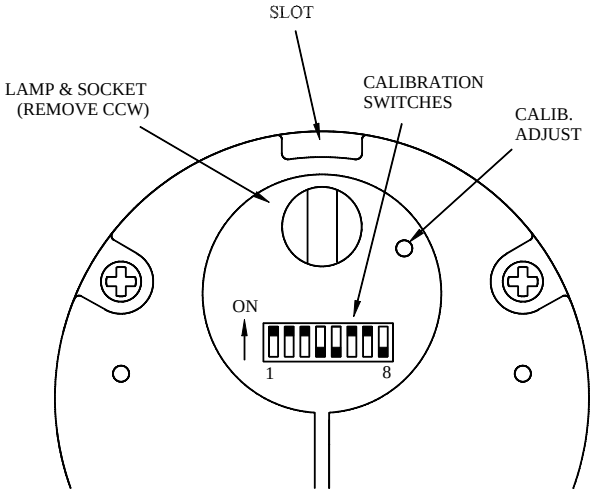
ISSPRO 3 3/8" Dia. Programmable Tachometer
Aircore Version

GENERAL INFORMATION:

OPERATING VOLTAGE: 11-30 VDC: NOTE – Instrument comes equipped with a 12V lamp. Replace lamp with one of proper voltage when installing instrument on 24V systems.
24 Volt Lamp is P/N 656
INPUT SIGNAL: Geartooth sensor, AC generator, alternator tap
PROGRAMMABLE RANGE: 1 – 255 pulses per revolution (gear teeth, magnets, etc.)
TRANSIENT PROTECTION: +100 V, -400 V
REVERSE VOLTAGE PROTECTED
HOURMETER operates only when engine runs

CALIBRATION: Remove the hole plug by pressing above the center enough to allow a small coin, screwdriver, etc. to be inserted in the slot behind the upper edge. Twist to remove. Each of the eight switches has a different value as shown in the table on the right. Add the switch values to equal the number of pulses per engine revolution. These switches will be set "on" (up). All others will be off.



REAR VIEW OF TACHOMETER

EXAMPLE: Find switch numbers by subtracting the switch value from the remaining number. Always use the largest value that can be subtracted from the remainder for each successive step. For gear with 103 teeth:

	Sw Value		New Remainder	Sw.
Start	103 - 64	=	39	#7 ON
Remainder	39 – 32	=	7	#6 ON
Remainder	7 – 4	=	3	#3 ON
Remainder	3 – 2	=	1	#2 ON
Remainder	1 –1	=	0	#1 ON

Switch #		Value
1	- - -	1
2	- - -	2
3	- - -	4
4	- - -	8
5	- - -	16
6	- - -	32
7	- - -	64
8	- - -	128

Or use the calibration chart provided (pages 3 and 4.)

SIGNAL GENERATOR (Sender unit): Generator is installed on tachometer cable drive of engine:

PULSES / REV = (# sender pulses/turn) X (ratio of take off RPM to engine RPM)

If the number of pulses per revolution from the above equation is not a whole number, the tachometer will not be accurate. In this case, either select a generator so that this number is non-fractional or, using a photo tach as reference, trim the calibration adjustment.

EXAMPLE: # sender pulses per turn = 15. take off ratio = 0.5:1 (i.e. cam drive);
#PULSES / REV = 15X 0.5 = 7.5. This will result in an error in the tachometer reading. Select a sender with an even number of pulses per turn (e.g. ISSPRO R8970). The # pulses per revolution will then be a whole number, in this case 15.

FREQUENTLY USED SENDERS	#PULSES PER TURN
DATCON 4-D-C 71267	8
DIXSON SG201A, SG201A1, SG202	2
ENGLER 870-0588	15
ISSPRO R8970, R8940	30
KIENZLE-ARGO 8-161-237008	8
MOTOROLA 4-100 (7SG100), 4-111 (7SG100B)	30
ROCKWELL 240R02-001	30
SUN Model CP7643	6
SYNCHRO-START Minigen	30
TELEFLEX 9604276	8
VDO (Old Style Engler) ISSPRO 300092	4
ZEMCO 4710	8
ZEMCO 6314	5

ALTERNATOR TAP INPUT: If a tap from the alternator has been provided, it can be used to provide the input signal.

$$\#\ \text{PULSES / REV} = \frac{\#\text{Poles of Alternator}}{2} \times \frac{\text{Dia. of crank Pulley}}{\text{Dia. of alternator pulley}}$$

 # PULSES /REV NOT KNOWN: Connect the tach as shown in the diagram and run the engine at a constant speed. Have an assistant monitor the engine speed with a photo tach. Set the switches while comparing the reading to that of the photo tach. Start with switches off, work down from switch #8, testing each switch in sequence. If the tach reads too low, turn off that switch and proceed to the next one.

TRIMMING CALIBRATION: Units are factory pre-calibrated. Normally, trimming will not be needed. However, use the following procedure, if necessary: Set calibration switches as close as possible to calibration setting and install tach (see below). Run engine at a constant speed while an assistant monitors RPM with a phototach. Insert jewelers screwdriver in calibration hole (see diagram) and adjust needle indication for correct reading. Do not force the adjustment past the stop as this will damage the potentiometer. Check RPM accuracy at other points on the scale to verify calibration.

INSTALLATION: Mount the tachometer in the dash panel and connect the wires as described below.

Make all your connections to the Black plug supplied and then plug it into the tachometer's white connectors.

RED – Connect to ignition switched power source.
BLACK – Connect to ground along with one of the sensor wires.
WHITE – Connect to other sensor wire.
GREEN – Connect to dash lamp power.

INSTALLATION HINTS:

1) Wire both sensor wires back to the connector. Don't connect the sensor ground wire to a point which is physically different than the speedometer ground.

2) When power is applied, the needle should go to the zero position. If it doesn't, there may be a bad connection in the "hot" (red wire) or ground wire circuit. Check power to the meter by measuring with a voltmeter at the plug (meter leads on the pins that attach to the red and black wires). If there is power at the plug, the problem is in the gauge.

3) Low voltage (below 10.5 volts) will cause inaccurate reading. Determine accuracy by comparing reading with phototach. If problem exists, measure voltage with vehicle operating and meter connected. This can be done by connecting a voltmeter to power source (i.e. fuse block, etc.) and/or by connecting the voltmeter leads to the red and black wires where they enter the tach's white connector.

4) If tach reads zero, then "jumps" to normal reading after a repeatable RPM, adjust the sensor in closer to gear (generators cannot be adjusted).

3 3/8” AIR CORE TACHOMETERS
SWITCH SETTINGS TO PULSES PER REVOLUTION

Pulses per Revolution	Switches Set “ON”							
	1	2	3	4	5	6	7	8
1	X							
2		X						
3	X	X						
4			X					
5	X		X					
6		X	X					
7	X	X	X					
8				X				
9	X			X				
10		X		X				
11	X	X		X				
12			X	X				
13	X		X	X				
14		X	X	X				
15	X	X	X	X				
16					X			
17	X				X			
18		X			X			
19	X	X			X			
20			X		X			
21	X		X		X			
22		X	X		X			
23	X	X	X		X			
24				X	X			
25	X			X	X			
26		X		X	X			
27	X	X		X	X			
28			X	X	X			
29	X		X	X	X			
30		X	X	X	X			
31	X	X	X	X	X			
32						X		
33	X					X		
34		X				X		
35	X	X				X		
36			X			X		
37	X		X			X		
38		X	X			X		
39	X	X	X			X		
40				X		X		
41	X			X		X		
42		X		X		X		
43	X	X		X		X		
44			X	X		X		
45	X		X	X		X		
46		X	X	X		X		
47	X	X	X	X		X		
48					X	X		
49	X				X	X		
50		X			X	X		
51	X	X			X	X		
52			X		X	X		
53	X		X		X	X		
54		X	X		X	X		
55	X	X	X		X	X		
56				X	X	X		
57	X			X	X	X		
58		X		X	X	X		
59	X	X		X	X	X		
60			X	X	X	X		
61	X		X	X	X	X		
62		X	X	X	X	X		
63	X	X	X	X	X	X		
64							X	

Pulses per Revolution	Switches Set “ON”							
	1	2	3	4	5	6	7	8
65	X						X	
66		X					X	
67	X	X					X	
68			X				X	
69	X		X				X	
70		X	X				X	
71	X	X	X				X	
72				X			X	
73	X			X			X	
74		X		X			X	
75	X	X		X			X	
76			X	X			X	
77	X		X	X			X	
78		X	X	X			X	
79	X	X	X	X			X	
80					X		X	
81	X				X		X	
82		X			X		X	
83	X	X			X		X	
84			X		X		X	
85	X		X		X		X	
86		X	X		X		X	
87	X	X	X		X		X	
88				X	X		X	
89	X			X	X		X	
90		X		X	X		X	
91	X	X		X	X		X	
92			X	X	X		X	
93	X		X	X	X		X	
94		X	X	X	X		X	
95	X	X	X	X	X		X	
96						X	X	
97	X					X	X	
98		X				X	X	
99	X	X				X	X	
100			X			X	X	
101	X		X			X	X	
102		X	X			X	X	
103	X	X	X			X	X	
104				X		X	X	
105	X			X		X	X	
106		X		X		X	X	
107	X	X		X		X	X	
108			X	X		X	X	
109	X		X	X		X	X	
110		X	X	X		X	X	
111	X	X	X	X		X	X	
112					X	X	X	
113	X				X	X	X	
114		X			X	X	X	
115	X	X			X	X	X	
116			X		X	X	X	
117	X		X		X	X	X	
118		X	X		X	X	X	
119	X	X	X		X	X	X	
120				X	X	X	X	
121	X			X	X	X	X	
122		X		X	X	X	X	
123	X	X		X	X	X	X	
124			X	X	X	X	X	
125	X		X	X	X	X	X	
126		X	X	X	X	X	X	
127	X	X	X	X	X	X	X	
128								X

3 3/8" AIR CORE TACHOMETERS
SWITCH SETTINGS TO PULSES PER REVOLUTION

Pulses per Revolution	Switches Set "ON"							
	1	2	3	4	5	6	7	8
129	X							X
130		X						X
131	X	X						X
132			X					X
133	X		X					X
134		X	X					X
135	X	X	X					X
136				X				X
137	X			X				X
138		X		X				X
139	X	X		X				X
140			X	X				X
141	X		X	X				X
142		X	X	X				X
143	X	X	X	X				X
144					X			X
145	X				X			X
146		X			X			X
147	X	X			X			X
148			X		X			X
149	X		X		X			X
150		X	X		X			X
151	X	X	X		X			X
152				X	X			X
153	X			X	X			X
154		X		X	X			X
155	X	X		X	X			X
156			X	X	X			X
157	X		X	X	X			X
158		X	X	X	X			X
159	X	X	X	X	X			X
160						X		X
161	X					X		X
162		X				X		X
163	X	X				X		X
164			X			X		X
165	X		X			X		X
166		X	X			X		X
167	X	X	X			X		X
168				X		X		X
169	X			X		X		X
170		X		X		X		X
171	X	X		X		X		X
172			X	X		X		X
173	X		X	X		X		X
174		X	X	X		X		X
175	X	X	X	X		X		X
176					X	X		X
177	X				X	X		X
178		X			X	X		X
179	X	X			X	X		X
180			X		X	X		X
181	X		X		X	X		X
182		X	X		X	X		X
183	X	X	X		X	X		X
184				X	X	X		X
185	X			X	X	X		X
186		X		X	X	X		X
187	X	X		X	X	X		X
188			X	X	X	X		X
189	X		X	X	X	X		X
190		X	X	X	X	X		X
191	X	X	X	X	X	X		X
192							X	X

Pulses per Revolution	Switches Set "ON"							
	1	2	3	4	5	6	7	8
193	X						X	X
194		X					X	X
195	X	X					X	X
196			X				X	X
197	X		X				X	X
198		X	X				X	X
199	X	X	X				X	X
200				X			X	X
201	X			X			X	X
202		X		X			X	X
203	X	X		X			X	X
204			X	X			X	X
205	X		X	X			X	X
206		X	X	X			X	X
207	X	X	X	X			X	X
208					X		X	X
209	X				X		X	X
210		X			X		X	X
211	X	X			X		X	X
212			X		X		X	X
213	X		X		X		X	X
214		X	X		X		X	X
215	X	X	X		X		X	X
216				X	X		X	X
217	X			X	X		X	X
218		X		X	X		X	X
219	X	X		X	X		X	X
220			X	X	X		X	X
221	X		X	X	X		X	X
222		X	X	X	X		X	X
223	X	X	X	X	X		X	X
224						X	X	X
225	X					X	X	X
226		X				X	X	X
227	X	X				X	X	X
228			X			X	X	X
229	X		X			X	X	X
230		X	X			X	X	X
231	X	X	X			X	X	X
232				X		X	X	X
233	X			X		X	X	X
234		X		X		X	X	X
235	X	X		X		X	X	X
236			X	X		X	X	X
237	X		X	X		X	X	X
238		X	X	X		X	X	X
239	X	X	X	X		X	X	X
240					X	X	X	X
241	X				X	X	X	X
242		X			X	X	X	X
243	X	X			X	X	X	X
244			X		X	X	X	X
245	X		X		X	X	X	X
246		X	X		X	X	X	X
247	X	X	X		X	X	X	X
248				X	X	X	X	X
249	X			X	X	X	X	X
250		X		X	X	X	X	X
251	X	X		X	X	X	X	X
252			X	X	X	X	X	X
253	X		X	X	X	X	X	X
254		X	X	X	X	X	X	X
255	X	X	X	X	X	X	X	X

Common Applications
Aircore Tachometer Calibration

The following table may be useful in calibrating the ISSPRO programmable tachometers in some ring gear sensing installations. This information is believed to be accurate, however, exceptions will occur and it is always best to verify the number of gear teeth when in doubt.

	ENGINE	# RING GEAR TEETH	SWITCHES SET "ON"
CUMMINS:	L10	103	1,2,3,6,7
	475,K6	118	2,3,5,6,7
	*NTC, FORMULA (855 series)	103	1,2,3,6,7

*Some models of cabover Freightliners use SAE #1 flywheels and have 118 ring gear teeth.

CAT:	3208	134	2,3,8
	3306	156	3,4,5,8
	3406,3408	113	1,5,6,7
	1693	119	1,2,3,5,6,7
	1674	152	4,5,8
DDA- DETROIT	8V71,8V92, 6-71, 12-71, 6V-92	118	2,3,5,6,7
	4-53, 4-54	138	2,4,8
	w/Auto Trans & # 2 Flywheel hsg	103	1,2,3,6,7
MACK:	All (domestic)	118	2,3,5,6,7
MERCEDES BENZ:	OM422,427,352	160	6,8
GM:	8.2 liter – SAE #2 flywheel (4 ¾" bolt centers on flywheel housing)	138	2,4,8
	8.2 liter – SAE #3 flywheel (4 3/8" bolt centers on flywheel housing)	126	2,3,4,5,6,7