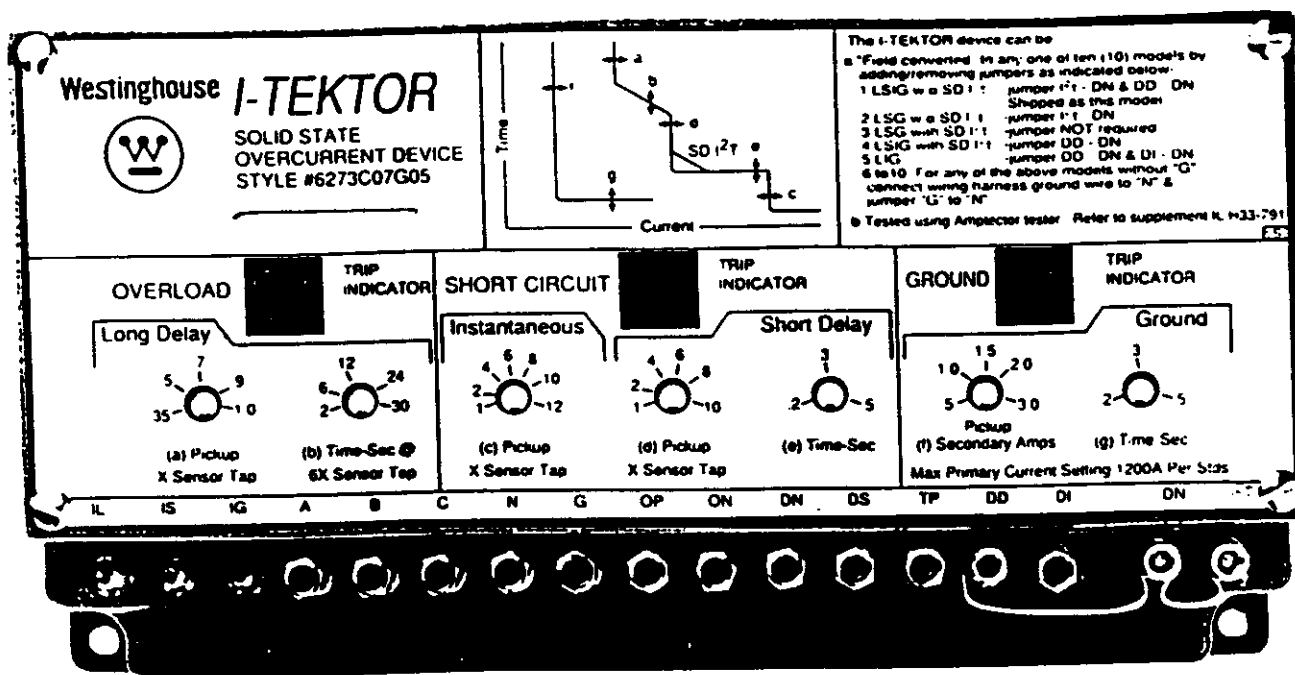


# THE WESTINGHOUSE **I-TEKTOR**

## MODEL "LSIG" FIELD CONVERTIBLE SOLID STATE OVERCURRENT DEVICE



FOR RETROFIT OF LOW VOLTAGE AIR CIRCUIT BREAKERS

## GENERAL

Distribution of electrical power is dependent upon well maintained and reliable equipment to detect and safely interrupt abnormal currents by means of circuit breakers, or other forms of interrupters, with the least disturbance to the power system. Series electro-mechanical overcurrent trip devices, installed on many existing low voltage power class circuit breakers, are prone to erratic tripping due to corrosion, contamination and wear. Frequent maintenance and adjustments are necessary to assure reasonably accurate and safe operation. Westinghouse has been the leader in providing a retrofit service to replace these series trip devices with modern state of the art solid state tripping systems featuring the proven Ampctor, and similar solid state overcurrent devices. In the past, due to space limitations, it often was difficult to economically retrofit some breakers. By utilizing the compact, horizontally or vertically mounted, front adjustable, solid state Westinghouse *I-TEKTOR*, it is possible to retrofit, economically and quickly, just about every conceivable low voltage power class circuit breaker, regardless of physical size. The *I-TEKTOR*, has been designed with the end user's needs in mind "...minimum down time" and flexibility. It provides the facility for field selection of desired time-current characteristics which are similar to, and test facilities that are compatible with the Ampctor.

While physically small, measuring just 8.13"L x 4.25"H x 2.06"D, the all inclusive, one type "does it all", model "LSIG" *I-TEKTOR* satisfies all system co-ordination requirements. With all protective adjustments covered in one unit, ordering and stocking is simplified. It requires no external auxiliary source. Instead, it obtains its input energy from a set of current sensors to continuously monitor system current levels. When pre-selected conditions of system current magnitude and duration are exceeded, it develops an output pulse to unlatch the breaker Direct Trip Actuator.

## IMPORTANT APPLICATION CONSIDERATION

The interrupting capability of a low voltage air circuit breaker, equipped with "LS" (long and short delay overcurrent trip devices, may be lower than for an equivalent breaker equipped with "LI" (long delay and instantaneous) overcurrent trip devices. This is regardless of manufacture or type of device. Therefore it is important to ensure that the breaker interrupting capability is not exceeded when changing from "LI" to "LS" trip device characteristics. For further information refer to ANSI Std. C37.16. A system coordination may be desirable to safeguard against this possibility.

## WIDE RANGE

The wide adjustment range of the *I-TEKTOR* results in the need for fewer sensor taps, and eliminates the need for a "range" selector switch. Removal of the transparent cover, allows access to the screwdrive type, continuously adjustable function level control through the silkscreened metal front plate.

## CHARACTERISTIC FIELD SELECTABILITY

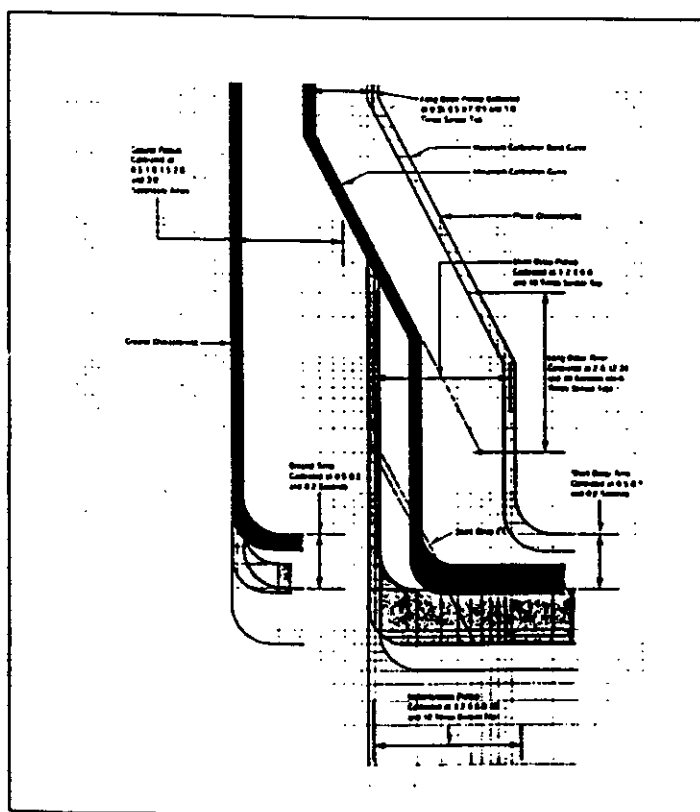
While the *I-TEKTOR* is always shipped as "LSIG" any one of the ten (10) models listed below may be field selected simply by adding or removing jumpers located on the front. Short delay I<sup>2</sup>T function is included as standard.

1. LSIG-LONG & SHORT DELAY.	GROUND. &	INSTANTANEOUS	W/O SHORT DELAY I <sup>2</sup> T	JUMPER I <sup>2</sup> T - DN & DD - DN
2. LSG-LONG & SHORT DELAY. &	GROUND		W/O SHORT DELAY I <sup>2</sup> T	JUMPER I <sup>2</sup> T - DN
3. LSG-LONG & SHORT DELAY. &	GROUND		WITH SHORT DELAY I <sup>2</sup> T	JUMPERS NOT REQUIRED
4. LSIG-LONG & SHORT DELAY.	GROUND. &	INSTANTANEOUS	WITH SHORT DELAY I <sup>2</sup> T	JUMPER DD-DN
5. LIG-LONG DELAY	GROUND. &	INSTANTANEOUS	I <sup>2</sup> T NOT USED	JUMPER DD-DN & DI - DN
6. TO 10. - ANY COMBINATION OF THE ABOVE WITHOUT GROUND(G). CONNECT WIRING HARNESS GROUND WIRE TO "N" & JUMPER "G" TO "N"				

## CONTROL ADJUSTMENTS

FUNCTION		RANGE/CALIBRATION MARKS AT
L	LONG DELAY CURRENT PICKUP	.35, .5, .7, .9 & 1.0 × SENSOR TAP
	LONG DELAY TIME	2.6, 12, 24 & 30 - SECONDS
S	SHORT DELAY CURRENT PICKUP	1, 2, 4, 6, 8, & 10 × SENSOR TAP
	SHORT DELAY TIME	0.2, 0.3 & 0.5 - SECONDS
I	INSTANTANEOUS CURRENT PICKUP	1, 2, 4, 6, 8, 10 & 12 × SENSOR TAP
G	GROUND CURRENT PICKUP	0.5, 1.0, 1.5, 2.0 & 3.0 - AMPS
	GROUND DELAY TIME	0.2, 0.3 & 0.5 - SECONDS

Refer to Curve #6273C07-C below for time-current characteristics of the *I-TEKTOR*



CURVE #6273C07-C

## INDICATORS

Overload, fault and ground indication are provided by means of internally activated, magnetically held, trip indicators, which reset automatically in approximately 2 seconds, after the breaker is closed and normal current is established. The indicators cannot be reset by external means. Easily accessible terminals on the front of the *I-TEKTOR* are provided to facilitate remote indication, if required.

## ADJUSTABLE DISCRIMINATOR

A built-in adjustable Discriminator is introduced automatically when any characteristic without instantaneous (I) is selected. Under these conditions, the *I-TEKTOR* acts as an instantaneous device until the breaker is closed and normal current is established, to ensure the breaker is not subjected to undue stresses, if closed onto a bolted fault. Note: The discriminator value is determined by the setting of the instantaneous current pickup level control. Suggested minimum setting is 10 times. Once normal system operation is established, the short delay (S) overrides the Discriminator, thus, allowing the *I-TEKTOR* to perform as a truly selective device, to enhance coordination with other devices.

## ENVIRONMENTAL PROTECTION CONSISTENT PERFORMANCE

To minimize the effects of airborne contaminants, ensure proper and reliable operation of the device over a long period of time and provide effective environmental protection, all solid state components are machine soldered to the printed circuit card and then the whole card assembly is conformal coated. The adjustable control and trimming resistors are computer selected to ensure consistent performance.

## DESIGN TESTS

The *I-TEKTOR* which conforms generally with the requirements of ANSI Std. C37.17-xxxx, has been subjected to and satisfactorily passed the following "design type" tests:

- -20°C to +85°C Operating range
- Electromagnetic susceptibility (EMI), per UL Standard
- Three phase, high power operation - when mounted as part of a retrofit kit on a typical low voltage air circuit breaker

## FIELD TESTING

Select any one of the ten (10) combinations listed under "Characteristic Field Selectability" to suit system co-ordination requirements, and test in accordance with IL#H33-791. An integrally mounted plug-in adapter which is compatible with the Westinghouse Ampactor, means the *I-TEKTOR* can be easily field tested using the portable, time proven, Ampactor "Secondary Injection Test Unit".

## CONNECTION DIAGRAMS

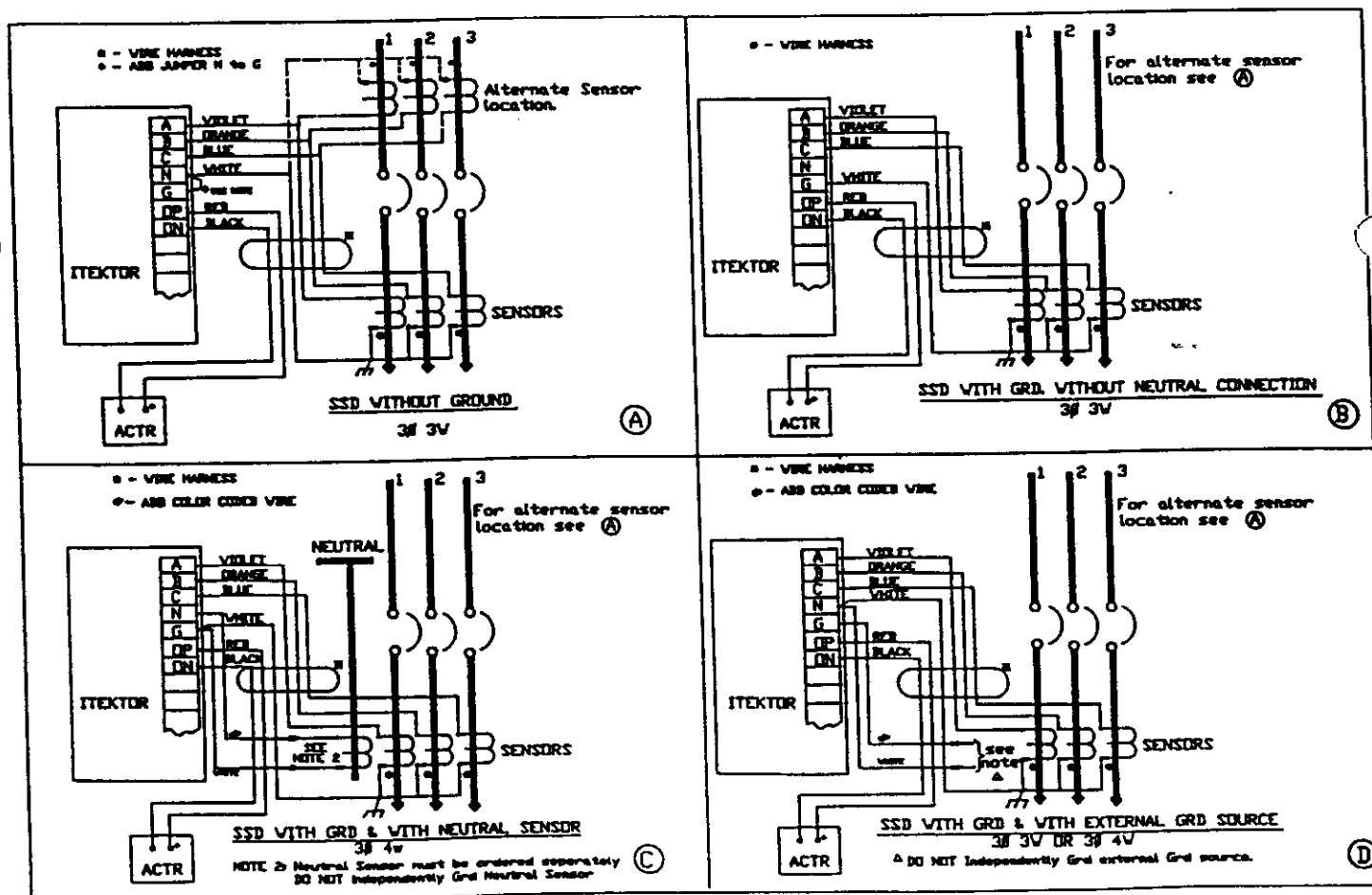
- Refer to diagrams A, B, C and D

Diagram A Where Ground (G) protection is not required, connect the common return wire to the *I-TEKTOR* terminal N, and jumper terminals N & G

Diagram B Where 3-W residual ground protection is required connect the common return wire to the *I-TEKTOR* terminal G. DO NOT JUMPER TERMINALS N & G.

Diagrams C & D Where ground protection via neutral sensor or external ground source is required connect the common return wire to the *I-TEKTOR* terminal G and add two wires to connect to the neutral sensor, or external ground source. DO NOT JUMPER TERMINALS N & G.

## RETROFIT CONNECTION DIAGRAMS



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