ALTRONIC DIGITAL SETPOINT GAUGE **INSTALLATION INSTRUCTIONS**
DSG-1201DU/DUP TACHOMETER **FORM DSG1201 II 7-95**

CAUTION: The DSG-1201DU and DSG-1201DUP digital setpoint gauges are suitable for use in Class I, Group D, Division 1 and 2 hazardous locations when installed in accordance with these instructions.

WARNING: DEVIATION FROM THESE INSTALLATION INSTRUCTIONS MAY LEAD TO IMPROPER OPERATION OF THE MONITORED MACHINE WHICH COULD CAUSE PERSONAL INJURY TO OPERATORS OR OTHER NEARBY PERSONNEL.

1.0 DESCRIPTION

1.1 The Altronic DSG-1201DU/DUP digital setpoint gauge is a microprocessor-based electronic instrument designed to provide an accurate indication of speed on engines or other rotating equipment. Speed input is in the form of a frequency signal. The signal can come from the number 1 cylinder ignition coil or the shutdown lead of a C.D. industrial ignition system. The signal can also come from a magnetic pick-up or other types of DC-powered, zero velocity sensors. The gauge uses a microcontroller to process the input signal and a nonvolatile memory to store the gauge setup and the setpoint values. An LCD display is used to display the numeric value, RPM units, state of the output switches, and a bargraph.

1.2 The monitored RPM is continuously compared against four adjustable setpoints. These setpoints allow for multiple overspeed/underspeed trip points. Each setpoint can be individually configured as high or low and as normally open or normally closed. In addition, each setpoint can be individually adjusted for a hysteresis value, a trip delay time and a reset delay time.

1.3 The Altronic DSG-1201DU/DUP digital setpoint gauge is designed to be simple to use with features such as front panel keypad configuration, a pre-set factory setting, and an escape key for programming mistakes. Although simple to use, the gauge is also very versatile with features such as programmable input pulse count, scalable input ratios, RPM indicator (which can be turned off for other rate unit measurements), setable decimal point, and the ability to accept inputs from uneven patterns. In addition, the LCD display contains a bargraph that can be programmed for bar mode or single bar between two selected points. A programmable software display filter is also incorporated to stabilize readings where the input signal is fluctuating.

1.4 A 4-20 mA current loop output is present on the DSG-1201DUP model. The current loop output can be configured anywhere within the range of the gauge, as well as reverse acting. If the 4-20 mA current loop output is configured for reverse acting, the current loop output would decrease or go towards the 4 mA point as the numeric RPM value on the display increases. The current loop is also easily configured through the keypad.

1.5 The power requirement for the DSG-1201DU/DUP gauge is 12 to 36 Vdc, 50 mA max.

1.6 For proper operation, these installation instructions must be adhered to strictly.

2.0 SIGNAL INPUT

2.1 The DSG-1201 series gauge is designed to accept a wide range of frequency signal inputs with an amplitude of 5 to 400 volts peak and a frequency range of 0.5 to 20 kHZ. There are two separate inputs: an isolated input intended for use with positive and negative ground C.D. ignition systems and a non-isolated input intended for use with magnetic pick-ups and various other types of D.C. powered zero velocity pick-ups.

2.2 ISOLATED SIGNAL INPUT - The isolated signal input is electrically isolated from all other terminals of the instrument including ground. The isolated signal input is designed to accept frequency signals from the ignition coil primary or the "shutdown" lead of either a positive or negative ground C.D. ignition system. The connection is made to the back of the DSG-1201 gauge at terminals 1 and 2. See wiring diagrams for correct hook-up.

2.3 NON-ISOLATED INPUT - The non-isolated input is designed to accept frequency signals from magnetic pick-ups or other types of zero velocity sensors. Altronic P/N 691 118-x magnetic pick-up series or P/N 791 050-x Hall-effect pick-ups can be used as signal sources. Connect the 691 118-x magnetic pick-up to pins 4(+) and 5(−) or connect the 791 050-x Hall-effect pick-up to the back of the DSG-1201 gauge as shown in the installation drawing. NOTE: Minimum operating voltage required from magnetic pick-up at slow speeds is 3V. peak-to-peak.

3.0 MOUNTING

3.1 Mount the gauge inside a control panel or to a suitable flat surface so that the display is at a convenient viewing height. A drilling template is provided. NOTE: Avoid mounting gauge with the LCD display facing direct sunlight. The display temperature range is −40°F to +175°F (−40°C to +80°C).

3.2 MAGNETIC PICK-UP 691 118 SERIES - If used, mount the magnetic pick-up securely to a rigid bracket or surface to maintain an air gap of .005"/.020" from the gear teeth to obtain the lowest operational RPM. Be sure the sensed gear will not hit the pick-up in the complete 360° of rotation. For best results, a gear with 20 pitch or courser should be used.

3.3 HALL-EFFECT PICK-UP 791 050 SERIES - If used, mount the Hall-effect pick-up sensor securely to a rigid bracket or surface to maintain an air gap not exceeding .040". The center of the pick-up face must line-up with the center of the north pole of the rotating magnet or magnets.

4.0 WIRING (SEE WIRING DIAGRAMS)

4.1 GENERAL - Take care not to damage the insulation and take precautions against damage from vibration, abrasion or liquids in conduits. Also never run low voltage power, current loop, or output switch wires in the same conduit as the ignition wiring or other high energy wiring such as AC line power, etc. Keep wires at least 12 inches away from all high voltage wiring.

4.2 POWER WIRING - Connect the power input wires to terminals 5(−) and 6(+); power requirement is 12 to 36 Vdc. The minus terminal (−) is connected to panel ground which should be the same as engine ground. DO NOT ground this device directly to the ignition system common coil ground.

4.3 SIGNAL INPUT WIRING:

- IGNITION COIL PRIMARY OR SHUTDOWN LEAD OF A C.D. IGNITION SYSTEM - Connect a wire from either an ignition coil primary or the shutdown lead of a C.D. ignition system to the back of the DSG-1201 gauge at terminal 1 or 2; the back of the gauge is labeled for proper hook-up. The ground connection should be made by placing a short ground wire from the ground polarity terminal on the back of the gauge to panel ground which should be the same as engine ground. Use a fine gauge stranded wire such as Altronic 603 102 (black) or 603 103 (white) 24 AWG for connections. DO NOT connect the ground polarity terminal directly to the ignition system common coil ground on the engine.
- MAGNETIC PICK-UP - Connect the two wires from the 691 118 series or similar magnetic pick-up to the back of the gauge at terminals 4 and 5 using cable assembly 693 104 series.
- HALL-EFFECT PICK-UP - Connect the three wires from the 791 050 series Hall-effect pick-up to the back of the gauge at terminals 3, 4, and 5 using cable assembly 593 050 series. Connect pick-up cable lead B to gauge terminal 3 (+5V. Supply), lead A to terminal 4 (non-isolated signal input), and lead C to terminal 5 (minus). In addition, a 10,000-ohm pull-up resistor must be placed across terminals 3 and 4 of the gauge.

4.4 OUTPUT SWITCH WIRING - A fault condition will cause the output switches configured for normally-open to turn ON, and the normally-closed switches to turn OFF, with their common. The shelf state (unpowered) is an open condition. Switches 1 and 2 turn on/off with common A; switches 3 and 4 turn on/off with common B. These outputs are solid state, Form A, switches that are isolated from the power supply. The switches are rated at 200 V, 140 mA and employ a unique internal overload current protection circuit. If an overload occurs, the internal circuitry limits current to safe levels. When the overload is removed, the relay resumes its normal ON characteristics. These outputs may be connected to an Altronic annunciator system or to pilot duty relays as shown in the wiring diagrams.

4.5 OUTPUT CURRENT LOOP WIRING - Model DSG-1201DUP has a 4-20 mA current loop available for the control of Altronic ignition systems, valves, actuators, and other devices commonly used in process control. The current loop output is accessible through terminals 7 and 8 and is internally limited to 20 mA. The output is protected against open and short circuits. A 250 ohm loop resistor can be used over the entire supply voltage range from 12 to 36 Vdc. The maximum load resistance that can be tolerated in the loop is determined by the supply voltage. When using the maximum rated loop resistor of 500 ohms with a desired full scale loop output of 20 mA, the supply voltage must be between 15 and 36 VDC. At 12 VDC supply voltage, the maximum load resistor for 20 mA loop output current is 350 ohms. Refer to the wiring diagrams for typical hook-up.

4.6 HAZARDOUS AREA OPERATION - The DSG-1201DU/DUP device is CSA certified for CLASS I, DIVISION 2, GROUP D areas when mounted in a suitable enclosure. The device may be operated as CLASS I, DIVISION 1, GROUP D intrinsically safe, if the following conditions are met:

A. The gauge is powered from a CSA-certified zener barrier rated 30 volts max., 120 ohms min. A suitable barrier is a Stahl part no. 9001/01-280-165-10; follow the installation instructions supplied with the barrier.

B. The signal input, if from either the ignition coil primary or a C.D. ignition shutdown lead, must be connected through Altronic barrier 690 107 or 690 108; follow the hook-up instructions supplied with the barrier.

C. The switch outputs, if used, are connected to the sensor inputs of an Altronic DA or DD annunciator system with a 690 series power supply.

D. The current loop output, if used, is connected to an intrinsically-safe transmitter mounted in a Division 1 area or through a CSA-certified zener barrier rated 30 volts max, 120 ohms min.

In addition, the following requirements must be met (see NFPA standard no. 493):

1. The intrinsically-safe gauge wires within the panel enclosure must be kept at least two (2) inches away from other wiring.
2. Wiring to the sensors must have a grade of insulation capable of withstanding an AC voltage of 500 volts RMS.
3. Sensor wires must be run in separate conduits and junction boxes from high voltage wires such as Ignition, fuel valve, and other high voltage wiring.

WARNING:	**SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY AND/OR SUITABILITY FOR CLASS I, DIV. 2, GROUP D.** **DO NOT DISCONNECT EQUIPMENT IN DIV. 2 ENVIRONMENT UNLESS POWER IS SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.**

5.0 NORMAL OPERATION

5.1 When the DSG-1201 gauge is in the "normal" mode, it displays a numeric value from 0 to 9999, RPM units, and a bargraph of the sensed speed. If a setpoint value is exceeded, its associated output switch turns ON and a display annunciator of 1, 2, 3, or 4 (switch 1, 2, 3, or 4) turns on indicating that switch has tripped. NOTE: The units and the bargraph can be turned off.

6.0 KEYPAD DESCRIPTION

6.1 The DSG-1201 gauge contains a six-key front keypad which is used to view or change the setpoint values, and to configure the gauge. The six front panel keys are MODE, ENTER, SETPTS, ESC, and ▲, ▼ (up and down arrow keys). Only one key should be pressed at a time.

6.2 MODE - The MODE key is used to enter configuration (or setup) mode and to scroll through the gauge setup menu.

6.3 ENTER - The ENTER key is used in the setup mode to proceed through the configuration and to accept the data. It is used in the setpoint mode to accept and save the new setpoint value. At the end of a configuration when a new setup has been entered, press ENTER and the display will read "SAVE", then "donE", and the new data or configuration will be stored in the nonvolatile memory.

6.4 SETPTS - The SETPTS (setpoints) key is used to view or change each setpoint's value. When in the normal mode, press the SETPTS key; the value and annunciator for setpoint no. 1 are displayed. Press the SETPTS key again; the value and annunciator for setpoint no. 2 are displayed. Repeat for setpoints nos. 3 and 4. Press SETPTS key one more time to return to the normal mode.

6.5 ESC - The ESC (escape) key can be used at any time during configuration or setpoint mode to return to the normal mode. When the ESC key is pressed in any configuration mode, any changed values are ignored (not stored in memory), the configuration returns to the previous values and the display returns to the normal reading.

6.6 ▲ ▼ - The up and down arrow keys are used to scroll through the selections in the setup mode and to increase or decrease setup values and setpoints. These two keys when held will rapidly increase or decrease display values.

7.0 DEFAULT FACTORY SETTINGS

7.1 The DSG-1201 series gauge contains several default settings that are available to the user anytime during the life of the gauge. Upon receipt, the gauge is set to these settings. These settings can be used as a starting point when custom-configuring the gauge as all of the parameters are set to known values.

7.2 SELECTING THE DEFAULT SETTING - From the normal mode, press the MODE key until the display reads "UnIt" and press ENTER. Use the ▲ and ▼ keys to select "dFLt" and press ENTER. All of the configuration parameters will automatically be set to the factory default settings. NOTE: If you do not want to change the gauge configuration at this time, press the ESC key instead of the ENTER key and the gauge configuration will not change.

7.3 DEFAULT SETTINGS - Listed below are the factory default settings stored in permanent memory.

SETPOINT VALUES:	SETPOINT 1 - 100 RPM SETPOINT 2 - 500 RPM SETPOINT 3 - 1000 RPM SETPOINT 4 - 1200 RPM
INPUT CONFIGURATION:	1 pulse per revolution (ignition coil primary, 2 cycle)
UNITS:	RPM
BARGRAPH:	The bargraph is set for bar mode between 0 and 1000 RPM.

SETPOINT CONFIGURATION:	SETPOINT 1	SETPOINT 2	SETPOINT 3	SETPOINT 4
	LOW	LOW	HIGH	HIGH
	N/C	N/C	N/O	N/O
	10 RPM hyst	5 RPM hyst	10 RPM hyst	5 RPM hyst
	1.0 sec trip	3.0 sec trip	0.5 sec trip	0.25 sec trip
	1.5 sec reset	2.0 sec reset	1.0 sec reset	0.5 sec reset

OUTPUT CURRENT LOOP:	The 4 mA point is set at 0 RPM. The 20 mA point is set at 1300 RPM.
DISPLAY FILTER:	The display filter is set for 240 out of 255, which provides a moderate amount of dampening.

8.0 INITIAL OPERATION

8.1 Mount and wire the gauge as described above. Upon power-up all segments on the display will turn on for a display check. The display will then proceed to read 0 if there is no signal input. The gauge will be set for 1 pulse per revolution from the factory. To change the signal input to a different pulse per revolution count, press the MODE key until the display reads "InPt", then press ENTER. The display will read "PPr"; press ENTER, and the numeric value representing the pulses per revolution will be shown. Press the ▲ or ▼ (up or down arrow keys) to increase or decrease the value until the desired pulse count is reached. Press ENTER to accept and save the new value. The gauge will now be set for the desired pulse per revolution count. NOTE: The gauge reads the pulse count as the number of pulses seen in one revolution. When the signal is taken from C.D. ignition systems, the entered pulse rate must allow for 2 or 4 cycle and dual-storage capacitors. See the gauge configuration section (section 10.0) for further explanation.

9.0 ADJUSTING SETPOINTS

9.1 There are four individually adjustable setpoints which can be set anywhere within the range of the gauge. To view or change the setpoint values, press the SETPTS key, the RPM setpoint value and the annunciator "1" (indicating switch 1) will be shown on the display. To change the value, press ▲ or ▼ (the up or down arrow key) to increase or decrease the value until the desired trip point for that switch is reached; press ENTER to accept and save the new value. Each press of the SETPTS key allows the user to view the next setpoint value of switches 2, 3, and 4; follow the same procedure to change them if desired. NOTE: When in the setpoints mode, the previous setpoint values continue to be monitored; the new value is monitored only when the ENTER key is pressed. If no key is pressed for 20 seconds, the display will return to the normal mode and the configuration will revert back to the previous parameters.

NOTE: To avoid an unused setpoint annunciator (1,2,3,4) from displaying during normal operation, configure unused setpoints to HIGH with a setpoint well above the maximum operating speed. Follow the procedure in section 10.5, Setpoint Configuration.

10.0 GAUGE CONFIGURATION

10.1 The following are the headings for each configuration menu of the gauge. Press the MODE key to reach any of these configuration headings from the normal display mode. After a selection has been made and configuration performed, press the ENTER key; the display will read "SAVE/donE". It is at this time that the new data is saved. The ESC (escape) key can be used at any time to abort the configuration mode and return to the normal reading. During configuration, the gauge allows 20 seconds for first level and setpoints and 1 minute for other levels between keystrokes to change or save a new configuration. If the time lapses without a keystroke, the gauge will automatically return to the normal mode without making any changes. The new information is saved only if the ENTER key is pressed and the gauge reads "SAVE/donE". A flowchart is provided that shows step-by-step progression through the gauge configuration procedure.

10.2 INPUT CONFIGURATION - The input configuration allows the user to configure the number of pulses per revolution, the decimal point, the ratio of monitored gear teeth to display speed, and a predivide value for uneven input signals. Typically when setting the input signal configuration for either the number 1 cylinder ignition coil or the C.D. ignition shutdown lead application with even patterns, only the pulse count will be required to be set. NOTE: For connection to the shutdown lead with uneven patterns, please see the chart on page 9.

A. PULSE COUNT - To set the pulse count, or number of input pulses per revolution, press the MODE key until the display reads "InPt", then press ENTER. The display will read "PPr" (pulses per revolution); press ENTER and the previous numeric value representing the pulse count will be shown. Press the ▲ or ▼ arrow keys to increase or decrease the value until the desired pulse count is reached. Press ENTER to accept and save the new value. The gauge will now be set for the desired pulse per revolution count. NOTE: The gauge will read the correct value for the entered number of pulses per revolution; 2 or 4 cycle and dual capacitor C.D. ignition systems must be allowed-for when entering the pulse count. See the examples on the following page.

B. DECIMAL POINT - There are three decimal points available. Only one decimal point can be on at a time. Adding a decimal point to the display does not change the scale value of the user displayed range. To set the decimal point, follow the above procedure for setting the pulse count but instead of pressing ENTER to finish the change, press the MODE key and the display will read "dPnt". Use the ▲ or ▼ arrow keys to select the desired decimal point position and press ENTER; the display will read "SCAL" (scale). If the application requires either an input ratio or a predivide, proceed to the next sections. If not, continue to press ENTER until the display reads "SAVE/donE" the new configuration will be saved.

C. SCALE - The scale or input ratio is used primarily to set the ratio of gear speed to display speed when the input is from a magnetic pick-up monitoring a gear at some ratio other than 1 to 1. If the monitored gear is running 2 times the speed of interest (or display speed), then the ratio is 2 to 1. If the monitored gear is running 5 times slower than the speed of interest or display speed, then the ratio is 1 to 5. Although the input ratio is limited to whole numbers, virtually any ratio can be programmed by changing the ratio to whole numbers and entering the whole numbers. For example, a ratio of 1.67 to 1 would be entered as 167 to 100.

   1. To set the input ratio, follow the procedure above for the pulse count and the decimal point (if a decimal point is required). Press ENTER and the display will read "SCAL" (scale); press ENTER again and the display will read "GEAr" indicating the next input will be the gear speed number. Press ENTER and use the ▲ or ▼ arrow keys to adjust the value until the desired gear speed number is reached.
   2. Press ENTER and the display will read "dISP" (display) indicating the next input will be the display speed number. Press ENTER and use the ▲ or ▼ arrow keys to adjust the value until the desired display speed number is reached. If the application requires a predivide, proceed to the next section, if not continue to press ENTER until the display reads "SAVE/donE", the new configuration will be saved.

D. PREDIVIDE - The predivide input configuration is used for nonsymmetric or uneven input signals. It divides the input signal down to an even, repeating pattern so the gauge can process the signal and output steady display readings. The predivide may be required if the gauge reads erratically even with the filter value near maximum (255). To set the predivide input, follow the procedure above for the pulse count and continue to press ENTER until the display reads "PrEd" (predivide); press ENTER, and the display will read the current numeric value of the predivide. Press ENTER, and use the ▲ or ▼ arrow keys to adjust the value until the desired predivide number is reached; set the predivide to provide the internal circuitry of the DSG-1201 gauge with an even, repeating pattern. Press ENTER until the display reads "SAVE/donE"; the new configuration will be saved. NOTE: A setting of "1" provides no predivide of the incoming signal.

INPUT CONFIGURATION EXAMPLES - To configure the input of the gauge to indicate correct engine RPM, the number of pulses being sent to the gauge during one (1) revolution must be known. The following examples will help determine this number.

IGNITION SYSTEM APPLICATION USING COIL PRIMARY:

APPLICATION	PPr	PREDIVIDE
2-cycle engine	1.0	1
4-cycle engine	0.5	1

IGNITION SYSTEM APPLICATION USING SHUTDOWN LEAD:

NOTE: n = no. of engine cylinders

APPLICATION	PPr	PREDIVIDE
2-cycle, single capacitor	n	n
2-cycle, dual capacitor	n/2	n/2
4-cycle, single capacitor	n/2	n
4-cycle, dual capacitor	n/4	n/2

Preferred Configuration For EVEN-FIRING PATTERNS ONLY.

APPLICATION	PPr	PREDIVIDE
2-cycle, single capacitor	n	1
2-cycle, dual capacitor	n/2	1
4-cycle, single capacitor	n/2	1
4-cycle, dual capacitor	n/4	1

PICK-UP APPLICATIONS:

APPLICATION	TEETH	PPr	SCALE	FACTORS
crankshaft gear	360	360	gear = 1	display = 1
camshaft gear	180	180	gear = 1	display = 2
1.58 faster than display	26	26	gear =158	display = 100
0.45 slower than display	72	72	gear = 45	display = 100

DECIMAL POINT AND SCALE CONFIGURATION:

DECIMAL POINT	SCALE	FACTORS	DISPLAY
xxxx	gear = 1	display = 1	Units
xxx.x	gear = 1	display = 10	Tenths
xx.xx	gear = 1	display = 100	Hundredths
x.xxx	gear = 1	display = 1000	Thousandths

10.3 UNITS - The unit indicator is normally RPM; if used it appears on the right side of the display. For other rate units the RPM indicator may be turned off and the units labeled externally. To turn the unit indicator off or on, press the MODE key until the display reads "Unit", either RPM or no unit indicator will appear. Use the ▲ or ▼ arrow keys to select either RPM or no indicator and press ENTER to accept and save the change. The display will read "SAVE/donE" and return to the normal mode displaying the new unit indicator. NOTE: "dFLt", the factory default settings indicator, is also displayed and can be selected under the units configuration.

10.4 BARGRAPH - The bargraph appears across the bottom of the display and can be configured in three different modes. The selections are:

"On IIIIII" Bar mode between two points
"On I I I" Single bar between two points
"OFF" No bargraph displayed

To change the bargraph mode, press the MODE key until the display reads "bAr" and press ENTER. Use the ▲ or ▼ arrow keys to select a bargraph mode. A description of each mode follows:

"On IIIIII" - Bar mode between two points: press ENTER and the display will read "br.LO", indicating the low bar value, press ENTER and the current numeric RPM low bar value will be displayed. Use the ▲ or ▼ arrow keys to adjust the low bar value. Press ENTER and the display will read "br.HI", indicating the high bar value, press ENTER and the current numeric RPM high value will be displayed; follow the same procedure to adjust this value. Press ENTER to return to the normal display mode with the new bargraph configuration.

"On I I I" - Single bar mode between two points: press ENTER and the display will read "br.LO", indicating the low bar value, press ENTER and the current numeric RPM low bar value will be displayed. Use the ▲ or ▼ arrow keys to adjust the low bar value. Press ENTER and the display will read "br.HI", indicating the high bar value, press ENTER and the current numeric RPM high value will be displayed; follow the same procedure to adjust this value. Press ENTER to return to the normal display mode with the new bargraph configuration.

"OFF" - No bargraph: press ENTER and the display will return to the normal mode and the bargraph will be off.

10.5 SETPOINT CONFIGURATION - The setpoint configuration allows the user to select each output switch as either a low or high setpoint, and normally-open or normally-closed setpoint; the hysteresis value, trip delay and reset delay time for each setpoint are also set through the setpoint configuration. To change the setpoint configuration, press the MODE key until the display reads "SP.CF", press ENTER and the display will read "SP.1", press the ENTER key to configure output switch 1. Press the MODE key to access the setpoint configuration for switches 2, 3, or 4.

A. LOW OR HIGH OUTPUT SWITCH - Each individual switch can be set to change state on either a low or high value. After pressing the enter key the display will read "1-LO" or "1-HI". Use the ▲ or ▼ arrow keys to select and press ENTER.

B. NORMALLY-OPEN OR NORMALLY-CLOSED OUTPUT SWITCH - Each individual switch can be set to be either a normally-open or normally-closed output switch. After pressing ENTER the display will read "1-NO" or "1-NC". Use the ▲ or ▼ arrow keys to select and press ENTER.

C. HYSTERESIS - Hysteresis sometimes is referred to as a deadband value. It is a numeric value that is added to a low setpoint value and subtracted from a high setpoint value before the switch reverts to the normal condition (clears). The hysteresis value range is 0 to 9999 and is displayed in RPM units. NOTE: If the hysteresis value is set for a number greater than the RPM range of the application, the gauge will have to be powered-down to clear the switch. This can be used to determine if a high or low limit was ever reached (in effect, a latching output). After pressing ENTER the display will read "HySt". Use the ▲ or ▼ arrow keys to select a hysteresis value and press ENTER.

D. TRIP DELAY TIME - The trip and reset time delays can be used for numerous timing applications such as crank disconnect, overcrank, engine loading and underspeed. These times can be set from 0.25 to 99.75 seconds in 0.25 second increments. The output switch will trip or reset only if the reading exceeds the setpoint value for the entire time period without interruption. After pressing ENTER the display will read "t.dLy" (trip delay time). Press ENTER and the previously set trip delay time will be shown. Use the ▲ or ▼ arrow keys to select a trip delay time and press ENTER.

E. RESET DELAY TIME - The output switch will not reset until the reset time delay is continuously satisfied. After pressing ENTER the display will read "r.dLy" (reset delay time). Press ENTER and the previously set reset delay time will be shown. Use the ▲ or ▼ arrow keys to select a reset delay time. Press ENTER to accept the selected configuration for switch 1, the display will then read "SAVE/donE", and the new configuration will be saved. Repeat the same procedure to configure setpoints 2, 3, and 4.

SETPOINT EXAMPLE: If the setpoint is configured as HIGH, 1000 RPM with a 2.5 second trip delay time, the reading must be above 1000 RPM for the full 2.5 seconds without interruption before the switch will trip. The reset time delay works in a similar manner but with the addition of the hysteresis value. If the same setpoint had a reset time delay of 5 seconds and a hysteresis value of 10 RPM, the reading would have to be below 990 RPM for at least 5 seconds before the switch would reset.

10.6 OUTPUT CURRENT LOOP (DSG-1201DUP ONLY) - The 4-20 mA current loop output allows the user to output a signal proportional to the RPM being measured and displayed. To configure the current loop, press the MODE key until the display reads "LOOP" and press ENTER. The display will read "LP.LO" (loop low); press ENTER and the RPM value for the previously set 4 mA point will be displayed. Use the ▲ or ▼ arrow keys to adjust the numeric value for the 4 mA point. Press ENTER and the display will read "LP.HI" (loop high); press ENTER and the previous RPM value for the 20 mA point will be displayed. Again use the ▲ or ▼ arrow keys to adjust the desired 20 mA numeric value. Press ENTER to save the new 4-20 mA configuration and return to the normal reading. NOTE: The 4-20 mA current loop can be configured for reverse action; simply configure the "LP.LO" or low point with the 20 mA value and the "LP.HI" or high point with the 4 mA value.

10.7 DISPLAY FILTER - The display filter can be used to stabilize the display reading of a changing input. Filtering is done in both hardware and software. The software filter is an adjustable dynamic filter - for relatively small RPM changes the filter value remains as set, but for relatively large RPM changes (such as engine acceleration or deceleration), the filter value is decreased proportionally to speed. The filter value is read-out in a number from 1 to 255; 1 being no filter value and 255 being maximum filter value. To set the filter value, press the MODE key until the display reads "FILt" and press ENTER. The display will read the previously set filter value. Use the ▲ or ▼ arrow keys to increase or decrease the filter value and press ENTER to save the new value.

FIGURES SECTION:

MOUNTING DIMENSIONS AND SPECIFICATIONS

DSG1201 CONFIGURATION WORKSHEET

DSG1201 FLOWCHART

GENERAL ELECTRICAL CONNECTIONS

WIRING DIAGRAM - IGNITION COIL INPUT, NEGATIVE GROUND
WIRING DIAGRAM - IGNITION COIL INPUT, POSITIVE GROUND

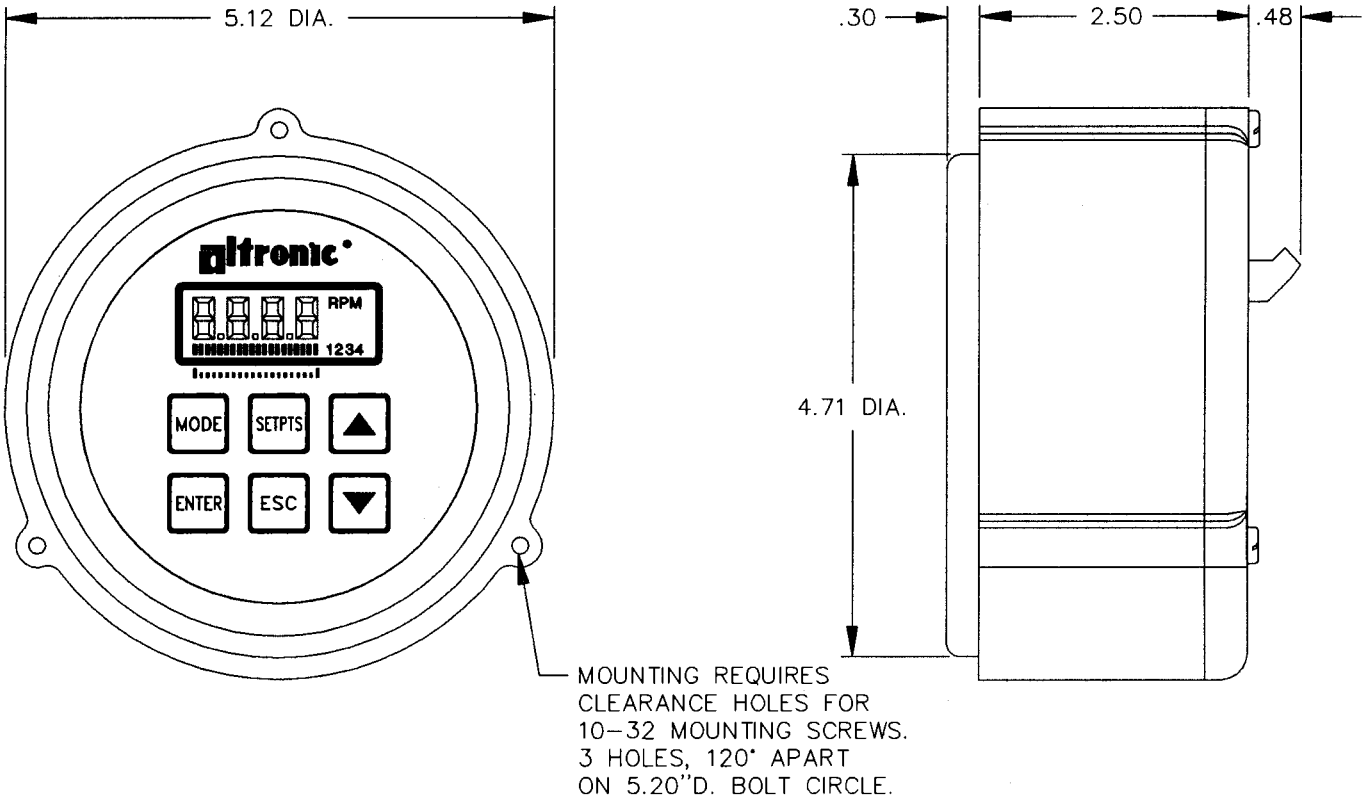
WIRING DIAGRAM - NEGATIVE GROUND C.D. IGNITION SHUTDOWN LEAD
WIRING DIAGRAM - POSITIVE GROUND C.D. IGNITION SHUTDOWN LEAD

WIRING DIAGRAM - MAGNETIC PICK-UP INPUT
WIRING DIAGRAM - HALL-EFFECT PICK-UP INPUT

WIRING DIAGRAM - ALTRONIC ANNUNCIATOR SYSTEMS

WIRING DIAGRAM - DC RELAY
WIRING DIAGRAM - CURRENT LOOP OUTPUT

MOUNTING DIMENSIONS AND SPECIFICATIONS



SPECIFICATIONS:

POWER REQUIRED: 12–36 VDC 50mA MAX.

SENSOR INPUT: C.D. IGNITION "SHUTDOWN LEAD" (100 – 400V),
OR C.D. IGNITION NO. 1 CYLINDER (100 – 400V),
OR VARIABLE RELUCTANCE MAGNETIC PICK-UP,
OR VARIOUS TYPES OF D.C. POWERED ZERO VELOCITY SENSORS.

SIGNAL INPUT: PROGRAMMABLE INPUT PULSE COUNT, SCALABLE RATIOS,
ABILITY TO ACCEPT INPUTS FROM UNEVEN PATTERNS.

DISPLAY: .4" 4 DIGIT LCD WITH DISPLAY INDICATORS AND 20 SEGMENT BARGRAPH.

RANGE: 0 TO 9999, SETABLE DECIMAL.

DISPLAY UPDATE RATE: 2 TIMES PER SECOND WITH PROGRAMMABLE DISPLAY FILTER.

UNITS: PROGRAMMABLE FOR RPM OR OTHER RATE–UNITS USING AN EXTERNAL LABEL.

INSTRUMENT ACCURACY: ±.5%, ±1 DIGIT.

AMBIENT TEMPERATURE RANGE: −40° TO 175°F (−40° TO +80°C).

SETPOINTS: 4 USER PROGRAMMABLE SETPOINTS EACH SELECTABLE HIGH OR LOW, NORMALLY OPEN OR NORMALLY CLOSED. EACH SWITCH HAS INDEPENDANT ADJUSTABLE HYSTERESIS VALUE AND SETTABLE TRIP DELAY AND RESET DELAY TIMES.

OUTPUT SWITCH RATING: 200 VDC, 140mA CONTINUOUS.

CURRENT LOOP OUTPUT SPAN: 4–20mA USER PROGRAMMABLE, DIRECT OR REVERSE ACTING.

MAXIMUM LOOP RESISTANCE: 500Ω.

LOOP ACCURACY: ±.5% OF SPAN.

HAZARDOUS AREA CLASSIFICATION: CLASS I, GROUP D, DIV. 2
CLASS I, GROUP D, DIV. I WHEN POWERED
FROM A CSA CERTIFIED ZENER BARRIER
RATED 30 VOLTS MAX., 120Ω MIN.

DSG 1201 - CONFIGURATION WORKSHEET

SITE: _____

MODEL# DSG-1201DU___ **SERIAL#** _____ **DATE** _____

SETPOINTS #1 _____ **RPM** #3 _____ **RPM**

#2 _____ **RPM** #4 _____ **RPM**

INPUT _____ PPr (PULSE PER REVOLUTION)

___ d P n t ___ d.P n t ___ d P.n t ___ d P n.t

SCALE: _____ GEAR SPEED

_____ DISPLAY SPEED

_____ PREDIVIDE

BAR ___ OFF ___ ON ___ ON (between bar-LOW, bar-HIGH)
br.LO _____ br.HI _____

UNIT ___ RPM ___ none

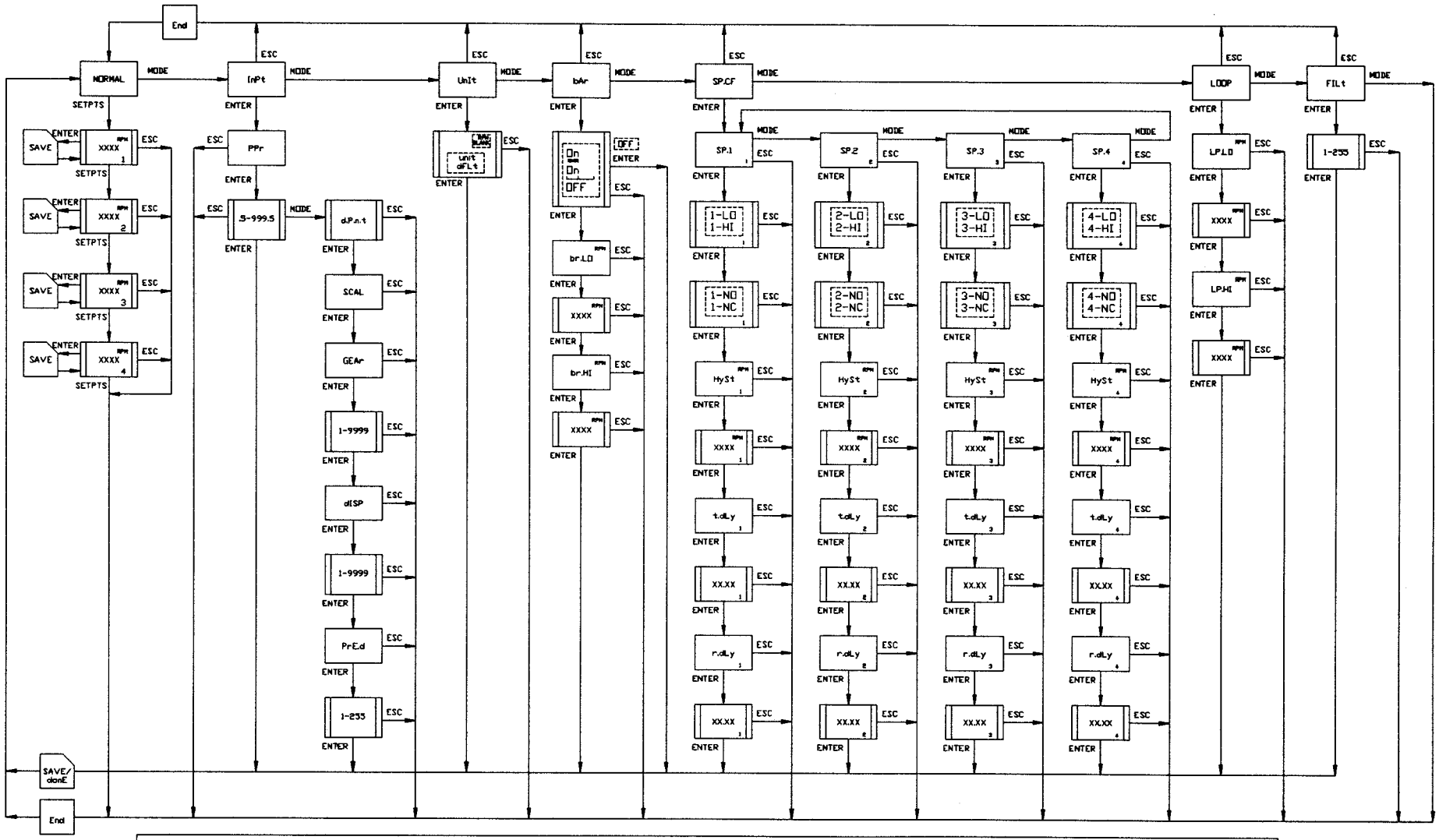
SP.CF

SETPOINT 1	SETPOINT 2	SETPOINT 3	SETPOINT 4
___ LO ___ HI	___ LO ___ HI	___ LO ___ HI	___ LO ___ HI
___ NO___ NC	___ NO___ NC	___ NO___ NC	___ NO___ NC
_____ HYST	_____ HYST	_____ HYST	_____ HYST
_____ t.dLy	_____ t.dLy	_____ t.dLy	_____ t.dLy
_____ r.dLy	_____ r.dLy	_____ r.dLy	_____ r.dLy

LOOP _____ RPM LP.LO (4 ma) _____ RPM LP.HI (20 ma)

FILT _____ (1=min filtering, 255=max filtering, default = 240)

DSG-1201 - FLOWCHART



DEFAULT SETTINGS

FOR DEFAULT SETTINGS, SELECT RPM UNDER UNIT

PPr: 1

UNITS: RPM

BARGRAPH: BAR MODE BETWEEN 0 AND 1000 RPM

OUTPUT SWITCH CONFIGURATION

SETPOINT 1 -	100 RPM,	LOW,	NORMALLY CLOSED,	10 RPM HYSTERESIS,	TRIP DELAY 1 SEC.,	RESET DELAY 1.5 SEC.
SETPOINT 2 -	500 RPM,	LOW,	NORMALLY CLOSED,	5 RPM HYSTERESIS,	TRIP DELAY 3 SEC.,	RESET DELAY 2 SEC.
SETPOINT 3 -	1000 RPM,	HIGH,	NORMALLY OPEN,	10 RPM HYSTERESIS,	TRIP DELAY .5 SEC.,	RESET DELAY 1 SEC.
SETPOINT 4 -	1200 RPM,	HIGH,	NORMALLY OPEN,	5 RPM HYSTERESIS,	TRIP DELAY .25 SEC.,	RESET DELAY .5 SEC.

CURRENT LOOP: 4 mA - 0 RPM, 20 mA - 1300 RPM

FILTER: 240

FLOWCHART KEY

XXXX

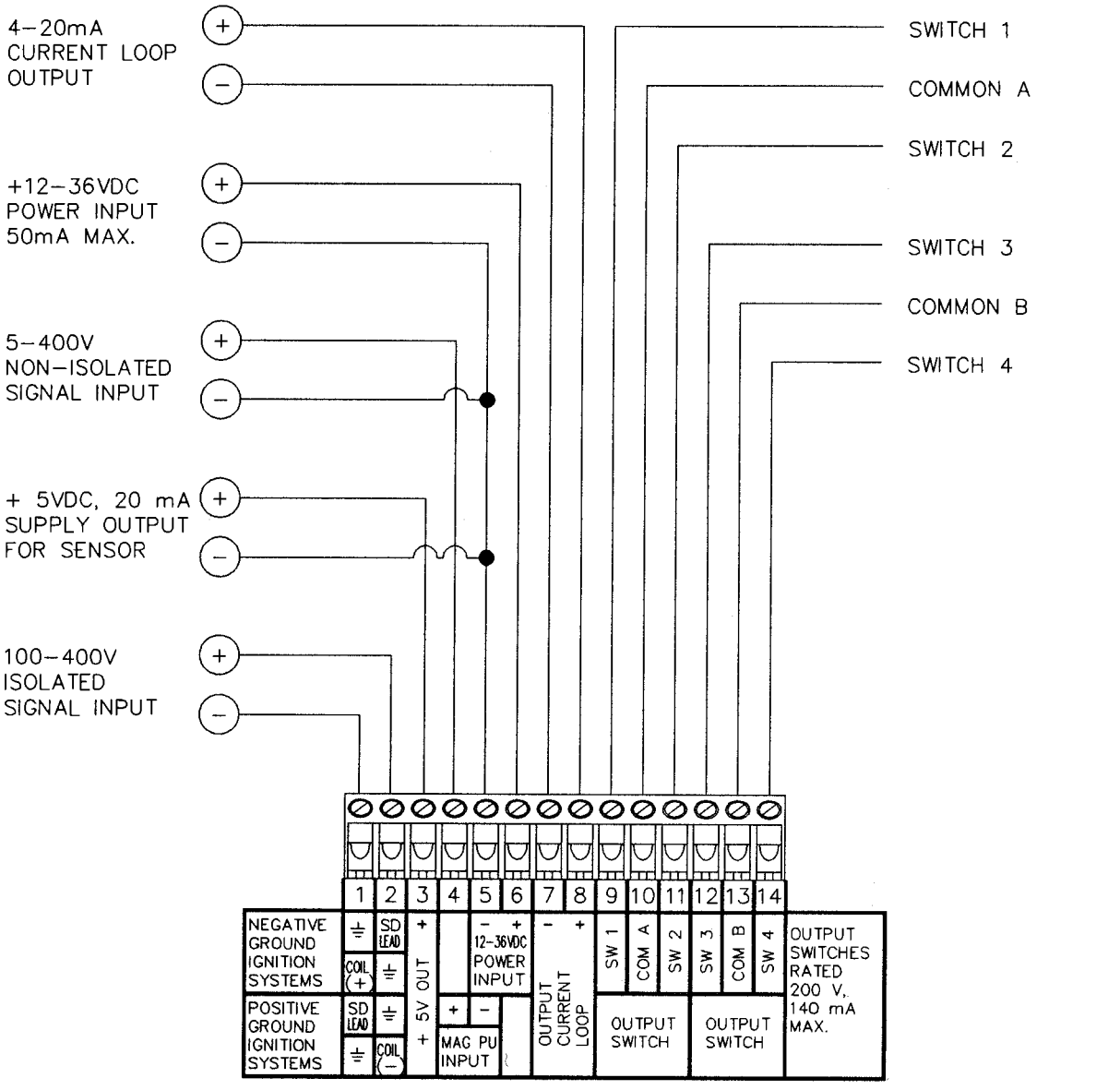
△ DOUBLE BARS- USE UP AND ▽ DOWN ARROW KEYS TO SCROLL

SP.LO / SP.HI: DASHED LINES- MAKE A SELECTION

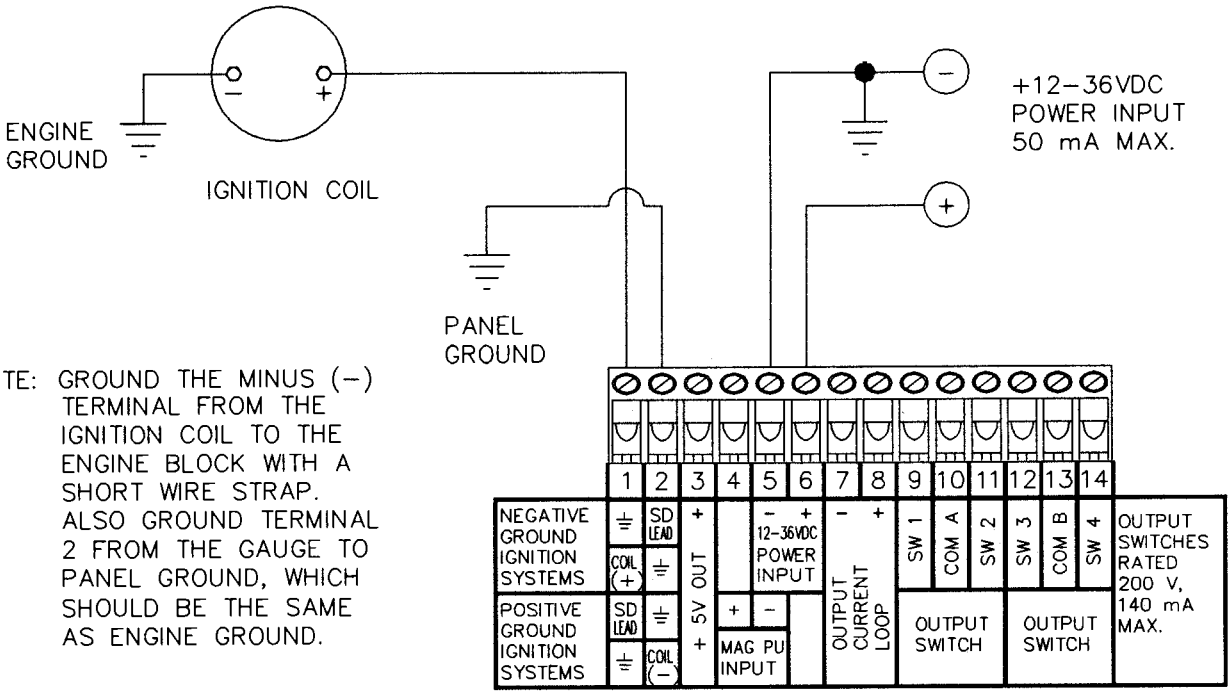
OUTPUT SWITCH DELAY TIME IS IN INCREMENTS OF .25 SECONDS FROM .25 TO 63.50 SECONDS

GENERAL ELECTRICAL CONNECTIONS

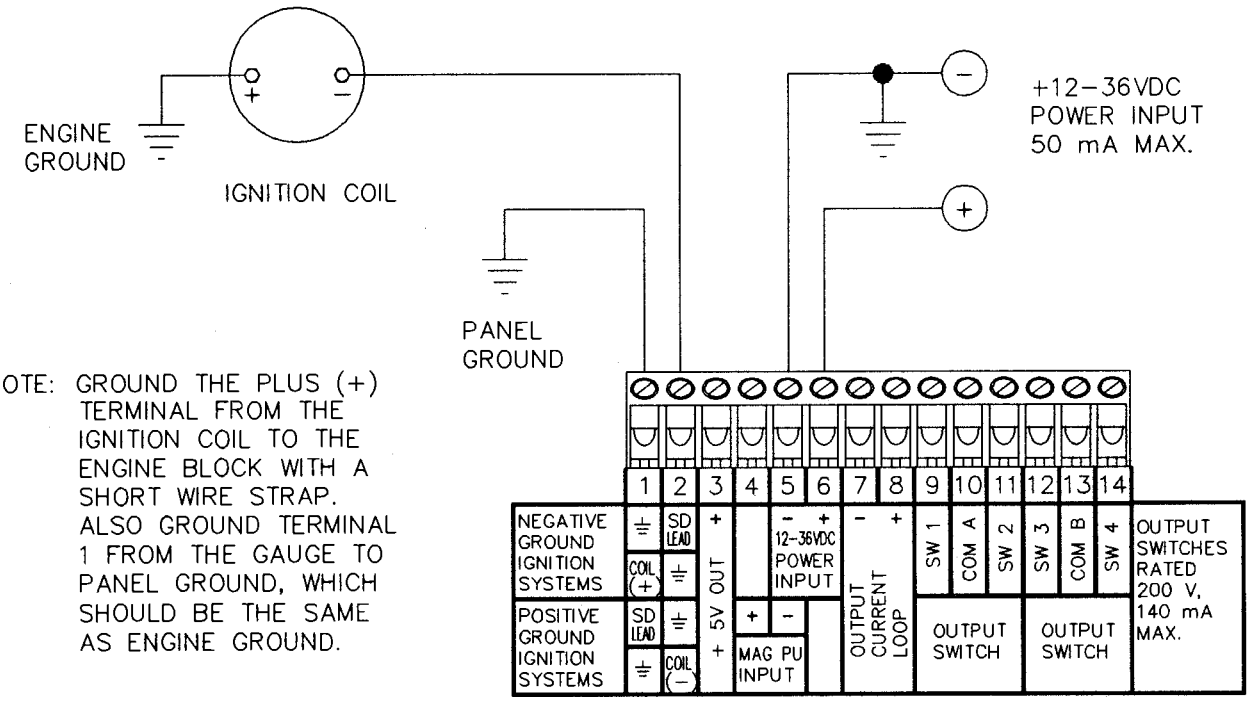
NOTE: OUTPUT SWITCHES ARE CLASS "A"
RATED 200VDC, 140mA CONTINUOUS OPERATION.
SWITCH 1 AND 2 TURNS ON TO COMMON A;
SWITCH 3 AND 4 TURNS ON TO COMMON B.
ALL FOUR SWITCHES ARE ISOLATED FROM MINUS.



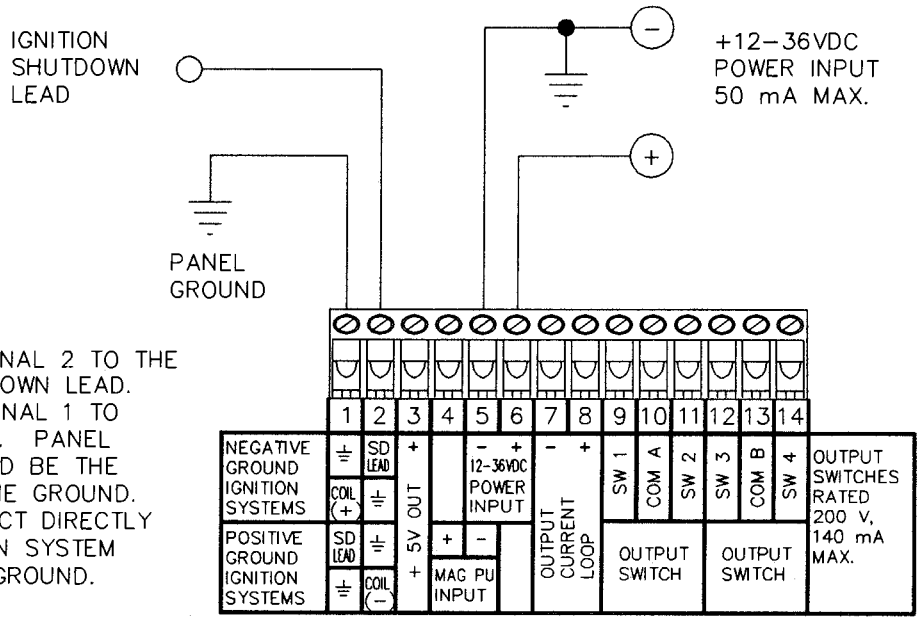
WIRING DIAGRAM – IGNITION COIL INPUT, NEGATIVE GROUND



WIRING DIAGRAM – IGNITION COIL INPUT, POSITIVE GROUND

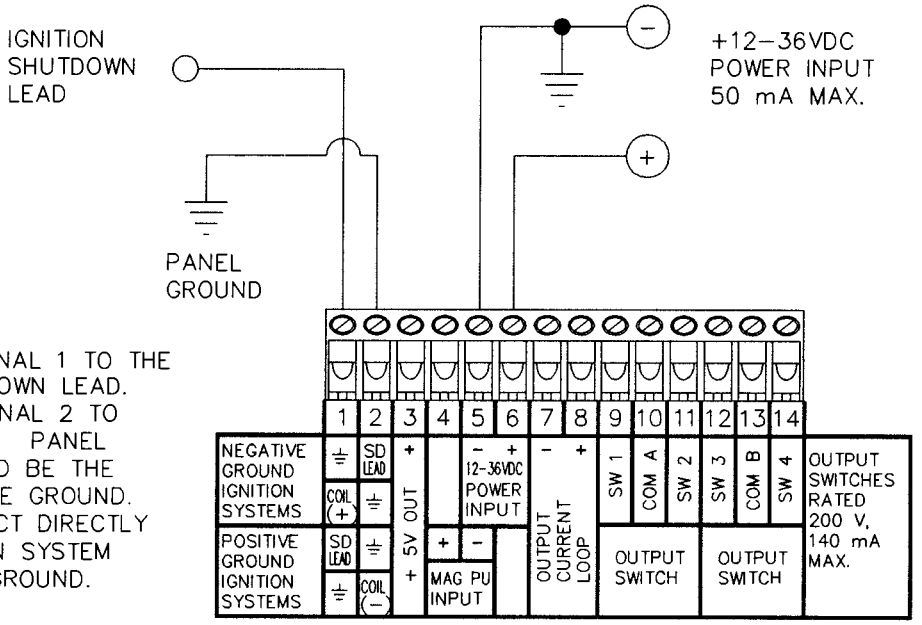


WIRING DIAGRAM
NEGATIVE GROUND C.D. IGNITION SHUTDOWN LEAD INPUT



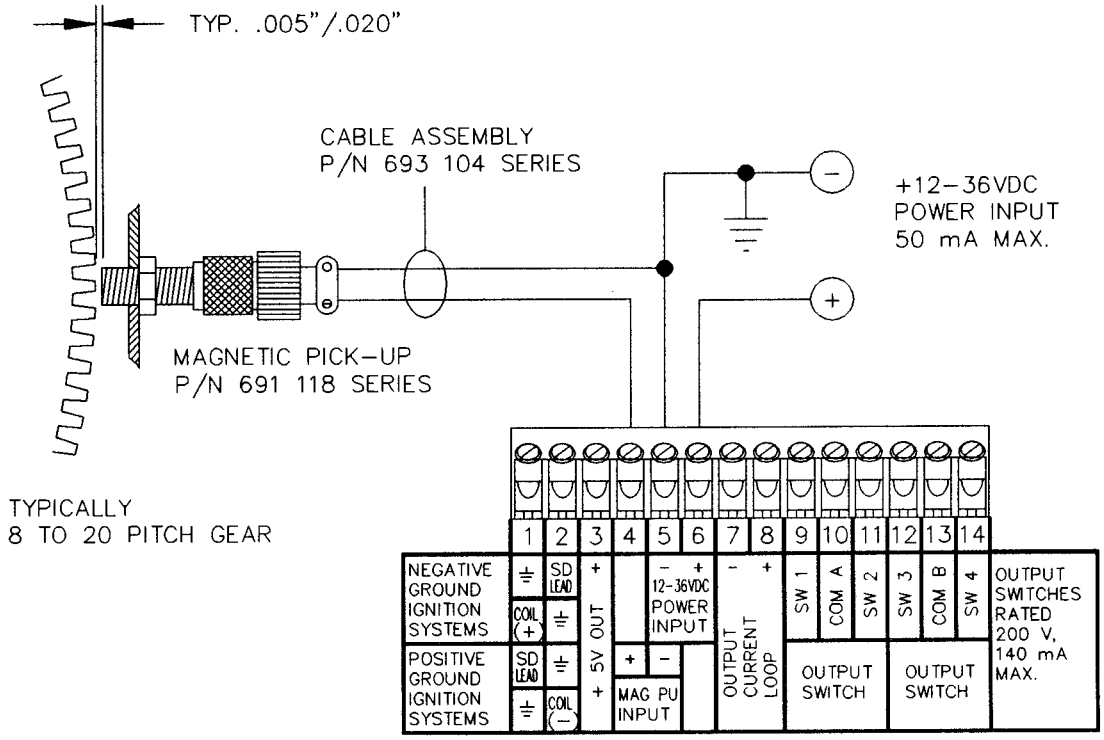
NOTE: CONNECT TERMINAL 2 TO THE IGNITION SHUTDOWN LEAD. CONNECT TERMINAL 1 TO PANEL GROUND. PANEL GROUND SHOULD BE THE SAME AS ENGINE GROUND. DO NOT CONNECT DIRECTLY TO THE IGNITION SYSTEM COMMON COIL GROUND.

WIRING DIAGRAM
POSITIVE GROUND C.D. IGNITION SHUTDOWN LEAD INPUT

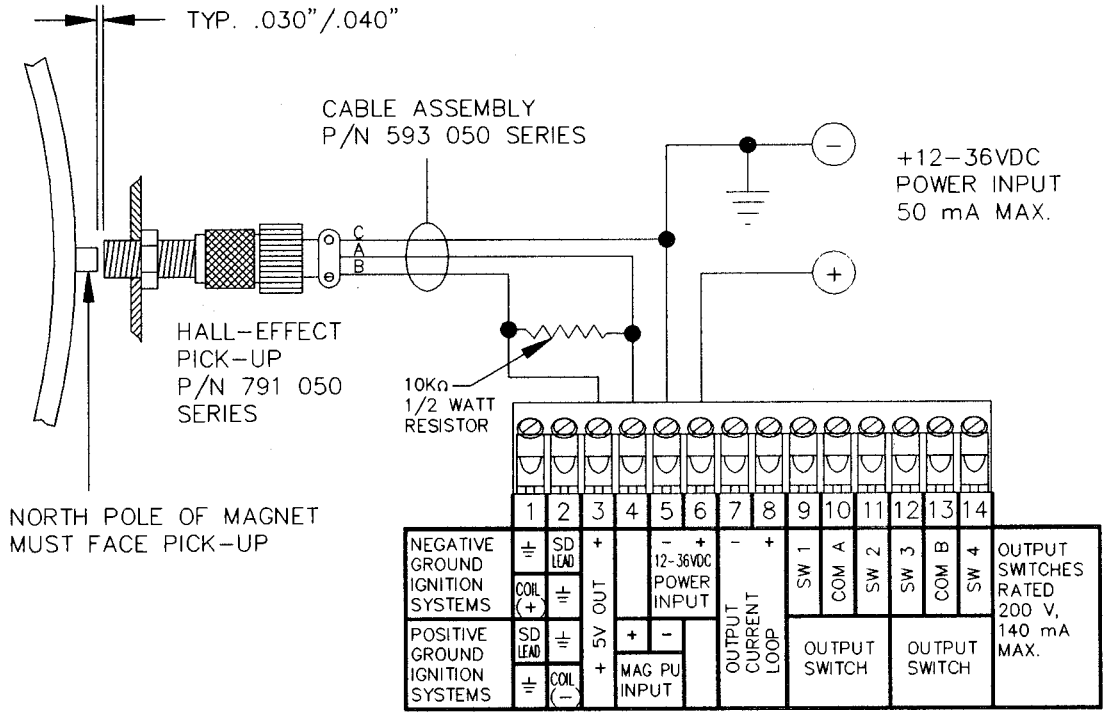


NOTE: CONNECT TERMINAL 1 TO THE IGNITION SHUTDOWN LEAD. CONNECT TERMINAL 2 TO PANEL GROUND. PANEL GROUND SHOULD BE THE SAME AS ENGINE GROUND. DO NOT CONNECT DIRECTLY TO THE IGNITION SYSTEM COMMON COIL GROUND.

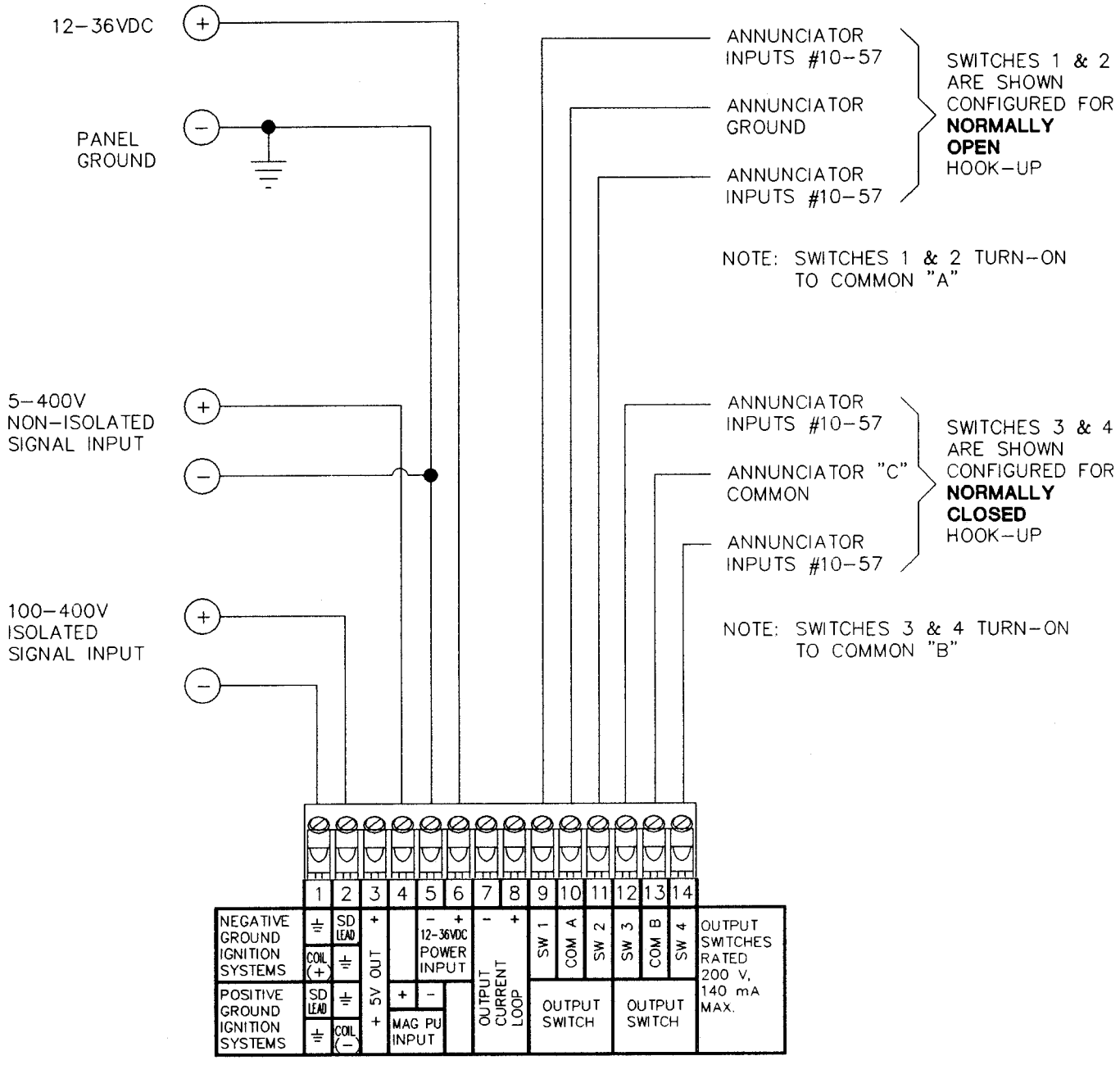
WIRING DIAGRAM – MAGNETIC PICK-UP INPUT



WIRING DIAGRAM – HALL-EFFECT PICK-UP INPUT

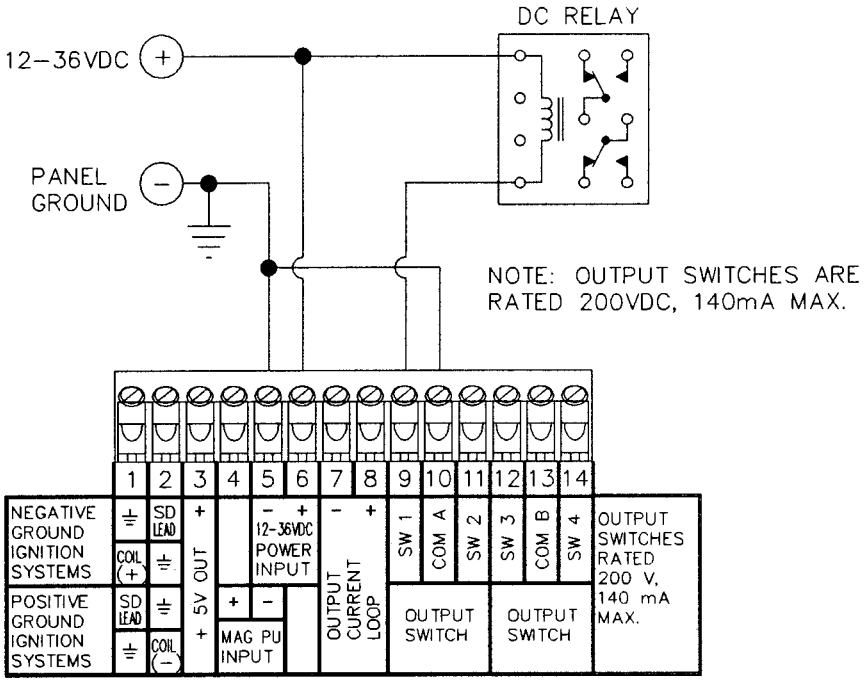


WIRING DIAGRAM
ALTRONIC ANNUNCIATOR SYSTEMS



NOTE: FOR INTRINSICALLY SAFE OPERATION, POWER THROUGH A CSA CERTIFIED ZENER BARRIER RATED 30 VOLTS MAX., 120Ω MIN. THE SIGNAL INPUT, IF FROM THE IGNITION COIL OR THE SHUTDOWN LEAD, MUST BE RUN THROUGH AN ALTRONIC BARRIER 690 107 OR 690 108. FOLLOW THE INSTALLATION INSTRUCTIONS SUPPLIED WITH THE BARRIERS.

WIRING DIAGRAM – DC RELAY



WIRING DIAGRAM – CURRENT LOOP OUTPUT