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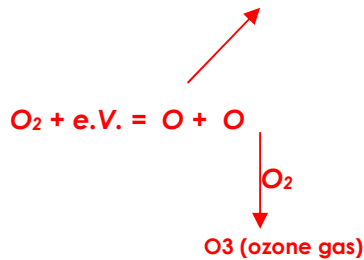
# VARIABLE FREQUENCY CORONA DISCHARGE SIMULATOR

Programmable/Non-programmable

MTFM-Series



Nascent oxygen reacting with polymer



$$V_b = 21 \cdot K_1 \cdot m \cdot K_2 \cdot D_1 \cdot \log(D_2/D_1)$$

$V_b$ =Corona break down voltage,  $k_1$ =constant  $K_2=3.92.p/(273+T)$ ,  
 $D_2$ = roller our diameter,  $D_1$ = roller inner diameter,  $p$ = atm.pressure (cm).

## DIMENSIONAL SPECIFICATION OF DIGITAL CORONA DISCHARGE FILM TREATER SYSTEM:

MCDT-0010	0001	kilo watt	12x24x15 inch	MCDT-0300	0030	kilo watt	30x30x36 inch
MCDT-0020	0002	kilo watt	15x24x20 inch	MCDT-0500	0050	kilo watt	36x40x42 inch
MCDT-0050	0003	kilo watt	18x24x24 inch	MCDT-1000	0100	kilo watt	35x45x42 inch
MCDT-0100	0010	kilo watt	24x24x30 inch	MCDT-1500	0150	kilo watt	35x45x42 inch
MCDT-0200	0020	kilo watt	35x45x42 inch	MCDT-2000	0200	kilo watt	35x45x42 inch

## MOTORON SEMICONDUCTORS CORPORATION

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# VARIABLE FREQUENCY CORONA DISCHARGE SIMULATOR

Programmable/Non-programmable

MTFM-Series

## Introduction:

MCDT series of high variable frequency corona discharge simulators are available in more than 10 different models, virtually offering meeting solutions (15.0 to 1000 kilo watts), more than 50 different models working in constant voltage/current mode virtually offering solutions to electrochemical, petrochemical industry, organic/inorganic chemical, heavy electrical/mechanical industries, machine tools, insulators testing, transmission/distribution/generators/motors/generator/solids state physics application and many uncountable defense/nuclear applications. Updated design topology ensures better controllability and efficiency with additional integrated power/voltage and frequency control/protection.

## Operating Principle:

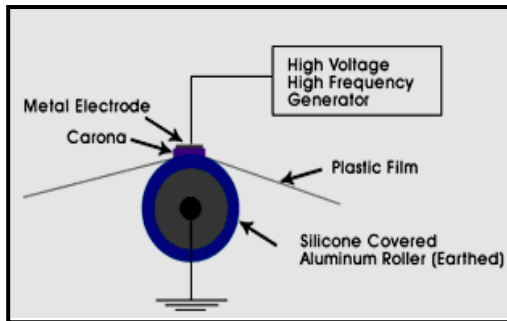
These high frequency corona treaters are line commutated S.C.R. or force commutated high frequency I.G.B.T. controlled converters working in constant surface energy/power feedback/ cascade mode ensuring uniform corona treatment over wide line speed under varied voltage variation and climatic conditions. Set energy/power immediately settles to set point with consistent regulation over wide load range with fail proof protection against over/under voltage. These high frequency treaters generate ozone gas/nascent oxygen, which activate the top, ionize surface structure of polymer by interlocking itself into molecular structure of carbon and hydrogen of top layer film surface, making its surface active/wettable.

Corona break down voltage/power of corona treaters is as under...

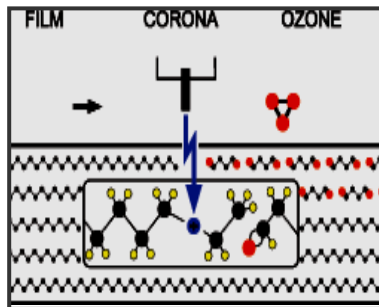
$$V_b = 21.m. K_2.D1.log (D2/D1) , \quad K_2 = 3.92.p / (273+T), \quad D2 = \text{roller our diameter}, \quad D1 = \text{roller inner diameter}, \quad p = \text{atm.pressure (cm)}, \quad K_1 = \text{constant}$$

$$P = k_1/k_2. (V-V_b)^2. (f+25). (D1/D2)^{1/2} \quad V_b = \text{Break down voltage}, \quad V = \text{applied voltage} \quad f = \text{frequency}, \quad m = \text{material factor (silicon=0.98, glass=1.0)}$$

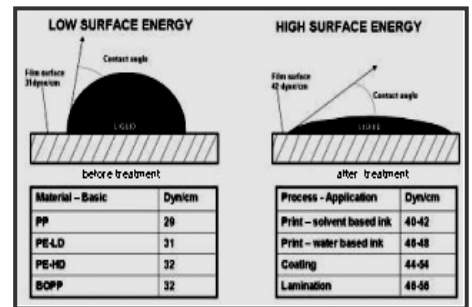
$$T_a = \text{Amb. Temperature}, \quad T = \text{Surrounding temperature}$$



Schematic view of corona treatment



Interlocking mechanism of ozone



effect of corona discharge on insulator surface

model	Watt/ no. of phase	Frequency K.Hz	Current Ampere(HT/LT)	Line speed(m/s)/ Web breadth(m)	Accuracy/ Repeatability	Power density Watt/ft <sup>2</sup> . min	Roller compatibility	Output signal	Cooling
MCDT-0010	1000/1	50.0	0.100/004	optional	99.5 100	4.5-2.5	silicon/optional	0.0-12.0	Air/oil
MCDT-0020	2000/1	50.0	0.200/008	optional	99.5 100	4.5-2.5	silicon/optional	0.0-12.0	Air/oil
MCDT-0030	3000/1	50.0	0.300/012	optional	99.5 100	4.5-2.5	silicon/optional	0.0-12.0	Air/oil
MCDT-0050	5000/1	40.0	0.400/020	optional	99.5 100	4.5-2.5	silicon/optional	0.0-12.0	Air/oil
MCDT-0075	7500/1	40.0	0.750/030	optional	99.5 100	4.5-2.5	silicon/optional	0.0-12.0	Air/oil
MCDT-0100	10,000/3	40.0	1.000/028	optional	99.5 100	4.5-2.5	silicon/optional	0.0-12.0	Air/oil
MCDT-0200	20,000/3	30.0	2.000/056	optional	99.5 100	4.5-2.5	silicon/optional	0.0-12.0	Air/oil
MCDT-0300	30,000/3	30.0	3.000/084	optional	99.5 100	4.5-2.5	silicon/optional	0.0-12.0	Air/oil
MCDT-0500	50,000/3	20.0	5.000/140	optional	99.5 100	4.5-2.5	silicon/optional	0.0-12.0	Air/oil
MCDT-1000	100,000/3	20.0	5.000/280	optional	99.5 100	4.5-2.5	silicon/optional	0.0-12.0	Air/oil

## DIGITAL CORONA DISCHARGE FILM TREATER SPECIFICATION:

Operating voltage 220 volts/1-3 phase, 50 Hz.

Excitation frequency 25-80 kHz.

Treatment level: 35-55 dyne

Film: PP/HM/METAL etc (corona power density-4.5-2.5 Watt/ft<sup>2</sup>.min)

Interface Signal 0.0-12.0 volts D.C. (proportional to treatment level)

Treatment control range: 30-50 dyne

Step down ratio 1:50(1:100-optional)

Accuracy 98% of set point

Repeatability 100 percent

Response time 0.5-1.1 milli-seconds

Roller tube material silicon/glass/ceramic coated aluminum

Electrode material SS-316/Has-alloy/aluminium

Control option: feed back control (constant energy/contact power with multi treater synchronized control (interactively)

Display 3½ & 4½ digit red glow LED/LCD display (Voltage, current, power, frequency)

Controller size as above (page no.01) ,other option: Other option: RS-232

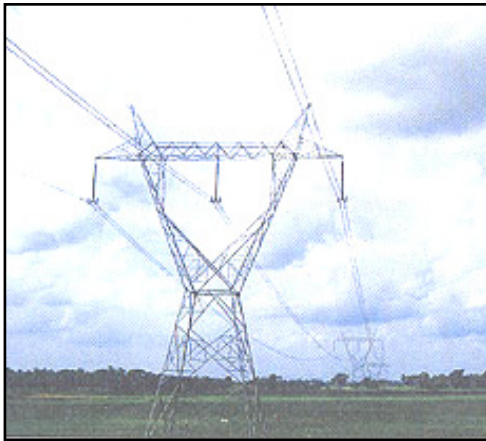


MCDT-00002

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# VARIABLE FREQUENCY CORONA DISCHARGE SIMULATOR

(SOME OF THE APPLICATION OF CORONA DISCHARGE SIMULATOR)



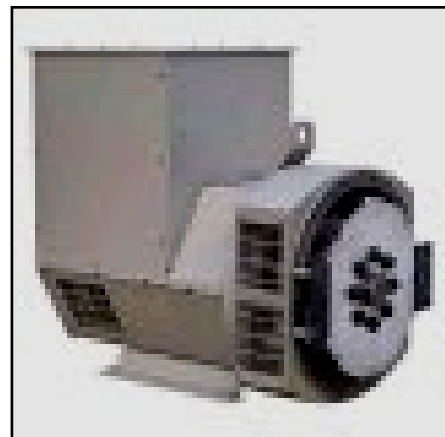
TRANSMISSION/DISTRIBUTION LINE



TRANSFORMER (DISTRIBUTION/TRANSMISSION)



TROLLEY GENERATOR



H.T.GENERATOR



SWITCHGEAR



HIGH VOLTAGE TRANSFORMER

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