

# DRA05 SERIES

AC - DC DIN RAIL MOUNTABLE POWER SUPPLY  
INDUSTRIAL CONTROL EQUIPMENT



## FEATURES

- UL / cUL / TUV / CE
- UNIVERSAL INPUT 90~264VAC
- SHORT CIRCUIT PROTECTION
- INTERNAL INPUT FILTER
- 2 YEARS WARRANTY



## MODEL LIST

MODEL NO.	INPUT VOLTAGE	OUTPUT WATTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	EFF. (min.)	EFF. (typ.)
<b>Single Output Models</b>						
DRA05-05	90~264 VAC	5 WATTS	+ 5 VDC	1000 mA	67%	69%
DRA05-12	90~264 VAC	5 WATTS	+ 12 VDC	420 mA	70%	72%
DRA05-15	90~264 VAC	5 WATTS	+ 15 VDC	340 mA	70%	72%
DRA05-24	90~264 VAC	5 WATTS	+ 24 VDC	210 mA	70%	72%

## SPECIFICATION

All Specifications Typical At Nominal Line, Full Load, 25°C Unless Otherwise Noticed

GENERAL						
Characteristics	Conditions		min.	typ.	max.	unit
Switching frequency	Vi nom, Io nom			132		KHz
Isolation voltage	Input-Output		3000 / 4242			VAC / VDC
	Input-FG		1500 / 2121			VAC / VDC
Isolation resistance	Input-Output, @ 500VDC		100			MΩ
Ambient temperature	Operating at Vi nom		-20		+ 71	°C
Derating (see derating curve)	Vi nom, from +61°C to +71°C				2.5	% / °C
Storage temperature	Non operational		-25		+ 85	°C
Relative humidity	Vi nom, Io nom		20		95	% RH
Temperature coefficient	Vi nom, Io min				± 0.03	% / °C
MTBF	Bellcore Issue 6 @40°C, GB	5V model		802000		Hours
		12V model		805000		Hours
		15V model		808000		Hours
		24V model		812000		Hours
Altitude during operation	IEC 60068-2-13				4850	m
Dimension	Spring terminal type		L90 x W22.5 x D114			mm
Cooling	Free air convection					
Pollution degree			2			

## SPECIFICATION

All Specifications Typical At Nominal Line, Full Load, 25°C Unless Otherwise Noticed

### INPUT SPECIFICATIONS

Characteristics	Conditions	min.	typ.	max.	unit
Rated input voltage	Io nom	100		240	VAC
Absolute input max. range	Ta min ... Ta max, Io nom	AC in		264	VAC
		DC in	120	375	VDC
Input current	Vi : 115 / 230 VAC, Io nom		115 / 80		mA
Rated input current	Vi : 90 VAC, Io nom			200	mA
Line frequency	Vi nom, Io nom	47		63	Hz
Inrush current	Vi : 115 / 230 VAC, Io nom			10 / 18	A
Power dissipation	Vi : 230 VAC, Io nom	5V model	2.2		W
		12V model	1.9		W
		15V model	2.1		W
		24V model	1.8		W
Leakage current	Input-Output			0.25	mA
	Input-FG			3.5	mA

### OUTPUT SPECIFICATIONS

Characteristics	Conditions	min.	typ.	max.	unit
Output voltage accuracy (Adjusted before shipment)	Vi nom, Io max	0		+ 1	%
Minimum load	Vi nom	0			%
Line regulation	Io nom, Vi min ... Vi max			± 1	%
Load regulation	Vi nom, Io min ... Io nom			± 2	%
Voltage trim range	Vi nom, 0.8 Io nom	5V...15V models	- 10	+ 15	%
		24V model	- 10	+ 20	%
Rated continuous loading	Vi nom	5V model	1.0 A @ 5Vdc / 0.85 A @ 5.75 Vdc		
		12V model	0.42 A @ 12Vdc / 0.36 A @ 13.8 Vdc		
		15V model	0.34 A @ 15Vdc / 0.28 A @ 17.25 Vdc		
		24V model	0.21 A @ 24Vdc / 0.17 A @ 28.8 Vdc		
Hold up time	Vi : 115 / 230 VAC, Io nom	30 / 130			ms
Turn on time	Vi nom, Io nom			1000	ms
	Vi nom, Io nom → with 3500 μF CAP			1500	ms
Rise time	Vi nom, Io nom			150	ms
	Vi nom, Io nom → with 3500 μF CAP			500	ms
Fall time	Vi nom, Io nom			150	ms
Transient recovery time	Vi nom, I ~ 0.5 Io nom			2	ms
Ripple & noise	Vi nom, Io nom, BW = 20MHz			50	mV
Power back immunity	Vi nom, Io nom 1 second	5V model	7.5		VDC
		12V model	18		VDC
		15V model	22		VDC
		24V model	35		VDC
Capacitor load	Vi nom, Io nom			3500	μF
DC ON indicator threshold at start up (Green LED)	Vi nom, Io nom	5V model	3.5	4.5	VDC
		12V model	9.0	10.8	VDC
		15V model	11.0	13.5	VDC
		24V model	18	21.6	VDC
DC LOW indicator threshold after start up (Red LED)	Vi nom, Io nom	5V model	3.5	4.5	VDC
		12V model	9.0	10.8	VDC
		15V model	11.0	13.5	VDC
		24V model	18	21.6	VDC
Efficiency	Vi nom, Io nom, Po / Pi	Up to 72%, See model list and typ efficiency curve			

### CONTROL AND PROTECTION

Characteristics	Conditions	min.	typ.	max.	unit
Input fuse		T2A / 250VAC internal			
Internal surge voltage protection	IEC 61000-4-5	Varistor			
Rated over load protection	Vi nom (see typ current limited curve)	110		135	%

## SPECIFICATION

All Specifications Typical At Nominal Line, Full Load, 25°C Unless Otherwise Noticed

### CONTROL AND PROTECTION

Characteristics	Conditions	min.	typ.	max.	unit
Over voltage protection	$V_i$ nom, $I_o$ nom (Auto Recovery)	125		145	%
Output short circuit		Hiccup mode			
Degree of protection		IP20			

### APPROVALS AND STANDARDS

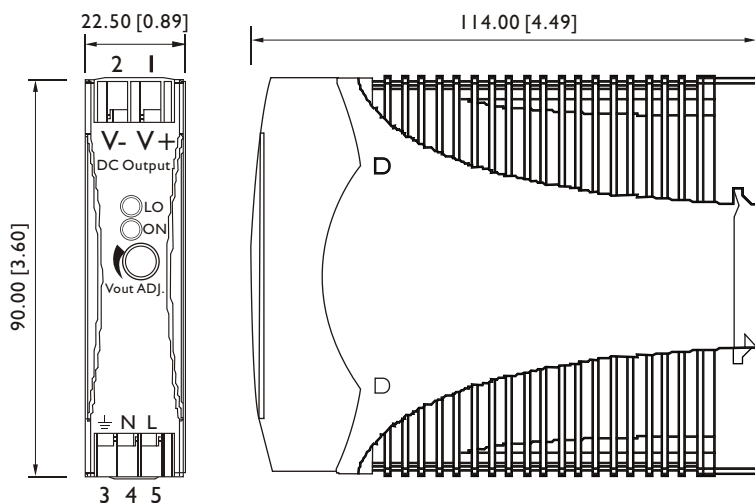
UL / cUL	UL 508 Listed UL 60950-1, UL 1310 Class 2 Power Recognized ISA 12.12.01(Class I, Division 2, Groups A, B, C and D)
TUV	EN 60950-1, CB scheme
CE	EN 61000-6-3, EN 55022 Class B, EN 61000-3-2, EN 61000-3-3 EN 61000-6-2, EN 55024, EN 61000-4-2 Level 4, EN 61000-4-3 Level 3 EN 61000-4-4 Level 4, EN 61000-4-5 L-N Level 3, L / N-FG Level 4 EN 61000-4-6 Level 3, EN 61000-4-8 Level 4, EN 61000-4-11 ENV 50204 Level 2, EN 61204-3
CCC	GB4943, GB9254, GB17625.1
Vibration resistance	meet IEC 60068-2-6 (Mounting by rail : 10-500 Hz, 2G, along X, Y, Z each Axis, 60 min for each Axis )
Shock resistance	meet IEC 60068-2-27 (15G, 11ms, 3 Axis, 6 Faces, 3 times for each Face)

## PHYSICAL CHARACTERISTICS

Case size	90 x 22.5 x 114 mm (3.6 x 0.89 x 4.49 inches)
Case material	Plastic
Weight	120 g
Packing	0.21 kg ; 56 pcs / 12.5 kg / 2.16 CUFT

## MECHANISM & PIN CONFIGURATION

mm [inch]



### CONSTRUCTION

Easy snap-on mounting onto the DIN-Rail (TS35/7.5 or TS35/15), unit sits safely and firmly on the rail.

### INSTALLATION

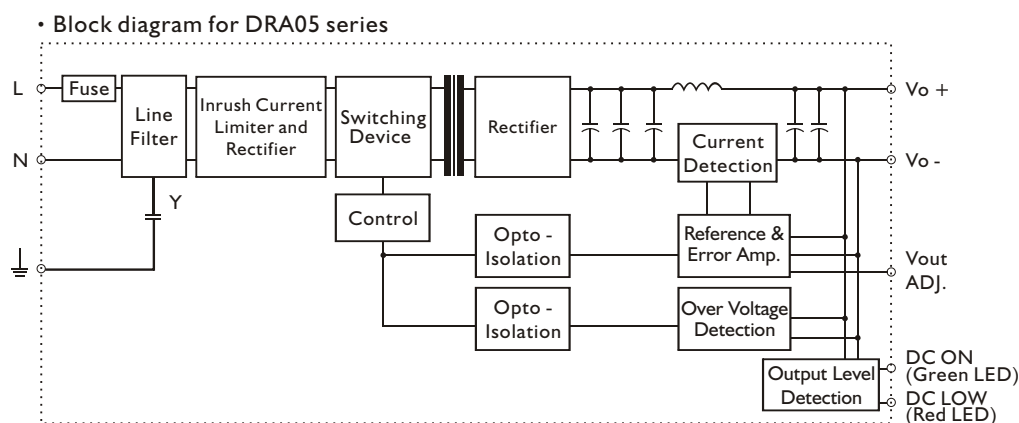
Ventilation / Cooling  
Normal convection  
All sides 25mm free space  
For cooling recommended  
Connector size range  
Spring terminal:  
AWG24-14 (0.2~2mm<sup>2</sup>) flexible / solid cable,  
10 m/m stripping at cable end recommends  
Use copper conductors only, 60 / 75°C

GENERAL TOLERANCE	
0.00[0.00] - 30.00[1.18]	±0.30[0.01]
30.00[1.18] - 120.00[4.72]	±0.50[0.02]

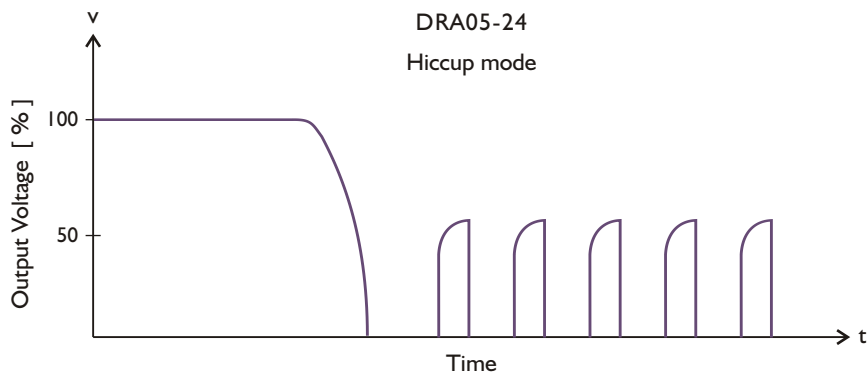
## PIN ASSIGNMENT

PIN NO.	Designation	Description
1	OUT	V +
2		V -
3	IN	$\perp$
4		N
5		L
	OTHER	ON
		LO
		Vout Adj.

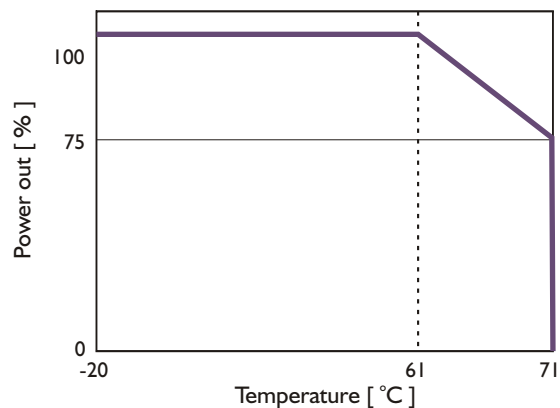
## CIRCUIT SCHEMATIC



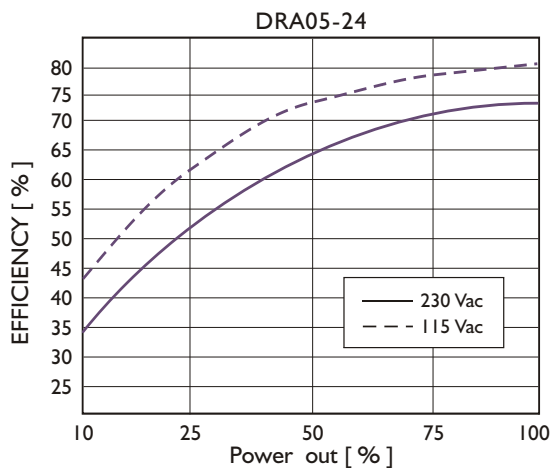
## TYP. CURRENT LIMITED CURVE



## DERATING CURVE



## TYP. EFFICIENCY CURVE



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MODEL NO.	INPUT VOLTAGE	OUTPUT WATTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	EFF. (min.)	EFF. (typ.)
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DRA05-12A	90~264 VAC	5 WATTS	+ 12 VDC	420 mA	70%	72%
DRA05-15A	90~264 VAC	5 WATTS	+ 15 VDC	340 mA	70%	72%
DRA05-24A	90~264 VAC	5 WATTS	+ 24 VDC	210 mA	70%	72%

## SPECIFICATION

All Specifications Typical At Nominal Line, Full Load, 25°C Unless Otherwise Noticed

GENERAL						
Characteristics	Conditions	min.	typ.	max.	unit	
Switching frequency	Vi nom, Io nom		132		KHz	
Isolation voltage	Input-Output	3000 / 4242			VAC / VDC	
	Input-FG	1500 / 2121			VAC / VDC	
Isolation resistance	Input-Output, @ 500VDC	100			MΩ	
Ambient temperature	Operating at Vi nom	-20		+ 71	°C	
Derating (see derating curve)	Vi nom, from +61°C to +71°C			2.5	% / °C	
Storage temperature	Non operational	-25		+ 85	°C	
Relative humidity	Vi nom, Io nom	20		95	% RH	
Temperature coefficient	Vi nom, Io min			± 0.03	% / °C	
MTBF	Bellcore Issue 6 @40°C, GB	5V model		802000		Hours
		12V model		805000		Hours
		15V model		808000		Hours
		24V model		812000		Hours
Altitude during operation	IEC 60068-2-13			4850	m	
Dimension	Screw terminal type	L90 x W22.5 x D114			mm	
Cooling	Free air convection					
Pollution degree		2				

## SPECIFICATION

All Specifications Typical At Nominal Line, Full Load, 25°C Unless Otherwise Noticed

### INPUT SPECIFICATIONS

Characteristics	Conditions	min.	typ.	max.	unit
Rated input voltage	Io nom	100		240	VAC
Absolute input max. range	Ta min ... Ta max, Io nom	AC in		264	VAC
		DC in		375	VDC
Input current	Vi : 115 / 230 VAC, Io nom		115 / 80		mA
Rated input current	Vi : 90 VAC, Io nom			200	mA
Line frequency	Vi nom, Io nom	47		63	Hz
Inrush current	Vi : 115 / 230 VAC, Io nom			10 / 18	A
Power dissipation	Vi : 230 VAC, Io nom	5V model		2.2	W
		12V model		1.9	W
		15V model		2.1	W
		24V model		1.8	W
Leakage current	Input-Output			0.25	mA
	Input-FG			3.5	mA

### OUTPUT SPECIFICATIONS

Characteristics	Conditions	min.	typ.	max.	unit
Output voltage accuracy (Adjusted before shipment)	Vi nom, Io max	0		+ 1	%
Minimum load	Vi nom	0			%
Line regulation	Io nom, Vi min ... Vi max			± 1	%
Load regulation	Vi nom, Io min ... Io nom			± 2	%
Voltage trim range	Vi nom, 0.8 Io nom	5V...15V models		+ 15	%
		24V model	- 10	+ 20	%
Rated continuous loading	Vi nom	5V model	1.0 A @ 5Vdc / 0.85 A @ 5.75 Vdc		
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Rise time	Vi nom, Io nom			150	ms
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Fall time	Vi nom, Io nom			150	ms
Transient recovery time	Vi nom, I ~ 0.5 Io nom			2	ms
Ripple & noise	Vi nom, Io nom, BW = 20MHz			50	mV
Power back immunity	Vi nom, Io nom 1 second	5V model	7.5		VDC
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Degree of protection		IP20			

### APPROVALS AND STANDARDS

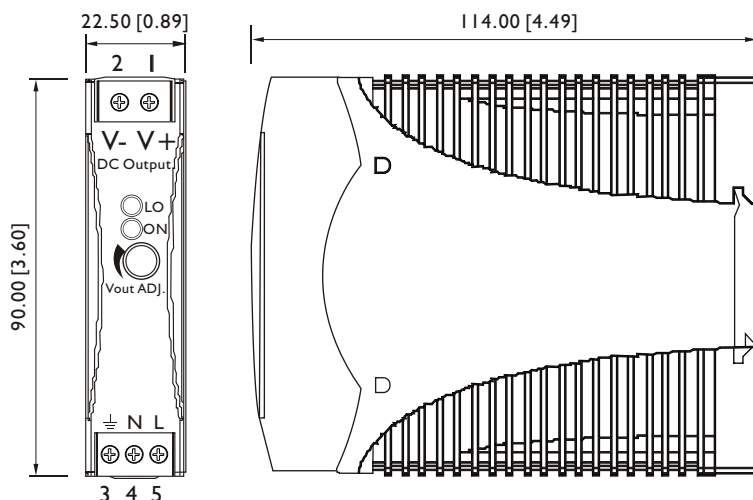
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Vibration resistance	meet IEC 60068-2-6 (Mounting by rail : 10-500 Hz, 2G, along X, Y, Z each Axis, 60 min for each Axis )
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Case material	Plastic
Weight	120 g
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## MECHANISM & PIN CONFIGURATION

mm [inch]



### CONSTRUCTION

Easy snap-on mounting onto the DIN-Rail (TS35/7.5 or TS35/15), unit sits safely and firmly on the rail.

### INSTALLATION

Ventilation / Cooling  
Normal convection  
All sides 25mm free space  
For cooling recommended  
Connector size range  
Screw terminal:  
AWG26-12 (0.2~2.5mm<sup>2</sup>) flexible / solid cable, connector can withstand torque at maximum 5 pound-inches.  
4~5 m/m stripping at cable end recommends  
Use copper conductors only, 60 / 75°C

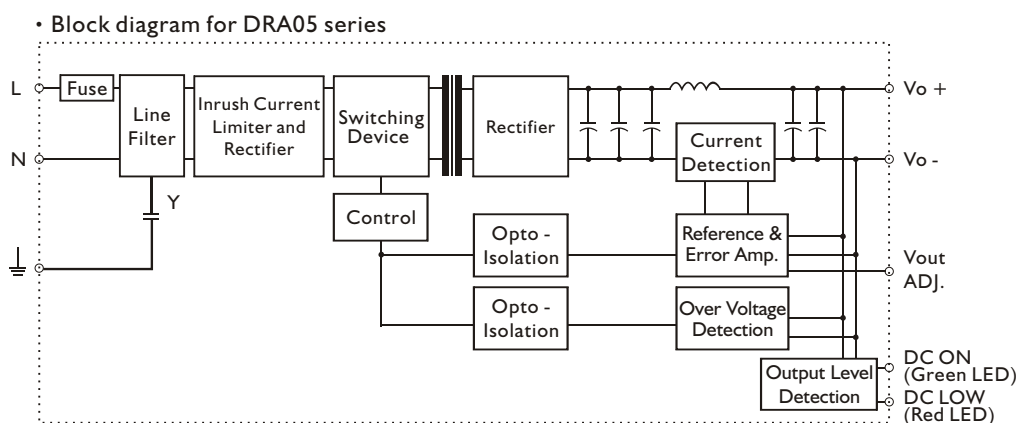
### GENERAL TOLERANCE

0.00[0.00] - 30.00[1.18]	±0.30[0.01]
30.00[1.18] - 120.00[4.72]	±0.50[0.02]

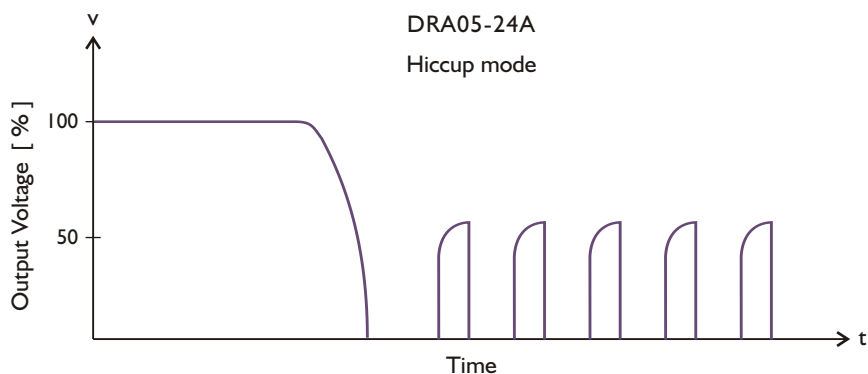
## PIN ASSIGNMENT

PIN NO.	Designation	Description
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2		V -
3	IN	$\perp$
4		N
5		L
	OTHER	ON
		LO
		Vout Adj.

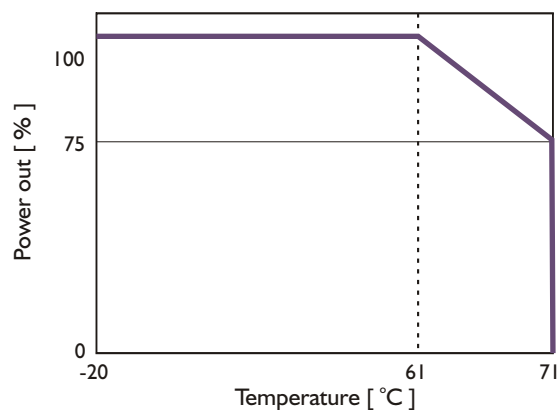
## CIRCUIT SCHEMATIC



## TYP. CURRENT LIMITED CURVE



## DERATING CURVE



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