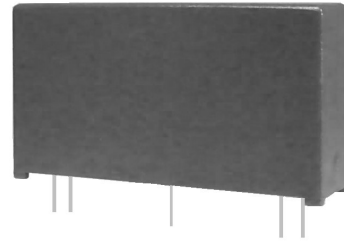


AT404 EZYTRIGGER

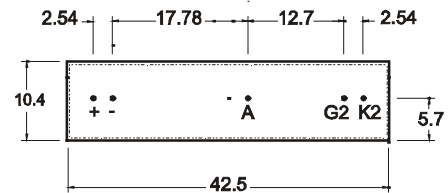
The AT404 EasyTrigger in combination with a fibre optic cable replaces pulse transformers including all associated circuitry in phase controlled thyristor equipment. It is intended for applications where high insulation voltages or long transmitting distances are important. Because of the small control current, the unit serves as an ideal link between the control intelligence and the thyristor. Each unit triggers a single thyristor and is intended for 115 - 690Vrms supplies.

The operation of the AT404 is based on a controlled current source connected between anode and gate of the thyristor to be triggered. The large gate current is initiated by the output current from a fibre optic receiver diode. With a suitable transmitter, small and large thyristors can be triggered directly from standard logic circuits without the need of a gate drive power supply. The receiver diode is not part of the unit.

Among the many possible applications, it is specifically useful in electrostatic precipitators.



AT404 Actual Size



Height 23 mm Colour Black
PCB Hole Size 0.8 mm

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	AT404-22	AT404-24	Unit
Peak voltage - positive and negative	Vp	2200	2400	V
Nominal mains voltage	Vm	690	690	Vrms
Continuous DC voltage	V=	690	690	Vdc
Turn-on delay for gate current = 1A	tdg	5	5	µs
Transient immunity	(dv/dt)d	2000	2000	V/µs
Ambient temperature	Ta	-25 to +85		°C
External gate cathode short circuit during operation can be destructive				

TECHNICAL DATA at 25°C

Parameter	Symbol	AT404-22	AT404-24	Unit	
200mA Gate current threshold	Vgtl	16	16	V	
1.2A gate current threshold	Vgtm	36	36	V	
Gate current rise time at anode voltage of	(di/dt)g	100V	1.2	1.2	A/µs
		200V	2	2	
		400V	2.5	2.5	
		800V	3	3	
		1200V	4	4	
Peak gate current (typical)	Ip	1.3	1.3	A	
Anode - cathode current at Vp	In	5.1	5.8	mA	
Maximum off state gate current	Io	2	2	µA	
Minimum output current of receiver diode	Icm	15	15	µA	
Minimum voltage rating of receiver diode	Vcm	30	30	V	
Turn-on delay with receiver current = 30µA	tdi	35	35	µs	

APPLICATION INFORMATION

The sensitivity of the fibre optic system is important if it is desirable to drive the AT404 directly from the control logic. For a receiver diode output above 30µA the turn-on delay is approximately inversely proportional to the current and therefore pulse shaping can reduce the turn-on delay down to a

AT404 EZYTRIGGER

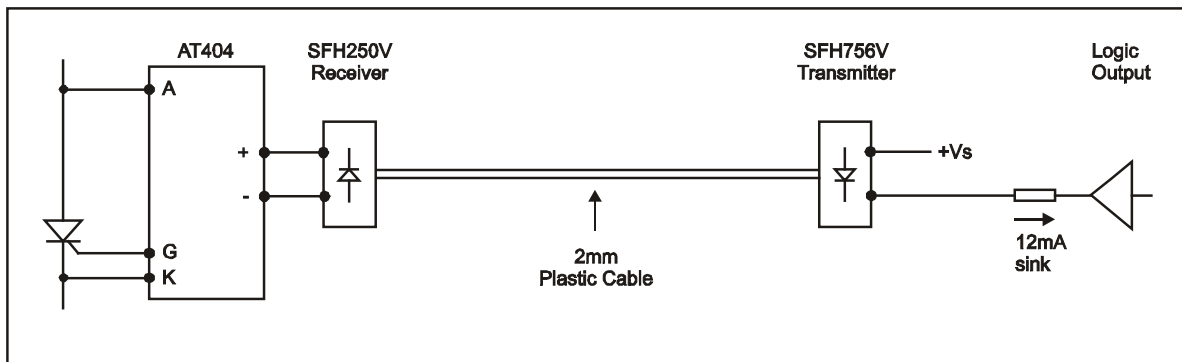
minimum of about $5\mu\text{S}$. The printed circuit board tracks from the fibre optic receiver to the AT404 EasyTrigger need to be as short as possible. Furthermore the (+) track should preferably surround the (-) track to minimize capacitive interference from fast rising voltages in the vicinity.

Since the gate current is derived from the anode of the thyristor no gate drive power supply is required. It is advisable to maintain the control signal during the entire conduction period of the thyristor. Once the thyristor is triggered, the gate current ceases to flow because the anode voltage drops below the threshold voltage, which arises because the anode voltage is used as a source for the gate current. The effect of this threshold voltage is very small because it only limits the minimum regulated output voltage of the controller. For example with a 115V single phase controller, this minimum voltage is less than 0.3% and on a 400V system it can be safely ignored.

The thyristor is triggered from a current source with a maximum voltage of 22V. This allows for twisted gate leads of up to 1m without seriously affecting the rate of rise of gate current (di/dt)g.

Note that the envelope of the voltage across the thyristor can have any desired shape provided the rms value is below V_m and the peak value does not exceed V_p .

The connection diagram below shows the typical application of the AT404 EasyTrigger in mains operated systems using thyristors with current ratings of a few Amps up to several thousand Amps.



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