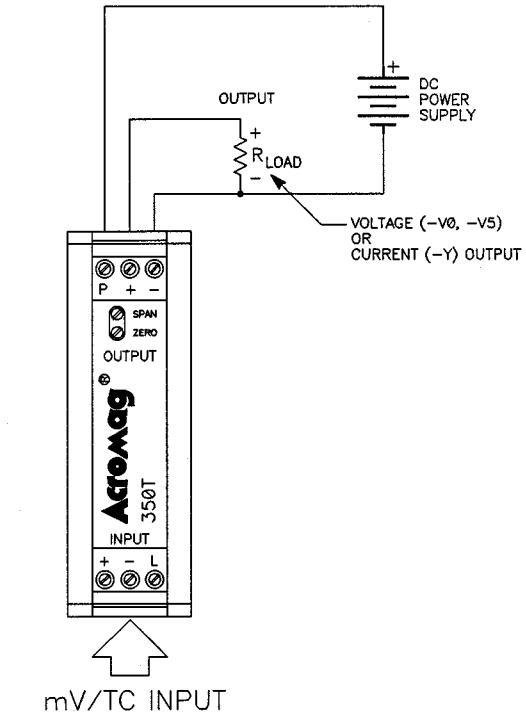
Assembly Procedure for the 350T Plastic Housing:

NOTE: The Model/Serial Number label is attached to the left plastic side.

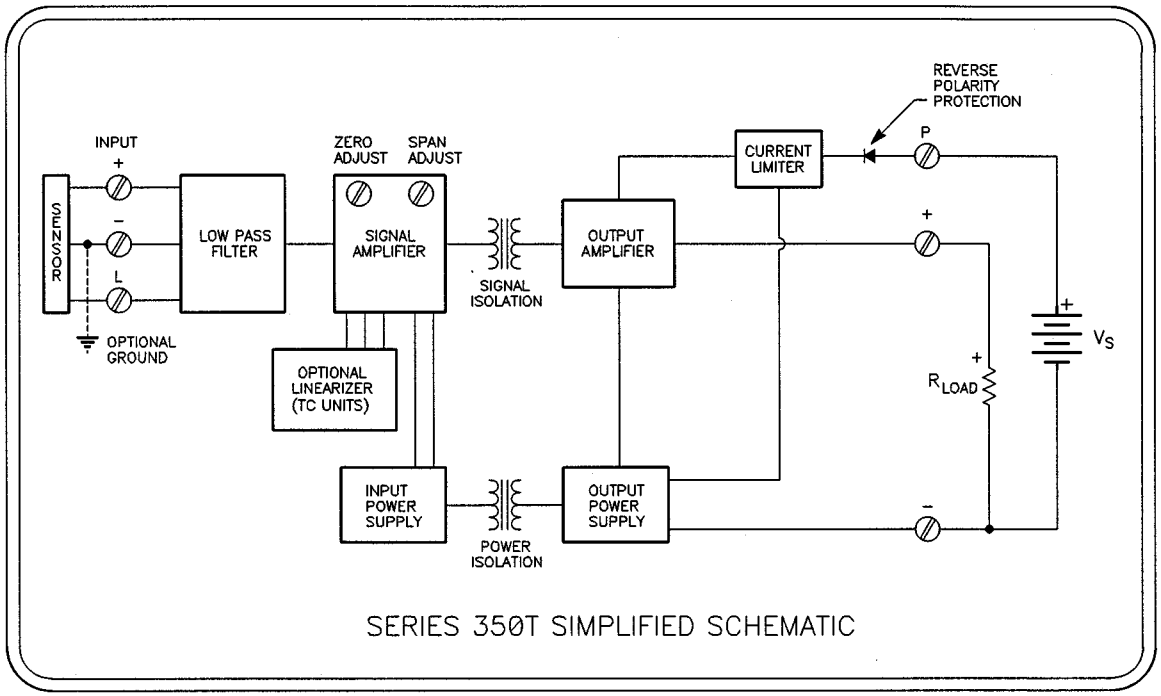
1. Refer to drawing 4501-251 and line up the left plastic side with the board and terminal assembly. Carefully but firmly press the pieces together.
2. Before installing the right side, place the mounting bracket (unique to the mounting type you have) around the pins at the back of the housing.
3. Line up the right side of the housing with the assembly and carefully but firmly press the pieces together.

GENERAL MAINTENANCE:

The transmitter contains solid-state components and requires no maintenance except for periodic cleaning and calibration verification. When a failure is suspected, a convenient method for identifying a faulty transmitter is to exchange it with a known good unit. It is highly recommended that a non-functioning transmitter be returned to Acromag for repair, since Acromag makes use of tested and burned-in parts, and in some cases, parts that have been selected for characteristics beyond that specified by the manufacturer. Further, Acromag has automated test equipment that thoroughly checks the performance of each transmitter.



mV/TC INPUT



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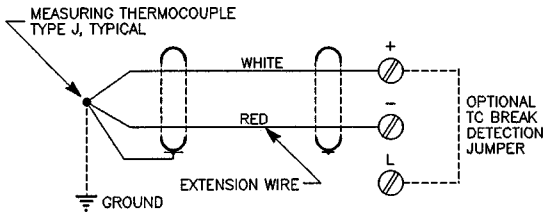
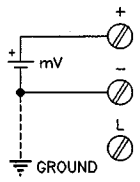


THERMOCOUPLE



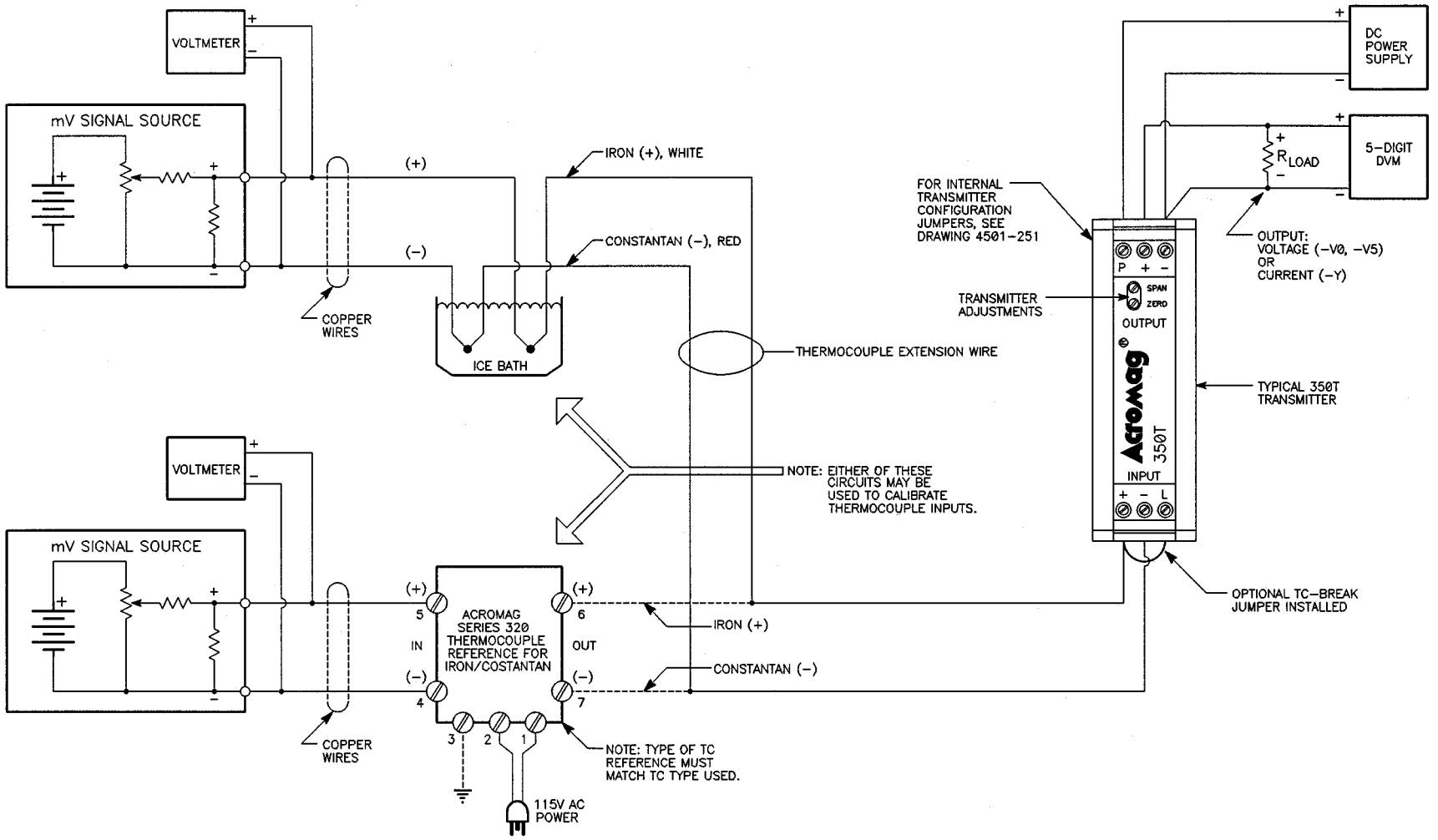
MILLIVOLT

INPUT CONNECTIONS

ANSI STANDARD THERMOCOUPLE COLOR CODE				
TYPE	(+) INPUT	COLOR	(−) INPUT	COLOR
J	IRON	WHITE	CONSTANTAN	RED
K	CHROMEL	YELLOW	ALUMEL	RED
T	COPPER	BLUE	CONSTANTAN	RED
R	PLAT./13% RHOD.	BLACK	PLATINUM	RED
S	PLAT./10% RHOD.	BLACK	PLATINUM	RED
E	CHROMEL	PURPLE	CONSTANTAN	RED
B	PLAT./30% RHOD.	GRAY	PLAT./6% RHOD.	RED

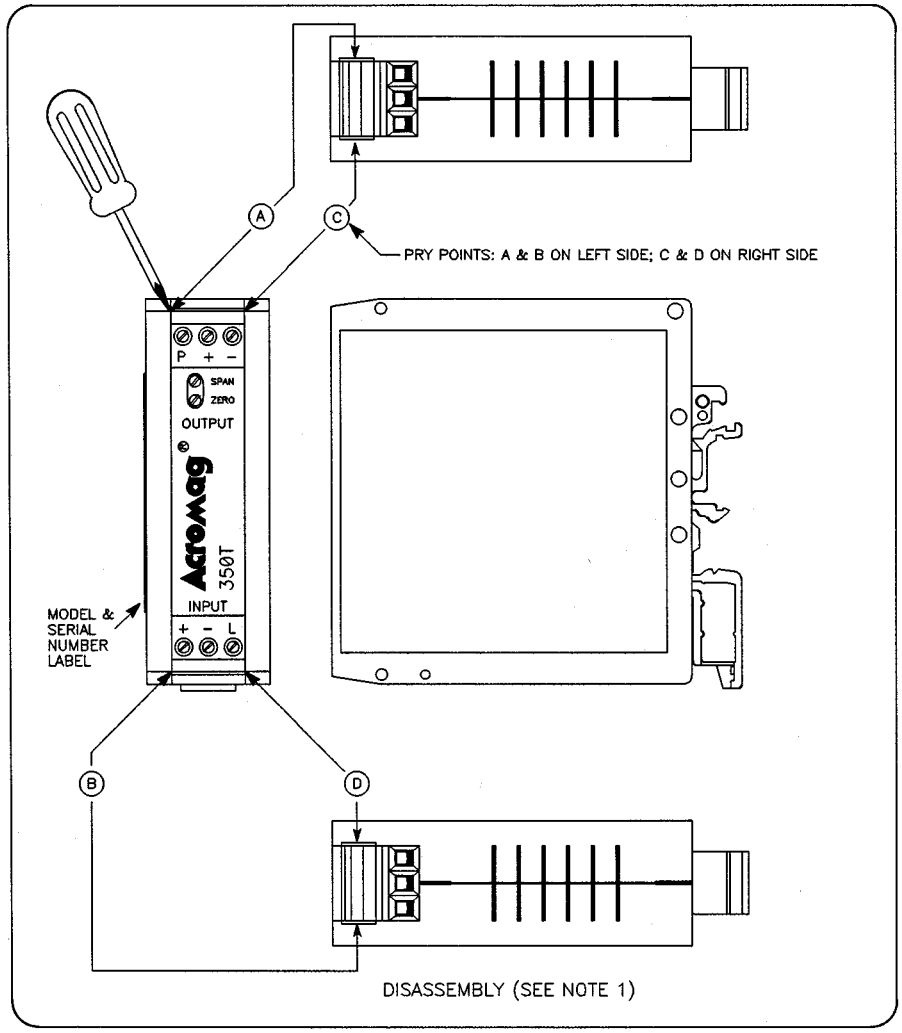
SERIES 350T mV/TC ELECTRICAL CONNECTIONS

Acromag WIXOM, MICH.						
	01-DEC-92	A		BC	BC	
	DATE	REV	ECN	DR	ENG	CLP
TITLE: 350T mV/TC INPUT CONNECTIONS						
D	SERIES: 350T	1 of 1	DWG NO. 4501-249	A		

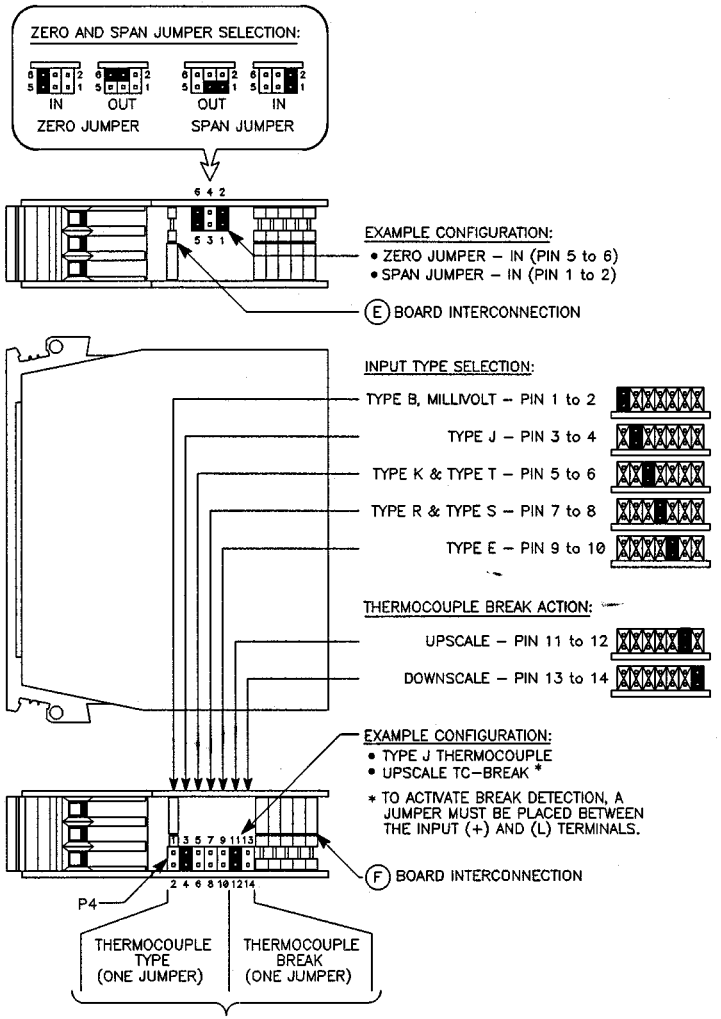


THERMOCOUPLE CALIBRATION CONNECTIONS

Acromag WIXOM, MICH.							
01-DEC-92	A		BC	BC			
DATE	REV	ECN	DR	ENG	CLP		
TITLE: 350T mV/TC CALIBRATION CONNECTIONS							
D	SERIES: 350T	1 of 1	DWG NO. 4501-250	A REV			



DISASSEMBLY (SEE NOTE 1)

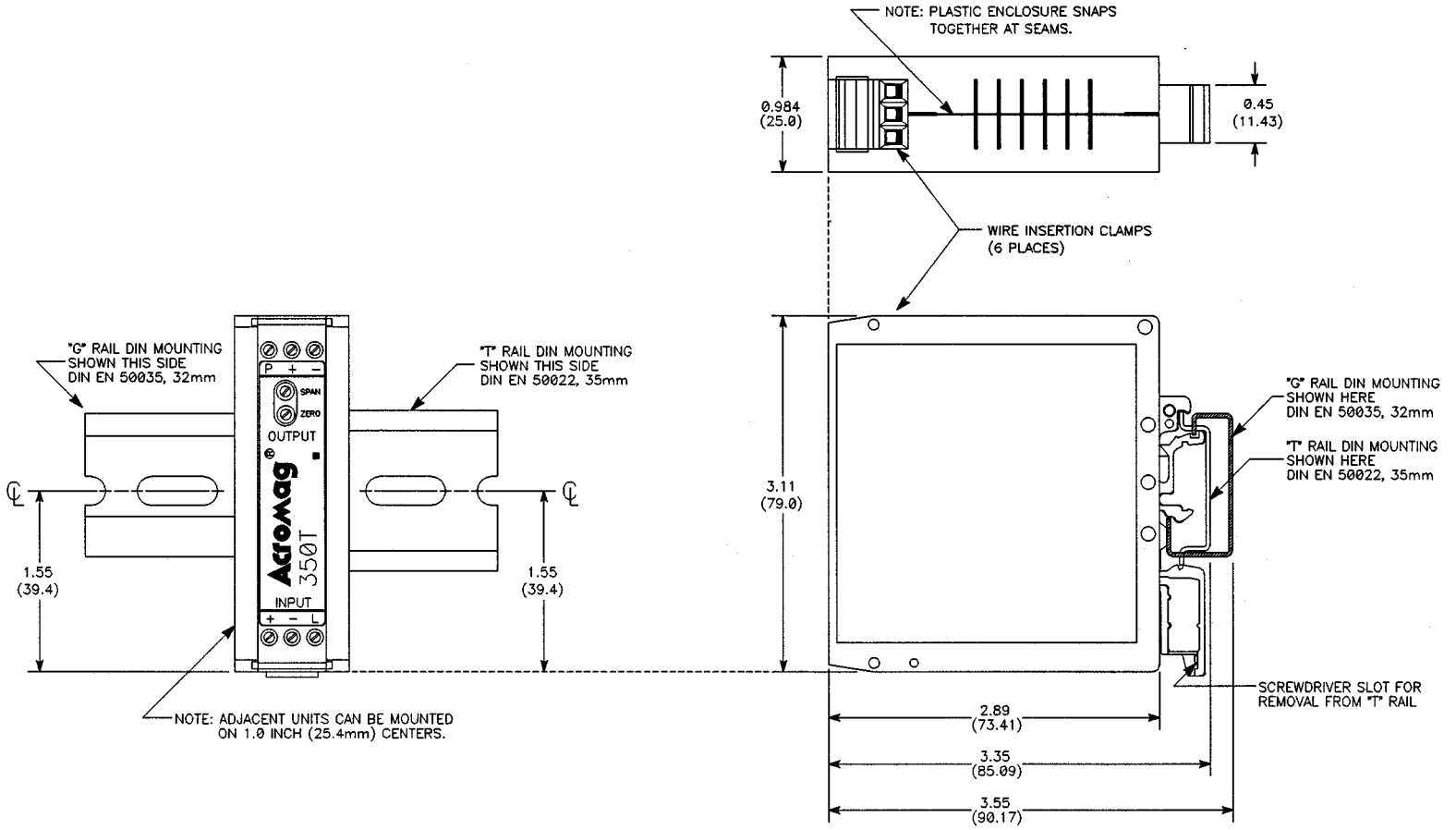


JUMPER CONFIGURATION (SEE NOTE 1)

NOTE: 1. REFER TO THE CALIBRATION SECTION OF THE MANUAL FOR DETAILED INSTRUCTIONS.

SERIES 350T mV/TC JUMPER CONFIGURATION

Acromag WIXOM, MICH.		18-DEC-92	A		BC	BC	
		DATE	REV	ECN	DR	ENG	CLP
TITLE: 350T mV/TC JUMPER CONFIGURATION							
D	SERIES: 350T	1 OF 1	DWG NO. 4501-251			A	REV



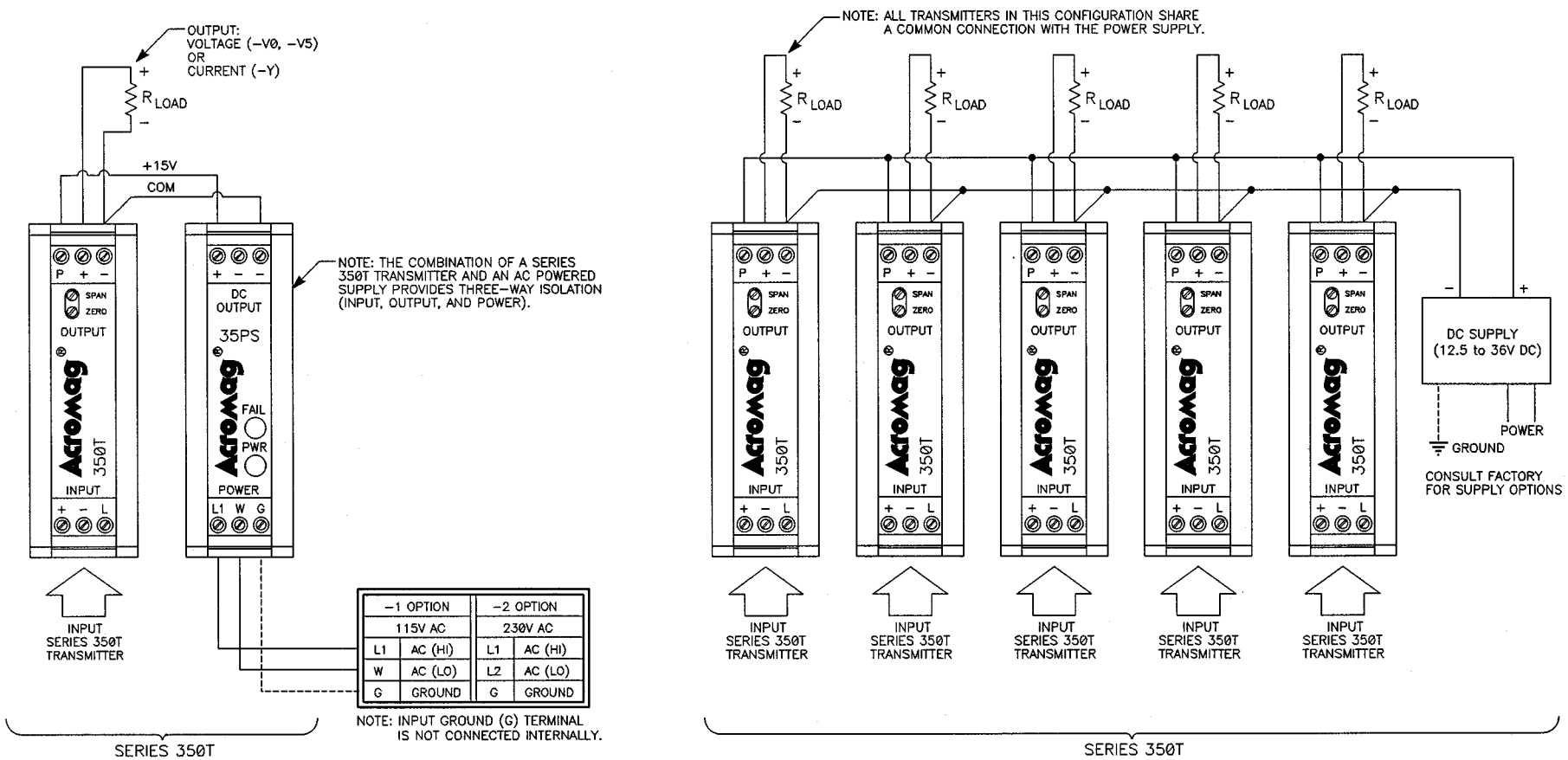
ENCLOSURE DIMENSIONS FOR DIN RAIL MOUNTING

NOTE: ALL DIMENSIONS ARE IN INCHES (MILLIMETERS).

Acromag WIXOM, MICH.	DATE	REV	ECN	DR	ENG	CLP
	12-FEB-93	B	93801	BC	BC	TH
	27-JAN-93	A	———	BC	BC	

TITLE: 350T HOUSING: DIN RAIL MOUNT

SIZE	SERIES		DWG NO.	REV
D	350T	1 OF 1	4501-252	B



POWER SUPPLY CONFIGURATIONS

Acromag WIXOM, MICH.							
	11–JAN–93	A		BC	BC		
	DATE	REV	ECN	DR	ENG	CLP	
TITLE: ELECTRICAL CONNECTIONS							
D	SERIES: 350T	1 of 1	DWG NO. 4501–254	A	REV		