

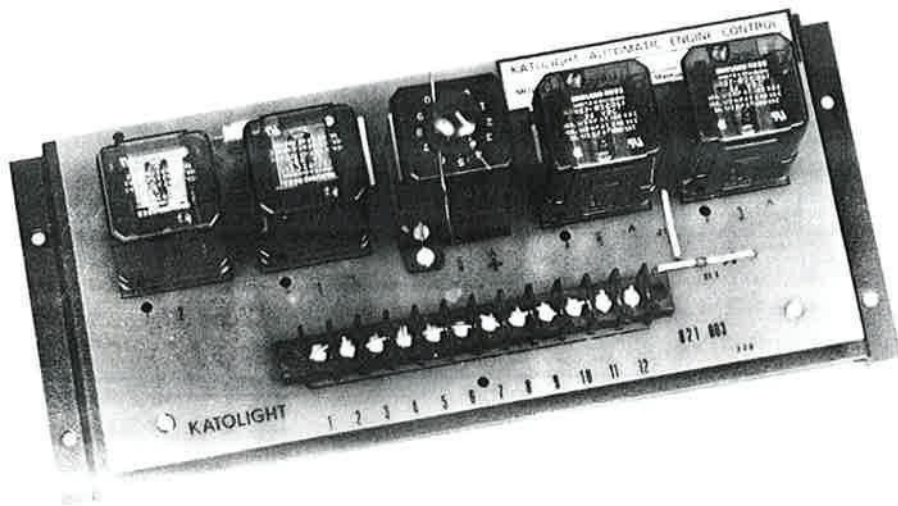


KATOLIGHT

AUTOMATIC START CONTROLS

TECHNICAL BULLETIN

MODELS:
KLAS 120
KLAS 130



Katolight Automatic Start controls will automatically start and stop diesel, gasoline, natural gas, or LPG engine-generator sets under the control of an automatic transfer switch or load start contact closed to run. These controls are manufactured to highest quality control standards to insure reliability.

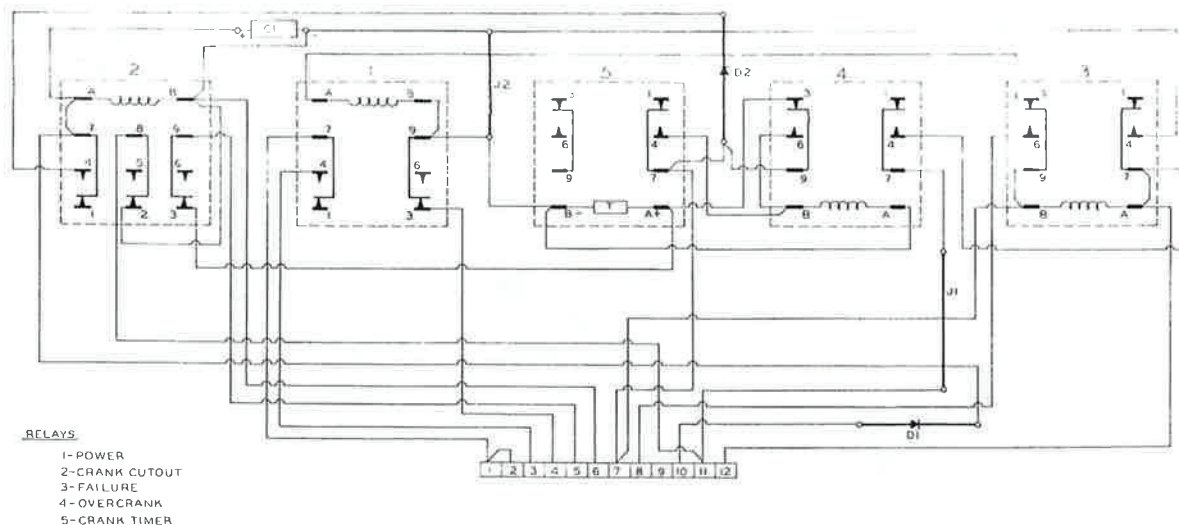
The Katolight KLAS 120 and KLAS 130 are non-cyclic automatic start controls. The KLAS 120 provides automatic engine shutdown due to overcrank, low oil pressure, and high water temperature conditions. The KLAS 130 provides automatic engine shutdown due to overcrank, low oil pressure, high water temperature, and overspeed conditions. On both models all the failures are visually indicated by the light. An audible alarm can also be provided as an option.

FEATURES

- Consistent operation for -20 to +60 degrees Centigrade.
- Reliable Katolight solid-state design timing relays.
- Heavy duty 10 amp relays with gold flashed contacts for reliable operation at low D.C. voltage.
- Compatibility with virtually all engines in today's market place.
- Ease of installation, simple bracket mounting.
- Barrier screw type terminals U.L. & C.S.A. Listed, with approved means for solderless connection of conductors.
- Non-cyclic or one-shot crank featuring an adjustable one (1) to one-hundred (100) second engine cranking circuit.
- Plug-in type solid-state timers with sockets and retaining clips.
- External alarm circuit for remote failure indication.
- Available from stock.
- Three position "Auto, Off, Manual" switch. In "Manual" position, the control is energized immediately; in "Automatic," operation commences only when a remote set of contacts close, such as those of an automatic transfer switch. The center position is "Off". (The "Off" position is also reset. after any failure.)
- Printed circuits are extra heavy construction of .093 board and .004 copper.
- Available for 12 and 24 volt battery systems; negative ground.
- Positive lock-out circuits prohibit re cranking while engine is running.
- Reverse polarity protection.

MODEL	CRANKING MODE	OPERATING CONTROL MODE	BATTERY VOLTAGE	CRANK DISCONNECT
KLAS 120	Non-cyclic	* Energized to run	12 or 24	12 or 24 VDC
KLAS 130	Non-cyclic	Energized to run	12 or 24	12 or 24 VDC

* Katolight Automatic Start controls are "Energized to Run" as standard, but "Energized to Stop" option is available.



CONTROL OPERATION

Current during cranking flows from Terminal No. 7 through normally closed Contact 3-9 Relay 3, to energize Relay 1. Relay 1 breaks normally closed Contact 3-9 magneto ground circuit to Terminal No. 4 (if used) also closes normally open Contact 4-7 energizing Terminal No. 3 (ignition coil or throttle solenoid on Diesel units). From Terminal No. 7 through normally closed Contact 3-9 Relay 4 energizes crank timer, Relay 5 and through normally closed Contact 3-9 Relay 2 energizing Terminal No. 5 (start solenoid).

If engine starts, Relay 2 is energized by a positive voltage on Terminals No. 10 through Diode D1. This positive DC voltage for Terminal No. 10 can come from the AC or ACC. tap on battery charging alternator, or speed switch or pressure switch. Relay 2 opens normally closed Contact 3-9 removing power to Terminal No. 5 (disconnecting start solenoid), opens normally closed Contact 5-8 preventing overcrank fail. Relay 2, locks itself in through normally

open Contact 4-7 to prevent starter re-engaging from loss of signal on Terminal No. 10. Timer T-5 closes normally open Contact 4-7 (after 45 seconds) energizing Relay 4 activating low oil shutdown circuit.

If engine doesn't start, timer T-5 (normally set at 45 seconds) will close normally open Contact 4-7, energizes Relay 4. Relay 4 will open normally closed Contact 3-9, de-energize Terminal No. 5 (start solenoid) close normally open Contact 6-9 locking itself in and close normally open Contact 4-7 energizing Relay 3. Relay 3 opens normally closed contact 3-9 de-energizing Relay 1 closes normally open Contact 6-9 energizing Terminal No. 8 (alarm light) closes normally open Contact 4-7 locking itself in failure mode.

To reset control after failure, turn engine control switch to "off" position.

SELECTOR SWITCH MODE OF OPERATION

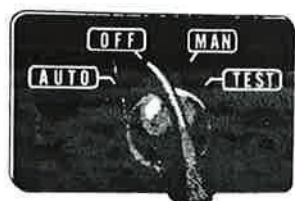
"AUTO" Places the control under control of remote start contact. This contact will control the engine—close to start—open to stop.

"OFF" Shuts engine down and/or resets control after failure. **CAUTION:** Always put in "off" position when servicing engine.

"MAN" Starts engine and operates with all safety shutdown features in operation.

"TEST" Additional position on 4 position switch. Allows you to start engine by bypassing engine control completely. **CAUTION:** No safety shutdown features will function in "test" position.

"FAILURE" Failure indicating light. Engine failed to start. Engine cranked for length of time set on adjustable crank timer but engine did not start. Engine started then failed from low oil pressure or overspeed on KLAS 130.



4 POSITION ROTARY SWITCH

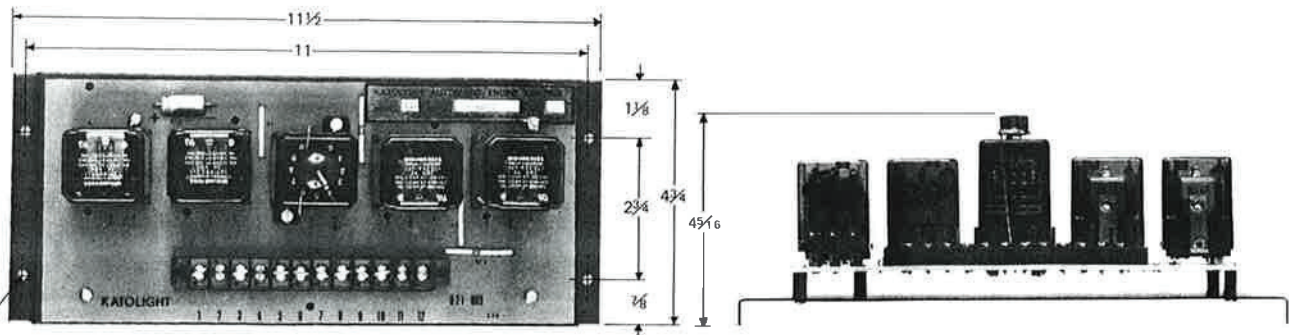


3 POSITION SWITCH

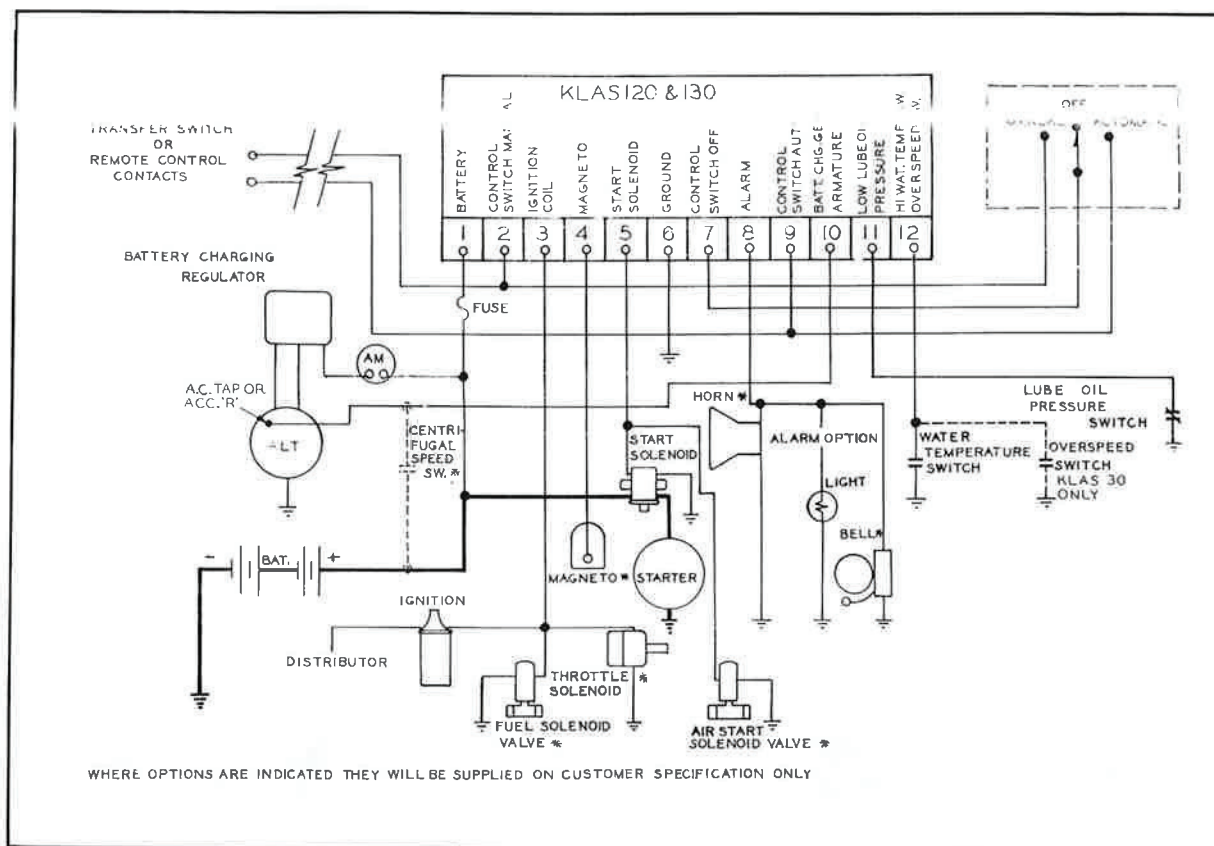


FAILURE INDICATING LIGHT

DIMENSIONS & WIRING DIAGRAMS



4 - MOUNTING HOLES
3/16 DIA.



ACCESSORIES

Dust cover

Audible alarm, horn, or bell—available as an option, in addition to the standard visual alarm light.

ORDER PROCESSING

When ordering specify:

- KLAS - model number
- battery voltage
- engine manufacturer
- enclosure number
- (dust cover optional)
- control switch (3 pos. std.)
- or (4 pos. optional)

TROUBLE SHOOTING CHART

SYMPTOM	CHECK FOR	CAUSE
Fail to crank	Blown fuse	Shorted leads when hooking up or overloaded circuits replace with SFE9.
	Low battery	May have defective battery or charger may not be functioning. Could have corroded or loose battery connection.
	Voltage at start solenoid	If voltage is present at starter, could have defective starter or solenoid. If no voltage at starter, could have open leads or you may have a signal already present at Terminal No. 10 to disconnect starter.
	Voltage on Terminal No. 10	There should be no voltage on Terminal No. 10 during cranking. If present, check signal source.
Unit cranks, does not start	Fuel supply	May have empty tank — bleed fuel supply line. Gas units may have wrong pressure, 4-6 oz. on naturally aspirated units. Turbo charged units require higher pressure.
	Voltage on Terminal No. 3	If present, may have defective fuel valve or ignition system or loose connection. If no voltage present, may have dirty Contact 4+7 Relay 1 in engine control.
Unit will start then fail	Loss of fuel	Tank may be empty — fuel line may be broken or loose.
	Failure light	Overcrank = May not have received crank disconnect signal on Terminal No. 10. Low oil = Low oil level in crankcase — oil pump failed — defective switch. High water = Low water level in radiator — thermostat closed — broken fan belt — restricted air flow through radiator — ambient temperature too high — defective switch. Over-speed (KLAS 130 only) = Lost governor control — defective switch.
	Loose or open connections	May have lost power to control or ignition system.
Unit starts, but starter does not disengage	Voltage on Terminal No. 10	Voltage must be present after unit starts to operate crank disconnect relay in control. No voltage after engine starts indicates defective signal source, speed switch, pressure switch, battery charging alternator, etc. Voltage present on Terminal No. 10 would indicate defective Relay 2 or Diode D1 or Capacitor C1.
	Malfunctioning starter	Starter could be hanging up or pilot solenoid not disengaging.

KATOLIGHT CORPORATION

3201 Third Avenue
P.O. Box 3229
Mankato, Minnesota 56001
Phone: (507) 625-7973
Telex: 29-0787
Printed in U.S.A.

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For more information contact your nearest Representative, Distributor, or Dealer below.