

# altronic<sup>®</sup> CPU-90

## DIGITAL IGNITION SYSTEM FOR INDUSTRIAL ENGINES 2 - 18 CYLINDERS

- **TWO SERIES:**
  - 100 SERIES — UNIVERSAL UNIT FITS ALL APPLICATIONS
  - 200 SERIES — DOUBLE-STRIKE SPARK OPTION FOR IMPROVED COMBUSTION ON PROBLEM ENGINES
- **HIGH ENERGY, CAPACITOR DISCHARGE IGNITION WITH SELECTABLE ENERGY LEVEL — SUITABLE FOR LEAN-BURN ENGINES**
- **PRECISE CRANKSHAFT-REFERENCED TIMING IMPROVES ENGINE PERFORMANCE**
- **ELECTRONIC VARIABLE TIMING:**
  - DUAL TIMING SETTINGS
  - 4-20 MA OR 0-1K OHM CONTROL SIGNAL
  - CUSTOM CURVE VS. ENGINE RPM
- **EASY RETROFIT INSTALLATION:**
  - OPERATES WITH ALL ALTRONIC I, III, V COILS
  - COMPATIBLE WITH C.D. IGNITION POWERED PANEL
- **12-24 VDC POWERED:**
  - NO WEARING PARTS
  - FULL OUTPUT AVAILABLE AT STARTING

The Altronic CPU-90 ignition system is a 12-24 VDC powered, microcircuit-based, digital ignition system applicable to a wide range of industrial engines. The system, which has no moving parts, delivers unparalleled timing accuracy and stability by eliminating dependence on mechanical engine drives, gears, chains and couplings. The CPU-90 also features the capability to precisely control ignition timing electronically as a function of either engine RPM or an external analog control signal.

The features of the Altronic CPU-90 ignition system lead to improved engine operation through a more balanced combustion process. Selectable energy output plus several modes of timing adjustment are available in all models. The optional "double-strike" 200 series is recommended for improved combustion in slow speed, 2-cycle engines or for other hard-to-start or ignite situations caused, for example, by poor quality fuel. The CPU-90 ignition system provides improved engine efficiency, lower exhaust emissions, reduced engine maintenance and decreased operating costs for the engine operator.

CPU-90 can be powered from a source of 12-24 VDC or from Altronic's engine-driven 24 VDC alternator power packages — see form ALT for additional details.

The CPU-90 system operates with all Altronic I, III and V ignition coils and is compatible with safety shutdown panels operating from a negative ground C.D. ignition system making retrofit applications simple and economical.



CERTIFIED  
CLASS I, GROUP D, DIVISION 2

## DESCRIPTION & OPERATION:

The CPU-90 system consists of the CPU-90 unit, two magnetic pick-ups and cables, a wiring harness and an ignition coil for each spark plug.

The two pick-ups input two external signals:

- counts from a ring gear or holes drilled in the flywheel;
- a reset pulse once per engine revolution.

These two pick-up inputs, taken from the engine crankshaft, provide for the basic accuracy of ignition timing. Magneto drive train mechanical variations are eliminated. On 4-cycle engines, an additional pick-up referenced to the engine camshaft is used to determine the compression cycle.

The system's EPROM memory chip is programmed with the number of teeth or holes, the engine's firing angle sequence, the timing range and other details of the particular application. The logic circuit outputs trigger pulses in precise, "real time" relationship with crankshaft revolution insuring accurate timing regardless of engine speed variations.

Each EPROM memory is factory-tested in an operating CPU-90 system to insure proper operation on-site. When special timing angles, ranges or curves are required, it is only necessary to obtain a new memory chip.

## SPECIFICATIONS:

NUMBER OF OUTPUTS . . . . . 16 or 18

POWER REQUIRED . . . 12 VDC, 3.0 amp  
24 VDC, 1.5 amp

VOLTAGE OUTPUT . . . . . 45 KV

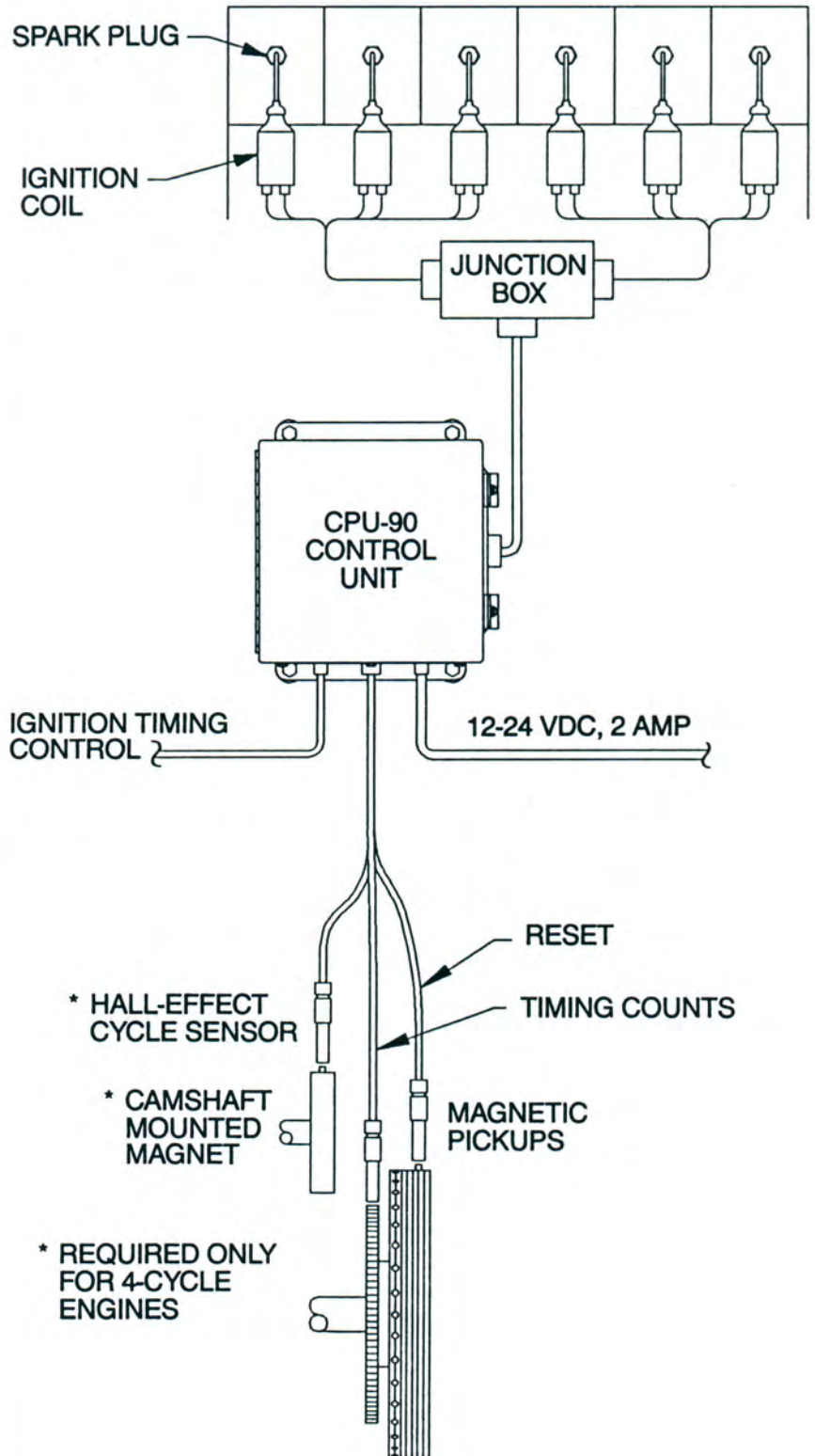
SPARK DURATION . . . . . 300-600  
microseconds

### UNIT SIZE:

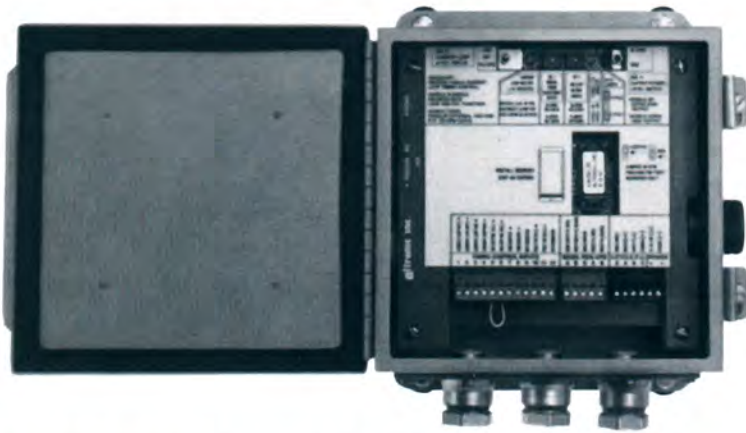
Enclosure . 4.30" H x 8.25" L x 8.25" W

Mounting . . . . . 8.70" L x 6.00" W

## CPU-90 SYSTEM DIAGRAM



## SYSTEM FEATURES



### EASE OF INSTALLATION AND SERVICE

- Plug-in terminal strips for ease of wiring connections and troubleshooting
- Terminal strips unplug for easy changeout of entire unit or board assembly

### FACTORY-TESTED EPROM MEMORY FOR EACH APPLICATION

- No programming required on initial installation or when replacing unit
- Factory burn-in test of program and individual chip
- Custom timing ranges and RPM curves available
- Expedited delivery service available on new EPROM's

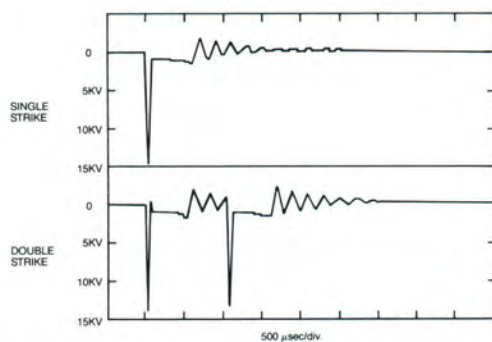


### DOUBLE-STRIKE OPTION

Selectable energy output plus a new DOUBLE-STRIKE option improves combustion in hard-to-ignite situations on certain 2-cycle engines, ultra lean-burn engines or for operation on poor quality fuel. The second spark reduces misfiring in these applications by:

- doubling the odds of igniting a good fuel mixture;
- adding more spark energy to maintain the combustion flame front.

**NOTE:** This option is recommended for Clark, Cooper-Bessemer and Worthington 2-cycle engines.



## TIMING CONTROL FEATURES:

- MANUAL TIMING SETTING**  
Internal 10-position switch allows for manual timing adjustments.
- DUAL TIMING SETTING**  
Internal 16-position switch allows two timing settings to be selected by external contacts. Typical uses are to optimize timing for load, temperature or fuel variations.
- TIMING VS. ANALOG SIGNAL**  
Electronic control of timing by externally supplied 4-20 ma current loop or 0-1,000 ohm potentiometer. Standard range is 24 degrees, 4-cycle and 16 degrees, 2-cycle; other ranges are optional.
- TIMING VS. ENGINE RPM**  
A pre-programmed timing curve vs. RPM is available as an option. This can be used to facilitate starting or to maintain optimum economy or emissions throughout the engine's operating range.

## OTHER SYSTEM FEATURES:

- Common Unit for All Applications**  
— One common unit fits all applicable engines through 16 cylinders; simply install the memory chip appropriate to the application.
- Full Output at Starting** — Full output is provided under engine cranking conditions with any input voltage from 10-32 VDC.
- Selectable Energy Output** — A selection switch provides two energy/spark duration levels to allow the user to customize the system output to particular application requirements.
- Negative ground Primary Circuit** — Operates with all Altronic I, III, V coils.
- Panel Board Compatibility** — The system will power and be shut-off by most panels previously powered from a self-generating, negative ground C.D. ignition system such as Altronic I, III, V.

## CPU-90 IGNITION COILS:

Altronic ignition coils cover all application requirements, unshielded or shielded. Shielded coils are available in the external type, flange mounted type, and integral coil series mounting directly to 1<sup>3</sup>/<sub>16</sub>"-20 or 1"-20 spark plugs.

### UNSHIELDED COIL 501 061



### FLANGED COIL 591 012



### SHIELDED COIL 501 061-S



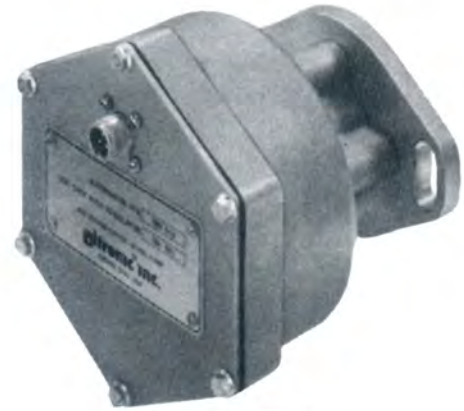
### INTEGRAL COIL 591 011B



## ACCESSORY EQUIPMENT

### POWER SOURCE

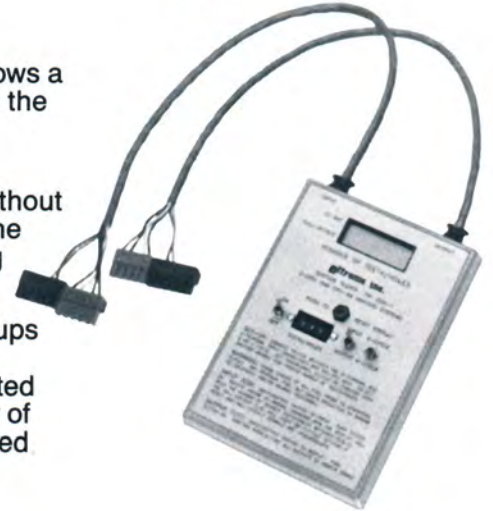
The CPU-90 ignition systems can be powered from a source of 12-24 VDC or from Altronic's engine-driven 24 VDC alternator power packages — see form ALT for full details.



### IGNITION TEST UNIT

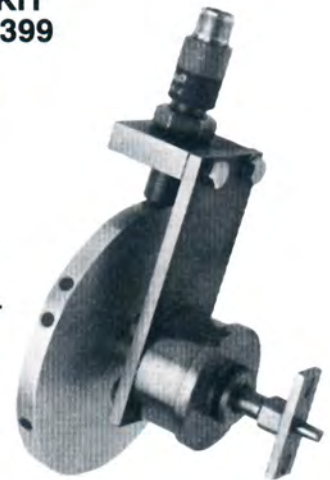
The Altronic CPU Test Unit allows a qualified technician to perform the following tests of a complete installation on an engine:

- Excite the output circuits without the engine rotating to test the CPU-90 unit, primary wiring harness and ignition coils.
- Indicates whether the pick-ups are generating the proper signals when engine is rotated and that the proper number of teeth/holes are being counted between reset pulses.



### 4-CYCLE TRIGGER MOUNTING KIT FOR CATEPILLAR G379/G398/G399

Adaptor kit 790 005 provides for mounting the CPU-90 4-cycle trigger magnet and Hall-effect pick-up on Caterpillar G379, G398 and G399 engines. The kit consists of a drive, pick-up mounting bracket and mounting adaptor that fits the existing service meter drive making for an easy retrofit on these popular engines.



**altronic<sup>®</sup>  
inc.**

712 TRUMBULL AVENUE/GIRARD, OHIO 44420  
(330) 545-9768/FAX: (330) 545-9005