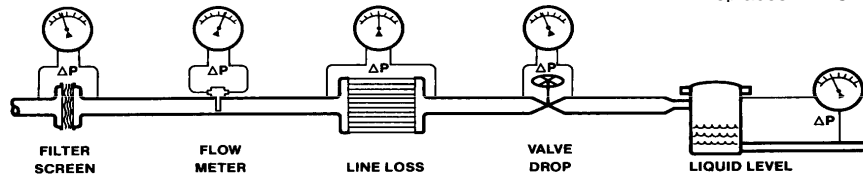


# Mid-West<sup>®</sup> Instrument



## Model 105 /106 & 109 “Locked Logic” Installation and Operating Instructions

### INSPECTION

Before installation carefully check the "Electrical Specifications" plate (See Fig. 1) on each instrument against the receiving paperwork and the intended application for the correct input and output. Make certain that the enclosure (NEMA 4 or NEMA 7) is appropriate for the area in which it is to be installed. Inspect for shipping damage and, if damaged, report it immediately. Verify when the unit is unpacked and in a vertical position that the pointer is on 0.

**NOTE: BEFORE ATTEMPTING REPAIRS, CONTACT YOUR LOCAL MID-WEST REPRESENTATIVE OR OUR FACTORY. FAILURE TO DO SO WILL VOID ANY WARRANTY.**



### ELECTRICAL SPECIFICATIONS

**INPUT:** 8-28 VDC  115 VDC   
115 VAC 50-60 HZ  230 VAC 50-60 HZ

**OUTPUT (RESISTIVE LOAD):**  
10 A, 28 VDC  
10 A, 115/240 VAC 50-60 HZ

FIG. 1: ELECTRICAL SPECIFICATION PLATE

### PRODUCT DESCRIPTION

"Locked Logic" alarm control is a solid-state optical-electronic control available as an option on Mid-West Models 105/106 and 109 differential pressure gauges. The control is an optical "no-contact" design that does not affect the indicated accuracy of the instrument.

The standard unit is designed for an 8 to 28 VDC uninterruptable power input. Optional power inputs include 115 VDC, 115 VAC 50-60 hertz, or 230 VAC 50-60 hertz.

Output interface is via a set of (1) or (2) isolated SPDT or DPDT relay contacts, dependent on the number of set points specified. Interface to the relay contacts is customer configurable provided the relay contact ratings are not exceeded.

An alternate option allows the incorporation of an adjustable dead band. For this configuration the right set pointer determines the upper trigger point, while the left set pointer determines the lower trigger point. Output interface is to (1) isolated set of SPDT relay contacts.

### INSTALLATION

All Mid-West "Locked Logic" alarm-controls are calibrated and tested prior to shipment and are ready for immediate installation.

1. **Panel Mounting** - Both weatherproof and explosion-proof models may be panel mounted. See Fig. 2 for panel cutout information.
  - A. **Weatherproof** - This unit mounts through the front of the panel. After making the panel cutout insert the (4) panel mounting studs, finger tight, into the (4) tapped holes in the rear of the housing. Insert the gauge through the panel, aligning the panel mounting studs with the holes in the panel. Install the (4) #8-32 nuts onto the studs and tighten securely.
  - B. **Explosion-proof** -

**WARNING: THE COVER MUST NEVER BE REMOVED WHEN THERE IS POWER TO THE UNIT.**

Normally pipe mounted, this unit may also be panel mounted through the front of the panel. Unless otherwise specified, your explosion-proof unit will be provided with a pipe mounting kit. To panel mount, remove the pipe mounting kit by removing the (4) hex headed 1/4 - 20 bolts attaching it to the back of the enclosure. Save the (4) bolts and washer for use in mounting to the panel. Refer to Fig. 2 for panel cutout information. Once the appropriate cutout is made, mount the unit through the front of the panel and install the (4) 1/4 - 20 bolts and washers from the back of the panel and into the enclosure. Tighten securely.

You may now proceed with plumbing and wiring the unit into your system.

2. **PIPE MOUNTING** - (See Fig. 2 for mounting instructions.)

WEATHERPROOF – Pipe mounting is an optional extra for Models 105, 106 & 109 "Locked Logic" units.

EXPLOSION-PROOF - A pipe mounting kit is provided as standard for all Model 105, 106 and 109 "Locked Logic" units unless otherwise specified.

3. **CONNECTIONS** - For plumbing the Model 105, 106 or 109 to the pressure connections on your system, follow the instructions for that instrument. Once accomplished, proceed with the electrical instructions that follow.

4. **ELECTRICAL** - Both weatherproof and explosion-proof "Locked Logic" enclosures have an opening, top rear, for a ½" or ¾" flexible cable or conduit connector. An appropriate connector must be installed before making connections to the wire leads provided. See the wiring interface drawing provided with your gauge for proper electrical connections to the gauge.

For Units supplied with both AC and DC input power leads, do not accidentally connect AC power to the DC leads. The unit will be damaged

**CAUTION: FOLLOW ALL ELECTRICAL CODE REQUIREMENTS FOR VOLTAGE, AC OR DC SUPPLY AND ENVIRONMENTAL CONDITIONS AS REQUIRED LOCALLY.**

**NOTE: INSTALL THE FRONT COVER AND BEZEL ASSEMBLY AFTER SWITCH ADJUSTMENT, AND DO NOT LEAVE THE UNIT OUTDOORS WITHOUT A CONNECTOR IN THE ELECTRICAL OPENING OR THE UNIT MAY BE DAMAGED FROM ENVIRONMENTAL CONDITIONS.**

5. **SETPOINT ADJUSTMENT** - Set pointers are adjustable from 5 to 95% of full scale and to within 5% (of full scale) of each other if equipped with (2) set pointers. The adjustment screws are inside the enclosure to protect against unauthorized adjustment. Before opening the unit to make a set point adjustment, check plant operating procedures and electrical codes. For weatherproof units, remove the (4) bezel screws and the bezel assembly. For explosion proof units, unscrew the window assembly from the housing.

**CAUTION: BE SURE POWER IS TURNED OFF BEFORE REMOVING THE COVER FROM (EXPLOSION-PROOF) UNITS.**

Insert a screwdriver in the setpoint adjustment slot and rotate until the setpointer is at the desired point on the scale. Replace the bezel assembly and screws, or window assembly.

6. **START UP** All "Locked Logic" set pointers, except adjustable dead-band units, have one green and one red state indication LED per set pointer assembly. Upon power up of the assembly the green LED(s) shall be lit and the output relay(s) de-energized. As the indicating pointer moves up scale and passes a set pointer, the green LED shall extinguish, the red LED shall be on, and the output relay shall energize. On declining differential the sequence shall be reversed.

For adjustable dead-band units, the left set pointer has 1 green and 1 red state indication LED. The right set pointer has no indicators. Upon power up of the assembly the green LED shall be lit and the output relay shall be de-energized. As the indicating pointer moves up scale and passes the Right set pointer, the green LED shall extinguish, the red LED shall be on, and the output relay shall energize. On declining differential (indicating pointer moves downscale), the red LED shall extinguish, the green LED shall be lit, and the relay shall de-energize when the indicating pointer passes the left set pointer.

Please note that these units use a reflective optical sensor that is sensitive to infrared light. Sunshine is a source of infrared. If the unit is placed outdoors, it is recommended, although not necessary, to either shade the unit or position the gauge so that the glass faces in either a East or West direction. In extremely rare cases the unit has triggered due to bright sunlight conditions. For this occurrence a tinted glass is available to correct this problem.

**TROUBLE SHOOTING - SYMPTOM(S)**

1. GAUGE DOES NOT INDICATE DIFFERENTIAL. Check trouble shooting procedures in the appropriate gauge manual and proceed accordingly.
2. L.E.D.'S DO NOT COME ON WHEN POWER IS TURNED ON. Check wiring diagram (Fig. 1) and wiring to make certain that all connections are properly and securely made. Also check to make certain that the proper power input is being provided.
3. UNIT "ALARMS" INADVERTENTLY. Check for sunshine condition described above. Make necessary adjustments and re-test.
3. If 1, 2, or 3 do not resolve the problem contact one of our factory customer service representatives for assistance and or a RGA (Return Goods Authorization) number and return the instrument for repair or replacement.

## Specification

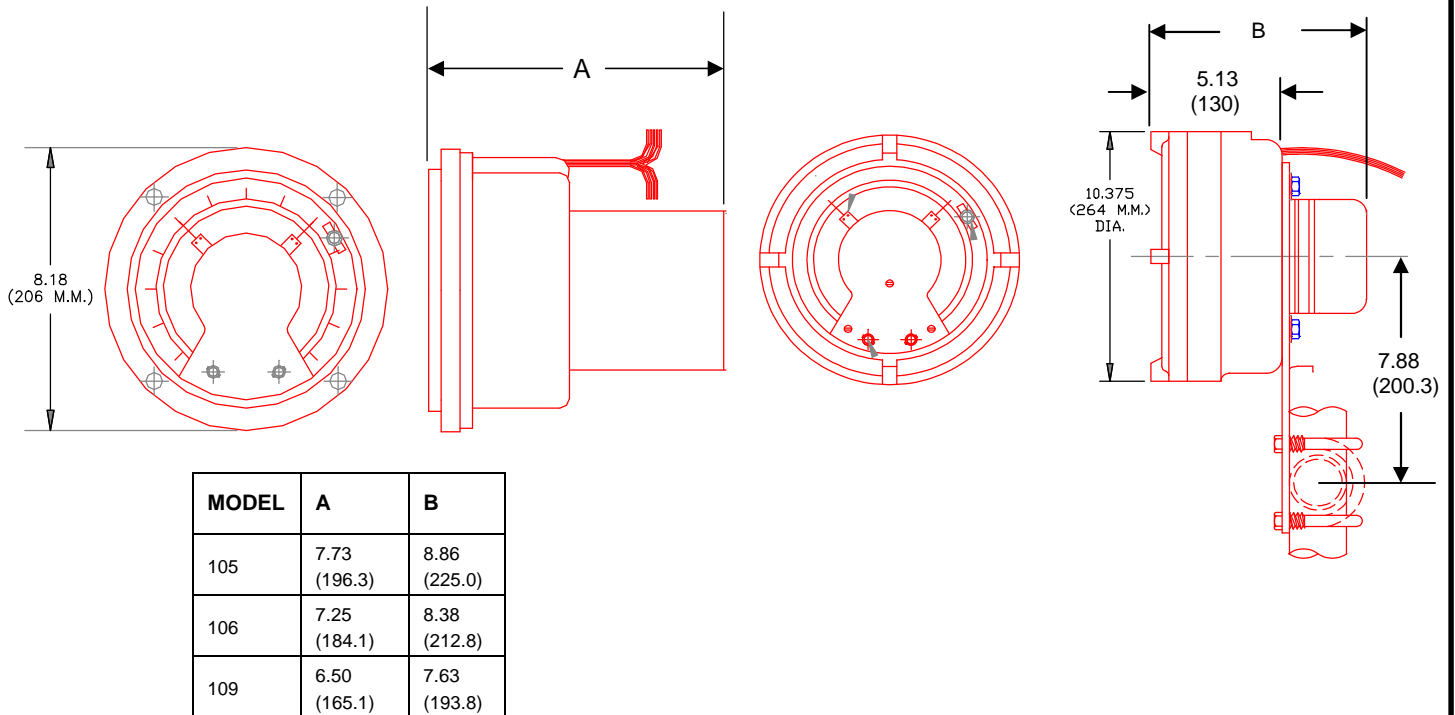
<b>Input Voltage:</b>	Standard Range:	8 to 28 Vdc	Select one of four input ranges.	
	Optional:	110 to 170 Vdc 85 to 165 Vac 153 to 345 Vac		
	Reverse Polarity	8 to 28 Vdc		Input Polarity Protected AC units Not Applicable
	Power Loss:	≤ 0.5 seconds		For loss of input power of less than 0.5 seconds unit will remember last state of output(s).
	Logic Reset	> 1 seconds	To Reset logic, power must be off for greater than 1 second before re-application input power	
<b>Input Current:</b>	DC Inputs:	400 ma. maximum	Steady State Values	
	AC Inputs:	100 ma maximum		
<b>Set Pointers:</b>	Quantity:	1 or 2	2 set point units only	
	Adjust:	5% to 95% of Full Scale		
	Set 1 to Set 2 Diff.:	5 % of Full Scale (Nominal)		
<b>Output(s):</b>	Contact(s):	1 or 2 SPDT or DPDT	@ 30 VDC @ 115/240 VAC	
	Contact Rating:	10 Amps Maximum 10 Amps maximum		
<b>Temperature:</b>	Operating:	-40F to +160 F / -40 C to +70 C		
<b>Environment:</b>	Standard:	Weather-proof Housing	NEMA 4	
	Optional:	Explosion-proof Housing	Class I, Groups B, C & D Class II, Groups E, F, & G	
<b>Electrical Interface</b>	Standard:	2 Ft., 18 Awg., 600V, 105 C, color coded wire leads	½" FNPT for 1 or 2 SPDT Outputs and 1 DPDT Output. ¾" FNPT for 2 DPDT Outputs.	
	Optional	Flexible metal conduit Weatherproof flexible metal conduit Extra lengths of either of above		
	Drawings:	101384 107882 108047 108158 108479 108736	8-28 VDC Input, SPDT Output 120/240 VAC Input, SPDT Output AC Input, 1 DPDT Output AC Input, 2 DPDT Output DC Input, 1 DPDT Output DC Input, 2 DPDT Output	
<b>Materials of Construction</b>	Weatherproof:	Cast Aluminum with "engineering plastic" bezel		
	Explosion Proof:	Cast Aluminum		

**MANUFACTURER RESERVES THE RIGHT TO CHANGE SPECIFICATIONS WITHOUT PRIOR NOTICE**

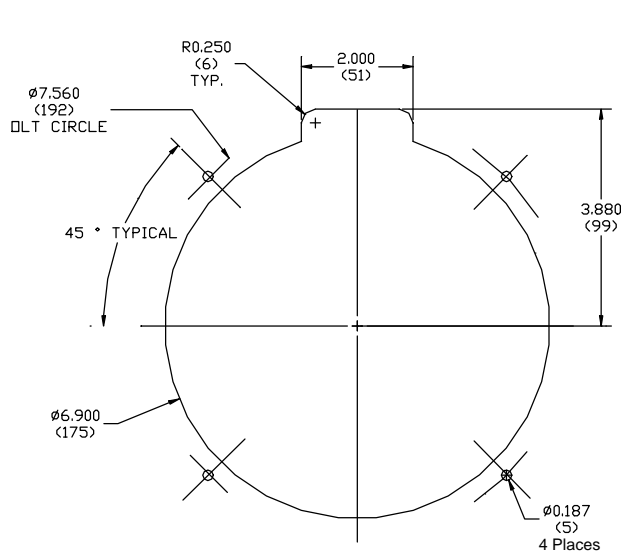
## FIGURE 2: MOUNTING INFORMATION & DIMENSIONAL DATA

### WEATHER PROOF

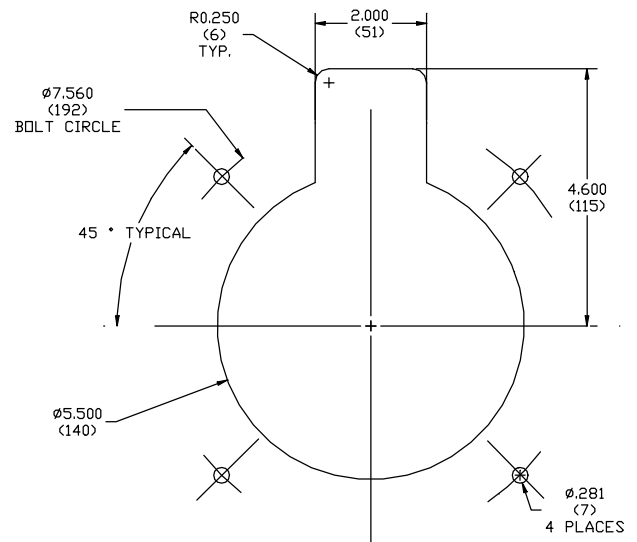
### EXPLOSION PROOF



### PANEL CUT-OUTS



### WEATHER PROOF



### EXPLOSION PROOF

**Mid-West**<sup>®</sup>  
Instrument



**CMC TECHNOLOGIES**

PTY LIMITED ACN: 085 991 224, ABN: 47 085 991 224

Engineering &  
Industrial  
Instrumentation

Phone: +61 2 9669 4000  
Fax: +61 2 9669 4111  
Email: [sales@cmctechnologies.com.au](mailto:sales@cmctechnologies.com.au)  
Web Site: <http://www.cmctechnologies.net.au>

Unit 19, 77 Bourke Road,  
Alexandria, NSW, 2015  
AUSTRALIA