TRABTECH

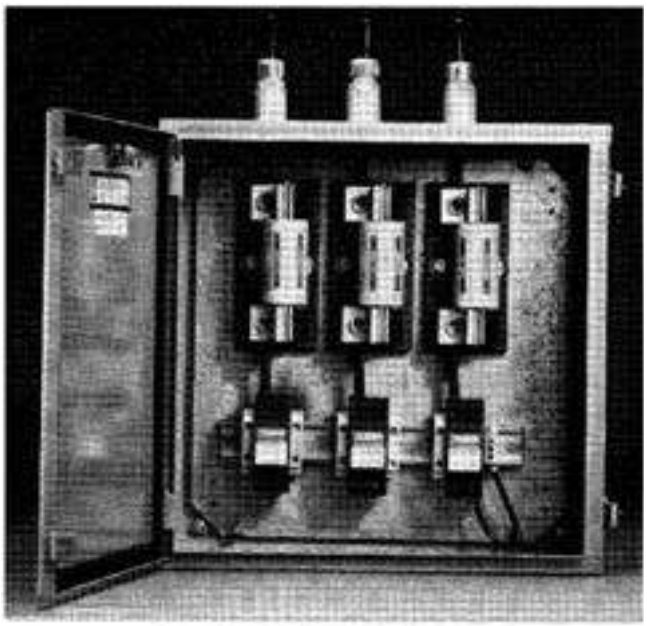
TRansient ABsorbtion TECHnology

FLASHTRAB

FLT60-400 Protection Panels
Secondary Main Lightning Ar restor

Features

- Protection of secondary power mains from damaging lightning currents on conductor cables.
- 60 kA of lightning discharge current by 10 x 350 µs test waveform.
- Utilizes the patented ARC Chopping Principle.
- Panel box mounting for easy installation.
- Suitable for 1-2-3 phase WYE or DELTA power circuits up to 400 volts common mode.
- Panels UL listed file number, 6D52; FLASHTRAB modules UR file number E167572, CSA 6052.



Patented ARC Chopping Technology Quenches Lightning Strikes up to 60 kA.

General Description

The FLASHTRAB lighting arrestor system is designed to protect commercial and industrial facilities from the damaging effects of lightning. Power cables carry the damaging current into facilities. FLASHTRAB shunts these damaging currents safely to earth ground. FLASHTRAB utilizes a new ARC Chopping Principle spark gap technology to effectively handle the high voltage and damaging current associate with lightning energies that are coupled onto power cables.

The heart of the FLASHTRAB features two spark electrodes positioned opposite each other. See Figures 1 and 2. They are held in place by an insulation barrier and separated by a baffle. This arrangement and spacing of electrodes is termed "ARC Chopping" and provides reliable ignition of the discharge arc, which is then chopped by the baffle into several smaller arcs. Another benefit provided by the ARC Chopping technology is the reduction of the line follow current.

Mounting and connection of the FLASHTRAB is simplified by convenient panel mounting. The enclosure is rated for NEMA 4 installation. Wiring connections are accomplished through 3/4" NPT conduit fittings. An earth ground conductor connection is made through the panel bottom conduit fitting.

Fusing is installed in series to every FLASHTRAB module. The fusing is specially designed only to trip in the event of a short circuit in the FLASHTRAB module. The time delay fusing prevents false trips and allows the FLASHTRAB system to shunt the damaging surges to a low impedance earth ground.

FLASHTRAB meets UL and IEC testing and approvals. FLASHTRAB can be installed in –40˚C to +85˚C applications with <95% humidity. FLASHTRAB withstands the stringent 4/10 duty cycle testing and can extinguish up to a 4 kA follow current that is required by UL testing.

FLASHTRAB FLT60-400
Protection Panel System
Function Cutaway Diagram of the FLT60-400 Module

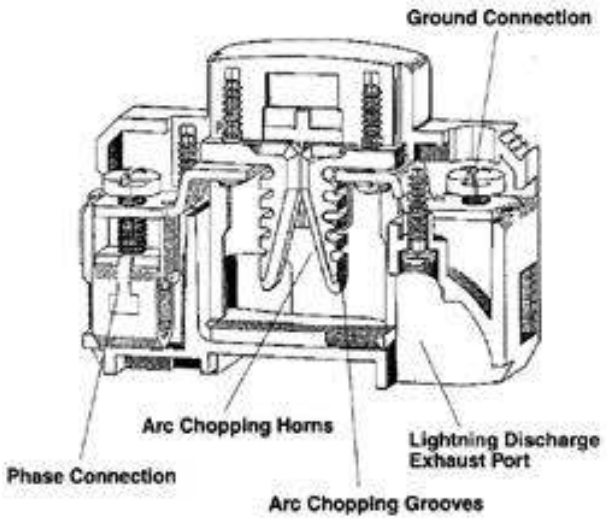


Figure 1

The FLASHTRAB lightning protection system is able to handle the new test waveform standard 10 x 350 microseconds, a true performance test waveform. Since lightning energies are long in duration, the 350 microsecond is representative of typical lighting stroke energies. FLASHTRAB is able to discharge 60 kA of this waveform and survive. This waveform greatly exceeds the energy level that is currently represented in the standard ANSI/IEEE, 8 x 20 microsecond waveform as defined in C62.41. Since the FLASHTRAB system contains no decaying components, repeated lightning events can be shunted safely to a low impedance ground connected of 10 Ohms or less. The FLASHTRAB panel system has been tested by UL and is the only secondary listed arrestor available utilizing the ARC Chopping Principle. The 4 x 10 microsecond duty cycle test was performed on the FLASHTRAB to 10 kA. This test would destroy or quickly decay surge arrestors containing common metal oxide varistors or MOVs.

ARC Chopping Operating Principle

The FLASHTRAB enclosure system is the first line of protection of a facility. We still recommend downline TRABTECH protection modules to handle the residual current/voltage of approximately 4 kA @ 4 kV. This is where MOV based suppression technology is valuable. The ARC Chopping Principle guides the lightning transient down the center of the horns to the crash plate. From the crash plate the lightning arc wraps around the outside of the horns and breaks down into smaller arcs. These smaller arcs self extinguish. In the event of the module failing, the special delay fuse will open and remove the short module from the parallel installation circuit.

The FLASHTRAB enclosure system provides easy installation for all common 1-2-3 phase secondary electrical distribution panels. The FLASHTRAB protection system is installed after the primary circuit fusing.

1. Ignition at response voltage
2. Electrical arc bridges the spark gap horns
3. Arc is forced down and outwards
4. Arc is chopped against the bottom crash plate
5. Formation of a partial arc
6. Breakdown and extinguishing of all arcs

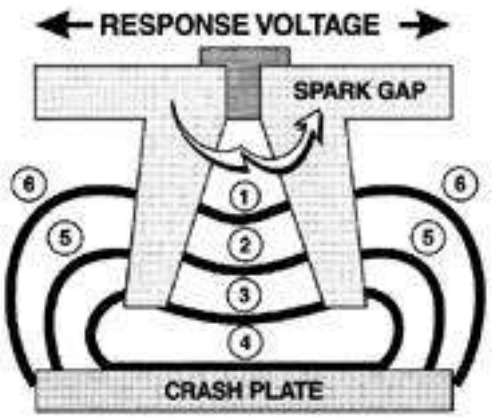
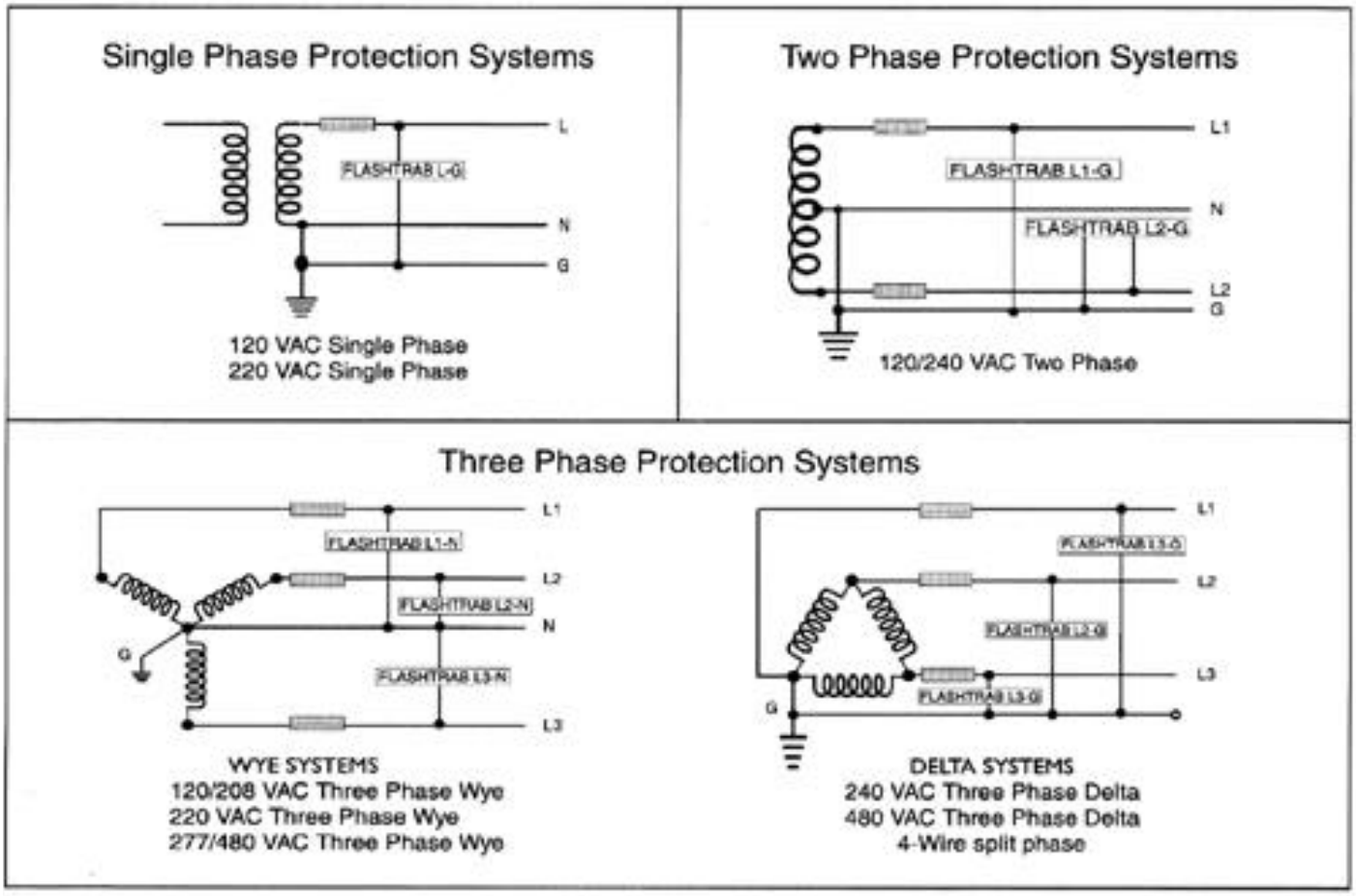


Figure 2

FLASHTRAB FLT60-400
Protection Panel System
Standard FLASHTRAB Installation Configurations



FLASHTRAB Panel Layout and Enclosure Dimensions

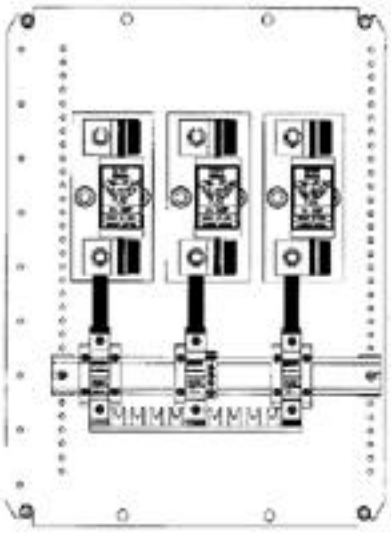


Figure 3 - A Typical 3-Phase FLASHTRAB Panel Layout

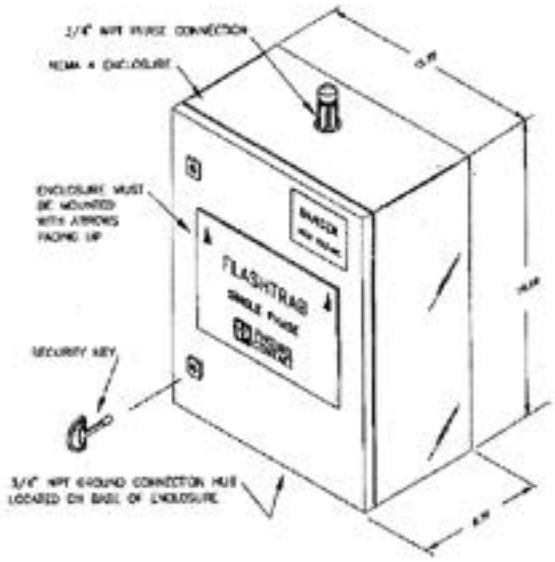


Figure 4

Product Specifications

Module Technical Data
Circuit Types: 1ø, 2ø or 3ø

Maximum Operating Voltage…….	400 VAC, ø-GND
Minimum Line Fuse Rating…….	250 A
Maximum Series Fuse to FLASTRAB Module…….	200 A
Rated Discharge Surge Current (10/350 µs curve)……..	60 kA
Maximum Discharge Surge Current (8/80 µs curve)……	100 kA
Maximum Discharge Surge Current (4/10 µs curve)……	10 kA
Output Voltage Limitation using a 1kV/µs waveform)…..<3.5 kV	
System Clamping Speed……..	<100 ns
Module Operating Temperature…….	-40˚C to +85˚C
NEMA Rating……..	NEMA 1
Housing Material……..	Polyamide 6.6

Minimum Wire Gauge (Metric/AWG)	Torque	
Stranded……..	16 mm2/#6 AWG	25 lbs.-ins
Solid……..	10 mm2/#8 AWG	11 lbs.-ins
Maximum Wire Gauge (Metric/AWG)	**Torque**	
Stranded……..	35 mm2/#2 AWG	50 lbs.-ins
Solid……..	50 mm2/1/0 AWG	50 lbs.-ins

Enclosure Data

Material……..	Steel
Installation Temperature Limits…….	(-40˚C to +85˚C) –40˚F to +176˚F
Enclosure Rating…….	IP65
Nearest NEMA Equivalent……..	NEMA 4, 6, 12, 13

Dimensions:

Height……..	500 mm / 19.68"
Length……..	400 mm / 15.75"
Depth…….	210 mm / 8.26"

3/4" NPT Conduit Hub Connection

Replacement Fuse…….	Bussman/Cooper Industries, 200 Amp, LPJ200SP

How to Order

Configuration	Description	Order Number
Three Phase Systems	FLT60-3 Phase Enclosure System	5523391
Two Phase Systems	FLT60-2 Phase Enclosure System	5525771
Single Phase Systems	FLT60-1 Phase Enclosure System	5525768
	FLT60-400 Module	2740603

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