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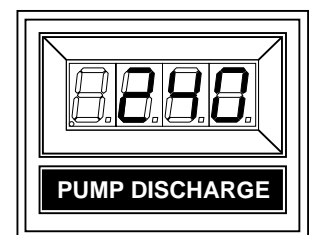
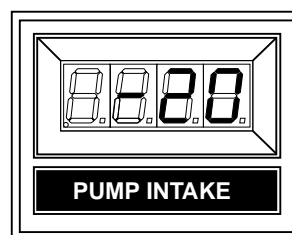
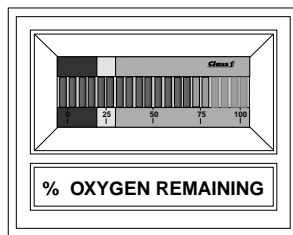
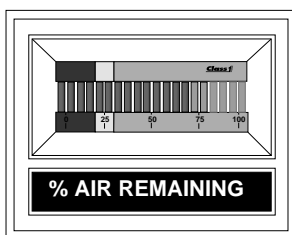
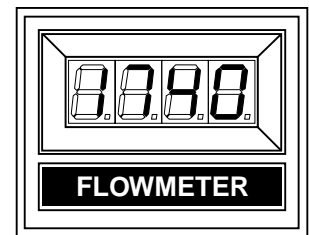
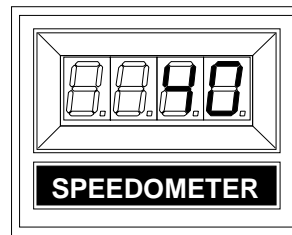
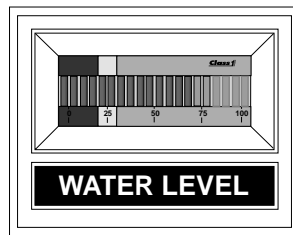
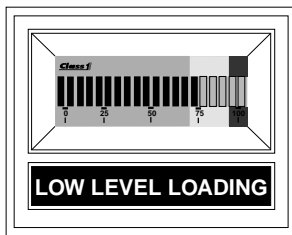
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## Class 1's Digital Gauges.

Digital displays come in both seven (7) segment bright LED displays for alphanumeric information and bargraph displays for percentage information.

Currently available displays:

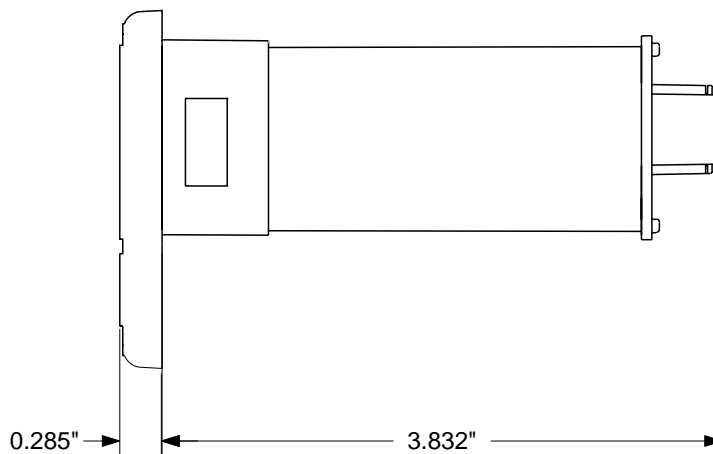
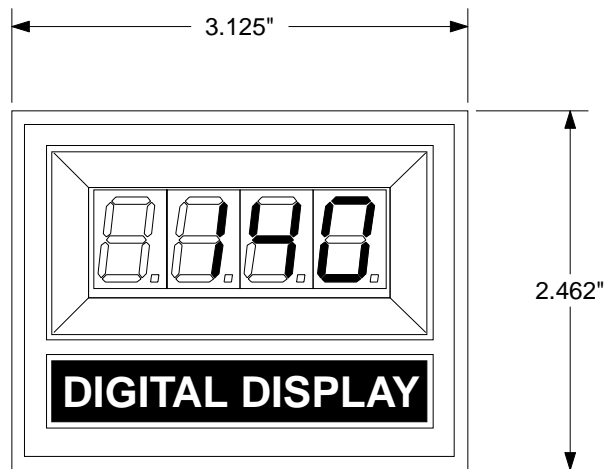
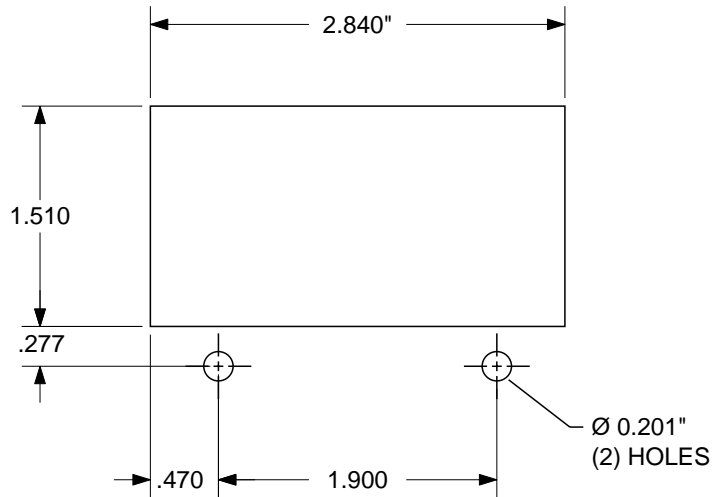
- 102046 Flowmeter
- 102190 Pump Pressure (Intake and Discharge)
- 102245 Tank Level Gauge (Water and Foam)
- 102245 Pressurized Tank Level (0 to 100 %)
- 102007 Speedometer
- 102342 Aerial Loading
- 102263 Breathing Air Level (0 to 100 %)
- 102264 Oxygen System Level (0 to 100 %)
- 103282 Dual Current Amplifier for dual displays (air, O2 and Aerial Loading)



# Mounting

# Class 1

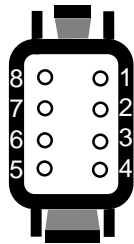
The **Class 1** digital display mounts in a 2.85" by 1.55" cutout.  
Overall area necessary for installation is 2.5" by 3.2".  
Two 0.20 diameter holes are provided for mounting screws.



The digital displays are connected to the OEM harness with a Deutsch 8 pin mini-connector.

Mating Connector: DTM06-08S  
Locking Wedge WM-8S  
Mating Terminal: 0462-201-20141 20 gauge socket

### General Terminal Assignments:



Wire Insertion View

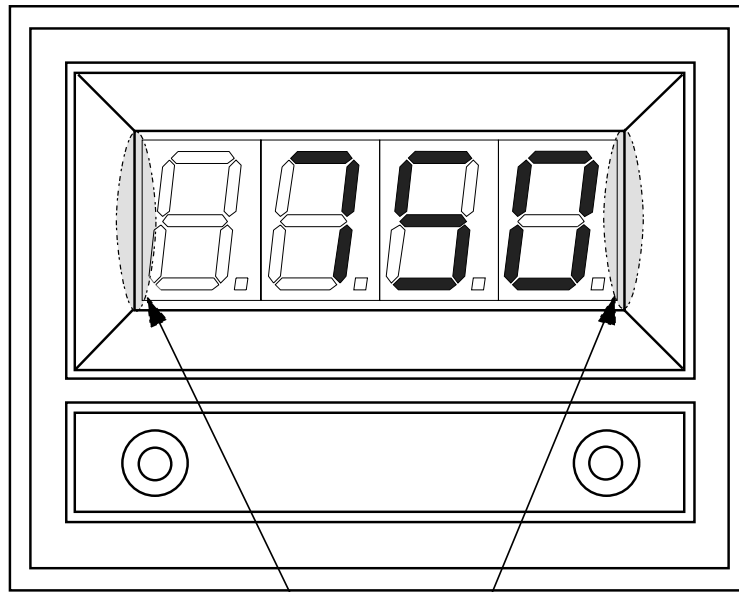
- 1) Alarm Output (Ground)
- 2) Primary Pressure Signal
- 3) Sensor Supply (+ 5 or +10 VDC)
- 4) System Power (+ 12 VDC)
- 5) System Ground
- 6) Sensor Ground
- 7) Signal (**frequency** or secondary PSI in)
- 8) Test, Total or Alarm Switch (Ground)

Not all of the digital displays use all of the terminals.  
See individual display pages for application specific information.

Harnesses are available for the digital displays in various lengths.  
These include transmitter/transducer and power connections.

### Harness Part Numbers by length and application.

	5'	10'	20'	30'
Flowmeter Display	102064	102033	102065	103165
Pressure Display	102060	102035	102061	102271
Breathing Air Display	102670	102671	102672	
Oxygen System Display	"	"	"	
Tank Level Display	102193	102194	102195	102729
Dual Transducer	102439Y		102455	
Speedometer	102242	102243	102244	
DC Voltmeter	"	"	"	
Dual Display "Y"			102294	102295
Dual Current Amplifier	103318			
Display Pigtail	102272		Extension 15'	103367



Location of Magnetic Switches

Digital Display Calibration should be performed to assure accuracy. The calibration mode is entered by the use of a “password”. There are two magnetic switches, one located at each side of the display. These switches are activated with the use of a magnet. Switch activation is visually confirmed by the lighting of the closest decimal point on the display to the switch.

### Display Calibration sequence for Gauges with 7 segment LED's

A password will look like the following example.

L L L R R R

**Enter the switch sequence with a magnet to enter the basic calibration mode.**

Left Switch Left Switch Left Switch Right Switch Right Switch Right Switch

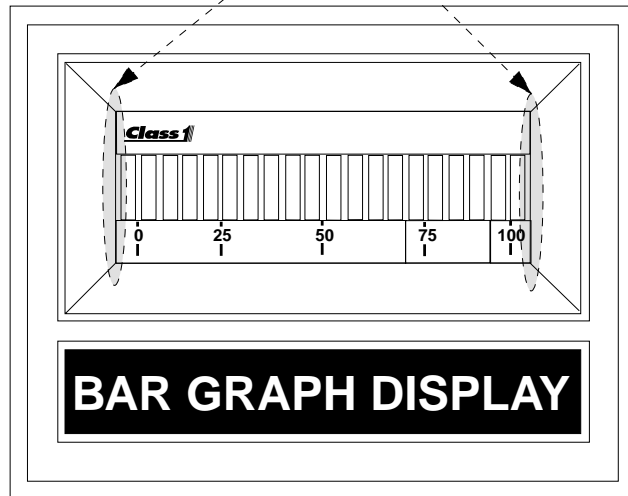
If the password is correctly entered, **CAL** will be displayed for 1/2 second followed by a number that is dependent on the display being calibrated (usually **0**). If necessary, the calibration number can be changed using the switch on the right side.

Establish accurate and stable conditions for calibration.

When the calibration conditions are stable, activate the left switch.

The display will read **donE** and then return to normal operation.

Location of magnetic switches



### Display Calibration for Gauges with bargraph displays

The calibration mode is entered by the use of a “password”.

There are two magnetic switches, one located at each side of the display.

These switches are activated with the use of a magnet.

Switch activation is visually confirmed by the toggling of the four closest bars on the display to the switch. If they are on they will turn off, if they are off they will turn on.

A password will look like the following example.

**L L L R R R**

Enter the switch sequence with a magnet to enter the basic calibration mode.

Left Switch    Left Switch    Left Switch    Right Switch    Right Switch    Right Switch

If the password is correctly entered, the left-most bar will turn on and flash. This indicates that the display is ready to be calibrated for the low set point.

With the system adjusted to the minimum calibration point (the system should be empty or at the lowest pressure condition) activate the left switch and then the right switch.

The right-most bar will begin to flash, indicating the display is ready for the high set point calibration.

Adjust the system to it’s maximum operating condition. Activate the right switch followed by the left switch.

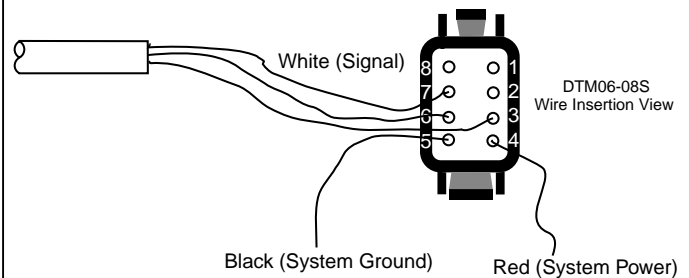
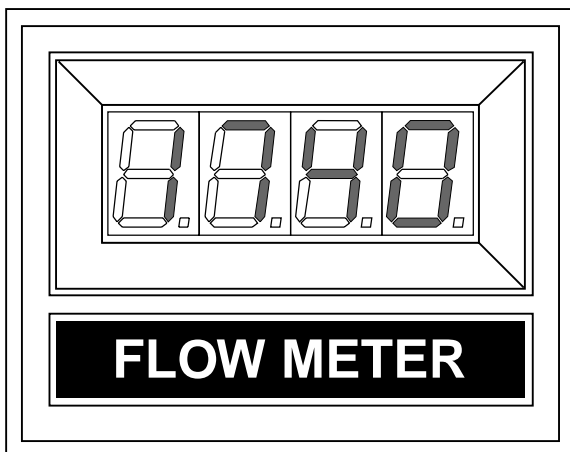
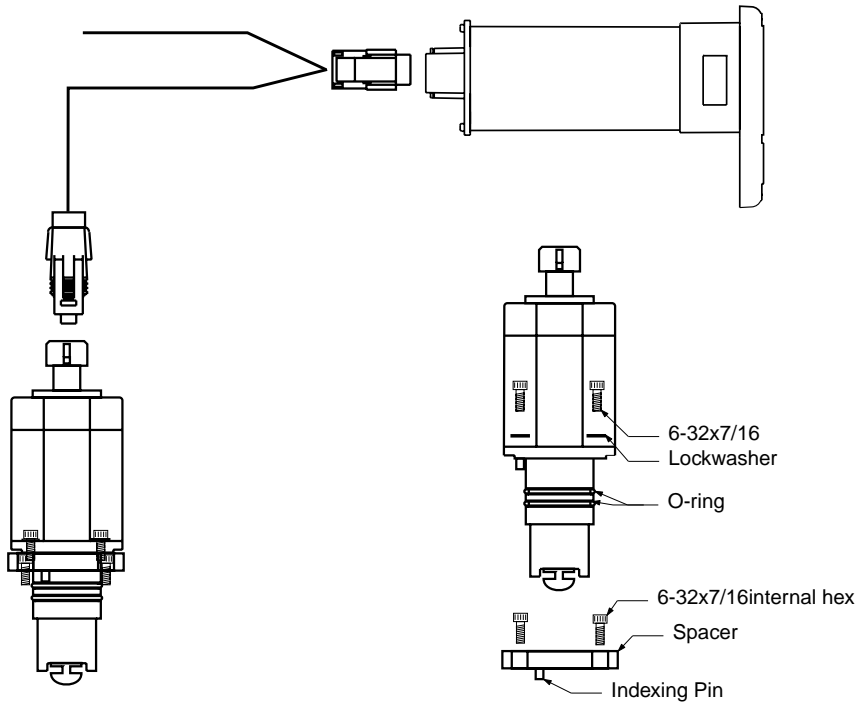
The display will return to normal operation and indicate current system status as a percentage of maximum calibrated capacity.

The **Class 1** digital flowmeter system comes with the digital display, a paddlewheel transmitter and a connecting harness (specify length). Mounting the transmitter to the discharge can be done with a saddle clamp, a welded boss or a valve adapter. Call for options and specify pipe diameter.

The flow display includes a totalizer function. A momentary switch (optional) is required to operate this feature. The display will continuously monitor flow when the unit has power and display the latest total volume when the totalizer switch is pressed. The total flow is cleared when power is removed from the unit.

## Class 1

### Paddlewheel Installation



## Installation

The **Class 1** Digital Flowmeter measures water velocity in the pipe to calculate the flow rate. The location of the paddlewheel transmitter is important for proper operation and accurate readings. Mount the transmitter in a location that is accessible for future maintenance and in an area where laminar (non-turbulent) flow is most likely to be maintained. Most problems with flowmeter accuracy and performance can be traced to the location of the transmitter.

**The hole size for the paddlewheel transmitter (PN102714) mount is 1-1/2".**

The hole size for the paddlewheel transmitter (PN101199) mount is 1-7/8".

## Transmitter Location

Elbows/Bends A straight run of pipe to the transmitter of at least six (6) times the pipe diameter after an elbow or other turbulence producing item is desirable for a successful installation. Try to locate the transmitter using the longest straight section of pipe available. Minimal turbulence at the transmitter provides the most accurate reading.

Valves/Gates If the transmitter is downstream of a valve, the minimum distance is fifteen (15) times the pipe diameter. Whenever possible, mount the transmitter before a valve.

Horizontal Pipes The transmitter will work in any position, however when mounted on a horizontal run, it should be mounted in the top half of the pipe to allow debris to be flushed out of the paddlewheel.

Increase/Decrease in pipe size The transmitter can be placed after an increase in pipe diameter, never after a decrease.

**Class 1** flexible hose can greatly assist in reducing the number of elbows and amount of turbulence between the pump and discharge pipe.

## Wiring

The Flowmeter system comes with a wiring harness that connects the transmitter to the display.

The OEM must supply power and ground to the digital display. Consideration should be given to the conditions under which the display will have power. The display is internally protected against short circuits, overvoltage and reverse polarity, but standard installation procedures should provide for circuit protection. Maximum current used by the flowmeter is 1.5 Amps.

A momentary grounding switch can be added when the totalizer function is desired. This is connected to the display through the 8 pin mini-connector at pin 8.

## **Operation**

The flowmeter displays the current flow rate whenever the display has power and the discharge is open. Range is 0 to 9995 GPM, LPM or IGPM as calibrated.

## **Totalizer**

The display includes a totalizer function that displays the total amount of water that has been flowed since the unit was turned on. This feature is enabled by grounding terminal number eight (8) of the display connector.

When in the totalizer mode, all decimal points will flash to indicate this mode.

While terminal number 8 is grounded, activating the left switch resets the totalizer to zero (0).

The totalizer resets to zero whenever power is removed from the display.

Multiply the reading on the display by 100 (add two zeroes) for total flow.

**Calibration**

Calibration matches the display to the paddlewheel transmitter installation and signal for a given flow rate.

A method of accurately determining flow should be used to calibrate the unit.

A smoothbore nozzle and a Pitot gauge is suitable.

Flowmeter calibration must be performed with the discharge flow stabilized at the desired calibration flow rate.

Establish and maintain the calibration flow rate for a minimum of 10 seconds to assure an accurate and stable reading. When the flow is stable, enter the flowmeter calibration mode.

The calibration mode password for the flowmeter is **L L L R R R**.

Switches are located at each side of the display.

These switches are activated with the use of a magnet.

Switch activation is visually confirmed by the lighting of the closest decimal point on the display.

Enter the switch sequence below to enter calibration mode.

**Left Left Left Right Right Right**

LEFT SWITCH LEFT SWITCH LEFT SWITCH RIGHT SWITCH RIGHT SWITCH RIGHT SWITCH

If the password is correctly entered, **CAL** will be displayed for 1/2 second followed by **0**.

Using the right switch on the display, enter the flow rate you intend to calibrate. If the department will use a standard flow for the discharge, use that figure for calibration.

The speed that the display increments/decrements increases the longer that the switch is held. If you pass the flow calibration number, “release” the switch and reactivate it. The display will “reverse direction” each time the switch is activated and the speed will start out at the slowest rate.

When the number on the display matches the discharge flow rate, check the Pitot for the desired pressure and then activate the left switch to complete calibration.

The display will read **donE** and then return to normal operation.

**Calibration is now complete.**

## Example Calibration (4")

Install a Pitot gauge and a two inch (2") smoothbore nozzle on the deck gun.  
Determine the flow rate that you want to use. (70 PSI=994 GPM).  
Start pumping water through the deck gun until the Pitot gauge reads 70 PSI.

Enter the calibration mode by bringing a magnet close to the left side of the display and removing it three (3) times, the left decimal point should light with each switch closure. Bring a magnet close to the right side of the display and remove it three (3) times, the right decimal point should light with each switch closure. The display should read **CAL** for 1/2 second and then **0**

Bring the magnet close to the right side of the display and hold it, the display number should increase. When the display reads **994**, move the magnet away from the display. If you stop short of **994**, you must bring the magnet close to the right side, remove it and bring it close again for the display to increase. If you pass **994**, just bring the magnet close to the right side and hold it until the number decreases to **994**

When the flow has been stable at 70 PSI for at least 10 seconds, move the magnet close to the left side of the display and remove it.

The display should read **donE** for several seconds and then display **994**  
Adjust the flow so that the Pitot reads **50**, the display should read **840**  
Adjust the flow so that the Pitot reads **110**, the display should show **1245**

All readings should be within +- 3 % of the 120 PSI value. (+-40 GPM for a 2" nozzle)

Use a Pitot nozzle flow chart to select a calibration setting. Ideally it should be a value close to the average rate expected from the discharge.  
Check your calibration with flow values that are lower and higher than the calibration flow but within normal flow rates for the discharge.

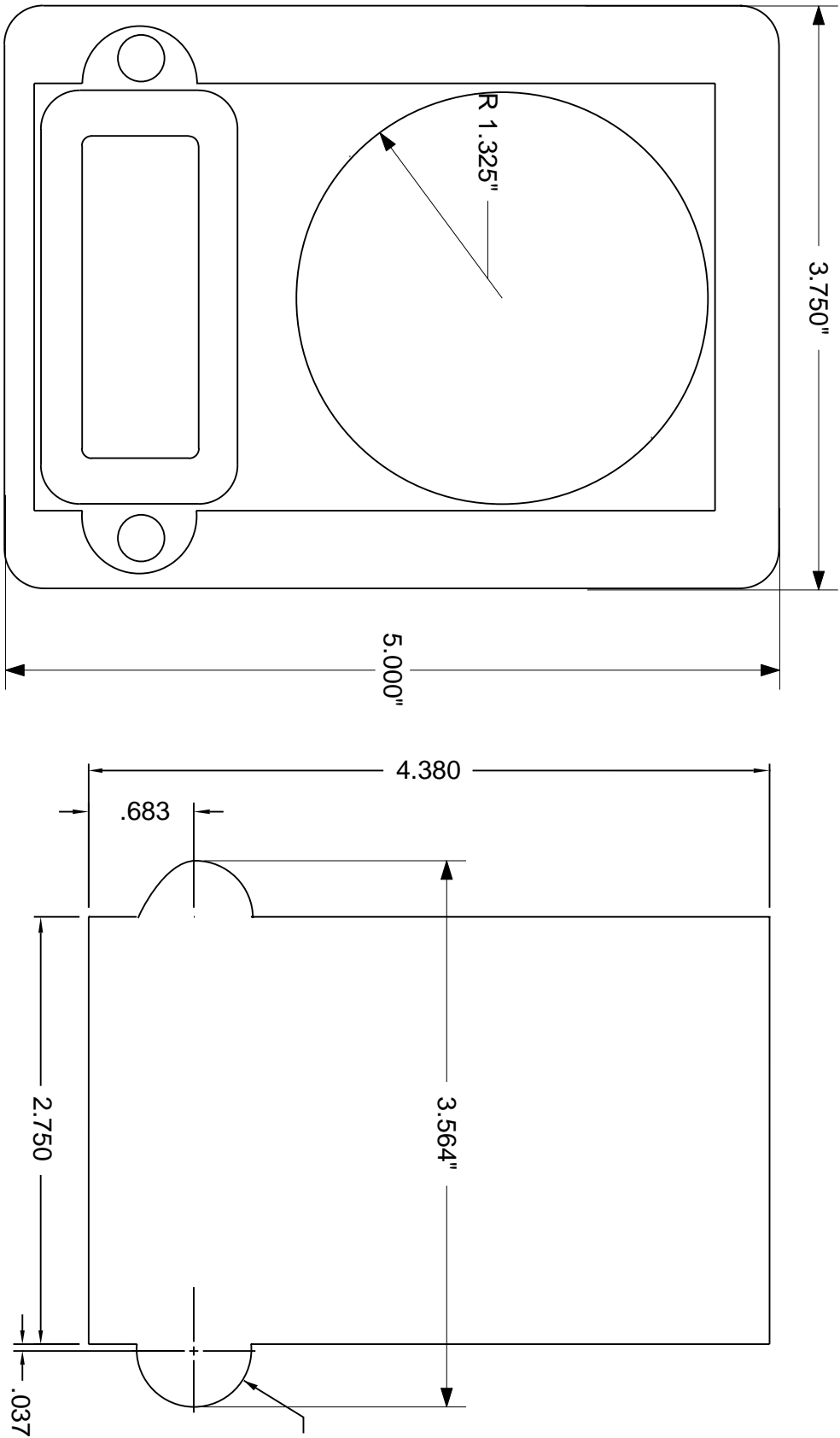
### Note:

There is a default calibration setting for 2", 2.5", 3", 4" and 5" schedule 80 pipes.

Password to enter default calibration:

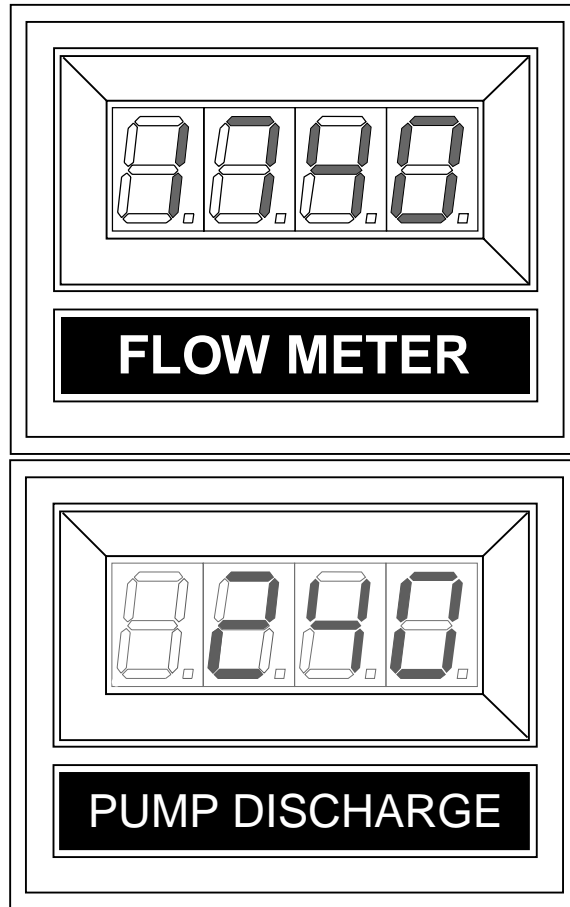
**L R R R L L L**

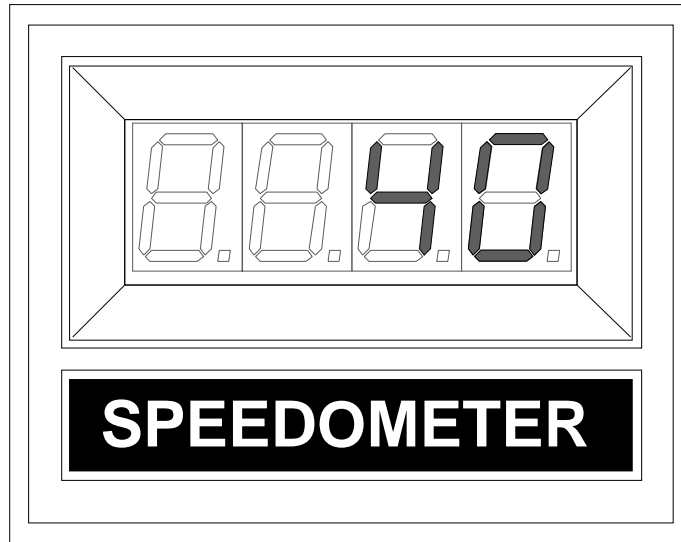
Scroll through the pipe sizes with the right switch and select with the left switch.  
The defaults will only work with schedule 80 pipe.



The Value Series flowmeter uses the digital display and a 2-1/2" or 3-1/2" pressure gauge to give the pump operator information on both flow and pressure for the discharge. A stainless steel bezel is available that can have insets color coded to identify the associated discharge. The panel cutout is a little more difficult than just mounting a gauge and a display and some planning should be given to cutting out the panel and mounting this system if you plan to use the bezel.

The flowmeter Super System is designed using the digital flowmeter and the digital pressure gauge. Each piece uses the standard digital display cutout. The only additional consideration from the standard flowmeter is for mounting the pressure transducer. This should generally be mounted after the valve and is a 1/4 NPT fitting. Use only the 1-1/4" hex to tighten the transducer, not the body of the sensor. Follow the calibration procedure for pressure and flow as appropriate after installation.



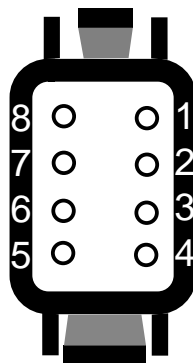


The Speedometer Display is connected to the OEM harness with a Deutsch 8 pin mini-connector.

Mating Connector: DTM06-08S  
Locking Wedge WM-8S  
Mating Terminal: 0462-201-20141 20 gauge socket

Terminal Assignments:

1	N/C (no connection)
2	N/C
3	N/C
4	Display Power (Ignition 12 VDC)
5	System Ground
6	N/C
7	Pulses IN (speedometer input)
8	N/C



Wire Insertion View

A usable **Pulses In** signal is available on the World Transmission wire #157 at the Vehicle Interface Module connection H-2.

## Calibration

Digital Speedometer calibration is performed with the vehicle speed stabilized at 40 M.P.H. or (40 K.P.H.)

The calibration mode is entered by the use of a “password”.

There are two magnetic switches, one located at each side of the display.

These switches are activated with the use of a magnet. Switch activation is visually confirmed by the lighting of the closest decimal point on the display.

Enter the switch sequence below to enter calibration mode.

L L L R R R

Left Switch

Left Switch

Left Switch

Right Switch

Right Switch

Right Switch

If the password is correctly entered, “**CAL**” will be displayed for 1/2 second followed by  
“**40**”

Maintain a constant speed of 40 for a minimum of 10 seconds to assure an accurate and stable calibration before activating the left switch.

Activate the left switch.

The display will read “**donE**” and return to normal operation showing the current speed.

**Calibration is now complete.**

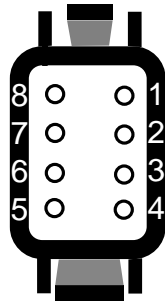
**NOTE: CALIBRATION SHOULD BE PERFORMED BY A PERSON OTHER THAN THE APPARATUS DRIVER.**

**IT IS UNSAFE FOR A DRIVER’S ATTENTION TO BE DIVERTED BY ANY TASK OTHER THAN THE SAFE OPERATION OF THE VEHICLE.**

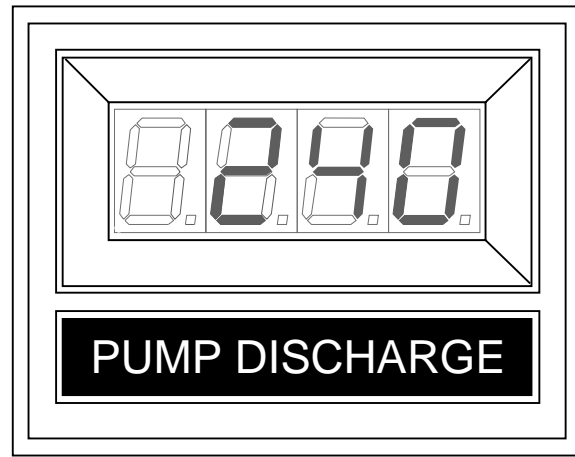
## Installation and Operation of the *Class 1* Digital Pressure Gauge.

The pressure transducer (**PN 102161**) mounts to the pump with a 1/4" NPT fitting. Mount the pressure transducer on the pump discharge manifold and tighten using the 1-1/4 hex. Mount the digital display on the pump panel using the dimensions provided.

Connect the wiring harness PN 102035, 102060, or 102061 to the transducer, the display and to the vehicle power and ground circuits.



Wire Insertion View



Operation is straightforward.

When the unit is turned on, the display indicates pump pressure at the transducer location. Normally no calibration is required, however if the gauge does not read zero when the pump is not running, a ZERO calibration can be performed. Password **L R R L L**.

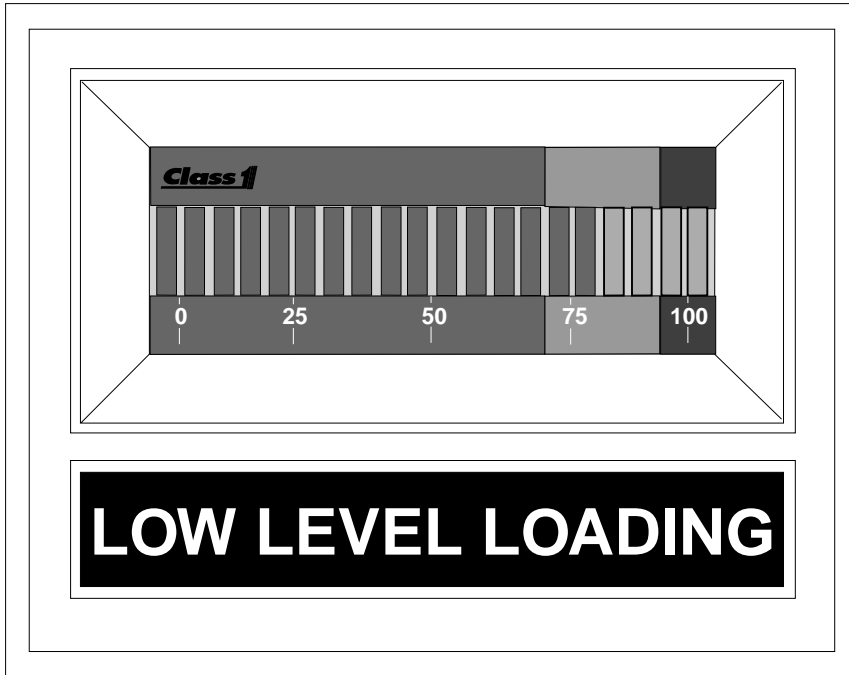
This feature works only on displays that read rP1.7 and above at power on.

Harness PN 102060 5'  
102035 10'  
102061 20'

PIN	COLOR	FUNCTION
A	BLACK	SENSOR GROUND
B	RED	SENSOR SUPPLY
C	WHITE	SENSOR SIGNAL

PIN	COLOR	FUNCTION
1	PLUG	
2	WHITE	SIGNAL
3	RED	SENSOR SUPPLY
4	RED	POWER IN
5	BLACK	GROUND IN
6	BLACK	SENSOR GROUND
7	PLUG	
8	PLUG	





The **Class 1** Aerial Loading Display is designed to warn aerial operators of dangerous loading conditions when an aerial device is operated at low angles of elevation. Live loads (factors that increase this load such as ice, occupants on the ladder, water load, extra equipment, etc.) are instantly taken into account by the system and displayed to the operator.

The display presents load information in an easy to interpret LED bargraph display as a percentage of maximum calibrated load and includes visual and aural warnings.

When the aerial load approaches the maximum load (approx. 80%), 18-20 bars will be illuminated on the display. When the load is increased to 90%-100%, the display will begin to flash, when the maximum load is exceeded by 50-100 pounds, an audible alarm output is activated in addition to the visual warning to notify the operator of a potentially hazardous condition.

**NOTE: THE DISPLAY PROVIDES A WARNING ONLY AND CANNOT PREVENT A TIP-OVER. THE AERIAL DEVICE MUST BE OPERATED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND OPERATORS MUST BE THOROUGHLY TRAINED.**

## Single transducer installation:

The transducer (**PN 102606**) must be installed in the pressure feed line to the actuating cylinder(s) or where it can sense the hydraulic pressure necessary to lift the aerial device.

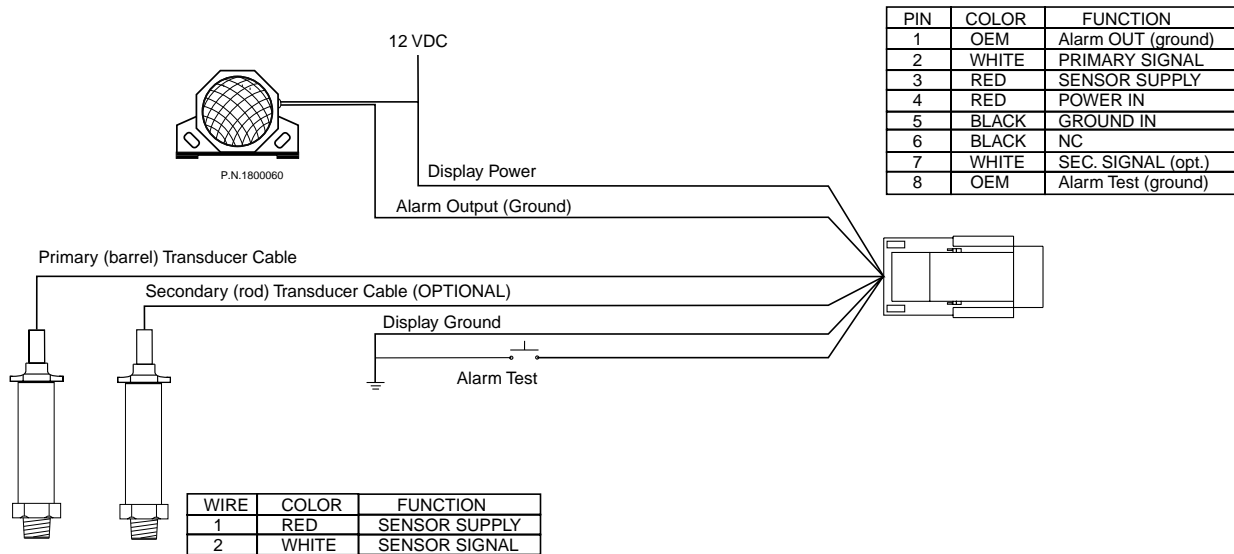
Supply 12 VDC and ground to the display.

Route the transducer wiring from the display to the transducer and plug in the connector.

If an audible alarm is desired, connect the alarm output (ground) from terminal #1 of the 8 pin display connector to the ground side of the alarm. An alarm test switch may be connected from ground to terminal #8 of the display connector.

## Dual transducer installation:

Identical to a single transducer installation with the addition of a second transducer that should be installed on the rod side of the hydraulic actuator. This transducer signal is read at terminal #7 of the display connector.



The Aerial Loading Display is connected to the OEM harness with a Deutsch 8 pin mini-connector.

Mating Connector: DTM06-08S  
 Locking Wedge WM-8S  
 Mating Terminal: 0462-201-20141 20 gauge socket

Terminal Assignments:

1	Alarm OUT (ground)
2	Pressure Signal IN (4-20 mA)
3	10 VDC OUT
4	Display Power (Ignition 12 VDC)
5	System Ground
6	Sensor Ground OUT
7	Rod pressure IN (Dual Transducer 4-20 mA)
8	Alarm Test IN (ground)

**WARNING:  
CALIBRATION SHOULD ONLY BE PERFORMED BY THE  
AERIAL MANUFACTURER!**

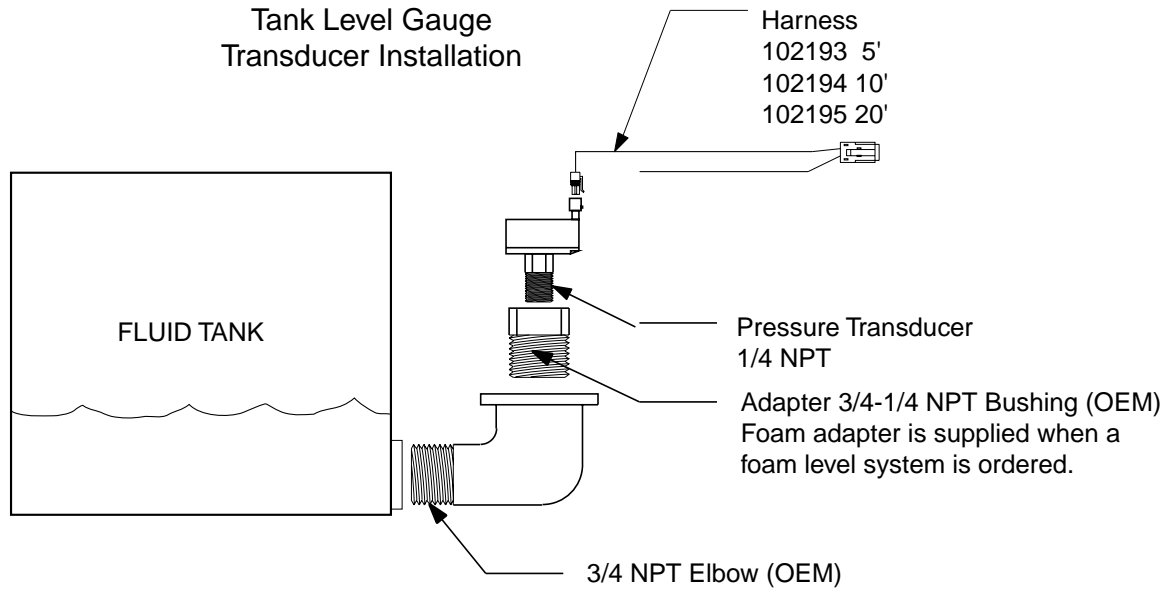
**IF YOU FEEL THAT THE DISPLAY NEEDS CALIBRATION, CONTACT YOUR  
AERIAL MANUFACTURER.**

Aerial manufacturers must ensure that the lift cylinder(s) do not bottom out during operations. This would cause an erroneous hydraulic pressure reading and the warning system will not operate as designed.

### **Dual Displays**

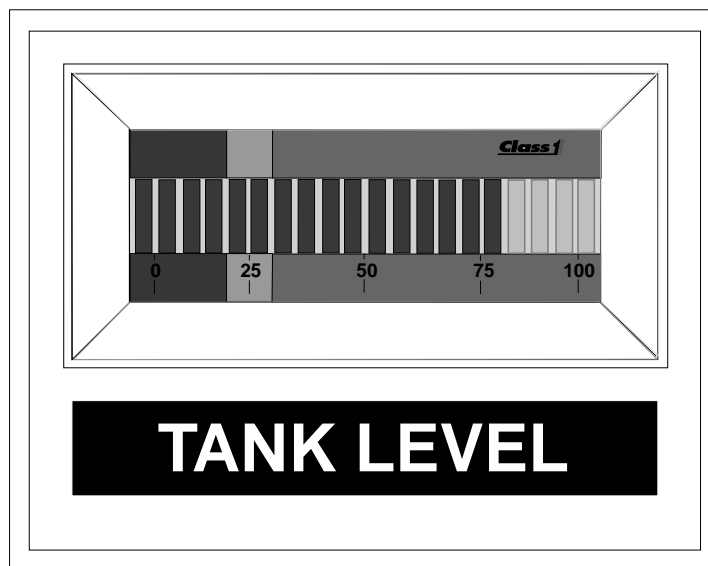
The ***Class 1*** Dual Current Amplifier (PN 103282) should be used whenever two displays are operated from one current transducer (aerial loading, air pressure and oxygen gauges)

A harness is available to simplify the installation (PN 103283)



The transducer must be mounted vertically as depicted to insure an accurate and reliable reading. This will also prevent damage to the transducer from freezing.

The tank level gauge transducer should be mounted near the bottom of the tank. (Approximately two (2) inches off the bottom)  
The display, the transducer and the harness are supplied to ease installation.  
When ordered for foam, a special baffled adapter is included with the installation kit.



The Tank Level Display is connected to the OEM harness with a Deutsch 8 pin connector.

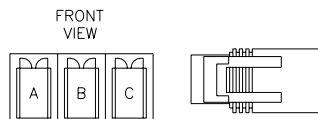
Mating Connector: DTM06-08S  
Locking Wedge WM-8S  
Mating Terminal: 0462-201-20141 (20 gauge socket)

Terminal Assignments:

1	Alarm OUT
2	Pressure Signal IN
3	5 VDC OUT
4	Display Power (Ignition 12 VDC)
5	System Ground
6	Sensor Ground OUT
7	Secondary pressure IN ( option )
8	Alarm Silence IN

Mount a 3/4 NPT elbow just off the bottom of the tank, enough to keep sediment out of the elbow and transducer (**PN 102162**). Attach a 3/4 to 1/4 NPT adapter (supplied for foam) to the elbow and mount the transducer to that. The elbow and adapter need to be installed so that the transducer is mounted vertically.

PIN	COLOR
A	RED
B	BLACK
C	WHITE



## Pressurized Tanks

If you have a pressurized tank, two pressure transducers (**PN 102162**) can be used to compensate for pressure or vacuum in the tank. One transducer should be mounted near the bottom of the tank and one near the top.

When calibrating the dual transducer installation, the tank should be vented to the atmosphere.

Basic Calibration: (2 point)

With the fluid tank empty, enter the calibration password.

L L L R R R

The left (0%) bar will flash to indicate that you are ready to calibrate for an empty tank.

Activate the left switch followed by the right switch.

The right (100%) bar will flash to indicate that the display is ready to calculate for a full tank.

When the tank is full, actuate the right and then the left switch.

**Calibration is complete.**

If after checking the accuracy of your calibration, you are not satisfied, you can perform the advanced calibration procedure. This is rarely necessary except in the case of oddly shaped tanks.

Advanced Calibration: (5 point)

With the fluid tank empty, enter the calibration password.

L L R R L L

The left (0%) bar will flash to indicate that you are ready to calibrate empty.

Activate the left switch followed by the right switch.

The fifth bar from the left (25%) will flash to indicate that the display is ready to calculate for a quarter tank.

Fill the tank to 1/4 full, actuate the right and then the left switch.

The tenth bar from the left (50%) will flash to indicate that the display is ready to calculate for a half tank.

Fill the tank to 1/2 full, actuate the left and then the right switch.

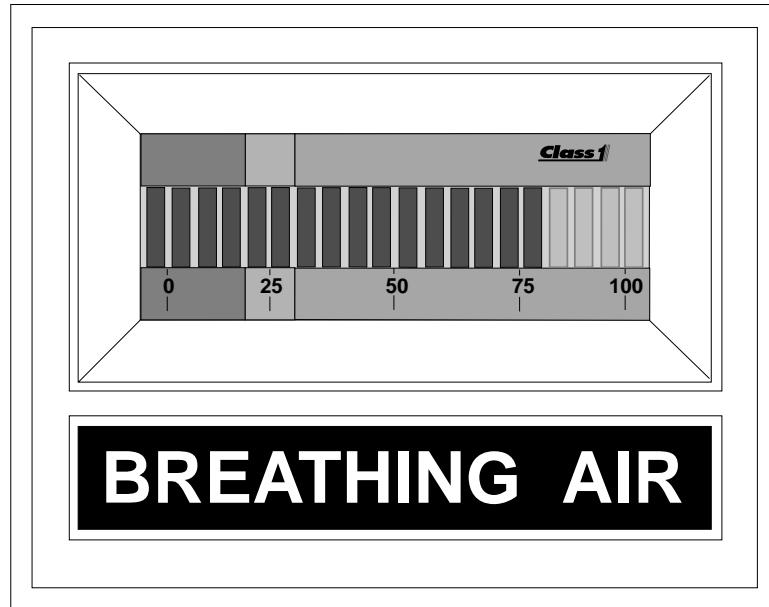
The fifteenth bar from the left (75%) will flash to indicate that the display is ready to calculate for three fourths tank.

Fill the tank 3/4 full, actuate the right and then the left switch.

The right (100%) bar will flash to indicate that the display is ready to calculate for a full tank.

When the tank is full, actuate the right and then the left switch.

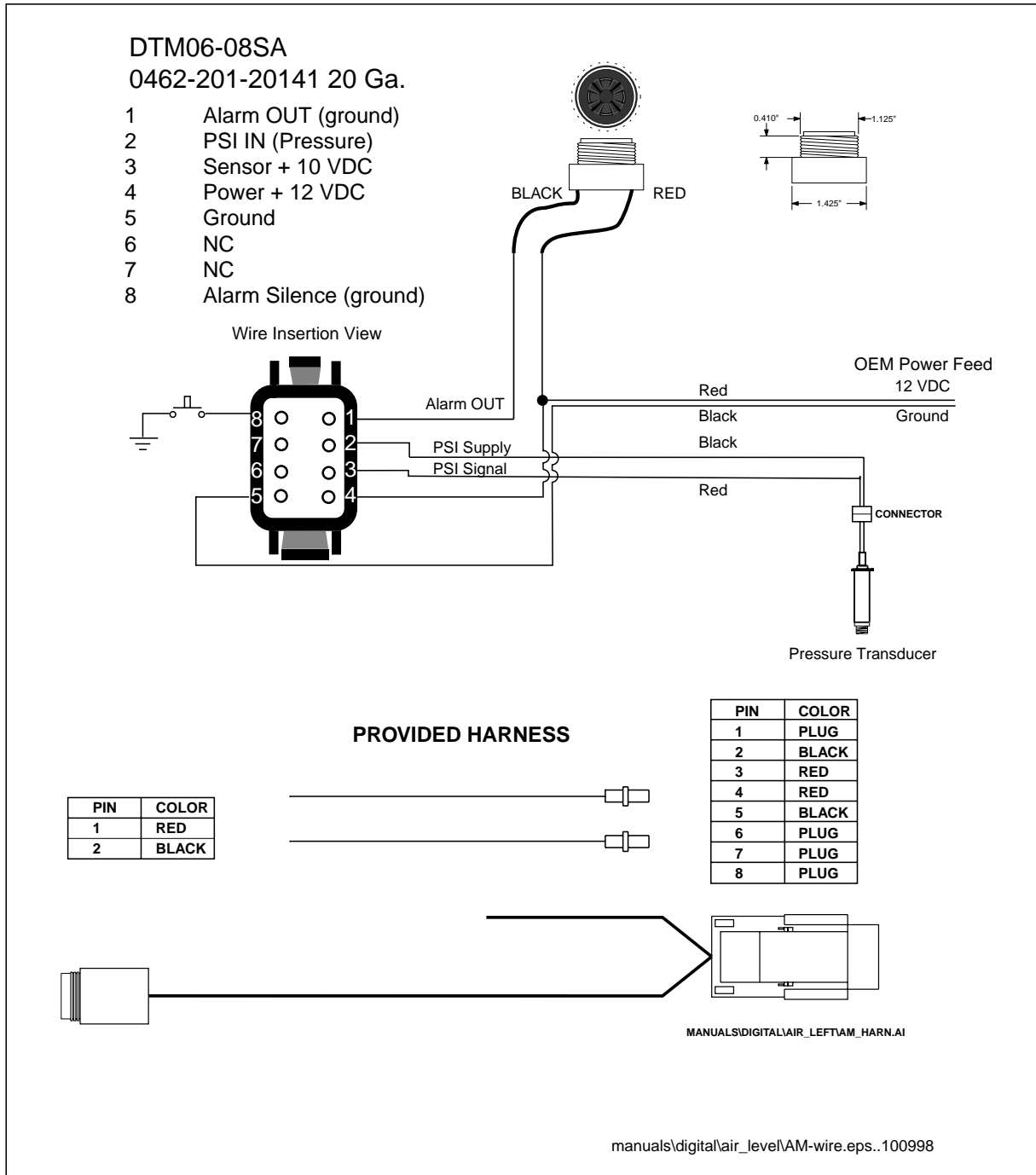
**Calibration is complete.**



The **Class 1** Breathing Air Display is designed to provide firefighters with a visible indication of breathing air remaining and an audible warning when there is less than 20% air remaining. The alarm will not activate when there is less than 50 PSI air in the system, this silences the alarm when the air supply is turned off.

The display represents air volume information in an easy to interpret LED bargraph display as a percentage of maximum calibrated pressure. The Breathing Air Display includes a visual warning and an auxiliary warning alarm output.

When the relative volume of air remaining reaches 25%, the bars will begin to flash and the alarm output will become active when system pressure drops to 20%. The alarm can be silenced with an alarm silence switch. Once the alarm is silenced, it will remain silent for five (5) minutes or until the unit is turned off and then back on, and is reset whenever the volume of air exceeds 20%.



The **Class 1** breathing air gauge is easily wired into the apparatus using the supplied installation kit that includes the necessary wiring harness and connectors.

## **Calibration for Breathing Air Gauge installations:**

Empty Cylinder (Closed Valve)

With the air bottle closed and the system purged, enter the calibration password.

**L L L R R R**

The left (0%) bar will flash to indicate that you are ready to calibrate for an empty system.

Activate the left switch followed by the right switch.

The right (100%) bar will flash to indicate that the display is ready to calibrate for a full system.

Maximum Air

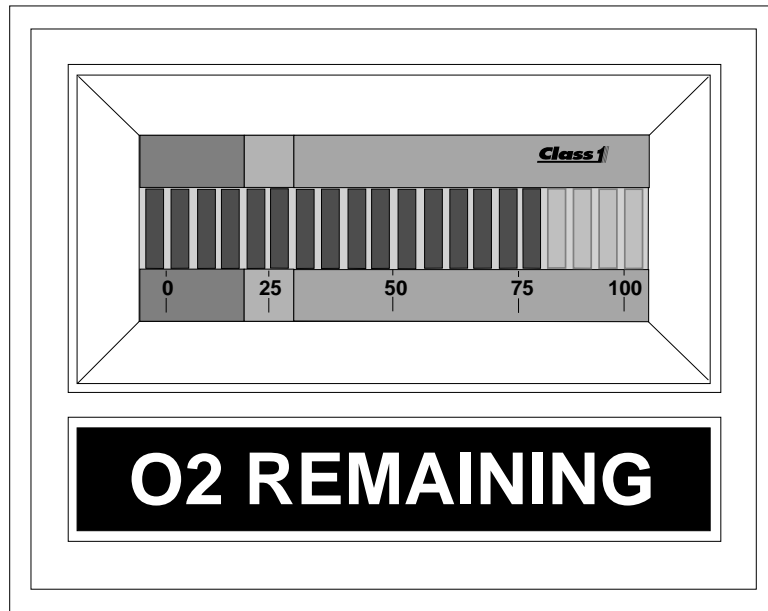
With a full air bottle and the valve open actuate the right switch and then the left switch.

**Calibration is complete.**

Calibration should be accomplished using an air cylinder filled to the locally established maximum pressure.

## **Dual Displays**

The ***Class 1*** Dual Current Amplifier (PN 103282) should be used whenever two displays are operated from one current transducer (aerial loading, air pressure and oxygen gauges). A harness is available to simplify the installation (PN 103283)



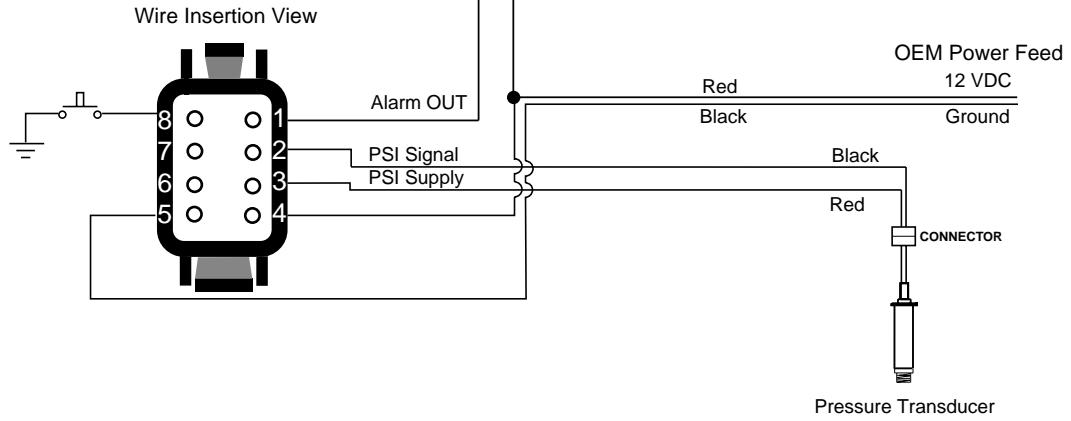
The **Class 1** Oxygen Remaining Display is designed to provide operators with a visible indication of Oxygen remaining and an audible warning when there is less than 20% oxygen remaining. The audible warning is inactive whenever the pressure is below 50 PSI so that it will not sound when the supply is turned off.

The display represents oxygen volume information in an easy to interpret LED bargraph display as a percentage of maximum calibrated pressure. The display includes a visual warning and an auxiliary warning alarm output.

When the relative volume of oxygen remaining reaches 25%, the bars will begin to flash, and when the system pressure drops to 20%, the auxiliary output will turn on. The alarm can be silenced with an alarm silence switch. Once the alarm is silenced, it will remain silent until the unit is turned off and then back on, and will reset whenever the volume of air exceeds 20%. When the alarm is silenced, there will be an alert chirp every fifteen (15) minutes to remind the operator that the oxygen supply is low.

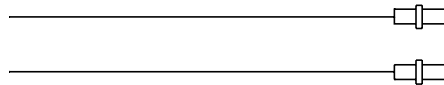
DTM06-08SA  
0462-201-20141 20 Ga.

- 1 Alarm OUT (ground)
- 2 PSI IN (Pressure)
- 3 Sensor + 10 VDC
- 4 Power + 12 VDC
- 5 Ground
- 6 NC
- 7 NC
- 8 Alarm Silence (ground)

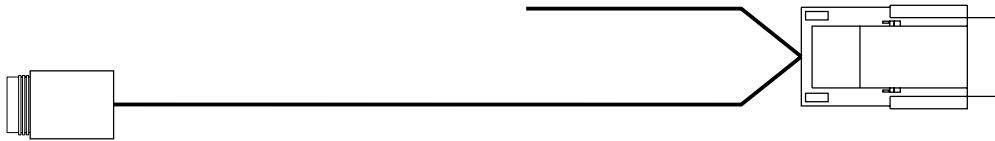


### PROVIDED HARNESS

PIN	COLOR
1	RED
2	BLACK



PIN	COLOR
1	PLUG
2	BLACK
3	RED
4	RED
5	BLACK
6	PLUG
7	PLUG
8	PLUG



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**Calibration for Breathing Oxygen Gauge installations:**

Empty Cylinder (Closed Valve)

With the oxygen bottle closed and the system purged, enter the calibration password.

**L L L R R R**

The left (0%) bar will flash to indicate that you are ready to calibrate for an empty system.

Activate the left switch followed by the right switch.

The right (100%) bar will flash to indicate that the display is ready to calibrate for a full system.

Maximum Volume

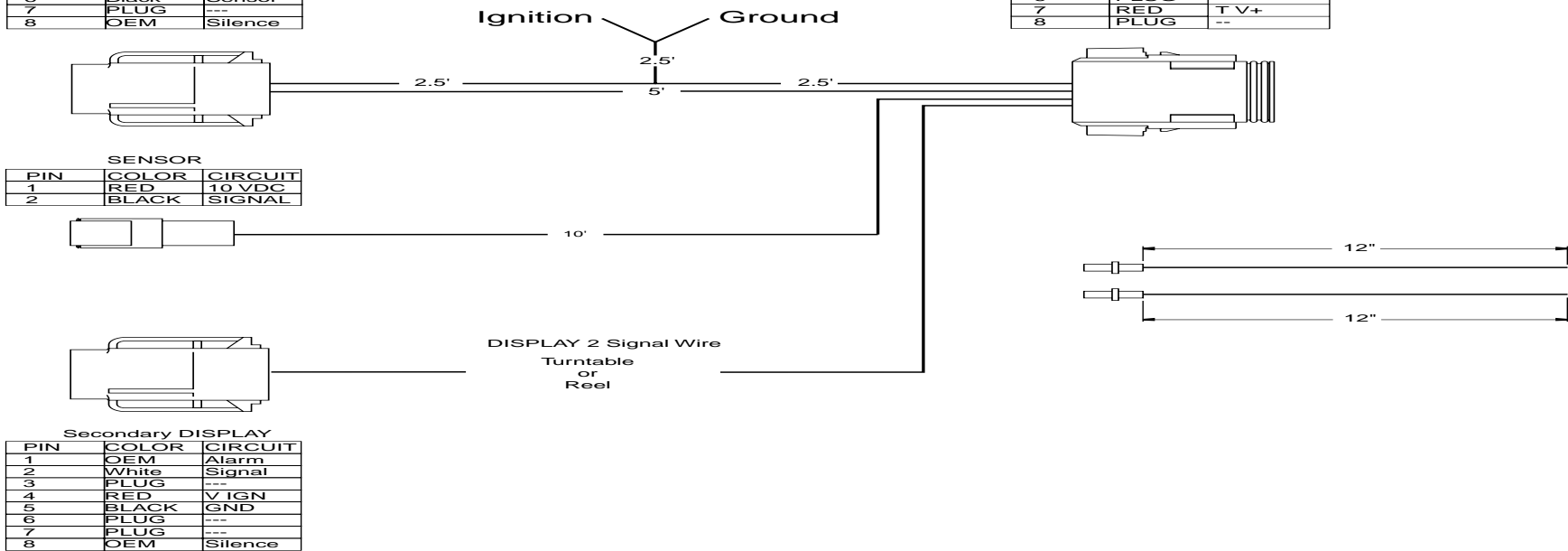
With a full oxygen bottle and the system pressurized, actuate the right switch and then the left switch.

**Calibration is complete.**

**NOTE:**            *Calibration should be accomplished using an oxygen cylinder filled to the locally established maximum pressure.*

PRIMARY DISPLAY		
PIN	COLOR	CIRCUIT
1	OEM	Alarm
2	BLACK	Signal
3	RED	10 VDC
4	RED	V IGN
5	BLACK	GND
6	Black	Sensor -
7	PLUG	---
8	OEM	Silence

DUAL OUTPUT CONVERTER		
PIN	COLOR	CIRCUIT
1	BLACK	SIGNAL 1
2	WHITE	SIGNAL 2
3	BLACK	XDucer IN
4	RED	V IGN
5	BLACK	GND
6	PLUG	--
7	RED	T V+
8	PLUG	--



A Dual Current Amplifier should be used whenever two displays share a single 4-20 mA transducer.

PIPE Pitot PSI Pressure	U.S. Gallons per Minute at various nozzle sizes																
	3/4 1/2"	3/4 5/8"	2 3/4"	2 7/8"	2 1"	2 1-1/8"	2-1/2 1-1/4"	2-1/2 1-3/8"	2-1/2 1-1/2"	3 1-5/8"	3 1-3/4"	3-1/2 1-7/8"	4 2"	4 2-1/4"	5 2-1/2"	6 3"	12 6" approx
30	41	64	92	125	163	206	254	308	366	430	498	572	651	824	1017	1464	5856
35	44	69	99	135	176	222	275	332	395	464	538	618	703	890	1098	1581	6324
40	47	73	106	144	188	238	294	355	423	496	575	660	751	951	1174	1691	6764
45	50	78	112	153	199	252	311	377	448	525	610	700	797	1009	1245	1793	7172
50	53	82	118	161	210	266	328	397	473	555	643	738	840	1063	1313	1890	7560
55	55	86	124	169	220	279	344	417	496	582	675	774	881	1115	1377	1982	7928
60	58	90	130	176	230	291	360	435	518	608	705	809	920	1165	1438	2071	8284
62	58	91	132	179	234	296	366	442	526	618	716	822	935	1184	1462	2105	8420
64	59	93	134	182	238	301	371	449	535	628	728	835	950	1203	1485	2138	8552
66	60	94	136	185	241	305	377	456	543	637	739	848	965	1222	1508	2172	8688
68	61	96	138	188	245	310	383	463	551	647	750	861	980	1240	1531	2204	8816
70	62	97	140	190	248	315	388	470	559	656	761	874	994	1258	1553	2236	8944
72	63	99	142	193	252	319	394	477	567	666	772	886	1008	1276	1575	2268	9072
74	64	100	144	196	255	323	399	483	575	675	783	898	1022	1293	1597	2299	9196
76	65	101	146	198	259	328	405	490	583	684	793	910	1036	1311	1618	2330	9320
78	66	103	148	201	262	332	410	496	590	693	803	922	1049	1328	1639	2361	9444
80	66	104	150	203	266	336	415	502	598	702	814	934	1063	1345	1660	2391	9564
85	68	107	154	210	274	347	428	518	616	723	839	963	1095	1386	1711	2465	9860
90	70	110	159	216	282	357	440	533	634	744	863	991	1127	1427	1761	2536	10144
95	72	113	163	222	289	366	452	547	651	765	887	1018	1158	1466	1809	2605	10420
100	74	116	167	228	297	376	464	562	668	784	910	1044	1188	1504	1856	2673	10692
105	76	119	171	233	304	385	476	575	685	804	932	1070	1217	1541	1902	2739	10956
110	78	122	175	239	311	394	487	589	701	823	954	1095	1246	1577	1947	2803	11212
115	80	125	179	244	319	403	498	602	717	841	976	1120	1274	1613	1991	2867	11468
120	81	127	183	249	325	412	509	615	732	859	997	1144	1301	1647	2034	2928	11712

Flow Calibration Chart

PIPE	3/4	2	2-1/2	3	3-1/2	4	5	6	12	Imperial Gallons per Minute at various nozzle sizes approx							
Pitot PSI Pressure	1/2"	5/8"	3/4"	7/8"	1"	1-1/8"	1-1/4"	1-3/8"	1-1/2"	1-5/8"	1-3/4"	1-7/8"	2"	2-1/4"	2-1/2"	3"	6"
30	34	53	77	104	136	172	211	256	305	358	415	476	542	686	847	1219	4876
35	37	57	82	112	147	185	229	276	329	386	448	515	585	741	914	1316	5266
40	39	61	88	120	157	198	245	296	352	413	479	550	625	792	978	1408	5632
45	42	65	93	127	166	210	259	314	373	437	508	583	664	840	1037	1493	5972
50	44	68	98	134	175	221	273	331	394	462	535	615	699	885	1093	1574	6295
55	46	72	103	141	183	232	286	347	413	485	562	644	734	928	1147	1650	6601
60	48	75	108	147	192	242	300	362	431	506	587	674	766	970	1197	1724	6898
62	48	76	110	149	195	246	305	368	438	515	596	684	779	986	1217	1753	7011
64	49	77	112	152	198	251	309	374	445	523	606	695	791	1002	1237	1780	7121
66	50	78	113	154	201	254	314	380	452	530	615	706	804	1018	1256	1809	7234
68	51	80	115	157	204	258	319	386	459	539	625	717	816	1033	1275	1835	7341
70	52	81	117	158	207	262	323	391	465	546	634	728	828	1047	1293	1862	7447
72	52	82	118	161	210	266	328	397	472	555	643	738	839	1062	1311	1888	7554
80	55	87	125	169	221	280	346	418	498	585	678	778	885	1120	1382	1991	7964
85	57	89	128	175	228	289	356	431	513	602	699	802	912	1154	1425	2053	8210
90	58	92	132	180	235	297	366	444	528	620	719	825	938	1188	1466	2112	8447
95	60	94	136	185	241	305	376	455	542	637	739	848	964	1221	1506	2169	8676
100	62	97	139	190	247	313	386	468	556	653	758	869	989	1252	1545	2226	8903
105	63	99	142	194	253	321	396	479	570	669	776	891	1013	1283	1584	2281	9123
110	65	102	146	199	259	328	406	490	584	685	794	912	1038	1313	1621	2334	9336
115	67	104	149	203	266	336	415	501	597	700	813	933	1061	1343	1658	2387	9549
120	67	106	152	207	271	343	424	512	610	715	830	953	1083	1371	1694	2438	9752

**Flow Calibration Chart**

PIPE Pitot Kpa Pressure	Liters per Minute at various nozzle sizes									
	19mm	23.8mm	25.4mm	28.5mm	31.8mm	38.1mm	44.5mm	47.6mm	50.8mm	57.2mm
140									2014	2551
150									2108	2676
170									2203	2797
180									2294	2911
190									2381	3025
210									2464	3127
220									2548	3233
230									2623	3331
250									2699	3426
260									2775	3520
280	401	628	708	897	1113	1597	2177	2502	2847	3611
290	413	643	727	920	1139	1635	2230	2562	2915	3702
300	420	659	742	939	1166	1673	2283	2623	2983	3785
320	432	674	757	961	1192	1711	2336	2684	3051	3865
330	439	685	776	980	1219	1749	2385	2740	3119	3948
350	447	708	791	1003	11257	1787	2434	2824	3184	4031
360	458	716	806	1022	1268	1821	2483	2850	3244	4115
370	466	727	821	1041	1294	1855	2529	2907	3305	4194
390	473	742	837	1060	1317	1889	2574	2960	3365	4274
400	485	753	852	1079	1340	1923	2620	3013	3426	4349
420	492	774	867	1098	1374	1957	2665	3089	3483	4418
430	500	780	882	1117	1385	1987	2710	3115	3543	4493
440	507	791	897	1132	1408	2018	2752	3164	3600	4565
450	515	799	908	1151	1419	2052	2794	3189	3653	4633
470	522	818	924	1166	1450	2082	2839	3263	3710	4701
480	530	829	935	1185	1472	2112	2881	3308	3763	4770
500	538	840	950	1204	1491	2143	2919	3354	3816	4838
510	545	852	961	1219	1514	2173	2960	3403	3872	4900
530	553	869	977	1234	1542	2203	2996	3471	3922	4970
540	560	874	988	1249	1552	2230	3040	3494	3975	5035
550	568	886	999	1268	1575	2256	3078	3535	4024	5099
570	575	897	1014	1283	1593	2286	3115	3581	4073	5163
580	583	908	1026	1298	1612	2313	3153	3622	4122	5224
590	587	920	1037	1314	1631	2339	3191	3668	4172	5284
610	594	927	1049	1329	1650	2370	3229	3709	4221	5345
620	602	939	1060	1344	1669	2396	3263	3751	4270	5409
640	609	956	1071	1359	1696	2423	3301	3813	4315	5470
650	613	961	1083	1374	1703	2449	3335	3834	4361	5527
660	621	969	1094	1389	1722	2476	3369	3876	4406	5587
680	628	980	1105	1401	1741	2496	3407	3914	4452	5644
690	636	992	1117	1416	1760	2525	3441	3955	4501	5701
730	651	1020	1147	1450	1812	2585	3528	4075	4611	5837
760	666	1037	1173	1484	1843	2646	3611	4148	4720	5977
790	681	1060	1200	1518	1885	2707	3770	4239	4826	6113
830	693	1083	1226	1552	1927	2763	3891	4330	4932	6242

All of the digital displays have a built in lamp test feature. The password to activate this function is:

**L L R L L.**

When activated, all segments on the display LED's will illuminate for a few seconds and then return to normal operation.

The digital displays that utilize a pressure sensor have a sensor check feature. The password to activate this function is:

**L R R L R R.**

## Special Function Passwords:

Transducer Status Check:

**L R R L R R**

Pressure Gauge: *rP1.7 or above*

Zero Calibration to match transducer to display:

**L R R L L**

Used if the gauge indicates pressure or vacuum erroneously.

Flowmeter:

Display Raw Pulses:

**L R L R L L**

Checks paddlewheel operation.

Noise cancellation:

**L R L R R R L**

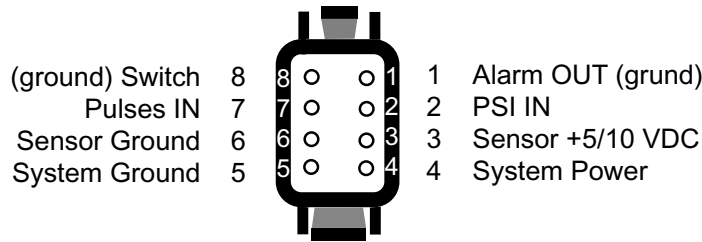
Cancels out flow indication from eddy currents on a transmitter when the discharge valve is closed. Toggles **C on** or **C off**.

Reset Totalizer:

**L**

*This password will only work when the flowmeter is in totalizer mode.*

DTM06-08SA  
0462-201-20141 20 Ga.



Wire Insertion View

### The display does not illuminate.

The display must have power at terminal 4 and ground at terminal 5.

With the connector removed, check across pins 4 and 5 for 12 VDC, if 12 volts is present with the correct polarity, replace the display. If voltage and/or ground is not present, check the vehicle wiring and display harness terminations.

### The pressure reading on a discharge or intake gauge does not change.

There is a problem with the pressure transducer or wiring. At the transducer connector, check for 5 VDC between pins A (ground) and pin B (+5 VDC). These are sent from the display and must be of the correct polarity for the transducer to function. Plug the connector into the transducer and check for voltage at the display between pin 6 (sensor ground) and pin 2 (signal). With zero pressure/suction at the pump, this voltage should be between 500 mV and 900 mV. As the pressure in the pump increases, the voltage should increase. If it does not, then replace the transducer. If the voltage increases, and the display does not change, perform a default calibration, call Class1 (1-800-533-3569) for instructions. If the default calibration does not correct the problem, replace the display.

### The pressure display reads **SEn5**.

There is a problem with the pressure transducer or wiring. At the transducer connector, check for 5 VDC between pins A (ground) and pin B (+5 VDC). These are sent from the display and must be of the correct polarity for the transducer to function. Plug the connector into the transducer and check for voltage between Pin A (sensor ground) and pin C (sensor signal) at the transducer. With zero pressure/suction at the pump, this voltage should be between 500 mV and 900 mV, if it is not, replace the transducer. Check for voltage at the display between pin 6 (sensor ground) and pin 2 (signal). With zero pressure/suction at the pump, this voltage should be between 500 mV and 900 mV. If it is not, check the wiring from the transducer to the display. If the correct voltage is present at pin 2, replace the display.

## **The tank level gauge has a bar traveling back and forth across the display.**

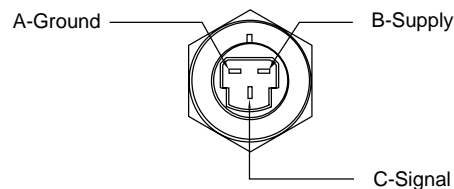
There is a problem with the pressure transducer (PN 102162) or wiring. At the transducer connector, check for 5 VDC between pins A (+5 VDC) and pin B (ground). These are sent from the display and must be of the correct polarity for the transducer to function. Plug the connector into the transducer and check for voltage between Pin B (sensor ground) and pin C (sensor signal) at the transducer. With an empty tank, this voltage should be between 500 mV and 900 mV, if it is not, replace the transducer. Check for voltage at the display between pin 6 (sensor ground) and pin 2 (signal). With an empty tank, this voltage should be between 500 mV and 900 mV. If it is not, check the wiring from the transducer to the display. If the correct voltage is present at pin 2, replace the display.

## **The Tank Level Gauge does not change or calibrate.**

There is a problem with the pressure transducer or wiring. At the transducer connector, check for 5 VDC between pins A (+5 VDC) and pin B (ground). These are sent from the display and must be of the correct polarity for the transducer to function. Plug the connector into the transducer and check for voltage at the display between pin 6 (sensor ground) and pin 2 (signal). With an empty tank, this voltage should be between 500 mV and 900 mV. As the water level in the tank increases, the voltage should increase. If it does not, then replace the transducer. If the voltage increases, and the display does not change, attempt to calibrate the unit. If the calibration does not correct the problem, replace the display.

## **The Flow Meter does not read flow or calibrate.**

Place the meter in raw mode **L R L R L L**. Does the meter read pulses, and do they change with a flow increase or decrease? If they do, re-calibrate. If you do not read pulses, then it is a wiring or paddlewheel problem. At the paddlewheel, check for 12 VDC between pins A (ground) and pin B (+12 VDC). These are sent from the display and must be of the correct polarity for the paddlewheel to function. Plug the connector into the paddlewheel and check for pulses at the display between pin 6 (sensor ground) and pin 7 (signal). If pulses are not present, then check the paddlewheel orientation and the signal wire from the paddlewheel to pin 7 at the display. If everything checks out OK, replace the paddlewheel. If the signal is present and the display does not read raw pulses, replace the display.



Pressure Transducer Pinout