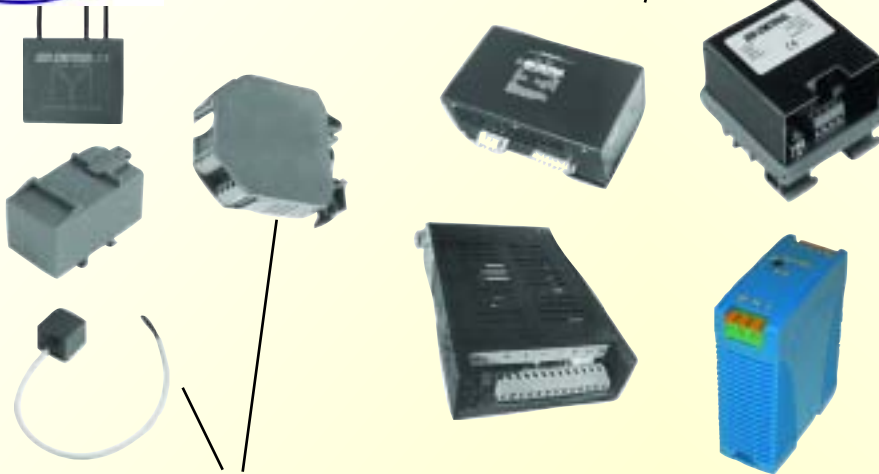


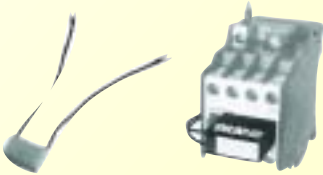


Power Supplies

AC to DC



Motor Transient Voltage Suppressors
Electric Noise Suppression



Coil Transient Suppressors
Electric Noise Suppression

Line Filters



POWER SUPPLIES

AC to 24VDC

Regulated Primary Switching

Single Phase 100 / 240 VAC 24VDC
5 VDC
12VDC
1 Amp to 20 Amp

Three Phase 480 VAC 24VDC
10 Amp to 50 Amp

- DIN RAIL MOUNT
- COMPACT DESIGN

TRANSIENT VOLTAGE SUPPRESSORS

INDUSTRIAL DESIGN

MINI

UNIVERSAL MOUNT

MOTOR SURGE SUPPRESSORS

(Voltage Suppressors)

SINGLE PHASE, THREE PHASE

LINE POWER FILTERS

(120 / 230 / 480 Volt)

SINGLE PHASE, THREE PHASE

ONE AMP TO 200 AMP

SINGLE & DOUBLE STAGE



ELECTRICAL & ELECTRONIC CONTROLS, INC.
3881 DANBURY ROAD
BREWSTER, NY 10509
845-278-5777 • FAX 845-278-5444
www.eecontrols.com
E-MAIL: info@eecontrols.com

EECONTROLS, LTD
17 STEWART COURT
ORANGEVILLE, ONTARIO
CANADA L9W 3Z9
519-941-6845, FAX 519-940-0514



VOLTAGE TRANSIENTS NOISE



Note: It is **BEST** to Extinguish the transient at its source to avoid instantaneous transfer to the rest of the system, i.e. thru the line, or thru inductive line to line.

Extinguish Electrical Noise at the Source



Single Phase Power Supply Type GSA-SWD



Compact Size
UL Listed

Standard Sizes: 24 Volt DC Output
 1.25 Amp
 2.5 Amp
 5 Amp
 10 Amp

Normal Input Voltages:
110 / 240VAC

Output Voltages:
24V DC \pm 10% Adjustable

Three Phase Power Supply Type GSA-TOP



Compact Size
Conform to CE
EN 55011 c1. B (EN 61000-3-2 on request)
Standard Sizes: 24Volt DC Output

10 Amp
20 Amp
30 Amp
40 Amp
50 Amp

Normal Input Voltage:
360 Volt thru 500 Volt

Output Voltages:
24V DC \pm 10% Adjustable

Designed for Parallel Connection
Negative Connection can be grounded

Other Power Supplies Available AC to DC



Type TLM
1Ø 230V, 460V



Type TRC
3Ø 400V



Type TRTL
3Ø 400V



Type TLT
3Ø 380/400/415



Type LCC
24VAC



Type LCF
1Ø 24VAC



Type LCL
1Ø 400/230/115



Type SW
AC or DC
Input



Type SWL
1Ø 115/230/400

SERIES GSA POWER SUPPLIES

DESCRIPTION - DETAS POWER SUPPLIES

Type GSA Power Supplies are components used to convert incoming voltage AC power to 24 volt DC output, either single phase or 3 phase regulated depending on the unit selected. The 24 volt DC standard size outputs are available 2.5 Amp to 120 Amp.

Other DC output voltages down to 5 VDC are also available.

Single Phase GSA Type SWLC

Seven different styles are packaged for space saving, easy mounting, and fast wiring. DIN RAIL mount power supplies have wide input voltage range of 100 thru 240Volt AC, (50/60Hz) with optional outputs of 5Volt DC to 24Volt DC. Output power range from 36 watts to 150 watts.

Three Phase GSA Type TOP

GSA Type TOP are available in 5 sizes, 400 thru 500Volt 50/60Hz. Output is 24Volt DC, adjustable +10%. Output current range options from 10Amp to 50Amp.

Other Power Supply Designs

Optional Series GSA Power Supplies are available with 5 Volt DC thru 24Volt DC outputs thru 120Amp.

INTERNATIONAL DIRECTIVES CE

Two European Directives are relevant to the manufacturer of power supplies: The low voltage Directive n.73/23/EEC and the EMC Directive 89/336/EEC. Both Directives must be applied in conjunction with the amending Directive 93/68/EEC for CE marking. These Directives are now in force and all the related products placed in the European union must carry the CE marking.

TWO CATEGORIES OF POWER SUPPLIES:

COMPONENT POWER SUPPLIES

Component Power Supplies for OEM are designed and produced to be "professionally installed" into a final product. "Professionally installed" means that the installer is technically competent and able to satisfy the requirements of the Directive applicable to the final product. The Component Power Supplies are intended to be incorporated in electrical panel equipment, as they are not complete in themselves.

As components they cannot fully comply with the requirements of all applicable Directives. This is dependent on the Professional Installer.

STAND ALONE POWER SUPPLIES

Stand Alone Power Supplies are intended for free standing operation in industries, laboratories, workshops and other areas.

As such these power suppliers are field installed by the final user and his contactor.

Typical examples include bench units, free standing and wall mounted types.

LOW VOLTAGE DIRECTIVE 73/23/EEC

This Directive applies to almost all electrical and electronic equipment, designed to operate in the voltage range 50-1000VAC or 75-1500VDC. There are some exceptions such as elevators, equipment used in explosive atmospheres, and equipment used on ships, aircraft and railways.

According to the Directive the equipment must be "safe" and manufactured in accordance with the Principle Elements of the Safety Objective.

Stand Alone Power Supplies and Component Power Supplies shall be CE marked under the Low Voltage directive. Furthermore, a confirming Declaration of Conformity must be kept in a technical file for ten years following the manufacture of the last unit.

EXAMPLES of Harmonized Safety Generic Standards for the Power Supplies include:

-EN 60950 (UL1950)

(Information Technology, Business and Communication Equipment)

-EN 60204

(Safety of Machinery - Electrical Equipment of Machines)

Other more recent standards include:

-IEC 61508 (UL508) Functional safety: safety related systems

-IEC 61000-1-2 Ed. 1.0 Methodology for the achievement of functional safety of electrical and electronic equipment. (Revision to EN-61000)

CE, EU-EUROPEAN REQUIREMENT FOR POWER SUPPLIES

EN-61000-3-1 (IEC 1000-3-1)

An EMC Electric Noise Specification Restriction. Effective in 2001.

EN-61000-3-2

An important CE requirement: A Power Factor Correction Specification Requires PF correction to 99%.

SERIES GSA SWD POWER SUPPLY

(Single Phase)

24 VOLT DC OUTPUT

DIN RAIL MOUNT

1.25 Amp to 10 Amp

COMPACT SIZE

30 Watt to 240 Watt

REGULATED OUTPUT



FEATURES

Single phase input
Wide Input Range 110-240 VAC



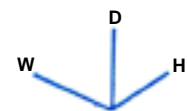
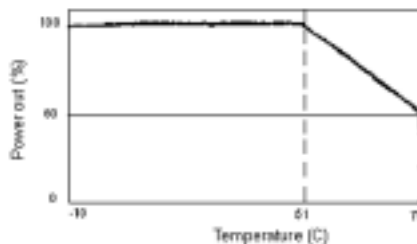
SPECIFICATIONS

Input Voltage	100 - 240 VAC
Frequency	47 - 63 Hz
Output voltage	Select: 24 VDC
Output voltage adj.	-5 +15%
Temperature rating	-10°C + 50°C
Approvals	01, 02 - UL1950, UL508 Listed, Class 2 05, 10 - UL508 Listed
Protection	Internal Fuse T2A / 250VAC
Connection	01, 02 Quick Connect Terminals 05, 10 Screw Clamp Terminal

Selection	GSA SWD 01			GSA SWD 02			GSA SWD 05			GSA SWD 10		
Catalog Number	D 0023 01			D 0023 02			D 0023 05			D 0023 10		
List Each	\$90			\$100			\$150			\$200		
Output Voltage	24VDC			24VDC			24VDC			24VDC		
Output Current	1.25A			2,5A			5A			10A		
Noise in mV	50			50			50			100		
Dimensions approx. mm Inch	H	W	D	H	W	D	H	W	D	H	W	D
	90 (3.5")	40 (1.6")	115 (4.5")	90 (3.5")	40 (1.6")	115 (4.5")	125 (4.9")	63 (2.5")	126 (5.0")	125 (4.9")	83 (3.3")	126 (5.0")



**Din Rail Mount
SWLC 02**



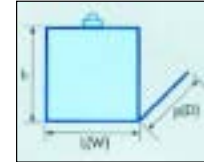
**Dimensions
Approx.**

SWITCH MODE POWER SUPPLY GSA SWLC (Primary Switched)



SPECIFICATIONS		
Input Voltage	Nominal voltage -20 +15%	
Frequency	47 - 63 Hz	
Output voltage	24VDC (adjustable 22 - 26VDC)	
Insulation voltage	3750 VAC acc. EN60950	
Protection	INPUT protection: Short Circuit (Auto recovery) and overload protection (automatic power limited)	
Efficiency	78%	
Temperature Rating	0°C + 50°C	
Connection	Screw connectors	
EMC	EN55011 Class B / EN 50082-2	
Selection	GSA SWLC 12	GSA SWL21
AC Input Voltage	115/230 VAC	115/230 VAC
Catalog Number	D 0022 32	D 0022 40
Output Voltage	24VDC	24VDC
Output rated Current	12 A	21 A
Max output current	13.7 A	
Ripple & Noise	<150mv @ 100% load	<150mv @ 100% load
Load regulation	<0.1v	
Weight	1.0 kg	2.0 kg
List Each	\$376.00	\$471.00
Dimensions approx. mm (Inch)	L(W) H D 55 127 216 (2.2") (5.0") (8.5")	L(W) H D 70 180 210 (2.8") (7.1") (8.3")

REGULATED OUTPUT (Single Phase)



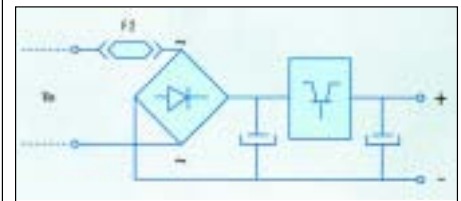
24 VOLT REGULATED POWER SUPPLY GSA LCF

24 Volt AC to 5, 12, 15, 18, 24 Volt DC



SPECIFICATIONS	
Input Voltage	Nominal voltage \pm 10%
Output Current	1,5 A
Frequency	50 - 60 Hz
Temperature Rating	0° ... + 50°C
Ripple	15 mV (@1,5 A)
Load Regulation	100 mV
Protection	Overload and overvoltage
Connections	Screw Connectors
EMC	EN55011 Classe A / EN 50082-2

ELECTRIC SCHEMATIC



24 Volt AC to DC

Selection	GSA LCF 5	GSA LCF 12	GSA LCF 15	GSA LCF 18	GSA LCF 24
AC Input Voltage	8 VAC	12 VAC	15 VAC	18 VAC	24 VAC
Catalog Number	D 0016 90	D 0016 93	D 0016 94	D 0016 95	D 0016 97
Output Voltage	5VDC	12VDC	15VDC	18VDC	24VDC
List Each	\$50.00	\$50.00	\$50.00	\$50.00	\$50.00
Ripple	15 mV				
Max output current	1,5 A				
Fuse Sce. F2	2,5 A				
Weight	Kg 0,145				
Dimensions approx. mm (Inch)	L(W) 68,5 (2.7")	H 66 (2.6")	D 80 (3.1")		

SERIES GSA SWLC POWER SUPPLY (Single Phase) 5 & 12 VOLT DC OUTPUT

**DIN RAIL MOUNT
COMPACT SIZE
REGULATED OUTPUT**

5 Amp to 20 Amp



FEATURES

Single phase input
Wide Input Range 100-230VAC



SPECIFICATIONS

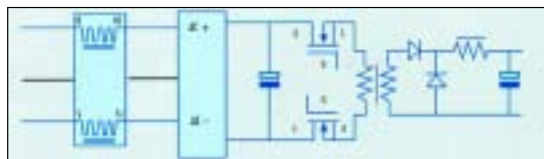
Input Voltage	115 - 230 VAC
Frequency	47 - 63 Hz
Output voltage	Select: 5VDC, 12VDC
Output voltage adj.	+/- 10%
Min. Efficiency	76% (60 W) / 82% (100 W)
Temperature rating	0° + 50°C
Protection Type	Short circuit Autorecovery, Overcurrent
Safety Specification	EN60950
EMC Specification	EN55011 EN50082
Transformer Isolation	3,750 VAC 1 MIN
Connection	Terminal Blocks

Selection	GSA SWLC 02/5			GSA SWLC 02/12			GSA SWLC 04/5			GSA SWLC 04/12			GSA SWLC 06/12		
Catalog Number	D 0022 01			D 0022 02			D 0022 04			D 0022 05			D 0021 97		
List Each	\$132.00			\$132.00			\$166.00			\$166.00			\$191.00		
Output Voltage	5VDC			12VDC			5VDC			12VDC			12VDC		
Output Current	12 A			5A			20A			8.0A			12,5A		
Noise in mV	100			100			100			100			100		
Dimensions approx. mm (Inch)	L	D	H	L	D	H	L	D	H	L	D	H	L	D	H
	35 (1.4")	150 (5.9")	99 (3.9")	35 (1.4")	198 (7.8")	99 (3.9")	50 (2.0")	190 (7.5")	106 (4.2")						

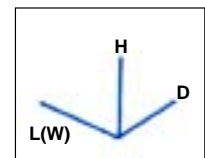


**Din Rail Mount
SWLC 04/5**

SWITCH MODE ELECTRIC SCHEMATIC



115 V - 230 VAC to 5V and 12 VDC



**Dimensions
Approx.**

SERIES GSA POWER SUPPLY

(Three Phase)

24 VOLT DC OUTPUT

DIN RAIL MOUNT

(10 & 20 Amp Only)

COMPACT SIZE

REGULATED OUTPUT



FEATURES

Three phase input 480 Volt, 3Ø

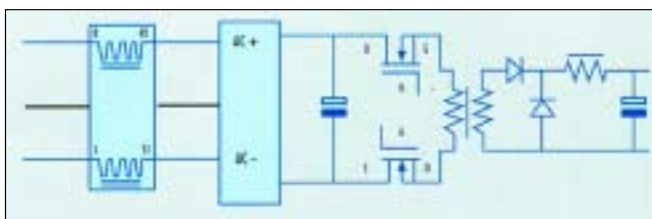


SPECIFICATIONS

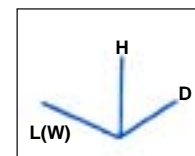
Input Voltage	360 - 500 VAC ± 15%
Frequency	47 - 63 Hz
Output voltage	Select: 24 VDC
Output voltage adj.	+/- 10%
Min. Efficiency	90%
Temperature rating	0°C + 60°C
Protection Type	Short circuit Autorecovery, Overcurrent
Safety Specification	EN60950
EMC Specification	EN55011 Class B EN50082
Transformer Isolation	3,750 VAC 1 MIN
Connection	Removable Terminal Blocks

Selection Catalog Number	GSA TOP 10 D 00 2260	GSA TOP 20 D 00 2270	GSA TOP 30 D 00 2275	GSA TOP 40 D 00 2280	GSA TOP 50 D 00 2285
Output Voltage	<u>24VDC</u>	<u>24VDC</u>	<u>24VDC</u>	<u>24VDC</u>	<u>24VDC</u>
Output Current	10 A	20 A	30 A	40 A	50 A
Noise in mV	100mV	100mV	100mV	100mV	100mV
Mounting	Din Rail	Din Rail	Panel	Panel	Panel
List Each	\$460.00	\$466.00	\$643.00	\$730.00	\$780.00
Dimensions approx. mm (Inch)	L D H 230 140 85 (9.0") (5.5") (3.3")	L D H 230 140 135 (9.0") (5.5") (5.3")	L D H 294 181 175 (11.6") (7.1") (6.9")	L D H 294 181 175 (11.6") (7.1") (6.9")	L D H 294 181 175 (11.6") (7.1") (6.9")

SWITCH MODE ELECTRIC SCHEMATIC



480 VAC 3Ø TO 24 VDC



Dimensions
Approx.

GENERAL DESCRIPTION

Transient Voltage Suppression in the Control Circuit

The opening and the closing of every electric device generates various random circuit phenomena depending on the type of loading, connected gears, cables, screens, etc. and their effect on command devices, both electro-mechanical and electrical. The mixed overvoltages, so generated, result from the disconnecting of these inductive loads. The electrical "noise" generated by these inductive loads varies dramatically. Typical diagrams include:



Every load represents a combination of factors such as, resistance, capacitive and inductive loads, type of input, temperature variations, etc., which determines the variables to consider in the choice of the most suitable transient voltage suppressor to avoid random malfunction or direct, the destruction of the connected device.

The suppression, which can operate at different circuit levels, is obtained using a module, mounted in parallel to the inductive load.

**This module must perform two functions:
The elimination of the voltage increase and the fastest discharge of the accumulated magnetic energy.**

Another important consideration is that the suppressor device itself must not generate noise, or modify, in any way, the normal function of the circuit.

The positioning of the suppressor module in the circuit is another important factor. **The best solution is to mount the module as near as possible to the origin of the noise itself. This avoids the involving of other devices in the phenomenon such as cables.**

SOLUTION

Solutions include the use of diodes as DC current "dumping" circuit, the use of combinations resistance-capacitor (RC) for alternating current, and varistors, effective in both types of circuits. In addition, DETAS has developed combination devices RC + Varistors, in order to reach the best solution in difficult cases.

The wide choice available by DETAS permits you to find the type of suppressor suitable to your requirements. Finally, the DETAS and EE CONTROLS design departments can assist further with more detailed information about specific circuit needs voltage suppressors.

Series D-9011 Electrical Noise Suppressors

Common sources of **electrical noise** are contactor coils and solenoids, both AC & DC, and AC Motors.

Type D-9011 are electrical noise suppressors available in three types, Diode, Varistor, and RC Circuit. Each is encapsulated in a Mini housing to be wired in parallel with the inductance or contactor coil. Important advantages include compact size, low cost, and versatile mounting.

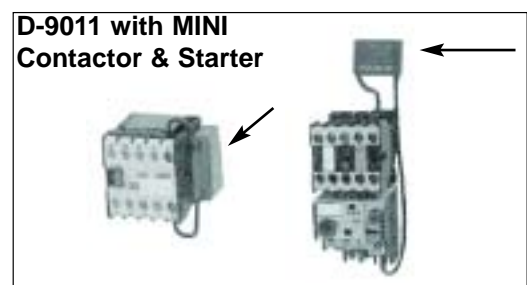
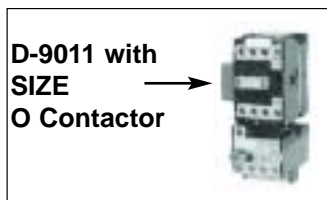
Mounting includes an industrial adhesive backing with cut-to-length 8 inch leads. Type D-9011, then, mounts with any manufacturer's contactors, reducing inventory, with both cost and space savings.

D-9011 DESIGN FEATURES

- * Versatile Mounting
- * UL Varistors Approved
- * Compact Size
- * Polycarbonated Class V2 Housing
- * Low Cost
- * Epoxy Resin per sec. UL94VO
- * 7.8" Wire Leads with Fork types terminals



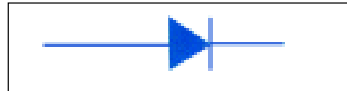
Mounting and Wiring Options



(Mini Size) Series D9011 For Coils



W x H x D
(1.26" x .87" x .43")
* 7.8"



DIODE

24 - 230 v / DC

Diode 1 Amp For LS4 to LS37 Catalog No. D 9011 00 \$6.50 List Each	Diode 3 Amp For LS47 to LS247 Catalog No. D 9011 03 \$8.00 List Each
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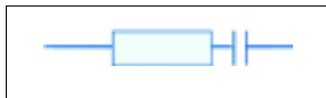


VARISTOR

24V / AC / DC Catalog No. D 9011 30 \$8.00 List Each	120V / AC Catalog No. D 9011 35 \$8.50 List Each	230V / AC Catalog No. D 9011 40 \$8.50 List Each	400v / AC Catalog No. D 9011 45 \$9.00 List Each
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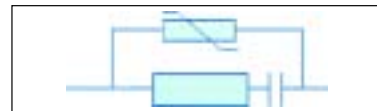


W x H x D
(1.26" x .87" x .43")
* 7.8"



RC

400 v / AC max .47 uf 220 ohm For LS07 to LS107 Catalog No. D 9011 99 \$6.50 List Each



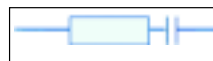
VARISTOR (VDR)+ RC

24v / AC / DC Catalog No. D 9011 90 \$8.00 List Each	120v / AC Catalog No. D 9011 91 \$8.00 List Each	230v / AC Catalog No. D 9011 92 \$8.50 List Each	400v / AC Catalog No. D 9011 93 \$9.00 List Each
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TRANSIENT SUPPRESSORS SERIES 9050 CONTACTOR MOUNT (SIEMENS & KM)



(1.06" x .43" x 1.10")
* 7.8"



RC

24-48v / AC 1.6 uf 110 ohm Catalog No. D 9050 48 \$7.50 List Each	115-230v / AC .22 uf 220 ohm Catalog No. D 9052 50 \$7.50 List Each
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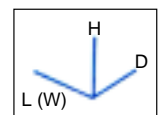
VARISTOR

24v / AC / DC Catalog No. D 9052 24 \$5.50 List Each



DIODE

24v - 230v DC Catalog No. D 9051 24 \$5.00 List Each



Dimensions
Approx.

For Allen Bradley or Square D (Tele)
Use above Mini Series

FOR 3 PHASE MOTORS

For Electrical Noise Suppression industrial procedures dictate, to maximum results, mount the suppressor near the single phase or 3 phase motor.



Electrical Noise from Motors

Three Phase MOTOR SUPPRESSOR sizes range from 5HP to 60HP with each usable on 230 Volt, 460 Volt, and 575 Volt motors.

MOUNTING OPTIONS

Series D9001 is epoxy encapsulated with three long 11 to 17 inch wire leads for convenient connections.

Series D9003 is DIN rail mount with contactor mounting on top of the Series 9003 suppressors.

Series D9002 is DIN rail mount with screw terminals.

Selected ratings include use with 5HP to 60HP, 3 phase motors.

MOUNTING / WIRING OPTIONS - Electrical Noise Suppressors



5HP Max



5 to 40HP



DIN RAIL
(Mount Under
Contactor)
5-40HP



DIN RAIL
5-10HP



DIN RAIL
10-60HP

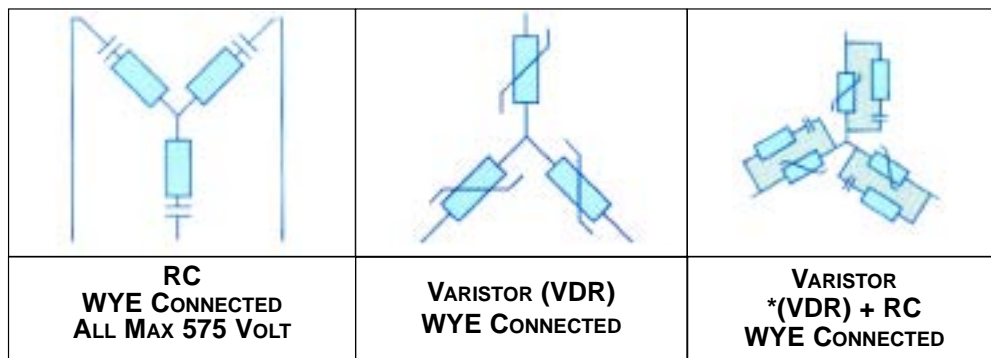
Features / Specifications

- * Compact Size
- * Low Cost
- * Wire Leads for fast Connections
- * DIN RAIL MOUNT
- * Mount Option with Industrial Adhesive
- * Polycarbonate Class V2 Housing
- * Epoxy Resin per UL94 VO
- * UL Varistors Approved
- * -20° C to +70° C Ambient
- * 50/60Hz
- * Max 1 operation per sec.
- * Capacitors-Non Inductive metalized film polypropylene type

VOLTAGE TRANSIENT SUPPRESSORS - SERIES D9000, D9001 FOR 3 PHASE MOTORS 460 VOLT AND (575V)

MOUNTING WIRING SYSTEM

Dimension Approx.
W x H x D
(inch)



5HP
W H D
(2" x 1.7" x 0.5")
*11.8"

Catalog No. D 9000 50 (MAX 575 V)	Catalog No. D 9000 40 (MAX 480 V)	
List Each \$18.50	List Each \$20.00	



5HP
W H D
(1.6" x 1.2" x 1.6")
*17.7

Catalog No. D 9001 20 (MAX 575 V)	Catalog No. D 9001 47 (MAX 480 V)	
List Each \$20.00	List Each \$21.00	



10HP
W H D
(1.6" x 1.6" x 1.6")
*17.7

Catalog No. D 9001 27 (MAX 575 V)		
List Each \$24.50		



15HP
W H D
(1.6" x 1.6" x 1.6")
*17.7

	Catalog No. D 9001 45 (MAX 480 V)	Catalog No. D 9001 35 (MAX 480 V)
	List Each \$27.50	List Each \$32.00



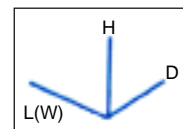
25HP
W H D
(1.6" x 1.6" x 1.6")
*17.7

	Catalog No. D 9001 60 (MAX 480 V)	Catalog No. D 9001 80 (MAX 480 V)
	List Each \$34.50	List Each \$36.00



40HP
W H D
(1.6" x 1.2" x 1.6")
*17.7

	Catalog No. D 9001 90 (MAX 480 V)	
	List Each \$37.50	

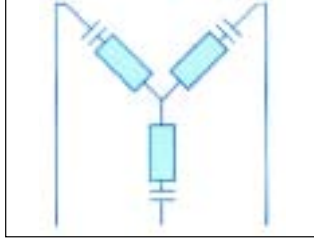


**Dimensions
Approx.**

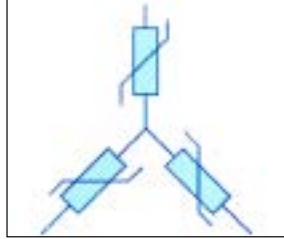
* Wire Lead Length -- Inches

DETAS
SUPPRESSORS

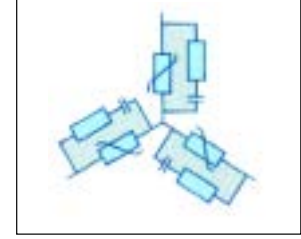
DIN RAIL MOUNT SERIES D9003



RC



VARISTOR (VDR)



**VARISTOR
*(VDR) + RC**



DIN RAIL MOUNT
MOUNT UNDER CONTACTOR
WIRE LEADS



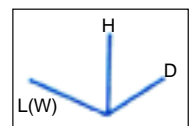
5HP W H D (1.8 x 3.3 x 2.1)	Catalog No. D 9003 04 (MAX 575 V) \$28.50 List Each
10HP W H D (2.2 x 1.8 x 3.1)	Catalog No. D 9003 07 (MAX 575 V) \$32.00 List Each
15HP W H D (2.2 x 1.8 x 3.1)	Catalog No. D 9003 19 (MAX 575 V) \$39.00 List Each
25HP W H D (2.1 x 3.3 x 2.1)	Catalog No. D 9003 20 (MAX 575 V) \$51.00 List Each
40HP W H D (2.1 x 3.3 x 2.1)	

Catalog No. D 9003 14
(MAX 480V)
\$37.00 List Each

Catalog No. D 9003 24
(MAX 480V)
\$47.00 List Each

Catalog No. D 9003 30
(MAX 480V)
\$46.00 List Each

Catalog No. D 9003 35
(MAX 480V)
\$50.00 List Each



Dimensions
Approx.

DIN RAIL MOUNT SERIES D9002



5HP
W H D
(0.9 x 3.1 x 4.1)

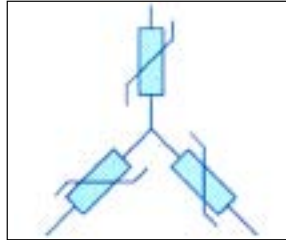
10HP
W H D
(3.5 x 1.8 x 5.1)



10HP
W H D
(2.2 x 1.8 x 3.1)

40HP
W H D
(3.5 x 1.8 x 5.1)

60HP
W H D
(3.9 x 1.8 x 3.1)



VARISTOR (VDR)

DIN RAIL MOUNT SCREW TERMINAL

Catalog No. D 9002 00
(MAX 575V)
\$34.00 List Each

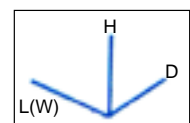
Catalog No. D 9002 10
(MAX 575V)
\$38.00 List Each

DIN RAIL MOUNT HIGH POWER SCREW TERMINAL

Catalog No. D 9002 16
(MAX 575 V)
\$33.00 List Each

Catlog No. D 9002 30
(MAX 480 V)
\$58.00 List Each

Catalog No. D 9002 45
(MAX 480 V)
\$77.50 List Each



Dimensions
Approx.

GENERAL DESCRIPTION

Drastic variations in load currents, on power lines, generate radio frequency interferences.

Normally defined as "conducted" emission noise, interference through the power line wires, flows throughout all the line. Additionally the "radiated" emission noise is transmitted by the wires through the air, as if these were antennas.

This difference is only theoretical because the voltage and currents, changing though time, correspond with the radiated noise. Every radiated noise induced on the power wires, work as receiving antennas, producing an equivalent conducted signal. LC filters, then, are key in power line distribution to avoid these interferences in the electrical network.

The typical LC filter has circuit configuration, as noted in the following catalog pages.

- L1 = Compensated Coil
- Cx = Class X Capacitor
- R = Resistor
- L2-L3 = Black Coil
- Cy = Class Y Capacitor

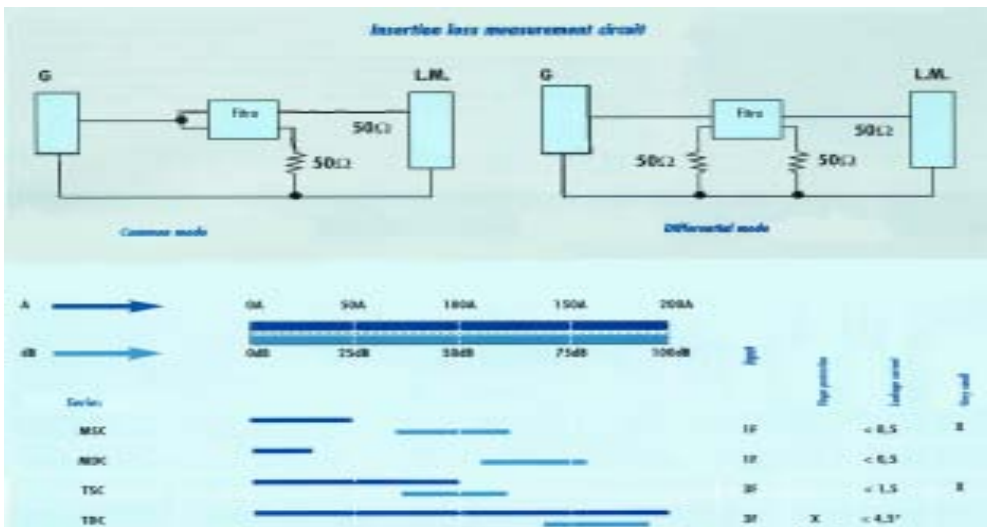
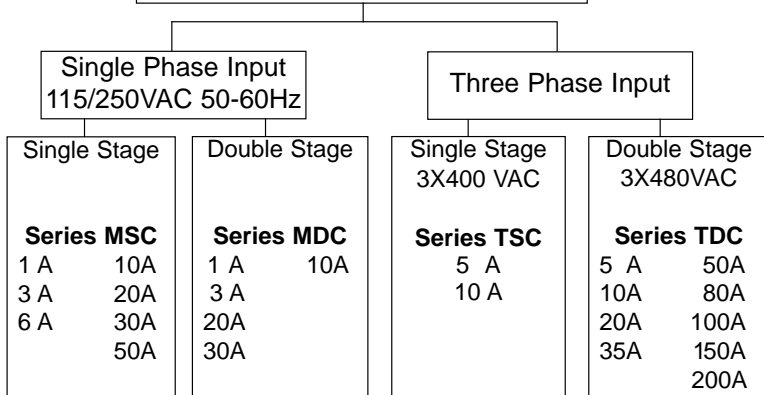
L1 and Cx are used for suppression of the different mode noise. L2, L3, Cy and L. are included for noise in the command mode.

The typical insertion loss of the single stage filter is approximately 30 to 50 dB. Values around 80 dB result from double stage filters. Extremely important is the connection to the ground, which must be very low impedance. Without a low independence ground the filter suppression is reduced.

Advantages of each DETAS power line filter is it's design with wide input voltage and wide output current range. Another advantage is the very high insertion loss and the very low leakage current to ground, as caused by the y capacitors. These allow the DETAS filters to meet the UL544-UL1286 and EN60335-1 standards.

The series TDC and NET are specially designed with three phase input and high insertion losses and as such are specially designed for frequency converters. These series can tolerate input voltages over 500 VAC and are protected against the transients on power lines. The very low leakage current, the small dimensions and, as stated, the very high insertion loss makes these models a performance "leader" in this category.

EMI / EMC POWER LINE FILTERS



**ELECTRICAL & ELECTRONIC
CONTROLS, INC.**
3881 DANBURY ROAD
BREWSTER, NY 10509
USA

EECONTROLS, LTD.
19 STEWART COURT
ORANGEVILLE, ONTARIO
CANADA L9W 3Z9

EMI LINE FILTERS SINGLE STAGE SERIES D MSC SINGLE PHASE 115 / 240 VAC

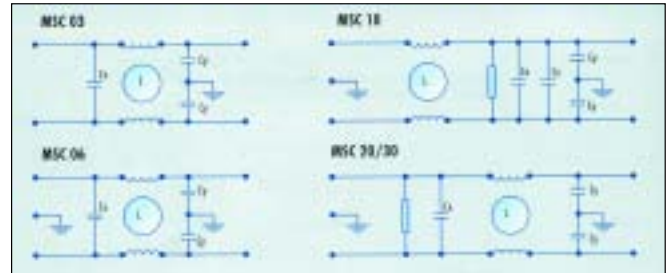


1 Amp to 30 Amp

Specifications

115/250 VAC 50/60Hz
 Leakage Current ≤ 0.5 mA
 Test Voltage (1 min)
 Line to Ground 1500 VAC / 2250 VDC
 Line to Line 1500 VDC
 Temperature Range -40° to $+85^{\circ}$ C
 UL - Filters 01, 03, 06, 10, 20

ELECTRIC SCHEMATIC



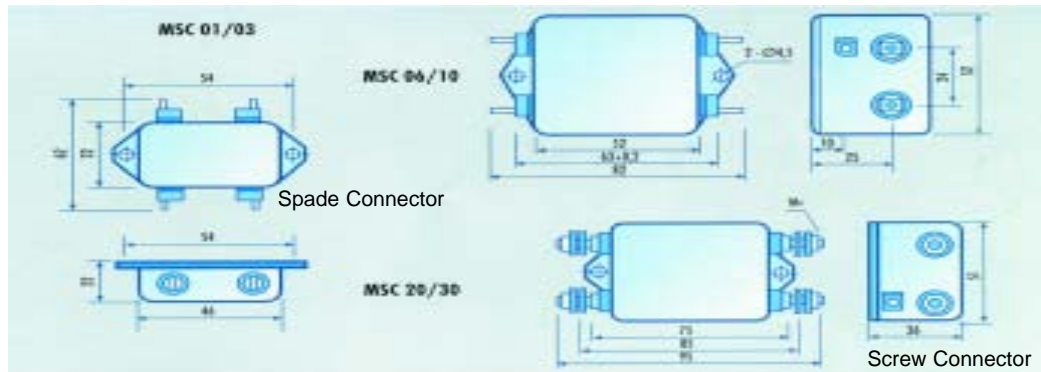
MINIMUM INSERTION LOSS IN dB (MEASURED IN 50 SYSTEM)

CATALOG No.	RATED CURRENT	COMMON MODE						DIFFERENTIAL MODE						LIST EACH
		FREQUENCY (MHz)						FREQUENCY (MHz)						
		.15	.5	1	5	10	30	.15	.5	1	5	10	30	
D-MSC 01	1 A	30	40	56	58	60	60	5	40	55	60	60	60	\$15.50
D-MSC 03	3 A	25	30	42	50	60	60	-	-	6	45	50	50	\$15.50
D-MSC 06	6 A	22	38	45	52	55	48	-	-	15	70	67	62	\$17.00
D-MSC 10	10 A	25	41	49	53	57	64	23	38	46	60	60	46	\$22.00
D-MSC 20	20 A	9	22	40	40	47	57	10	12	44	69	60	56	\$35.00
D-MSC 30	30 A	5	12	30	31	37	54	10	20	26	78	83	58	\$70.00

Note: The above units are CE, but not submitted to U.L.

	D-MSC 01	D-MSC 03	D-MSC 06	D-MSC 10	D-MSC 20	D-MSC 30
RATED CURRENT	1 A	3 A	6 A	10 A	20 A	30 A
L	2x4 mH	2x1, 5 mH	2x4, mH	2x2,4 mH	2x0,44 mH	2x0,3 mH
C (X2)	0,1 μ F	0,01 μ F	2x0, 47 μ F	2x0, 47 μ F	2x0, 1 μ F	2x0, 1 μ F
C (Y)	2x3300 pF	2x4700 pF	2x1000 pF	2x3300 pF	2x3300 pF	2x3300 pF
R				1,5 M	1,5 M	1,5 M

DIMENSIONS IN MM





General Terms and Conditions of Sale

All orders for products or services of Electrical and Electronic Controls, Inc. are subject to these conditions and terms of sale:

1. **ORDERS:** All orders must include description, prices, quantity and any shipping requirements.
2. **PRICES:** All prices are subject to change without notice and are subject to confirmation by quotation from EEControls, Inc. Orders for future delivery will be billed according to price at time of shipment. Unless otherwise noted in writing, all price quotations are conditioned upon acceptance by the Purchaser within thirty (30) days from quotation date.
3. **TERMS OF PAYMENT:** Terms are net 30 days to customer of satisfactory credit rating. When credit is not established, terms are Cash. Shipments will not be made to accounts with unpaid past due balance. Past due unpaid accounts will also accrue interest of 1-1/2% per month from date of invoice. However, this interest will never be greater than that allowed by law.
4. **DISCOUNTS:** Quantity discounts and other special discounts apply to current list prices for single orders for shipment at one time with the factory normal ship schedule.
5. **MINIMUM ORDERS:** All orders less than \$100.00 will be billed at \$100.00.
6. **ALTERATION OR CANCELLATION:** On alterations or cancellations of the order, the Purchaser assumes any costs already incurred by EEC in the preparation of the order.
7. **SHIPMENT:** Freight not allowed. Costs incurred from any special handling, insurance, or more expensive carrier requested by the Purchaser shall be assumed by the Purchaser.

No credit or allowance can be given for factory pick-ups.
8. **LOSSES:** Any claims for damages or losses due to shipment must be made to carrier within thirty (30) days of receipt of the shipment (as terms are F.O.B. Brewster, New York). Losses or damage costs not claimed within this period will be assumed by the Purchaser.
9. **LIABILITY:** No liability can be assumed for damages to Purchaser resulting from delay in shipment or inability to deliver.
10. **GUARANTEE:** EEControls, Inc. agrees to replace or repair equipment which has been found defective due to workmanship or material. This agreement is made only for a period within one year of invoice of the merchandise which is to have been subject to only normal and proper usage, and to which inspection of the material by EEC shows it to be thus defective. The agreement to repair or replace such material is limited to F.O.B. shipping point and is in no way a liability for damages, direct or consequential, or for delays, installation, transportation, adjustment or other expenses arising in connection with such merchandise. EEControls, Inc. is not responsible for equipment which is repaired or altered outside of EEC factory without express written authorization by an authorized executive of EEControls, Inc. Nor is EEC responsible for equipment subject to misuse, negligence, or accident. EEControls is in no way liable or responsible for injuries or damages to persons or property arising from or out of use of the equipment within described.
11. **RETURN OF EQUIPMENT:** Material is not to be returned to EEC without first obtaining written authorization from an authorized officer of EEC. Equipment may be returned only if new, unused, and in its original condition and within ninety (90) days of invoice for such material from EEC. Equipment thus properly accepted for credit by EEC are subject to a minimum service charge of 20% of original invoice and all transportation charges. Charges incurred by repairing or replacing equipment because of damages are the responsibility of the Purchaser. Equipment built to order is not subject to return for credit.
12. **WARRANTIES:** EEControls, Inc. warrants the products sold by this agreement to be free from defects in materials or workmanship under normal and proper usage for a period of one year from EEC invoice to Purchaser for such material. Except for the warranty hereinbefore stated, THERE ARE EXPRESS WARRANTIES AND NO IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OTHER THAN THOSE EXPRESSLY SET FORTH ABOVE. THIS EXPRESS WARRANTY IS IN LIEU OF AND EXCLUDES ALL OTHER REPRESENTATIONS MADE, BOTH EXPRESS AND IMPLIED, UNLESS SET FORTH IN WRITING AND SIGNED BY AN AUTHORIZED EXECUTIVE OF ELECTRICAL AND ELECTRONIC CONTROLS, INC.

Three Phase AC Motors*

Motor Rating hp	RPM	Current in Amperes*			Export* 380V (50HZ)	
		230V**	460V	575V	KW	AMPS
1/4	1800	0.91	0.45	0.36	.18	.75
	1200	1.10	0.53	0.41		
1/3	1800	1.15	0.56	0.41	.25	.85
	1200	1.32	0.67	0.77		
1/2	1799	1.67	0.83	0.67	0.37	1.2
	1200	1.95	0.94	0.77		
3/4	1800	2.37	1.18	0.96	0.55	1.65
	1200	2.63	1.31	1.06		
1	3600	2.74	1.37	1.09	0.75	2.15
	1800	3.06	1.53	1.23		
	1200	3.45	1.73	1.38		
1 ^{1/2}	3600	4.07	2.02	1.63	1.1	2.8
	1800	4.32	2.16	1.72		
2	3600	5.35	2.70	2.18	1.5	3.7
	1800	5.68	2.85	2.27		
3	3600	7.7	3.89	3.09	2.2	5.3
	1800	8.2	4.09	3.27		
	1200	8.8	4.42	3.54		
5	3600	12.5	6.3	4.95	3.75	8
	1800	13.0	6.5	5.24		
	1200	14.0	7.0	5.55		
7 ^{1/2}	3600	18.6	9.3	7.4	5.5	12
	1800	19.0	9.5	7.6		
	1200	20.1	10.1	8.0		
10	3600	24.0	12.1	9.7	7.5	16
	1800	24.9	12.4	9.9		
	1200	26.2	13.1	10.5		
15	3600	35.8	17.9	14.3	11	22.5
	1800	37.0	18.5	14.8		
	1200	38.7	19.3	15.5		

Motor Rating hp	RPM	Current in Amperes*			Export* 380V (50HZ)	
		230V**	460V	575V	KW	AMPS
20	3600	47.4	23.7	19.0	15	31
	1800	48.9	24.5	19.5		
25	1200	50.4	25.2	20.1	18.5	37
	3600	58.2	29.1	23.2		
	1800	60.8	30.3	24.2		
30	1200	62.4	31.1	24.9	22	43
	1800	71.3	35.7	28.5		
40	1200	74.2	37.2	29.7	30	57
	1800	95.2	47.6	38.1		
50	1800	96.6	48.3	38.5	37	73
	1200	118	59.0	47.2		
60	1800	119	59.6	47.9	45	87
	1200	139	69.8	55.8		
75	1800	143	71.7	57.4	55	107
	1200	174	87.1	69.6		
100	1800	177	88.4	70.7	74	144
	1200	229	114	91.7		
125	1200	232	117	93.4	90	173
	1800	285	142	113		
150	1200	290	146	116	110	206
	1800	340	170	136		
200	1200	345	172	138	150	288
	1800	451	226	181		
250	1200	457	228	182	180	346
	1800	569	284	228		
300	1200	569	284	228	220	412
	1800	682	341	272		
400	1200	682	341	272	300	576
	1800	892	450	359		
500	1200	892	450	359	360	692
	1800	1115	561	451		

Export - AEG 50HZ Motors at 1500RPM. Estimate FLI for other voltages as follows:

For **220V 50HZ**, F.L. Amps, use factor 1.74 x Amps 380V, to obtain approx. full load Amps.

For **415V 50HZ**, F.L. Amps, use factor 0.93 x Amps 380V, to obtain approx. full load Amp.

Example: For 4KW Motor, 220V 50HZ, multiply 1.74 x 9.3A = 16 Amps (FLA at 220V 50HZ)

* The full load currents listed are approximate and vary with manufacturer.

** For 200 volt and 208 volt motors, increase the 230 volt full load currents by 15 and 10 percent, respectively.

Motor Full Load Currents

Single Phase AC Motors (Approximate)*

Motor Rating hp	Current in Amperes	
	115V	230V
1/6	4.4	2.2
1/4	6.0	3.0
1/3	7.4	3.7
1/2	9.8	4.9
3/4	14	7
1	16	8
1 1/2	22	11
2	24	12
3	26	18
5	58	29
7 1/2	82	41
10	100	50

★★ OVERLOAD RELAY SUFFIX			
Suffix	O.L., Relay Setting Range (Amps)	Suffix	O.L. Relay Setting Range (Amps)
-A	0.12-0.18	-N	11-17
-B	0.18-0.28	-O	15-23
-C	0.28-0.4	-P	20-32
-D	0.4-0.6	-Q	32-50
-E	0.56-0.8	-RN	50-63
-F	0.8-1.2	-SN	63-80
-G	1.2-1.8	-TN	80-110
-H	1.8-2.8	-TT	110-135
-I	2.8-4	-UN	135-160
-K	4-6	-UU	150-180
-L	5.6-8	-VT	175-280
-M	8-12	-WT	250-400
		-X	315-500

*Important: Above HP/Amp ratings are approximate averages of common motor ratings. Refer to the motor nameplate for the exact Ampt setting.