



# 534HS Pressure Transmitter

## General Instructions

These instructions provide information for installation, process connection, electrical connection and field calibration of SOR® 534HS Pressure Transmitters. The 534HS Pressure Transmitter consists of a field proven thin film pressure transducer and a reliable electronic circuit. The housing features external adjustments and stainless steel construction.

The 534HS is capable of powering long cable lengths. See Formulas for maximum loop resistance formulas.

**NOTE: This instrument is non-repairable. If you suspect that it is defective, contact the factory or the SOR representative in your area for a return authorization number.**



## Installation

Ensure that wiring conforms to all applicable local and national electrical codes and install unit(s) according to relevant national and local safety codes.

Normally, line mounting provides adequate support for the instrument. When the installation is complete, the external adjustments must be accessible. (See Figures **B** and **D**) Determine whether the process connection or the electrical connection will be made first.

### Making the Process Connection First

The process connection is threaded onto a fitting within an adequately supported process piping system. Use two open end wrenches when connecting the pressure port to a

**NOTE: If you suspect that a product is defective, contact the factory or the SOR Representative in your area for a return authorization number (RMA). This product should only be installed by trained and competent personnel.**

*Design and specifications are subject to change without notice.*

*For latest revision, go to [www.sorinc.com](http://www.sorinc.com)*

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process piping system: one wrench to hold the hex flats of the pressure connection, the other to tighten the process fitting. Electrical connection may be rigid or flexible conduit.

### Making the Electrical Connection First

The electrical connection may be installed on an adequately supported rigid conduit system. Use suitable locknuts (not provided) when mounting the instrument to an unthreaded (knockout) hole. Process connection pipe or tubing may be rigid or flexible. Securely connect the conduit pipe or fitting by holding the hex on the electrical connection while tightening.



***Unit in Hazardous Locations – Prior to removal from service, make sure that the work area is declassified. Failure to do so could result in severe personal injury or substantial property damage.***


### Wiring 534HS - TN

Three 18” flying leads are provided for connection to a terminal strip within a cabinet or a splice within an outlet box:

**Red (+)** } Loop Voltage: 11 to 30 VDC; Output: 4 to 20 mA  
**Black (-)** }  
**Case ground** (bare wire) should be connected to earth ground.

Formula for determining maximum loop resistance:  $R_L (\text{Max}) = \frac{V_{\text{Supply}} - 11V}{}$

### Calibration

Two calibration screws (zero and span) are located underneath the adjustment cover. (See ) Loosen the cover screws slightly (do not remove) and rotate the cover to reveal the adjustment screws.

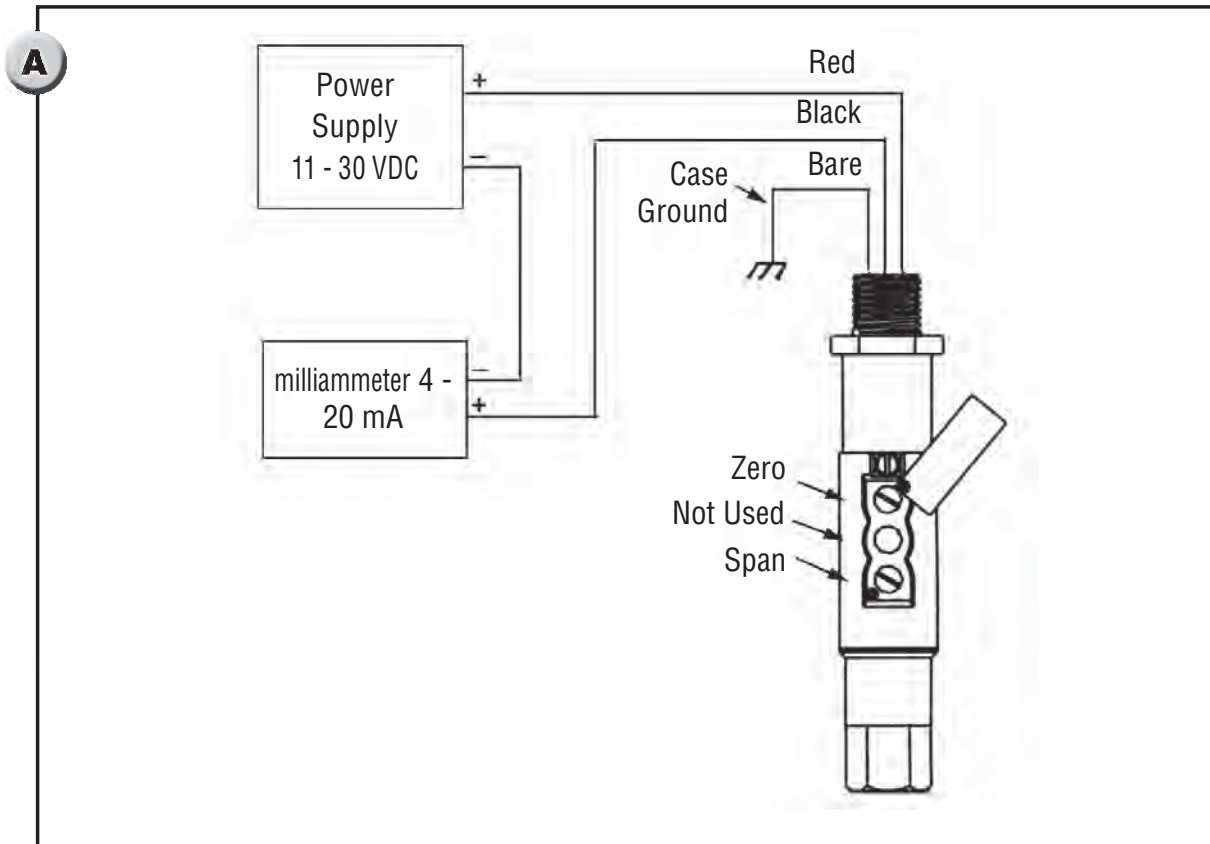
Numbers on the enclosure identify the adjustment screws: 1, 2 and 3.

Adjustment #1: Zero  
Adjustment #2: Not used  
Adjustment #3: Span

Unless specified otherwise, the transmitter is factory calibrated to 4 mA @ 0 psi and 20 mA at the upper limit of the adjustable range specified on the nameplate.

### Calibration Procedure

The zero and span calibration procedure should be performed under ambient process temperature conditions.



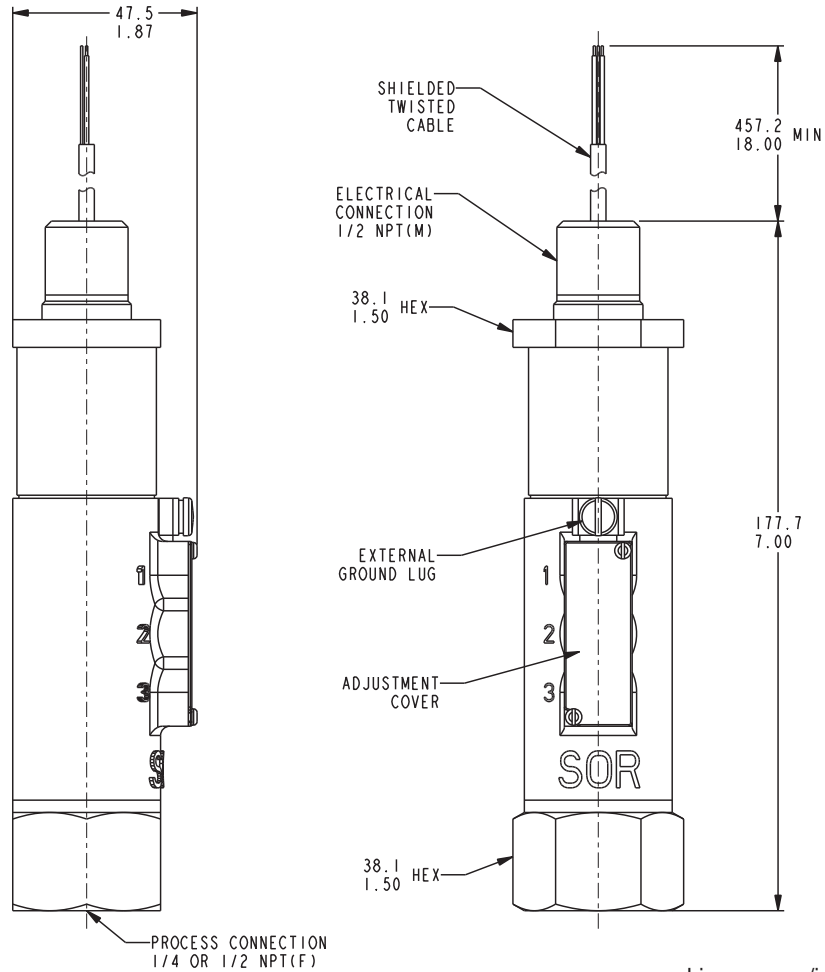
A pressure source with a calibrated reference gage, a milliammeter and a DC voltage supply are required. Note the adjustable range on the instrument nameplate. For both zero and span adjustments, turn the adjustment screw clockwise to increase, counterclockwise to decrease.

- ➊ Connect the transmitter as shown in **A**. Case ground must be connected to earth ground to ensure EMI/RFI protection.
- ➋ Apply pressure at which 4 mA output is desired. (Zero may be adjusted  $\pm 10\%$  of the upper range limit.)
- ➌ When zero is elevated above 0 psi, maintain 80% of the range of the transmitter range between the 4 mA and 20 mA points.
- ➍ With pressure source steady at the desired zero level, rotate the zero adjustment (#1) for a 4 mA indication on the milliammeter.
- ➎ Apply pressure at which 20 mA output is desired. Span may be adjusted from 20 to 100% of the upper range limit. (Maximum turndown is 5:1.)
- ➏ With pressure source steady at the desired span level, rotate the span adjustment (#3) for a 20 mA indication on the milliammeter.
- ➐ Repeat Steps 2 through 6 as needed if offsetting 4 mA from the normal zero point.

If interaction occurs, turn zero and span 15 turns counterclockwise. Repeat Steps 2 through 7 above.

## Dimensions

**B**



Linear = mm/inches

**Drawing 0091119**

*Dimensions are for reference only.  
Contact the factory for certified drawings for a particular model number.*

## Wiring 534HS-VN

Three screw terminals and center ground are provided for electrical connection, labeled as follows:

- + 11-30 VDC + Power Connection
- Power supply ground

**1-5 VDC Output**

**GND** Case ground should be connected to earth ground.

**Formula for determining maximum loop resistance:**

$$R_L (\text{Max}) = \frac{V_{\text{Supply}} - 16V}{\quad}$$

## Calibration

Two calibration screws (zero and span) are located underneath the adjustment cover. (See **D**) Loosen the cover screws slightly (do not remove) and rotate the cover to reveal the adjustment screws.

Numbers on the enclosure identify the adjustment screws: 1, 2 and 3.

Adjustment #1: Zero

Adjustment #2: Not used

Adjustment #3: Span

Unless specified otherwise, the transmitter is factory calibrated to 1 VDC @ 0 psi and 5 VDC at the upper limit of the adjustable range specified on the nameplate.

### Calibration Procedure

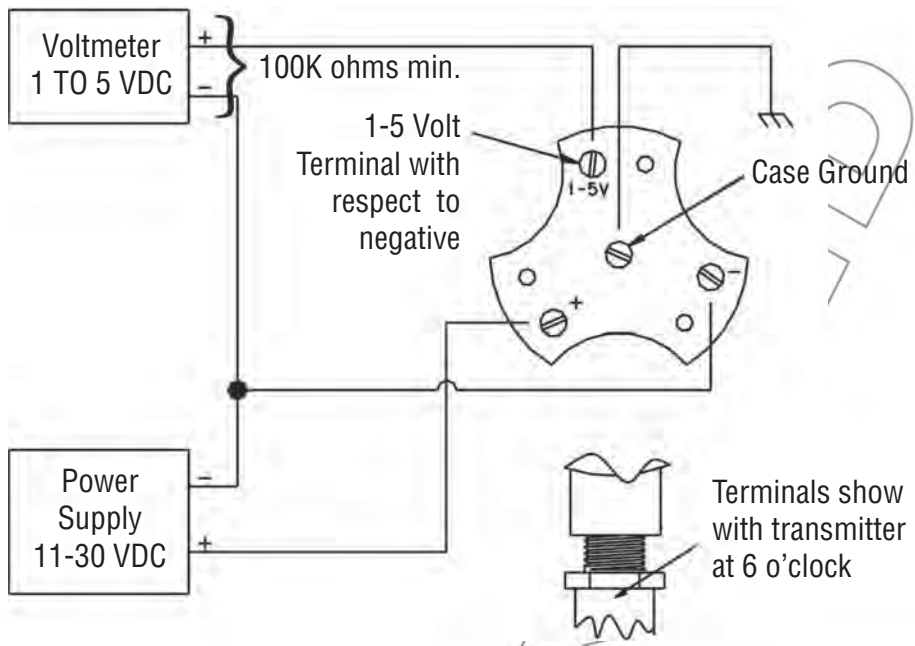
The zero and span calibration procedure should be performed under ambient process temperature conditions.

A pressure source with a calibrated reference gage, a voltmeter and a DC voltage supply are required. Note the adjustable range on the instrument nameplate. For both zero and span adjustments, turn the adjustment screw clockwise to increase, counterclockwise to decrease.

- ➊ Connect the transmitter as shown in Figure **C**. Case ground must be connected to earth ground to ensure EMI/RFI protection.
- ➋ Apply pressure at which 1 VDC output is desired. (Zero may be adjusted up to  $\pm 10\%$  of the upper range limit.)
- ➌ When zero is elevated above 0 psi, maintain 80% of the transmitter range between the 1 VDC and 5 VDC points.
- ➍ With pressure source steady at the desired zero level, rotate the zero adjustment (#1) for a 1 VDC indication on the voltmeter.
- ➎ Apply pressure at which 5 VDC output is desired. Span may be adjusted from 20 to 100% of the upper range limit. (Maximum turndown is 5:1.)
- ➏ With pressure source steady at the desired span level, rotate the span adjustment (#3) for a 5 VDC indication on the voltmeter.
- ➐ Repeat Steps 2 through 6 as needed if offsetting 1 VDC from the normal zero point.

If interaction occurs, turn zero and span 15 turns counterclockwise. Repeat Steps 2 through 7 above.

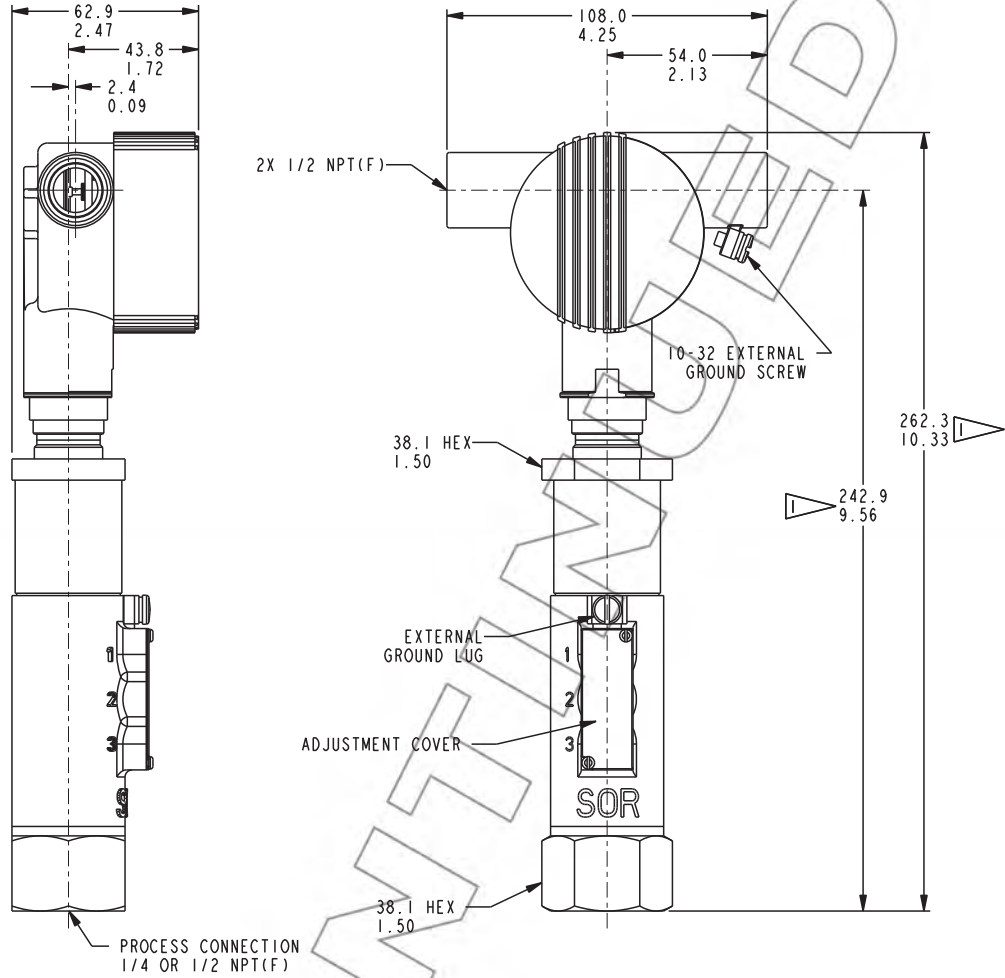
C



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# Dimensions

**D**



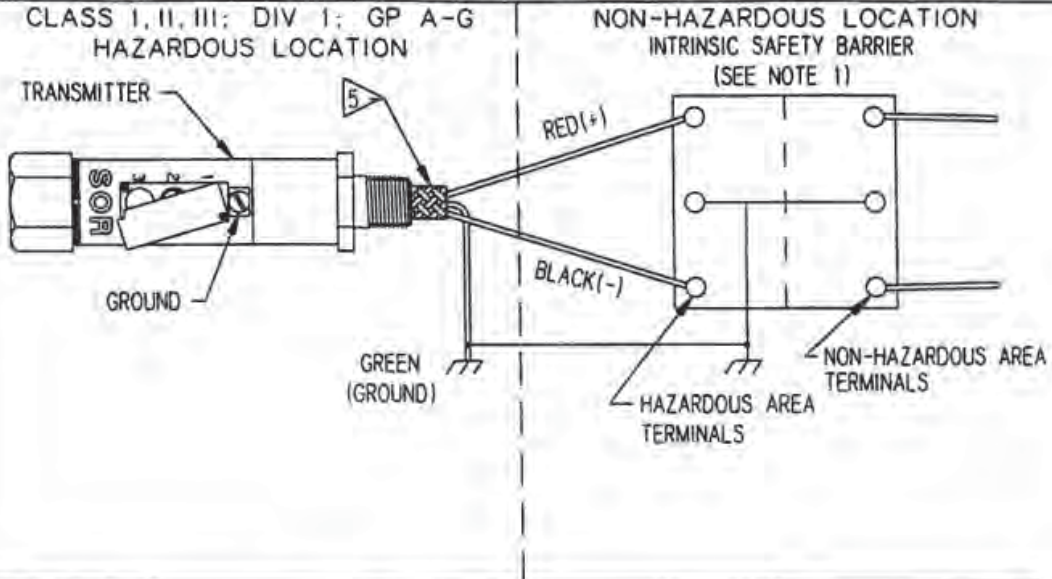
NOTES:  
 1. THIS DIMENSION IS APPROXIMATE AND BASED ON A 5 THREAD ENGAGEMENT.

Linear = mm/inches  
**Drawing 0091124**

*Dimensions are for reference only.  
 Contact the factory for certified drawings for a particular model number.*

**CONTROL DRAWING 9130-103**  
**SERIES 534HS TRANSMITTER**  
**FM APPROVED**

INTRINSICALLY SAFE (ENTITY)



ENTITY PARAMETERS	
$V_{max} = 30V$	$V_{oc} \text{ or } V_t \leq 30V$
$I_{max} = 100\text{ma (GP A-G)}$	$I_{sc} \text{ or } I_t \leq 100\text{ma for CL I, II, III; DIV 1; GP A, B, C, D, E, F, G}$
$I_{max} = 150\text{ma (GP C-G)}$	$I_{sc} \text{ or } I_t \leq 150\text{ma for CL I, II, III; DIV 1; GP C, D, E, F, G}$
$P_{max} = 1W$	$\left( \frac{V_{oc} \text{ or } V_t \times I_{sc} \text{ or } I_t}{4} \right) \leq 1W$
$C_i = 60\text{nF}$	SEE NOTE 1
$L_i = 4\mu\text{H}$	SEE NOTE 1

**NOTES:**

1. FMRC ENTITY APPROVED BARRIER, USED IN AN APPROVED CONFIGURATION WHERE BARRIER  $V_{oc}$  OR  $V_t$  DOES NOT EXCEED TRANSMITTER  $V_{max}$  AND BARRIER  $I_{sc}$  OR  $I_t$  DOES NOT EXCEED TRANSMITTER  $I_{max}$ .  $C_i$  OF TRANSMITTER PLUS CAPACITANCE OF INTERCONNECTING WIRING MAY NOT EXCEED BARRIER  $C_a$ .  $L_i$  OF TRANSMITTER PLUS INDUCTANCE OF INTERCONNECTING WIRING MAY NOT EXCEED BARRIER  $L_a$ .
2. CONTROL EQUIPMENT CONNECTED TO BARRIER MUST NOT USE OR GENERATE MORE THAN 250  $V_{rms}$  OR  $V_{dc}$ .
3. INSTALLATION SHOULD BE IN ACCORDANCE WITH ANSI/ISA PR12.6 "INSTALLATION OF INTRINSICALLY SAFE SYSTEMS FOR HAZARDOUS (CLASSIFIED) LOCATIONS" AND THE NATIONAL CODE (ANSI/NFPA 70).
4. ASSOCIATED APPARATUS MANUFACTURERS INSTALLATION DRAWING MUST BE FOLLOWED WHEN INSTALLING THIS EQUIPMENT.

5. BELDEN CABLE P/N 9501 NEC CM PCPT4 OR EQUIVALENT RATED AT 300V, 80°C MINIMUM

MAXIMUM LENGTH 45M (150ft).  
 CAPACITANCE OR 131 pF/M (40 pF/ft).  
 INDUCTANCE OF 0.82  $\mu\text{H/M}$  (0.25  $\mu\text{H/ft}$ ).  
 RESISTANCE OF 78.7  $\text{m}\Omega/\text{M}$  (24  $\text{m}\Omega/\text{ft}$ ).

THIS DRAWING NOT TO BE CHANGED WITHOUT FACTORY MUTUAL APPROVAL.



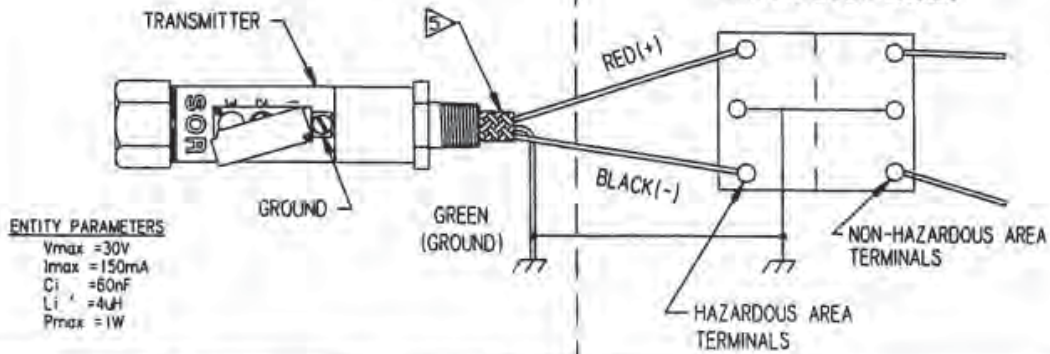


DRAWING NO. 9130-101

**CONTROL DRAWING 9130-101  
SERIES 534HS TRANSMITTER  
CSA CERTIFIED**

**HAZARDOUS LOCATION**  
CLASS I, II, III; DIV 1; GP A-G

**NON-HAZARDOUS LOCATION**



**ENTITY PARAMETERS**  
 $V_{max} = 30V$   
 $I_{max} = 150mA$   
 $C_i = 60nF$   
 $L_i = 4\mu H$   
 $P_{max} = 1W$

FOR INTRINSICALLY SAFE INSTALLATION, USE ONLY WITH A CSA CERTIFIED BARRIER WITH RATINGS AS FOLLOWS:

ZENER DIODE BARRIER STYLE	U MAX	R MIN	APPROVED FOR CL I, II, III
SINGLE CHANNEL	30Vdc	330 OHM	GROUPS A, B, C, D E, F, G
	28.5Vdc	300 OHM	
	25Vdc	200 OHM	
	22Vdc	180 OHM	
DUAL CHANNEL-SUPPLY -RETURN	SAME AS SINGLE CHAN		
SINGLE CHANNEL	30Vdc	150 OHM	GROUPS C, D, E, F, G
DUAL CHANNEL-SUPPLY	30Vdc	150 OHM	
-RETURN	10Vdc	50 OHM	

- NOTES: 1. FOR MULTI-BARRIER SYSTEMS, ALL BARRIERS MUST BE THE SAME POLARITY.  
 2. BARRIER GROUND AND TRANSMITTER GROUND MUST BE AT THE SAME POTENTIAL.  
 3. HYDROSTATIC TEST 10% OF EXPLOSION PROOF HOUSINGS TO 225 PSI FOR 1 MINUTE.

- BARRIERS MUST BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS.
- BARRIER PARAMETERS MUST MEET THE FOLLOWING REQUIREMENTS:  
 $V_{oc} \leq V_{max}$        $C_a \geq C_i + C_{Cable}$   
 $I_{sc} \leq I_{max}$        $L_a \geq L_i + L_{Cable}$
- MAXIMUM NON-HAZARDOUS AREA VOLTAGE MUST NOT EXCEED 250V.
- INSTALL IN ACCORDANCE WITH CANADIAN ELECTRICAL CODE, PART I.
- BELDEN CABLE P/N 9501 NEC CM PCCPT4 OR EQUIVALENT RATED AT 300V, 80°C MINIMUM  
 MAXIMUM LENGTH 45M (150ft)  
 CAPACITANCE OF 131 pF/M (40 pF/ft)  
 INDUCTANCE OF 0.82 μH/M (0.25 μH/ft)  
 RESISTANCE OF 78.7 mΩ/M (24 mΩ/ft).

Exia INTRINSICALLY SAFE/SECURITE INTRINSEQUE  
 WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.  
 ADVERTISSEMENT: LA SUBSTITUTION DE COMPOSANTS PEUT COMPROMETTRE LA SECURITE INTRINSEQUE

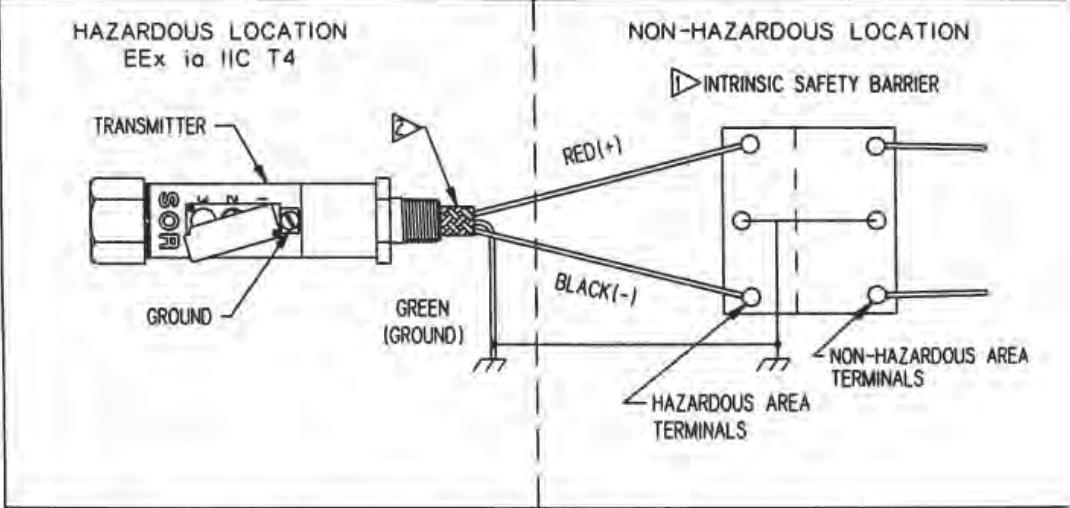
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DRAWING NO. 9130-102

**CONTROL DRAWING 9130-102**  
**SERIES 534HS TRANSMITTER**  
**CENELEC APPROVED**



▷ ENTITY PARAMETERS:

- U<sub>i</sub> = 30V
- I<sub>i</sub> = 150mA
- P<sub>i</sub> = 1W
- C<sub>i</sub> = 60nF
- L<sub>i</sub> = 4μH

▷ BELDEN CABLE P/N 9501 NEC CM PCC PT4 OR EQUIVALENT RATED AT 300V, 80°C MINIMUM

MAXIMUM LENGTH 45M (150ft).  
 CAPACITANCE OF 131 pF/M (40 pF/ft).  
 INDUCTANCE OF 0.82 μH/M (0.25 μH/ft).  
 RESISTANCE OF 78.7 mΩ/M (24 mΩ/ft).

THIS DRAWING NOT TO BE CHANGED WITHOUT CENELEC APPROVAL.

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