

# GP:50

## INSTALLATION, CALIBRATION & TROUBLESHOOTING MANUAL

### Model 7100 Transducers



**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:

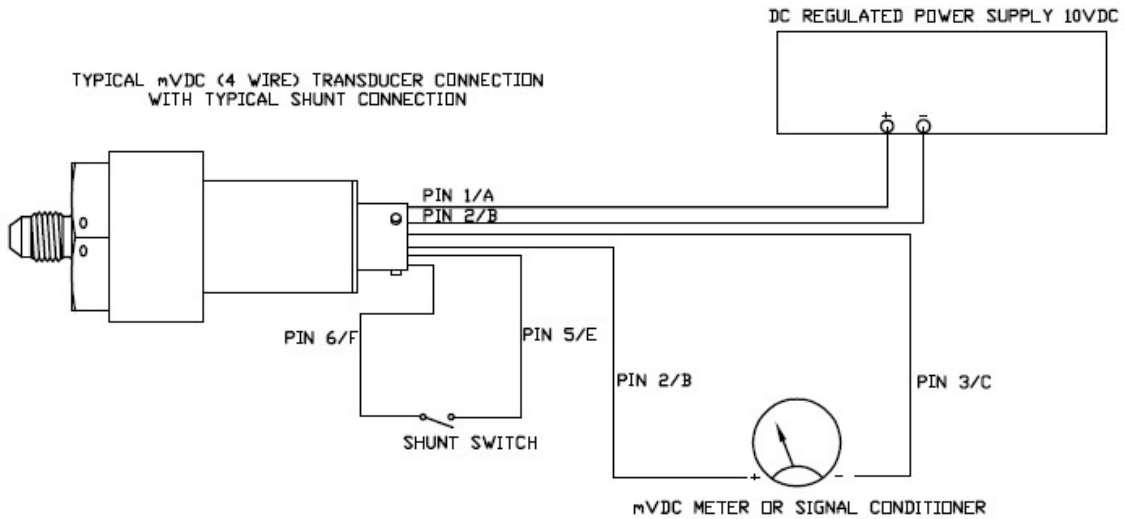
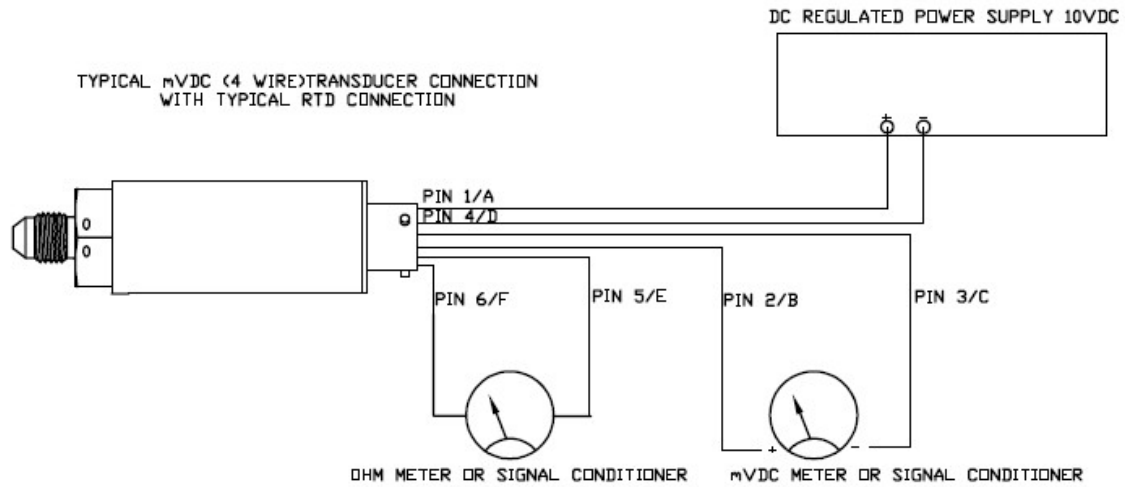
Option 1	3 mV/VDC
Option 7	2 mV/VDC
Option 8	10 mV/VDC

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

Symptom/Problem	Action
No Output	Verify power supply voltage meets transducer requirements Check wiring connections Verify pressure is being applied Verify output load is not shorted
Erratic/Intermittent output or Zero drift	Verify pressure applied is constant Verify power supply remains within specifications Inspect electrical connections for discontinuity or damage. Verify output with a multi-meter Check insulation resistance between amplifier and transducer case.
Loose or Leaking process connection	Inspect Weld joint Re-torque process connection Replace Teflon o-ring on face seal

## 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:**

7100-0R1C3P99C

**MC - MISCELLANEOUS OPTIONS**

- D = IMPROVED STATIC ACC 0.1X2 & 0.1X1
- GA = ALTERNATE FULL SCALE OUTPUT
- GD = 10X PROBE PRESSURE (25200psi MAX)
- GF = EXPANDED COMPENSATED TEMP RANGE -55°F TO 250°F
- GI = 100% COMPENSATED TO 252 FSD PER 100°F
- GK = INCH/LEAF PRESSURE CAVITY DIMENSION
- GL = CLEANING FOR EXGEN SERVICE
- GM = 1/4-18 NPT MALE
- GN = 1000psi 2-WIRE RTD
- GO = 800 INTERNAL SLANT CALIBRATION
- GP = MENDEL PRESSURE CAVITY M400 GPORT / M500 (SENSORS)
- GS = 1000psi 2-WIRE RTD
- GT = 1000psi 2-WIRE RTD
- GU = 1000psi 2-WIRE RTD
- GV = 1000psi 2-WIRE RTD
- HW = 1000psi 2-WIRE RTD
- HA = 1000psi 2-WIRE RTD
- HB = 1000psi 2-WIRE RTD
- HC = 1000psi 2-WIRE RTD
- HD = 1000psi 2-WIRE RTD
- HE = 1000psi 2-WIRE RTD
- HF = 1000psi 2-WIRE RTD
- HG = 1000psi 2-WIRE RTD
- HH = 1000psi 2-WIRE RTD
- HI = 1000psi 2-WIRE RTD
- HO = 1000psi 2-WIRE RTD
- HP = 1000psi 2-WIRE RTD
- HQ = 1000psi 2-WIRE RTD
- HR = 1000psi 2-WIRE RTD
- HS = 1000psi 2-WIRE RTD
- HT = 1000psi 2-WIRE RTD
- HU = 1000psi 2-WIRE RTD
- HV = 1000psi 2-WIRE RTD
- HW = 1000psi 2-WIRE RTD
- HX = 1000psi 2-WIRE RTD
- HY = 1000psi 2-WIRE RTD
- HZ = 1000psi 2-WIRE RTD

**FA = MSS3646-34 7/16-20 FEMALE**  
**FJ = MSS3646-34 7/16-20 MALE**  
**FK = 1/4-18 NPT MALE**  
**FL = 1/4-18 NPT MALE**  
**FM = 1/4-18 NPT MALE**  
**FN = 1/4-18 NPT MALE**  
**FO = 1/4-18 NPT MALE**  
**FP = 1/4-18 NPT MALE**  
**FQ = 1/4-18 NPT MALE**  
**FR = 1/4-18 NPT MALE**  
**FS = 1/4-18 NPT MALE**  
**FT = 1/4-18 NPT MALE**  
**FU = 1/4-18 NPT MALE**  
**FV = 1/4-18 NPT MALE**  
**FW = 1/4-18 NPT MALE**  
**FX = 1/4-18 NPT MALE**  
**FY = 1/4-18 NPT MALE**  
**FZ = 1/4-18 NPT MALE**

**PT = PRESSURE TYPE**  
**A = PSIA, SEALED ABSOLUTE GREF. TO VACUUM**  
**G = PSIG, GAGE GREF. TO ATMOSPHERIC**  
**S = PSID, SEALED GAGE GREF. TO 14.7PSIA**

**PR = PRESSURE RANGE:**

PR1	0 - 5
PR2	0 - 15
PR3	0 - 30
PR4	0 - 45
PR5	0 - 60
PR6	0 - 75
PR7	0 - 90
PR8	0 - 105
PR9	0 - 120
PR10	0 - 135
PR11	0 - 150
PR12	0 - 165
PR13	0 - 180
PR14	0 - 195
PR15	0 - 210
PR16	0 - 225
PR17	0 - 240
PR18	0 - 255
PR19	0 - 270
PR20	0 - 285
PR21	0 - 300
PR22	0 - 315
PR23	0 - 330
PR24	0 - 345
PR25	0 - 360
PR26	0 - 375
PR27	0 - 390
PR28	0 - 405
PR29	0 - 420
PR30	0 - 435
PR31	0 - 450
PR32	0 - 465
PR33	0 - 480
PR34	0 - 495
PR35	0 - 510
PR36	0 - 525
PR37	0 - 540
PR38	0 - 555
PR39	0 - 570
PR40	0 - 585
PR41	0 - 600
PR42	0 - 615
PR43	0 - 630
PR44	0 - 645
PR45	0 - 660
PR46	0 - 675
PR47	0 - 690
PR48	0 - 705
PR49	0 - 720
PR50	0 - 735
PR51	0 - 750
PR52	0 - 765
PR53	0 - 780
PR54	0 - 795
PR55	0 - 810
PR56	0 - 825
PR57	0 - 840
PR58	0 - 855
PR59	0 - 870
PR60	0 - 885
PR61	0 - 900
PR62	0 - 915
PR63	0 - 930
PR64	0 - 945
PR65	0 - 960
PR66	0 - 975
PR67	0 - 990
PR68	0 - 1005
PR69	0 - 1020
PR70	0 - 1035
PR71	0 - 1050
PR72	0 - 1065
PR73	0 - 1080
PR74	0 - 1095
PR75	0 - 1110
PR76	0 - 1125
PR77	0 - 1140
PR78	0 - 1155
PR79	0 - 1170
PR80	0 - 1185
PR81	0 - 1200
PR82	0 - 1215
PR83	0 - 1230
PR84	0 - 1245
PR85	0 - 1260
PR86	0 - 1275
PR87	0 - 1290
PR88	0 - 1305
PR89	0 - 1320
PR90	0 - 1335
PR91	0 - 1350
PR92	0 - 1365
PR93	0 - 1380
PR94	0 - 1395
PR95	0 - 1410
PR96	0 - 1425
PR97	0 - 1440
PR98	0 - 1455
PR99	0 - 1470
PR100	0 - 1485
PR101	0 - 1500
PR102	0 - 1515
PR103	0 - 1530
PR104	0 - 1545
PR105	0 - 1560
PR106	0 - 1575
PR107	0 - 1590
PR108	0 - 1605
PR109	0 - 1620
PR110	0 - 1635
PR111	0 - 1650
PR112	0 - 1665
PR113	0 - 1680
PR114	0 - 1695
PR115	0 - 1710
PR116	0 - 1725
PR117	0 - 1740
PR118	0 - 1755
PR119	0 - 1770
PR120	0 - 1785
PR121	0 - 1800
PR122	0 - 1815
PR123	0 - 1830
PR124	0 - 1845
PR125	0 - 1860
PR126	0 - 1875
PR127	0 - 1890
PR128	0 - 1905
PR129	0 - 1920
PR130	0 - 1935
PR131	0 - 1950
PR132	0 - 1965
PR133	0 - 1980
PR134	0 - 1995
PR135	0 - 2010
PR136	0 - 2025
PR137	0 - 2040
PR138	0 - 2055
PR139	0 - 2070
PR140	0 - 2085
PR141	0 - 2100
PR142	0 - 2115
PR143	0 - 2130
PR144	0 - 2145
PR145	0 - 2160
PR146	0 - 2175
PR147	0 - 2190
PR148	0 - 2205
PR149	0 - 2220
PR150	0 - 2235
PR151	0 - 2250
PR152	0 - 2265
PR153	0 - 2280
PR154	0 - 2295
PR155	0 - 2310
PR156	0 - 2325
PR157	0 - 2340
PR158	0 - 2355
PR159	0 - 2370
PR160	0 - 2385
PR161	0 - 2400
PR162	0 - 2415
PR163	0 - 2430
PR164	0 - 2445
PR165	0 - 2460
PR166	0 - 2475
PR167	0 - 2490
PR168	0 - 2505
PR169	0 - 2520
PR170	0 - 2535
PR171	0 - 2550
PR172	0 - 2565
PR173	0 - 2580
PR174	0 - 2595
PR175	0 - 2610
PR176	0 - 2625
PR177	0 - 2640
PR178	0 - 2655
PR179	0 - 2670
PR180	0 - 2685
PR181	0 - 2700
PR182	0 - 2715
PR183	0 - 2730
PR184	0 - 2745
PR185	0 - 2760
PR186	0 - 2775
PR187	0 - 2790
PR188	0 - 2805
PR189	0 - 2820
PR190	0 - 2835
PR191	0 - 2850
PR192	0 - 2865
PR193	0 - 2880
PR194	0 - 2895
PR195	0 - 2910
PR196	0 - 2925
PR197	0 - 2940
PR198	0 - 2955
PR199	0 - 2970
PR200	0 - 2985
PR201	0 - 3000

**D = OUTPUT**  
**7 = 2 mV/V**  
**8 = 10 mV/V**

**OUTPUT AT FULL SCALE:**  
 Example: FOR 10 VDC EXCITATION AND 3 mV/V  
 FSD @ 10 VDC = 9 mV  
 OUTPUT AT ZERO = 0 mV

**ALTERNATE CONFIGURATIONS**

**OPTION FJ**  
 (0.880)  
 (0.95)

**OPTION FA**  
 (0.750)  
 (0.930)

**OPTION CI**  
 (0.880)

**OPTION BI**  
 (0.750)

**OPTION FD**  
 (0.880)  
 (0.930)

**OPTION CA**  
 (0.880)  
 (0.930)

**0.0107 BREATHING HOLE WITH BREATHING PLUG (HYPHENATED INSIDE (FOR FSD UNITS ONLY))**

**0.0107 BREATHING HOLE WITH BREATHING PLUG (HYPHENATED INSIDE (FOR FSD UNITS ONLY))**

**TABLE 1**

STANDARD PIN-OUT UNLESS ADJUSTED BY SHIP TRAVELERS

PN	DESIGNATION
A / 1	-EXC (REQD)
B / 2	+SIG (BLD)
C / 3	-SIG (WH7)
D / 4	-EXC (CAL)
E / 5	N/C
F / 6	N/C

**USED FOR OPTIONAL OR RTD HOOD-UP.**

**ENGINEERING SPECIFICATIONS**

1. PROBE PRESSURE	STANDARD	OPTION D	OPTION GD	OPTION GF
1. PROBE PRESSURE	15X	10X	25200max	10X
2. BURST PRESSURE	3X	15X	25200max	10X
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	0.3% FSD
5. HYSTERESIS	0.2% FSD	0.07% FSD	0.3% FSD	0.3% FSD
6. NON-REPEATABILITY	0.1% FSD	0.05% FSD	0.2% FSD	0.3% FSD
7. ZERO BALANCE (70°F)	± 0.5% FSD	± 0.5% FSD	± 0.5% FSD	± 0.5% FSD
8. SPAN BALANCE (70°F)	± 0.5% FSD	± 0.5% FSD	± 0.5% FSD	± 0.5% FSD
9. TOTAL ERROR	± 0.5% FSD	± 0.5% FSD	± 0.5% FSD	± 0.5% FSD
10. ZERO BALANCE (w/ temp)	± 0.5% FSD	± 0.5% FSD	± 0.5% FSD	± 0.5% FSD
11. SPAN BALANCE (w/ temp)	± 0.5% FSD	± 0.5% FSD	± 0.5% FSD	± 0.5% FSD
12. COMPENSATED RANGE	-10° to 180°F	± 0.5% FSD	± 0.5% FSD	± 0.5% FSD
13. OPERATING RANGE	-20° to 190°F	± 0.5% FSD	± 0.5% FSD	± 0.5% FSD
14. SENSOR CYCLING RANGE	-55° to 250°F	± 0.5% FSD	± 0.5% FSD	± 0.5% FSD
15. STABILITY	±0.1% FSD/yr	± 0.5% FSD	± 0.5% FSD	± 0.5% FSD
16. RESOLUTION	Infinite	± 0.5% FSD	± 0.5% FSD	± 0.5% FSD
17. EXCITATION	3.5 - 15 VDC	± 0.5% FSD	± 0.5% FSD	± 0.5% FSD
18. PIN-OUT CONFIGURATION	PER TABLE 1	± 0.5% FSD	± 0.5% FSD	± 0.5% FSD
19. SHUNT SETPOINT	± 0.5% FSD	± 0.5% FSD	± 0.5% FSD	± 0.5% FSD

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

**NOTES**

1. REFERENCE 844-7100STD-3 FOR ASSEMBLY DRAWING

2. STANDARD MATERIALS OF CONSTRUCTION:

- SENSOR: 15-9PH or 17-4PH SST
- PRESSURE PORT: 316/316L SST
- SENDER/HOUSING CAN: 300 SERIES SST
- HEMISPHERICAL: 300 SERIES SST
- DIAPHRAGM: 300 SERIES SST
- MEMBRANE: 300 SERIES SST

3. CAN BE MODIFIED BY OPTIONS GK, GP AND GU

4. ALSO SENSOR CAN TO OBTAIN STANDARD STATIC ACCURACY AND TOTAL ERROR REQUIREMENTS. REFERENCE 801-7100STD-3 FOR PRESSURE << 500psi UNITS. OTHERWISE, OPTION GD STATIC ACCURACY AND TOTAL ERROR REQUIREMENTS WOULD APPLY.

5. OPTIONS D, GF, 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

REVISIONS	DATE	BY	REASON
1	5/3/08	DM	ISSUE

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**DESIGNED BY:** DATE: APPROVED: DATE: REV. NO. A

THIRD PARTY AGENCY APPROVAL CODE: N/A

