STYLE 9300 AKRON FLOW/PRESSURE SYSTEMS LPM/kPa
INSTALLATION CALIBRATION OPERATING INSTRUCTIONS

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Figure 6a

**LEFT BUTTON**
Press and Release to change
Mode to **lpm** or **TOTAL**
Press and hold to change **LED** intensity.

**RIGHT BUTTON**
Press and release to change
Mode to **PRESSURE** (bar)
Press and hold to change **LED** intensity.

**Akron 1890**
**ACTUAL FLOW**
1890 liters per minute

**Akron 380**
**TOTAL LITERS FLOWED**
380 x 100 = 38000

**Akron 8**
**DISCHARGE PRESSURE**
8 bar

**Akron 810**
**DISCHARGE PRESSURE**
810 kPa
METER INSTALLATION GUIDE

PANEL CUTOUT DIMENSIONS
A. MAIN OPENING 3-15/16"
B. MOUNTING—FOUR 7/32" HOLES ON A 4.950"
   BOLT CIRCLE

FIGURE 6
A. SYSTEM COMPONENTS

- Display Meter (Figure 6)
- Flow Sensor (Figure 1)
- Pressure Transducer (Figure 4)
- Interconnect Cables 5, 10, or 20'
- Sensor Holder
  1. Valve Inlet Adapters (Figure 2A, B & C)
  2. Saddles (Figure 3)

B. FLOW SENSOR LOCATION

Primary
1. Akron's specially designed inlet adapters for Swing-out Valves. Size 2" - 4".
2. Saddle Clamps. Size 2" - 5" (Schedule 40 pipe)

Note: Horizontal line installations must position the sensor port within 180° on topside (9:00 - 3:00).

Avoid
- Installations where the sensor would be located in a line where a smaller line precedes it.
- Installations where sensor would be positioned following a valve or elbow. Never install flow port valve adapter on discharge side of valve.
- Installations where sensor would directly precede bypass eductor.

Note: In tight installations where water flow is turbulent, custom calibration is required for maximum accuracy.

C. FLOW SENSOR INSTALLATION

1. Akron Valve Adapter
   a. Simply remove retainer nut or plug.
   b. Grease O-Rings on sensor with O-Ring lube or silicone grease. (Remove plastic paddlewheel protector.)
   c. Insert sensor into port and push in.
   d. Align pin 'A' (Figure 1) with locator hole and push in.
   e. Replace the retainer nut or plug and tighten with a wrench.

Sensor Installation Complete

2. Saddle Clamp
   a. Determine the location on the pipe.
   b. Drill a 1-1/8" hole in the pipe with a hole saw. Horizontal piping on top side from 9:00 - 3:00.
   c. Deburr the edge of the hole and clean the area where the gasket seals.
   d. Center saddle with hole in pipe (Sensor locator hole 'A' (Figure 3) may be on either side of pipe hole.)
e. Insert strap into saddle and tighten nuts hand tight.

f. Using a torque wrench tighten nuts alternately to 80 foot pounds.

g. Follow steps a - e in C.1 to add sensor.

Sensor Installation Complete

D. PRESSURE TRANSDUCER INSTALLATION

The Pressure Transducer (Figure 4) has a 1/8" NPT male thread.

1. Apply pipe sealant to the thread and insert into provided tapped hole in valve discharge adapter on discharge side of valve.

2. Tighten with wrench to torque used for small pipe fittings.

Pressure Transducer Installation is now Complete

E. METER INSTALLATION

⚠️ CAUTION: Always disconnect all wiring and cables from the meter before electric arc welding at any point on apparatus. Failure to do so will result in damage to meter.

1. Select mounting location(s) for meter(s). The meter is to be mounted from the outside of the panel and will need clearance behind of 3-15/16" width by 2-7/8" depth.

See Figure 5 for cutout and screw mounting dimensions.

⚠️WARNING: The meter is a sealed unit and the bezel should not be disassembled from the case.

2. After the cutout and mounting holes are finished, mount the meter using the provided fasteners.

3. It is now time to connect the Red power wire and, the Black ground wire, to the truck system.

⚠️ CAUTION: Exercise caution when working with the electrical system. Disconnect cable from battery positive terminal before connecting power to meter. See truck manual for additional information on electrical system.

⚠️ CAUTION: Do not connect meter to flow sensor or transducer cables until power hook up is verified correct and display is working. The meter has reverse polarity protection, but the transducer and flow sensor do not, since they require shielding. They will be grounded to the piping. Any mis-wiring could damage all components.

NOTE: It is essential that the connectors used be water-tight to prevent water from wicking up wires and into the meter. Always use sealed connectors or splices and the adhesive lined shrink tube provided, or other suitable connectors.

4. Using 16 or 18 AWG wire, connect the Red positive wire to the 12 or 24 VDC power supply. Connect the Black negative wire to a suitable ground.

SPECIFICATIONS:

Sensor Types

Flow Meter - Paddlewheel
Pressure Transducer - Ratio Metric, 0.5 - 4.5 VDC, 1/8" NPT, Male, 0-42 bar/0-4200 kPa

Meter

Operating Voltage 12 or 24 VDC
Minimum Operations Voltage - 9.5 VDC
Maximum Operations Voltage - 32.0 VDC
Operating Current - 150 mA
Display Type - LED
Enclosure - NEMA 4X
Operating Temperature - 40˚F - 140˚F

F. kPa/LPM POWER-UP OPTION

Akron Flow/Pressure Meters, equipped with the kPa or LPM selection feature, allows the user to select the display function to appear on power-up. To make this selection, use the following procedure.

Step 1 - Press and hold BOTH buttons simultaneously for approximately 15 seconds, until the display flashes “CAL” (calibration). Release buttons. After a few seconds “SIZE” will appear on the display and all mode lights will be illuminated.
Figure 3

**SADDLE CLAMP ASSEMBLY**

- **SPANNER WRENCH HOLES**
- **SENSOR LOCATOR HOLE**
- **RETAINER NUT**

**SIZES - 2”, 2-1/2”, 3”, 4”, 5”**

**SCHEDULE 40 PIPE**

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Figure 4

**PRESSURE TRANSDUCER & CONNECTOR**

**PRESSURE TRANSDUCER**

&

**CONNECTOR**

**CONNECTOR**

**PRESSURE TRANSDUCER**

1.62 Ref 3.62 Ref 1/4NPT
Figure 2c

- INLET
- Attach Valve This Side
- INTERCONNECT CABLE 5', 10' or 20'
  (used between flow sensor and transducer to meter)
- TRANSUDER CABLE - 6" LONG
- METER
  - To Power Supply
  - (Red) Positive
  - Negative (Black)
- 12-24 VDC
- TRANSDUCER
  - ¼" NPT
- SENSOR
- SENSOR RETAINER
- 3" HD21SF
- 5 ⅛
**Step 2** - Scroll the left button until “diSP” appears.

**Step 3** - Press and release right button. “PPPP” or “rrrr” will appear. “PPPP” signifies kPa and “rrrr” signifies LPM.

**Step 4** - Press and release left button to select what indication is desired at power-up. (kPa or LPM)

**Step 5** - When selection is made, press and release right button to enter and lock.

System will then always return to your selection at power-up. To change modes, repeat Steps 1 - 5.

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**SECTION II
CALIBRATION INSTRUCTIONS**

**GENERAL** - When unit is in Calibration mode, all mode lights on left side of display will be illuminated. A flashing mode light indicates what function is being calibrated.

**A. PRESSURE CALIBRATION**

1. Prior to calibration, the Pressure Transducer (Figure 4) must be installed into provided 1/4” NPT pressure port. Typically in a valve discharge adapter or piping.
2. Open the valve and drain to eliminate any pressure in line.
3. Power up the meter. (Figure 5)
4. After the display has gone through a sequence of messages, 0 will appear on the display, or an error message may appear if in the pressure mode. Also, a mode light will appear on the left side of the display.

**The unit is now ready for Pressure Calibration**

**Step 1** - Press and hold BOTH buttons simultaneously for approximately 15 seconds, until the display flashes CAL (calibration). Release buttons. After a few seconds SIZE will appear on display and all mode lights will be illuminated.

**Step 2** - Press and release the LEFT button. PRES (pressure) will appear on the display.

**Step 3** - Press and release RIGHT button. The word “ZERO” should appear and PSI mode light will flash. Note: If “ZERO” does not appear, the messages deAd, EpL, or EpH may appear on the display. They indicate possible transmission errors between the pressure transducer and the meter. (See trouble shooting guide - Section IV to resolve)

**Step 4** - With “ZERO” appearing on display, press and release right (pressure) button. ZERO will start flashing. After a moment, 0 will appear on display.

NOTE: On digital display, the word “ZERO” is displayed as “2Ero”.

Unit is now ready to provide pressure readings for operations. This procedure need not be repeated unless the transducer or meter is replaced.

**B. FLOW CALIBRATION - PIPE SIZE**

Typically a new or refurbished apparatus will be pre-calibrated using pipe size mode. This can also be done with any field conversion installing the Akron Flow/Pressure Systems.

Note: Akron Flow/Pressure units can be installed into existing flowmeter installations if a saddle clamp installation exists. (The Akron saddle clamp will adapt to holes up to 1-3/4” diameter.) The panel meter will also fit in place of most flowmeter or pressure gage cutouts. Most standard pressure gage cutouts can also be used or easily modified.

**Step 1** - Power up unit. No flow is required through system.

**Step 2** - Press and hold both buttons simultaneously for 15 seconds until the display flashes CAL (calibration) release buttons. After a few seconds SIZE will appear on the display.

**Step 3** - Press and release right button, if unit had previously been programmed with a pipe size, that size will appear. (See Note)

**Step 4** - Press and release left button until desired pipe size appears.

**Step 5** - With correct pipe size displayed, press and release right button, the pipe size will flash, then 0 will appear on display. Unit is now calibrated for pipe size.

NOTE: If unit was not calibrated with pipe size, CUS (custom) will appear. Press and release left button. FRE (frequency) will appear. Proceed with steps 4 & 5.
Step 6 - The accuracy of the installation should be checked, due to possible variations associated with individual installations. Use of an Akron Style 9015 or FK-25 or equivalent Water Flow Test Device is recommended as the basis for comparison. If recalibration is necessary use the custom flow flow setting covered in the next section.

C. FLOW CALIBRATION - CUSTOM FLOW SETTINGS (HIGH/LOW)

For maximum accuracy of each flow line, (especially with elbows in line) it may be desirable to set each discharge line to a given high flow/low flow range rather than using pipe size mode, this can be done utilizing a water flow test kit. (A UL classified Water Flow Test Device is recommended.) Use included flow chart provided. (TABLE I)

<table>
<thead>
<tr>
<th>Suggested Flow Ranges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line Size</td>
</tr>
<tr>
<td>2”</td>
</tr>
<tr>
<td>2-1/2”</td>
</tr>
<tr>
<td>3”</td>
</tr>
<tr>
<td>4”</td>
</tr>
<tr>
<td>5”</td>
</tr>
</tbody>
</table>

To explain this procedure, a 2-1/2” line with a 230 LPM low flow and 2280 LPM high flow will be used. See note following this procedure for other line sizes and flows.

Step 1 - Power up unit.

Step 2 - Press and hold both buttons simultaneously for approximately 15 seconds, until the display flashes CAL (calibration). Release buttons. After a few seconds SIZE will appear on the display.

Step 3 - Press and release left button until FLO (flow) appears on the display.

Step 4 - Press and release right button. HIFL (highflow) will appear on the display.

Step 5 - Start up pump and commence discharge through selected discharge line with water flow test kit connected according to instructions provided for its use.

Step 6 - Bring flow up to 2280 LPM and maintain a steady flow. Use the Pressure/Flow Conversion Sheet provided with the water flow test kit, or the sheet provided in this procedure. (Table I)

Step 7 - Press and release right button. The meter will begin to count pulses up to 1000. It will then stop and HEND (high end) will appear on display. If steady flow is not maintained during pulse counting, press and release left button. HIFL will appear on the display. Press and release right button to recollect 1000 pulses.

Step 8 - After ensuring that a steady reading has been maintained through the count sequence, press and release right button to accept pulse data. 0000 will appear on the display, with far left 0 flashing.

Step 9 - Since the display will show four characters and the high flow is 2280 ,press the left button until 2 appears.

Step 10 -Press and release right button. The second 0 from left will begin flashing.

Step 11 - Press and release the left button until 2 appears.

Step 12 -Press and release right button. The third 0 from left will begin flashing. Display should read 2200. Press the left button until 8 appears.

Step 13 - Press and release right button. The right 0 will begin flashing. The display should read 2880.

Step 14 -Press and release right button. 2880 will flash.

If other than 2880 is desired, use the left button to change numbers and right button to change fields, as steps 9-13 explain.
Attach Valve This Side

TYPICAL VALVE INSTALLATION

INTERCONNECT CABLE
(used between flow sensor and transducer to meter)

SENSOR RETAINER

SENSOR

METER

TRANSUDER

1/4" NPT

INLET

4" PDSF

3 7/16

To Power Supply

12-24 VDC

RED (Positive)

BLACK (Negative)
TYPICAL VALVE INSTALLATION

ATTACH VALVE THIS SIDE INLET

20SF to power Supply

12-24 VDC

Positive (Red)

Negative (Black)

1/4" NPT

TRANSUCER CABLE - 6" LONG

INTERCONNECT CABLE

5", 10", or 20'

(used between flow sensor and transducer to meter)

SENSOR RETAINER

SENSOR

ATTACH THIS SIDE

3 1/2" 2" P20SF
Step 15 - If value is correct, press and release right button. LOFL (low flow) will now appear on the display. Using the Pressure/Flow Conversion Sheet provided with the water flow test kit, hold flow at 230 LPM and maintain steady flow.

Step 16 - Press and release right button. The meter will begin to count pulses to 1000. Note: The Low flow pulse collection will take longer than high flow due to lower velocity.

Step 17 - When 1000 pulses have been reached, the counting will stop. LEND (low end) will appear on display.

Step 18 - Press and release right button. 0000 will appear on the display. Proceed as you did in steps 9-13, display should show 0230 after step 12 using 0230 instead of 2280.

Step 19 - Press and release right button. 0230 will flash.

Step 20 - Press and release right button. CAL (calibration) will flash momentarily, indicating that the meter is calibrated. Display will then show 0 with a mode indicator light.

Step 21 - Verify Flow Meter calibration by comparing flows to a Water Flow Test Device.

Unit is now ready for use

NOTE: The high flow settings should be 7 - 10 times the low flow settings.

SECTION III
OPERATION INSTRUCTIONS

A. GENERAL

These instructions describe features and operational steps for general service after the system is set up and calibrated. (See installation and calibration sections I & II if this has not been done.)

The meter consists of the display screen and two operation buttons located directly beneath the display. (See Figure 6)

When unit is powered, there are three red LED mode lights on the left side of display. Each of these lights align with particular function marked on the bezel face. (See Figure 6) They will only be illuminated individually, except during power up sequence and calibration.

The unit has four operation functions:
1. Flow LPM - Actual Liters per minute flowing. (Will read in single liter increments to 1200. Above 1200, 10 liter increments will appear.)
2. Flow TOTAL - Total liters flowed since unit was powered up. (Figure displayed must be multiplied X 100 to get total)
3. Pressure bar or kPa.
4. LED INTENSITY - Brightness of display.

B. OPERATION (See Figure 6)

At the time of power up, all three mode lights will appear with four ZEROS. In sequence a number value will appear, followed by LI, bar or kPa, CUS or PIPE and finally 0. This will be complete in a few seconds.

The unit is now ready for operation

TO READ:

LPM - Press and release left (flow) button to place mode light on LPM. Actual LPM will appear on display.

TOTAL FLOW - Press and release left (flow) button to place mode light on TOTAL. The figures displayed must be multiplied by 100 to give liters flowed.

bar or kPa - Press and release right (pressure) button to place mode light on bar or kPa. Actual pressure will appear on display.

LED INTENSITY - To brighten or dim LED, press and hold left button until desired brightness is displayed.

Refer to Section IV, Troubleshooting guide if problems occur.
## SECTION IV
### TROUBLESHOOTING GUIDE

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>CHECK</th>
<th>ACTION</th>
</tr>
</thead>
</table>
| Display does not illuminate | 1. Power Connection  
2. Power Source | If problems exist with power check, correct them. Replace Meter if power check is ok. |
| LPM shows 0-water is flowing | 1. Cable Connections  
2. Shut down pump - remove sensor - spin paddlewheel  
3. Remove sensor from cable connect direct to meter spin paddlewheel | If display shows reading, replace cable. If not, replace sensor. |
| dEAD, EprL, EprH Appears on display | 1. Check pressure transducer connections  
2. Shutdown pump remove transducer and connect directly to meter | If display clears, replace cable. If it does not, replace transducer. |
| LED Dim | | Hold left button down for 5 seconds. Should brighten. |
| LENS Foggy | | Should dissipate shortly after use with LED's lighted. Will cause no harm. This will happen if meter is not assembled in a humidity free area. |

**dEAd -** Hardware problem. Probably meter.  
**EprL -**  
1. Short to ground. Check cable.  
2. Not ZEROED at 0 bar or kPa.  
3. Check for vacuum in line  
**EprH -**  
1. Transducer not installed.  
2. Short to power. Check cable.  
3. Not ZEROED to 0 bar or kPa.  

**NOTE:** Eddy currents in discharge manifold systems may cause flow sensor paddlewheels to move and send a signal to the meter display. This could register a flow reading when the valve is actually closed. To eliminate this false reading, we have initiated a program for our flowmeters that will not display a reading until a minimum flow is attained. Based on discharge line size, the minimums have been established based on logical flows for each size line.

<table>
<thead>
<tr>
<th>LINE SIZE</th>
<th>DISPLAY WILL READ ABOVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>2&quot;</td>
<td>75 LPM</td>
</tr>
<tr>
<td>2 1/2&quot;</td>
<td>95 LPM</td>
</tr>
<tr>
<td>3&quot;</td>
<td>113 LPM</td>
</tr>
<tr>
<td>4&quot;</td>
<td>300 LPM</td>
</tr>
<tr>
<td>5&quot;</td>
<td>340 LPM</td>
</tr>
</tbody>
</table>
SECTION V
REPLACEMENT PARTS

<table>
<thead>
<tr>
<th>Item</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>5' Cable</td>
<td>93000013</td>
</tr>
<tr>
<td>10' Cable</td>
<td>93000002</td>
</tr>
<tr>
<td>20' Cable</td>
<td>93000014</td>
</tr>
<tr>
<td>50' Cable</td>
<td>93000015</td>
</tr>
<tr>
<td>Transducer</td>
<td>93000030</td>
</tr>
<tr>
<td>Meter (kPa)</td>
<td>93000005</td>
</tr>
<tr>
<td>Meter (bar)</td>
<td>93000010</td>
</tr>
<tr>
<td>Sensor (Flow)</td>
<td>93000004</td>
</tr>
<tr>
<td>2&quot; Saddle</td>
<td>93000006</td>
</tr>
<tr>
<td>2 1/2&quot; Saddle</td>
<td>93000007</td>
</tr>
<tr>
<td>3&quot; Saddle</td>
<td>93000008</td>
</tr>
<tr>
<td>4&quot; Saddle</td>
<td>93000009</td>
</tr>
<tr>
<td>5&quot; Saddle</td>
<td>93000010</td>
</tr>
</tbody>
</table>

FLOW SENSOR

PHONE: 330.264.5678 or 800.228.1161 | FAX: 330.264.2944 or 800.531.7335 | akronbrass.com

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