

# GP:50

## INSTALLATION, CALIBRATION & TROUBLESHOOTING MANUAL

### Model 7100 Transducers



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**Record of Changes**

<b>REV</b>	<b>DESCRIPTION</b>	<b>DATE</b>	<b>BY</b>

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## **Disclaimer**

No representations or warranties are made with respect to the contents of this Installation Guide. GP:50 reserves the right to revise this guide and to make changes periodically to the content hereof, without obligation to notify any persons of such revisions.

## **Warning**

Pressurized vessels as such and associated equipment are potentially dangerous. The product described in the guide should be operated only by personnel trained in the procedures that will assure safety to themselves, to others, to the equipment, and to the product. Before performing any maintenance, turn the power off.

## **Introduction**

The Model 7100 pressure transducer is designed for pressure measurement and easy recalibration. The all stainless steel parts construction and the hermetically sealed enclosure ensure that the product meets all customer specifications. The pressure transducers are designed and manufactured in accordance with MIL-Standards and GP: 50 QA procedures.

## **Unpacking and Inspection**

The Model 7100 pressure transducer was thoroughly tested and inspected and carefully packed. Upon receipt of the shipment thoroughly inspect the transducer.

If you see any visible signs of obvious shipping damage, notify the Freight Company immediately.

## **Mechanical Installation**

**Installation Note-** Transducers are precision instruments and should be given the same care as any other precision instrument during installation and operation.

**Handling-** the transducer has a protective cap covering the pressure ports and electrical connector of the transducer. This ensures that the surface is protected from nicks and scratches. It is recommended that the caps remain in place during storage and handling, in order to prevent damage to the diaphragm and connector.

**Installation-** Remove the protective plugs from the pressure port before installation. Thread the pressure port into a plumbing system. Use proper wrench size installation. Installation torque is 120inlb for port options FA,FD. For port option FJ use 45ft-lbs torque with compatible thread sealing compound or tape. In additional, mounting brackets can be employed for extra support if required by application. See Outline drawing for recommended location of the brackets. Included in the package is a O-ring for option FD connector so either the metal to metal joint or o-ring joint configuration can be used to seal the transducer to the manifold.

### **Electrical Installation**

USE ESD PRECAUTIONS DURING CONNECTION TO THE TRANSDUCER. Ensure power is off prior to connection or disconnection from the transducer or your instrumentation system.

The electrical connection for the model 7100 is either a 6 pin bayonet style, or 6 pin military grade threaded style connector. Below is a list of standard non-environmental plug part numbers available at the factory, please contact factory for other mating plug needs:

- Option CA use P/N: PT06E-10-6S
- Option CI use P/N: D38999/26WB98SN\*
- Option DB use P/N: D38999/26WA35SN\*

- Plug only, backshell must be purchased separately.

Output of the transducer is as follows:

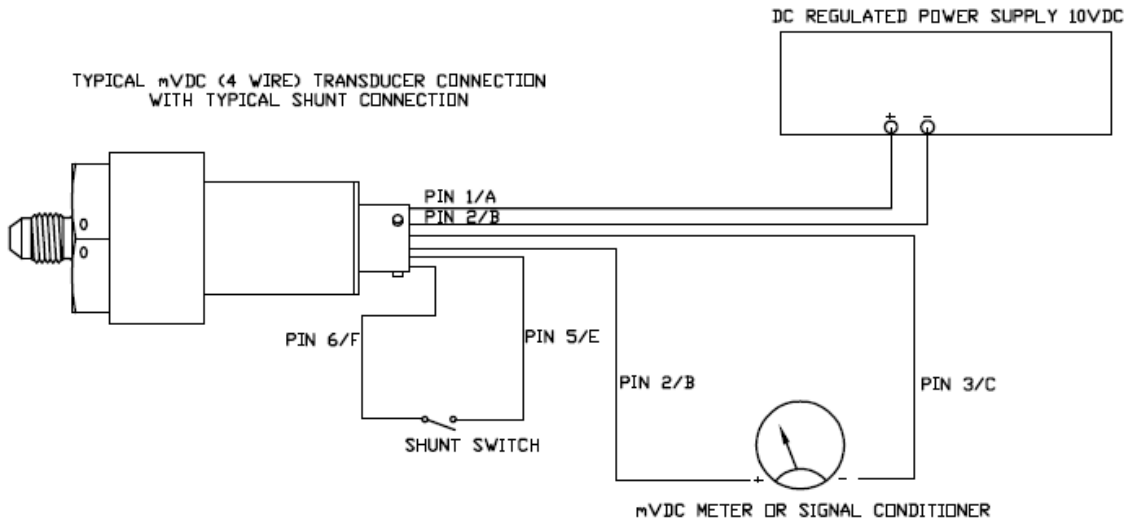
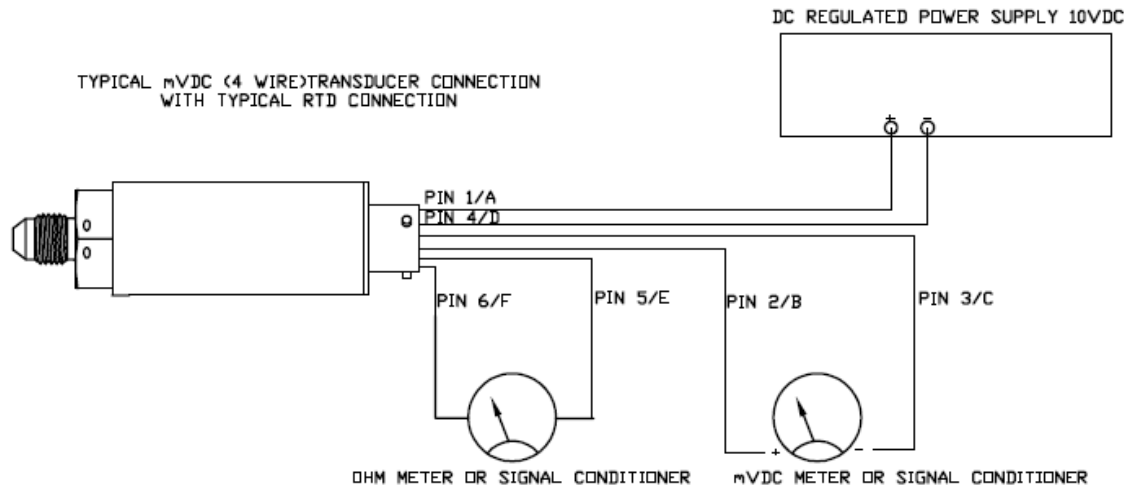
Option 1	3 mV/VDC
Option 7	2 mV/VDC
Option 8	10 mV/VDC

For proper wiring see wiring diagram below.

### **Wiring**

PINOUT	(4Wire) VDC
Pin 1/A	+Excitation
Pin 2/B	+Signal
Pin 3/C	-Signal
Pin 4/D	-Excitation
Pin 5/E	N/C/RTD/SHUNT
Pin 6/F	N/C/RTD/SHUNT

Connect the wires as per the table above providing the proper excitation voltage to the transducer. See attached Outline Drawings for complete technical information.



**Please Note:** Electronics have been designed so that momentary incorrect wiring of the power leads on the transducer will not damage the circuitry of the transducer.

Each transducer has been supplied with a calibration card for reference output data at different pressures and compensated temperatures also identifying the non-repeatability, hysteresis, non-linearity static accuracy and total transducer errors. Additionally, the card will identify optional RTD output resistance at 70°F or 80% / 100% optional shunt output.

## Troubleshooting

<b>Symptom/Problem</b>	<b>Action</b>
No Output	<ul style="list-style-type: none"> <li>• Verify power supply voltage meets transducer requirements</li> <li>• Check wiring connections</li> <li>• Verify pressure is being applied</li> <li>• Verify output load is not shorted</li> </ul>
Erratic/Intermittent output or Zero drift	<ul style="list-style-type: none"> <li>• Verify pressure applied is constant</li> <li>• Verify power supply remains within specifications</li> <li>• Inspect electrical connections for discontinuity or damage.</li> <li>• Verify output with a multi-meter</li> <li>• Check insulation resistance between amplifier and transducer case.</li> </ul>
Loose or Leaking process connection	<ul style="list-style-type: none"> <li>• Inspect Weld joint</li> <li>• Re-torque process connection</li> <li>• Replace Teflon o-ring on face seal</li> </ul>

## Warranty

### GP:50 Warranty Statement

GP:50 warrants its products to the original customer/purchaser against defects in material and workmanship for a period of one (1) year from the date of sale by GP:50, as shown in its shipping documents, subject to the following terms and conditions:

Without charge GP:50 will repair or replace products found to be defective in materials or workmanship within the warranty period provided that:

1. The product has not been subjected to abuse, neglect, accident, incorrect wiring (not provided by GP:50), improper installation or servicing, or use in violation of instructions furnished by GP:50.
2. Electronic access screws have not been removed. This will void calibration and warranty
3. As to any prior defect in materials or workmanship covered by this warranty, the product has not been repaired or altered by anyone except GP:50 or its authorized service agencies.
4. The serial number has not been removed, defaced or otherwise changed.
5. Examination discloses, in the judgement of GP:50, a defect in materials or workmanship which developed under normal installation, use and service; and
6. GP:50 is notified in advance of, and approves the return; and the products are returned to GP:50 transportation prepaid.

THIS WARRANTY IS THE ONLY WARRANTY AND IS IN LIEU OF ANY OTHER WARRANTY EXPRESSED OR IMPLIED, INCLUDING ANY WARRANTY OR MERCHANTABILITY OR FITNESS. NO REPRESENTATIVE OR PERSONS ARE AUTHORIZED TO GIVE ANY OTHER WARRANTY OR TO ASSUME FOR GP:50 ANY OTHER LIABILITY IN CONNECTION WITH THE SALE OF ITS PRODUCTS. GP:50 DOES NOT ASSUME THE COSTS OF REMOVAL AND/OR INSTALLATION OF THE PRODUCT OR ANY OTHER WORKMANSHIP, NOR WILL GP:50 BE LIABLE FOR ANY CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OR INSTALLATION OF ITS PRODUCT.

Contact our website <http://www.gp50.com> for a copy of our rework/repair policy or call our Aerospace dept.

THIRD PARTY AGENCY APPROVAL CODE: N/A

**MODEL NUMBER DESIGNATION:**

7000-DRR-LOC-PING

**MISCELLANEOUS OPTIONS:**

- D = IMPROVED STATIC ACC Q120 & Q121
- GA = ALTIMETER/PISTON (Q122)
- GI = 10X PROOF PRESSURE (Q25000) MAX QUIT AVAILABLE WITH OPTION GP
- GR = EXPANDED TO EXTENDED TEMP RANGE: 45°F TO 250°F
- GQ = 100% COMPENSATED TO 48X FSD PER 100°F
- GR = 100% INTERNAL SHUNT CALIBRATION
- GL = 100% GROUND / 1718 SENSORS
- GM = CLEANING FOR DRYGEN SERVICE
- GN = HASTELLOY PRESSURE CAVITY
- GO = 100% INTERNAL SHUNT CALIBRATION
- GP = 1000ohm 2-WIRE RTD
- GQ = 1000ohm 2-WIRE RTD
- GR = 1000ohm 2-WIRE RTD
- GS = 1000ohm 2-WIRE RTD
- GT = 1000ohm 2-WIRE RTD
- GU = 1000ohm 2-WIRE RTD
- GV = 1000ohm 2-WIRE RTD
- HW = HAZARDOUS (K300 SENSORS)
- HA00 (GPRD) / K300 (SENSORS)

**PRESSURE PORT:**

- FA = M33846-04 C7/16-50 FEMALE
- FJ = M33866-04 C7/16-50 MALE
- FJ = 1/4-18 NPT OMALE

**CONNECTOR:**

- CA = PTH-104-6P
- CB = D08999/27/0399N
- CC = D08999/27/0399N
- CD = D08999/27/0399N

**PRE-RELEASED:**

- PE = PRESSURE RELEASED
- PF = PRESSURE RELEASED
- PG = PSIG GAGE (REF. TO ATMOSPHERIC)
- PH = PSIG GAGE (REF. TO VACUUM)
- PI = PSIG, SEALED GAGE (REF. TO 14.7psia)

**PR = PRESSURE RANGE:**

PN	0 - 5
PO	0 - 10
PP	0 - 15
PQ	0 - 20
PR	0 - 25
PS	0 - 30
PV	0 - 50
PW	0 - 100
PX	0 - 150
PY	0 - 200
PZ	0 - 300
RK	0 - 500

**Q = OUTPUT:**

QA	1 = 3 mV/V
QB	7 = 2 mV/V
QC	8 = 10 mV/V

**OUTPUT AT FULL SCALE:**  
 Example: FOR 10 VAC EXCITATION AND 3 mV/V OUTPUT AT ZERO = 0 mV \* 60 mV = 30 mV

**ALTERNATE CONFIGURATIONS:**

OPTION FA: 0.680, 0.750

OPTION FJ: 0.680, 0.750

OPTION CI: 0.930, 0.680

OPTION DI: 0.930, 0.680

OPTION EA: 0.930, 0.680

OPTION EB: 0.930, 0.680

OPTION EC: 0.930, 0.680

OPTION ED: 0.930, 0.680

OPTION EE: 0.930, 0.680

OPTION EF: 0.930, 0.680

OPTION EG: 0.930, 0.680

OPTION EH: 0.930, 0.680

OPTION EI: 0.930, 0.680

OPTION EJ: 0.930, 0.680

OPTION EK: 0.930, 0.680

OPTION EL: 0.930, 0.680

OPTION EM: 0.930, 0.680

OPTION EN: 0.930, 0.680

OPTION EO: 0.930, 0.680

OPTION EP: 0.930, 0.680

OPTION EQ: 0.930, 0.680

OPTION ER: 0.930, 0.680

OPTION ES: 0.930, 0.680

OPTION ET: 0.930, 0.680

OPTION EU: 0.930, 0.680

OPTION EV: 0.930, 0.680

OPTION EW: 0.930, 0.680

OPTION EX: 0.930, 0.680

OPTION EY: 0.930, 0.680

OPTION EZ: 0.930, 0.680

**TABLE 1: STANDARD UNIT UNITS ADOPTED BY SHIP TRAVELER**

PN	DESIGNATION
A / 1	+5XC (GED)
B / 2	-SIG (GLD)
C / 3	-SIG (VHT)
D / 4	-EXC (CLD)
E / 5	M/C
F / 6	M/C

**TABLE 2: USED FOR OPTIONAL INTERNAL SHUNT-UP OR RTD HOOK-UP**

PN	DESIGNATION
A / 1	+5XC (GED)
B / 2	-SIG (GLD)
C / 3	-SIG (VHT)
D / 4	-EXC (CLD)
E / 5	M/C
F / 6	M/C

**NOTES:**

- REFERENCE BAL-7100STD-3 FOR ASSEMBLY DRAWING.
- STANDARD MATERIALS OF CONSTRUCTION:
  - SENSOR: 316/316L SST
  - SENSOR PART: 316/316L SST
  - SENSOR HOUSING: 300 SERIES SST
  - CONNECTOR: 300 SERIES SST
- CAN BE MODIFIED BY OPTIONS GK, GP AND GU.
- PRESSURE RANGE OPTIONS P1, P2, P3, P4 AND P5 REQUIRE USE OF A 1150 SENSOR CAN TO OBTAIN STANDARD STATIC ACCURACY AND OUTLINE DRAWING AND MODEL NUMBER DESIGNATION FOR LOW PRESSURE (≤ 50psi) UNITS. OTHERWISE DESIGNATION FOR STATIC ACCURACY AND TOTAL ERROR REQUIREMENTS WOULD APPLY.
- OPTIONS D, G, GK & GP CANNOT BE COMBINED WITH OPTION GD.

**THIS IS A CONTROLLED DRAWING AND MAY NOT BE CHANGED W/O ENGINEERING AUTHORIZATION UNLESS OTHERWISE SPECIFIED. DIMENSIONS ARE IN INCHES.**

**FRACTIONS: 1/64**

**TOLERANCES: ± 0.005**

**ANGLES: ± 1/2°**

**KEYWORD: INCH (A) DIMENSIONS: INCH (A)**

**KEYWORD: METRIC (B) DIMENSIONS: METRIC (B)**

**KEYWORD: MIXED (C) DIMENSIONS: MIXED (C)**

**KEYWORD: NONE (D) DIMENSIONS: NONE (D)**

**KEYWORD: ALL (E) DIMENSIONS: ALL (E)**

**KEYWORD: NONE (F) DIMENSIONS: NONE (F)**

**KEYWORD: ALL (G) DIMENSIONS: ALL (G)**

**KEYWORD: NONE (H) DIMENSIONS: NONE (H)**

**KEYWORD: ALL (I) DIMENSIONS: ALL (I)**

**KEYWORD: NONE (J) DIMENSIONS: NONE (J)**

**KEYWORD: ALL (K) DIMENSIONS: ALL (K)**

**KEYWORD: NONE (L) DIMENSIONS: NONE (L)**

**KEYWORD: ALL (M) DIMENSIONS: ALL (M)**

**KEYWORD: NONE (N) DIMENSIONS: NONE (N)**

**KEYWORD: ALL (O) DIMENSIONS: ALL (O)**

**KEYWORD: NONE (P) DIMENSIONS: NONE (P)**

**KEYWORD: ALL (Q) DIMENSIONS: ALL (Q)**

**KEYWORD: NONE (R) DIMENSIONS: NONE (R)**

**KEYWORD: ALL (S) DIMENSIONS: ALL (S)**

**KEYWORD: NONE (T) DIMENSIONS: NONE (T)**

**KEYWORD: ALL (U) DIMENSIONS: ALL (U)**

**KEYWORD: NONE (V) DIMENSIONS: NONE (V)**

**KEYWORD: ALL (W) DIMENSIONS: ALL (W)**

**KEYWORD: NONE (X) DIMENSIONS: NONE (X)**

**KEYWORD: ALL (Y) DIMENSIONS: ALL (Y)**

**KEYWORD: NONE (Z) DIMENSIONS: NONE (Z)**

**ENGINEERING SPECIFICATIONS:**

ENGINEERING SPECIFICATION	STANDARD	OPTION D	OPTION G1	OPTION G2
1. PROOF PRESSURE	15X	10X	25000max	10X
2. BURST PRESSURE	3X	15X	25000max	3X
3. STATIC ACCURACY (GROSS)	0.3% FSD	0.1% FSD	0.3% FSD	0.3% FSD
4. NON-LINEARITY (TEMP. P3)	0.2% FSD	0.07% FSD	0.3% FSD	0.2% FSD
5. HYSTERESIS	0.2% FSD	0.07% FSD	0.3% FSD	0.2% FSD
6. NON-REPEATABILITY	0.2% FSD	0.07% FSD	0.3% FSD	0.2% FSD
7. ZERO BALANCE (Q 70°F)	± 0.5% FSD	± 0.2% FSD	± 0.2% FSD	± 0.5% FSD
8. SPAN BALANCE (Q 70°F)	± 0.5% FSD	± 0.2% FSD	± 0.2% FSD	± 0.5% FSD
9. TOTAL ERROR	1.3% FSD	1.0% FSD	2.0% FSD	2.3% FSD
10. ZERO BALANCE (w/ temp)	± 0.5% FSD	± 0.2% FSD	± 1.0% FSD	± 1.0% FSD
11. SPAN BALANCE (w/ temp)	± 0.5% FSD	± 0.2% FSD	± 1.0% FSD	± 1.0% FSD
12. COMPENSATED RANGE	-10° to 180°F	± 100°F	± 100°F	± 100°F
13. OPERATING RANGE	-20° to 190°F	± 100°F	± 100°F	± 100°F
14. SENSOR CYCLING RANGE	-65° to 260°F	± 100°F	± 100°F	± 100°F
15. STABILITY	±0.1% FSD/yr	± 0.1% FSD/yr	± 0.1% FSD/yr	± 0.1% FSD/yr
16. RESOLUTION	1ppm/psi	1ppm/psi	1ppm/psi	1ppm/psi
17. EXCITATION	3.5 - 15 VDC	3.5 - 15 VDC	3.5 - 15 VDC	3.5 - 15 VDC
18. PIN-OUT CONFIGURATION	PER TABLE 1	PER TABLE 1	PER TABLE 1	PER TABLE 1
19. SHUNT SETPOINT	± 0.5% FSD	± 0.5% FSD	± 0.5% FSD	± 0.5% FSD

**VALUE IS FOR REFERENCE ONLY. \* DEFAULT TO STANDARD REQUIREMENT.**

**REGIONS:**

LET	DATE	BY	REV
A	5/9/09	DM	029

**DESIGNER:** [Signature]

**CHECKER:** [Signature]

**DATE:** 5/9/09

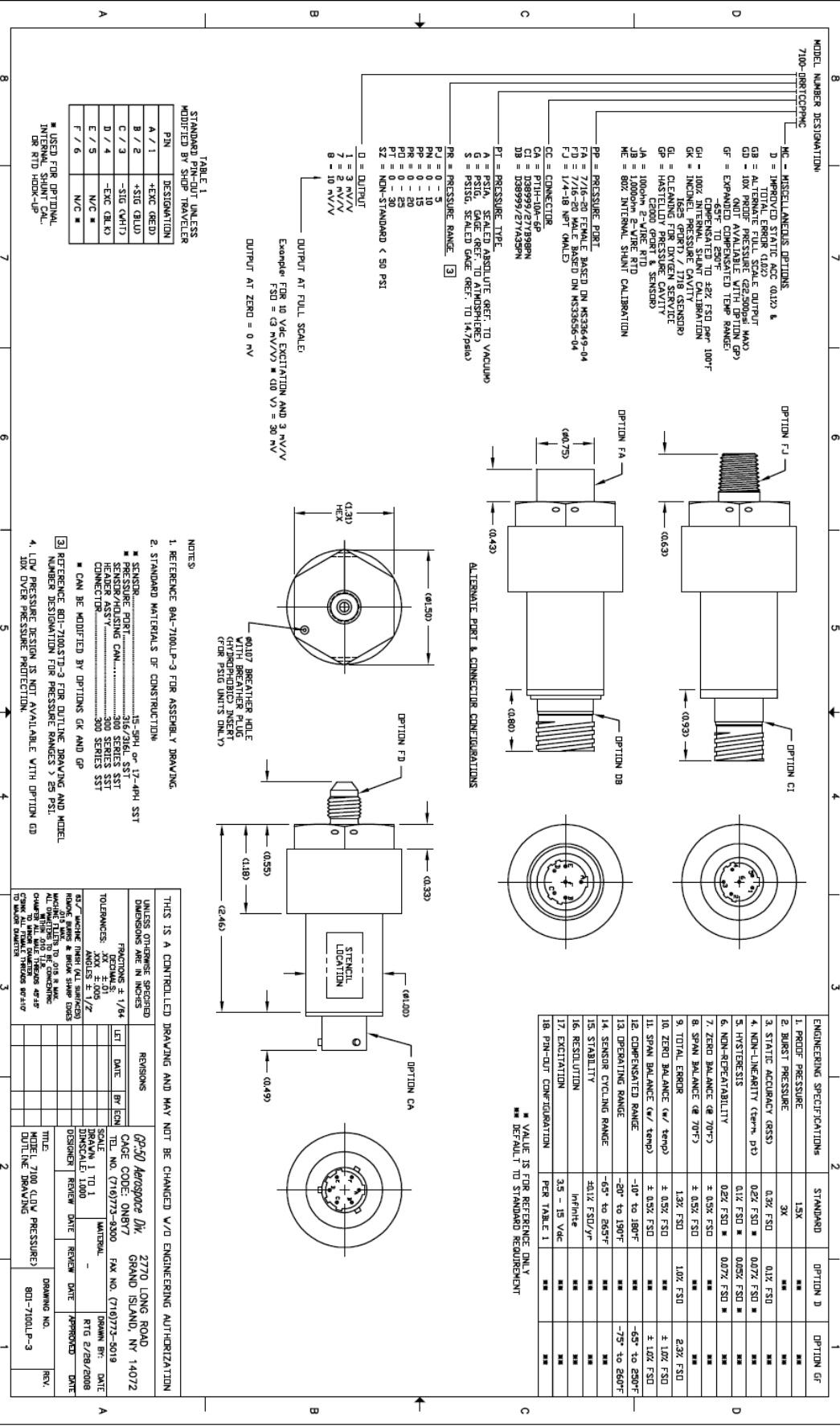
**SCALE:** 1:1

**TITLE:** MODEL 7100 (STANDARD) DUTLINE DRAWING

**DRAWING NO.:** 801-7100STD-3

**REV.:** A

THIRD PARTY AGENCY APPROVAL CODE: N/A



ENGINEERING SPECIFICATIONS	STANDARD	OPTION D	OPTION GF
1. PRESET PRESSURE	1.5X	***	***
2. BURST PRESSURE	3X	***	***
3. STATIC ACCURACY (RSS)	0.2% FSD	0.1% FSD	***
4. NON-LINEARITY (term. pt)	0.2% FSD	0.05% FSD	***
5. HYSTERESIS	0.1% FSD	0.05% FSD	***
6. NON-REPEATABILITY	0.2% FSD	0.07% FSD	***
7. ZERO BALANCE (0% FS)	± 0.5% FSD	***	***
8. SPAN BALANCE (0% FS)	± 0.5% FSD	***	***
9. TOTAL ERROR	1.3% FSD	1.0% FSD	2.3% FSD
10. ZERO BALANCE (w/ temp)	± 0.5% FSD	***	± 1.0% FSD
11. SPAN BALANCE (w/ temp)	± 0.5% FSD	***	± 1.0% FSD
12. COMPENSATED RANGE	-10° to 180°F	***	-65° to 260°F
13. OPERATING RANGE	-20° to 180°F	***	-75° to 260°F
14. SENSOR CYCLING RANGE	-65° to 260°F	***	***
15. STABILITY	±0.1% FSD/yr	***	***
16. RESOLUTION	Infinite	***	***
17. EXCITATION	3.5 - 15 VDC	***	***
18. P/N-OUT CONFIGURATION	PER TABLE 1	***	***

\*\*\* VALUE IS FOR REFERENCE ONLY  
 \*\* DEFAULT TO STANDARD REQUIREMENT

TABLE 1  
 STANDARD P/N-OUT VALUES  
 MODIFIED BY SHIP/RANGE

P/N	DESIGNATION
A / 1	+EXC (0E0D)
B / 2	+SIG (8LUD)
C / 3	-SIG (8M1Z)
D / 4	-EXC (8LKY)
E / 5	N/C #
F / 6	N/C #

NOTES  
 1. REFERENCE 9A-7100LP-3 FOR ASSEMBLY DRAWING.  
 2. STANDARD MATERIALS OF CONSTRUCTION:  
 ■ SENSITIVE PART.....15-9PH or 17-4PH SST  
 ■ PRESSURE PART.....316/316L SST  
 ■ SENSITIVE WELDING CAN.....300 SERIES SST  
 ■ CONNECTOR.....300 SERIES SST  
 ■ CAN BE MODIFIED BY OPTIONS GK AND GP.  
 3. REFERENCE 801-7100ST-3 FOR OUTLINE DRAWING AND MODEL NUMBER DESIGNATION FOR PRESSURE RANGES > 25 PSI.  
 4. LOW PRESSURE DESIGN IS NOT AVAILABLE WITH OPTION GD.  
 5. LOW OVER PRESSURE PROTECTION.

THIS IS A CONTROLLED DRAWING AND MAY NOT BE CHANGED W/O ENGINEERING AUTHORIZATION  
 UNLESS OTHERWISE SPECIFIED  
 DIMENSIONS ARE IN INCHES

REGIONS	DATE	BY/EN	SCALE	MATERIAL	DATE
02-50 Aerospace Div.			1:1		
CAGE CODE: 08N87					
TEL. NO. (716)773-3000					
FAX NO. (716)773-5019					
DESIGNER: RTG					
DRAWN BY: RTG					
DATE: 2/28/2008					
REVIEW: RTG					
DATE: 2/28/2008					
APPROVED: RTG					
DATE: 2/28/2008					

TITLE	MODEL	DRAWING NO.	REV.
OUTLINE DRAWING	7100 (LOW PRESSURE)	801-7100LP-3	