



World wide

Cost  
EffectiveSafety  
Approvals

EMI

Inrush  
current  
limiting

OCP



OVP

# WDA-series



## Feature

For DIN (35mm) Rail Products  
Built in overcurrent protection, overvoltage protection circuits  
Economical design

## Safety agency approvals

UL62368-1  
C-UL (equivalent to CAN/CSA-C22.2 No.62368-1)  
EN62368-1

## CE marking

Low Voltage Directive  
RoHS Directive

## UKCA marking

Electrical Equipment Safety Regulations  
RoHS Regulations

## 5-year warranty (See Instruction Manual)

## EMI

Complies with CISPR11-B, CISPR32-B, EN55011-B,  
EN55032-B, FCC Part 15-B, FCC Part 18-B

## EMS Compliance : EN61204-3, EN61000-6-2

EN61000-4-2  
EN61000-4-3  
EN61000-4-4  
EN61000-4-5  
EN61000-4-6  
EN61000-4-8  
EN61000-4-11



- ① Series name  
 ② Single output  
 ③ Output wattage  
 ④ Universal input  
 ⑤ Output voltage  
 ⑥ Option : \*6  
 C : With Coating

\*Make sure necessary tests will be carried out on your end equipment with the power supply installed in accordance with any required EMC/EMI regulations.

MODEL	WDA30F-5	WDA30F-12	WDA30F-24	WDA30F-48
MAX OUTPUT WATTAGE[W]	30	30	31.2	33.6
DC OUTPUT	5V6A	12V2.5A	24V1.3A	48V0.7A

## SPECIFICATIONS

	MODEL	WDA30F-5	WDA30F-12	WDA30F-24	WDA30F-48	
INPUT	VOLTAGE[V]	AC85 - 264 1ϕ				
	CURRENT[A]	ACIN 115V	0.6			
		ACIN 230V	0.3			
	FREQUENCY[Hz]	50/60 (47-63)				
	EFFICIENCY[%]	ACIN 115V	80typ	85typ	86typ	87typ
		ACIN 230V	82typ	86typ	87typ	88typ
	INRUSH CURRENT[A]	ACIN 115V	20typ Ta=25℃ (at cold start)			
ACIN 230V		40typ Ta=25℃ (at cold start)				
LEAKAGE CURRENT[mA]	ACIN115V	0.25max				
	ACIN240V	0.5max				
OUTPUT	VOLTAGE[V]	5	12	24	48	
	CURRENT[A]	6	2.5	1.3	0.7	
	WATTAGE[W]	30	30	31.2	33.6	
	LINE REGULATION[mV] *1	50max	120max	240max	480max	
	LOAD REGULATION[mV] *1	50max	120max	240max	480max	
	RIPPLE NOISE [mVp-p] *2	Io=100% 150(Bandwidth 20MHZ)				
	TEMPERATURE REGULATION[mV]	0~+50℃	100max	180max	360max	720max
	START-UP TIME[ms]	ACIN 115V	100typ			
		ACIN 230V				
	HOLD-UP TIME[ms]	ACIN 115V	10typ			
ACIN 230V		20typ				
PROTECTION CIRCUIT AND OTHERS	OUTPUT VOLTAGE ADJUSTMENT RANGE[V]	4.50 to 5.50	10.8 to 13.2	21.6 to 26.4	43.2 to 52.8	
	OUTPUT VOLTAGE SETTING[V]	4.90 to 5.30	11.75 to 12.25	23.5 to 24.5	47.0 to 49.0	
	OVERCURRENT PROTECTION [A]	Works over 105% of rating and recovers automatically				
ISOLATION	OVERVOLTAGE PROTECTION[V]	5.75 to 7.00	13.8 to 16.8	27.6 to 33.6	54.0 to 67.2	
	OPERATING INDICATION	LED (Green)				
	INPUT-OUTPUT	AC3,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature)				
ENVIRONMENT	INPUT-FG	AC2,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature)				
	OUTPUT-FG	AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)				
	OPERATING TEMP.,HUMID. *3	-20 to +70℃, 20 - 90%RH (Non condensing)				
SAFETY AND EMC	STORAGE TEMP.,HUMID.	-30 to +85℃, 20 - 90%RH (Non condensing)				
	VIBRATION	10 - 55Hz, 19.6m/s <sup>2</sup> (2G) , 3minutes period, 60minutes each along Z axis (Non operating.mounted on DIN Rail)				
	IMPACT	196.1m/s <sup>2</sup> (20G) , 11ms, once each X, Y and Z axis (Packing state)				
OTHERS	AGENCY APPROVALS	UL62368-1, C-UL (equivalent to CAN/CSA-C22.2 No.62368-1) , EN62368-1				
	EMC EMISSION	Complies with CISPR11-B, CISPR32-B, EN55011-B, EN55032-B, FCC Part 15-B, FCC Part 18-B				
	EMC IMMUNITY	Complies with EN61000-4-2, 3, 4, 5, 6, 8, 11				
WARRANTY	HARMONIC ATTENUATOR*4	Complies with IEC61000-3-2 (Class A) No built-in active PFC				
	CASE SIZE/WEIGHT	32×90×90mm (W×H×D) [1.26×3.54×3.54 inches] / 200g max				
	COOLING METHOD	Convection				
	WARRANTY *5	5 years (subject to the operating conditions)				

\*1 Consult us about dynamic load and input response. Measure the output voltage by using the average mode of the tester to deal with the burst operation at low (Io=0~20%typ) load.

\*2 This is the result of measurement of the testing board with capacitors of 47μF and 0.1μF placed at 150 mm from the output terminals by a 20MHz oscilloscope or a ripple-noise meter equivalent to Keisoku-GikenRM104.  
 When the load factor is low (Io=0~20%typ), the switching power loss is reduced by burst operation, which will cause ripple noise to go beyond the specifications.

\*3 Output power derating is required. Refer to "Derating"

\*4 Please contact us about another class. When two or more units are operating it may not

comply with the IEC61000-3-2. Please contact us for details.

\*5 Consult us about details.

\*6 The listed options may affect the published standard specifications. Please contact us for detailed product specifications and safety approvals.

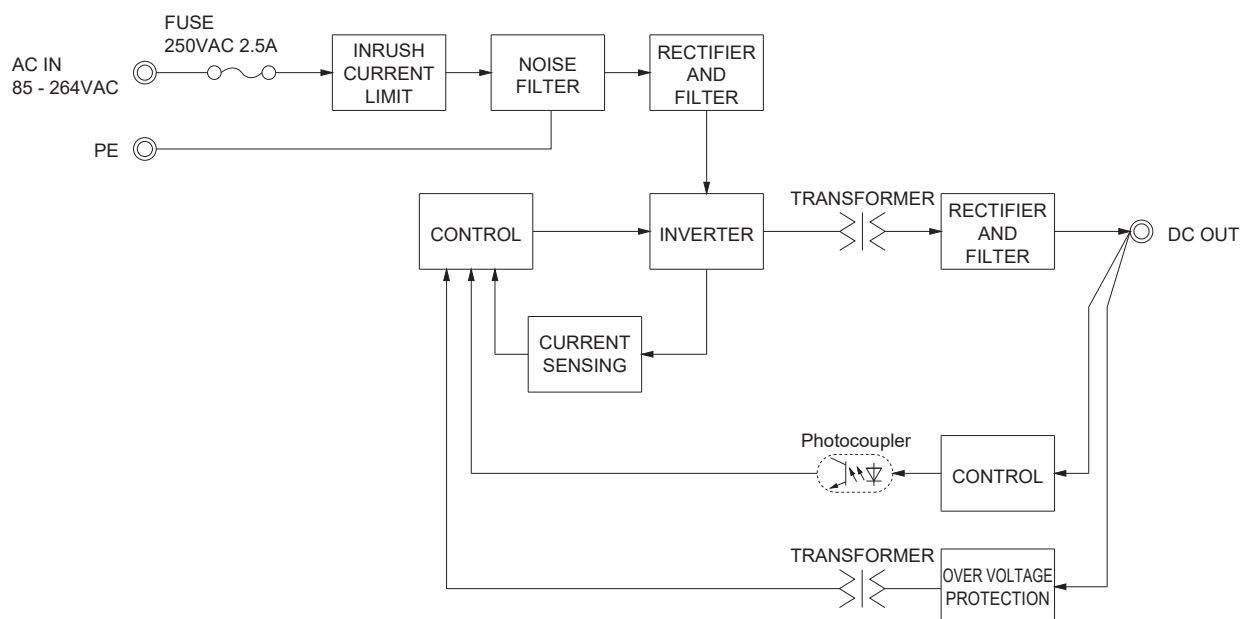
\* All parameters not specially mentioned are measured at ACIN 230V, rated load and 25°C of ambient temperature.

\* Do not use the power supply in overcurrent conditions or in unspecified input voltage ranges. Otherwise the internal components may be damaged.

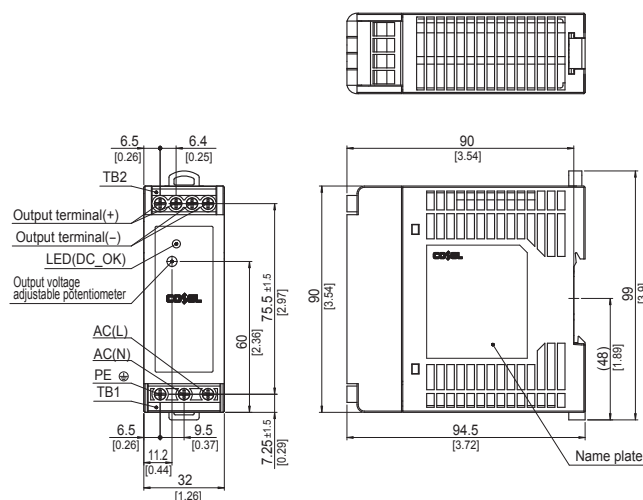
\* Parallel operation is not possible with this model.

\* Acoustic noise may be heard from the power supply when used for pulse load.

## Block diagram



## External view



- ※ Tolerance :  $\pm 1$  [ $\pm 0.04$ ]
- ※ Weight : 200g max
- ※ Chassis - Case material : PBT
- ※ Din rail attachment material : PC/ABS
- ※ Dimensions in mm, [ ] = inches
- ※ Screw tightening torque : 1N · m max



- ① Series name  
 ② Single output  
 ③ Output wattage  
 ④ Universal input  
 ⑤ Output voltage  
 ⑥ Option : \*6  
 C : With Coating

\*Make sure necessary tests will be carried out on your end equipment with the power supply installed in accordance with any required EMC/EMI regulations.

MODEL	WDA60F-12	WDA60F-24	WDA60F-48
MAX OUTPUT WATTAGE[W]	60	60	62.4
DC OUTPUT	12V 5A	24V 2.5A	48V 1.3A

## SPECIFICATIONS

	MODEL		WDA60F-12	WDA60F-24	WDA60F-48
INPUT	VOLTAGE[V]		AC85 - 264 1φ		
	CURRENT[A]	ACIN 115V	1.2		
		ACIN 230V	0.6		
	FREQUENCY[Hz]		50/60 (47-63)		
	EFFICIENCY[%]	ACIN 115V	84typ	86typ	87typ
		ACIN 230V	86typ	88typ	89typ
	INRUSH CURRENT[A]	ACIN 115V	20typ Ta=25℃ (at cold start)		
ACIN 230V		40typ Ta=25℃ (at cold start)			
LEAKAGE CURRENT[mA]	ACIN 115V	0.25max			
	ACIN240V	0.5max			
OUTPUT	VOLTAGE[V]		12	24	48
	CURRENT[A]		5	2.5	1.3
	WATTAGE[W]		60	60	62.4
	LINE REGULATION[mV] *1		120max	240max	480max
	LOAD REGULATION[mV] *1		120max	240max	480max
	RIPPLE NOISE [mVp-p] *2 Io=100%		150max (Bandwidth 20MHz)		
	TEMPERATURE REGULATION[mV] 0~+50℃		180max	360max	720max
	START-UP TIME[ms]	ACIN 115V	100typ		
		ACIN 230V			
	HOLD-UP TIME[ms]	ACIN 115V	10typ		
		ACIN 230V	20typ		
PROTECTION CIRCUIT AND OTHERS	OUTPUT VOLTAGE ADJUSTMENT RANGE[V]		10.8 to 13.2	21.6 to 26.4	43.2 to 52.8
	OUTPUT VOLTAGE SETTING[V]		11.75 to 12.25	23.5 to 24.5	47.0 to 49.0
	OVERCURRENT PROTECTION [A]		Works over 105% of rating and recovers automatically		
ISOLATION	OVERVOLTAGE PROTECTION[V]		13.8 to 16.8	27.6 to 33.6	54.0 to 67.2
	OPERATING INDICATION		LED (Green)		
	INPUT-OUTPUT		AC3,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature)		
ENVIRONMENT	INPUT-FG		AC2,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature)		
	OUTPUT-FG		AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)		
	OPERATING TEMP.,HUMID. *3		-20 to +70℃, 20-90%RH (Non condensing)		
SAFETY AND EMC	STORAGE TEMP.,HUMID.		-30 to +85℃, 20-90%RH (Non condensing)		
	VIBRATION		10-55Hz, 19.6m/s² (2G) , 3minutes period, 60minutes each along Z axis (Non operating.mounted on DIN Rail)		
	IMPACT		196.1m/s² (20G) , 11ms, once each X, Y and Z axis (Packing state)		
OTHERS	AGENCY APPROVALS		UL62368-1, C-UL (equivalent to CAN/CSA-C22.2 No.62368-1) , EN62368-1		
	EMC EMISSION		Complies with CISPR11-B, CISPR32-B, EN55011-B, EN55032-B, FCC Part 15-B, FCC Part 18-B		
	EMC IMMUNITY		Complies with EN61000-4-2, 3, 4, 5, 6, 8, 11		
WARRANTY	HARMONIC ATTENUATOR*4		Complies with IEC61000-3-2 (Class A) No built-in active PFC		
	CASE SIZE/WEIGHT		32×90×90mm (W×H×D) [1.26×3.54×3.54 inches] / 250g max		
	COOLING METHOD		Convection		
	WARRANTY *5		5 years (subject to the operating conditions)		

\*1 Consult us about dynamic load and input response. Measure the output voltage by using the average mode of the tester to deal with the burst operation at low (Io=0~20%typ) load.

\*2 This is the result of measurement of the testing board with capacitors of 47μF and 0.1μF placed at 150 mm from the output terminals by a 20MHz oscilloscope or a ripple-noise meter equivalent to Keisoku-GikenRM104.

When the load factor is low (Io=0~20%typ), the switching power loss is reduced by burst operation, which will cause ripple noise to go beyond the specifications.

\*3 Output power derating is required. Refer to "Derating"

\*4 Please contact us about another class. When two or more units are operating it may not

comply with the IEC61000-3-2. Please contact us for details.

\*5 Consult us about details.

\*6 The listed options may affect the published standard specifications. Please contact us for detailed product specifications and safety approvals.

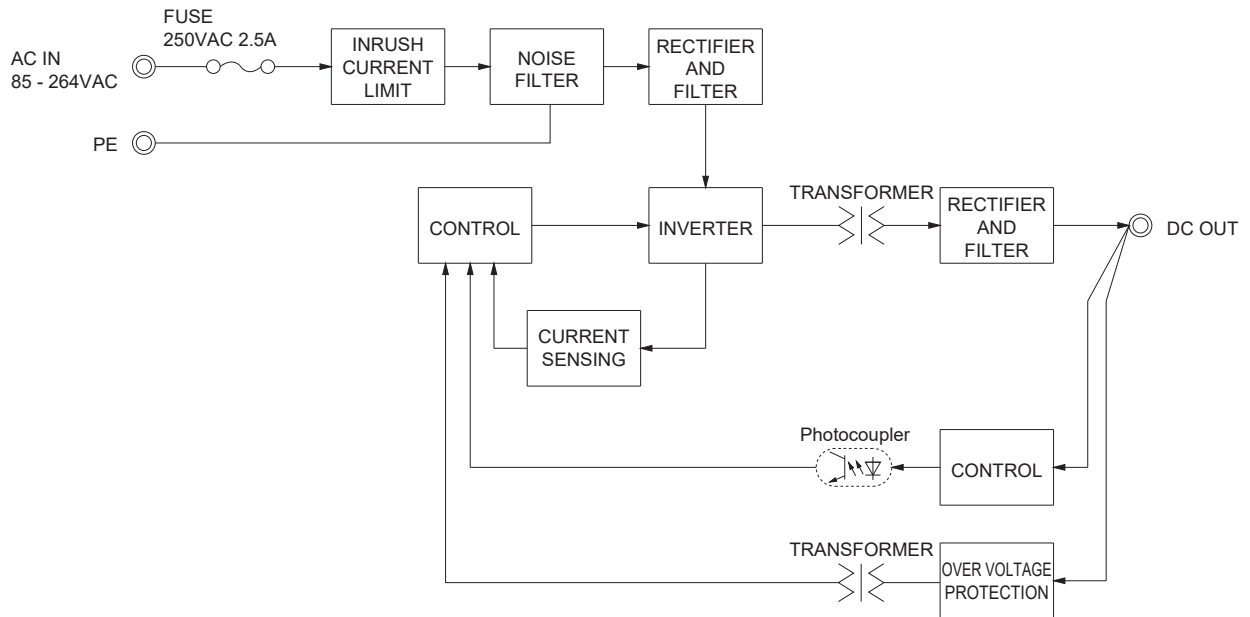
\* All parameters not specially mentioned are measured at ACIN 230V, rated load and 25°C of ambient temperature.

\* Do not use the power supply in overcurrent conditions or in unspecified input voltage ranges. Otherwise the internal components may be damaged.

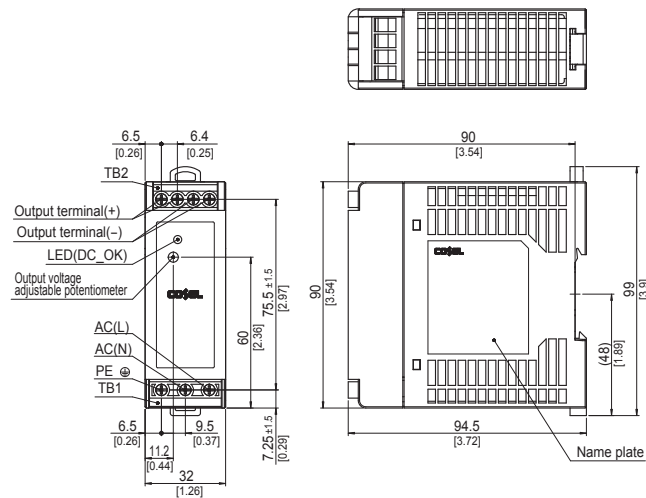
\* Parallel operation is not possible with this model.

\* Acoustic noise may be heard from the power supply when used for pulse load.

## Block diagram



## External view



- ※ Tolerance :  $\pm 1$  [ $\pm 0.04$ ]
- ※ Weight : 250g max
- ※ Chassis · Case material : PBT
- ※ Din rail attachment material : PC/ABS
- ※ Dimensions in mm, [ ] = inches
- ※ Screw tightening torque : 1N · m max



- ① Series name  
 ② Single output  
 ③ Output wattage  
 ④ Input voltage selectable by switch  
 ⑤ Output voltage  
 ⑥ Option : \*6  
 C : With Coating

\*Make sure necessary tests will be carried out on your end equipment with the power supply installed in accordance with any required EMC/EMI regulations.

MODEL	WDA90F-12	WDA90F-24	WDA90F-48
MAX OUTPUT WATTAGE[W]	90	91.2	91.2
DC OUTPUT	12V 7.5A	24V 3.8A	48V 1.9A

## SPECIFICATIONS

	MODEL		WDA90F-12	WDA90F-24	WDA90F-48
INPUT	VOLTAGE[V]		AC85 - 264 1ϕ		
	CURRENT[A]	ACIN 115V	1.8		
		ACIN 230V	0.9		
	FREQUENCY[Hz]		50/60 (47-63)		
	EFFICIENCY[%]	ACIN 115V	84	87	88
		ACIN 230V	86	89	90
	INRUSH CURRENT[A]	ACIN 115V	20typ Ta=25℃ (at cold start)		
ACIN 230V		40typ Ta=25℃ (at cold start)			
LEAKAGE CURRENT[mA]	ACIN 115V	0.4max			
	ACIN 240V	0.75max			
OUTPUT	VOLTAGE[V]		12	24	48
	CURRENT[A]		7.5	3.8	1.9
	WATTAGE[W]		90	91.2	91.2
	LINE REGULATION[mV] *1		120max	240max	480max
	LOAD REGULATION[mV] *1		120max	240max	480max
	RIPPLE NOISE [mVp-p] *2 Io=100%		150max (Bandwidth 20MHz)		
	TEMPERATURE REGULATION[mV] 0~+50℃		180max	360max	720max
	START-UP TIME[ms]	ACIN 115V	100typ		
		ACIN 230V	10typ		
	HOLD-UP TIME[ms]	ACIN 115V	10typ		
ACIN 230V		20typ			
PROTECTION CIRCUIT AND OTHERS	OUTPUT VOLTAGE ADJUSTMENT RANGE[V]		10.8 to 13.2	21.6 to 26.4	43.2 to 52.8
	OUTPUT VOLTAGE SETTING[V]		11.75 to 12.25	23.5 to 24.5	47.0 to 49.0
	OVERCURRENT PROTECTION [A]		Works over 105% of rating and recovers automatically		
ISOLATION	OVERVOLTAGE PROTECTION[V]		13.8 to 16.8	27.6 to 33.6	54.0 to 67.2
	OPERATING INDICATION		LED (Green)		
	INPUT-OUTPUT		AC3,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature)		
ENVIRONMENT	INPUT-FG		AC2,000V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (At Room Temperature)		
	OUTPUT-FG		AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (At Room Temperature)		
	OPERATING TEMP.,HUMID. *3		-20 to +70℃, 20-90%RH (Non condensing)		
SAFETY AND EMC	STORAGE TEMP.,HUMID.		-30 to +85℃, 20-90%RH (Non condensing)		
	VIBRATION		10 - 55Hz, 19.6m/s² (2G) , 3minutes period, 60minutes each along Z axis (Non operating.mounted on DIN Rail)		
	IMPACT		196.1m/s² (20G) , 11ms, once each X, Y and Z axis (Packing state)		
OTHERS	AGENCY APPROVALS		UL62368-1, C-UL (equivalent to CAN/CSA-C22.2 No.62368-1) , EN62368-1		
	EMC EMISSION		Complies with CISPR11-B, CISPR32-B, EN55011-B, EN55032-B, FCC Part 15-B, FCC Part 18-B		
	EMC IMMUNITY		Complies with EN61000-4-2, 3, 4, 5, 6, 8, 11		
WARRANTY	HARMONIC ATTENUATOR*4		Complies with IEC61000-3-2 (Class A) No built-in active PFC		
	CASE SIZE/WEIGHT		50×90×90mm (W×H×D) [1.97×3.54×3.54 inches] / 350g max		
	COOLING METHOD		Convection		
	WARRANTY *5		5 years (subject to the operating conditions)		

\*1 Consult us about dynamic load and input response. Measure the output voltage by using the average mode of the tester to deal with the burst operation at low (Io=0~20%typ) load.

\*2 This is the result of measurement of the testing board with capacitors of 47μF and 0.1μF placed at 150 mm from the output terminals by a 20MHz oscilloscope or a ripple-noise meter equivalent to Keisoku-GikenRM104.

When the load factor is low (Io=0~20%typ), the switching power loss is reduced by burst operation, which will cause ripple noise to go beyond the specifications.

\*3 Output power derating is required. Refer to "Derating"

\*4 Please contact us about another class. When two or more units are operating it may not

comply with the IEC61000-3-2. Please contact us for details.

\*5 Consult us about details.

\*6 The listed options may affect the published standard specifications. Please contact us for detailed product specifications and safety approvals.

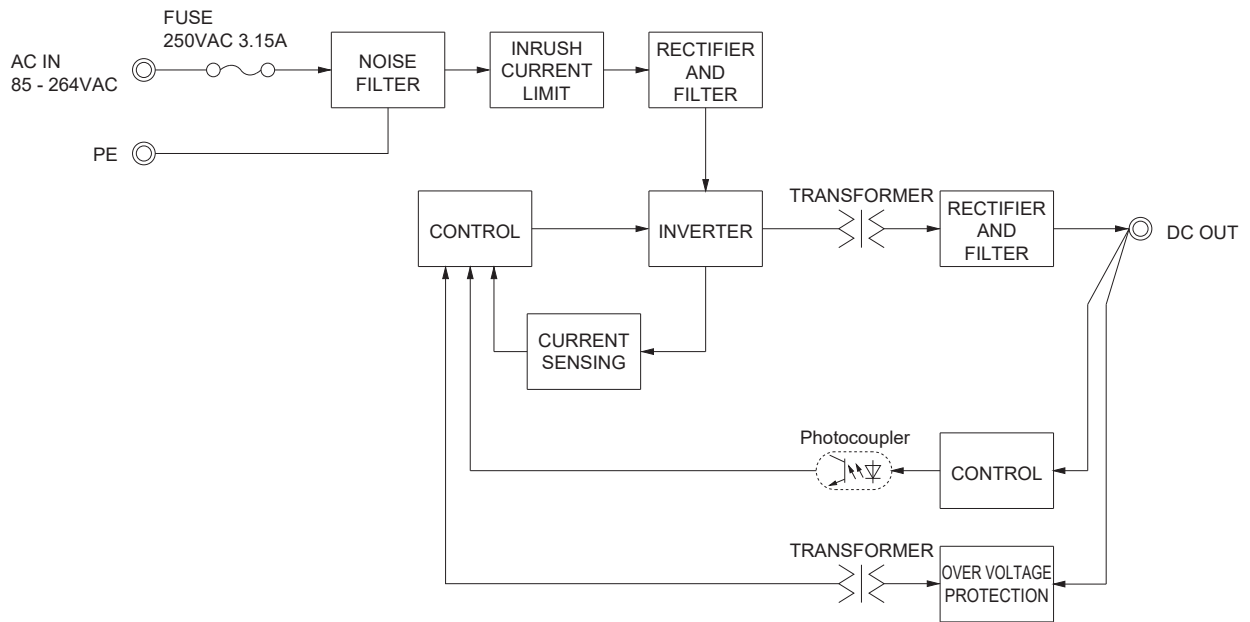
\* All parameters not specially mentioned are measured at ACIN 230V, rated load and 25°C of ambient temperature.

\* Do not use the power supply in overcurrent conditions or in unspecified input voltage ranges. Otherwise the internal components may be damaged.

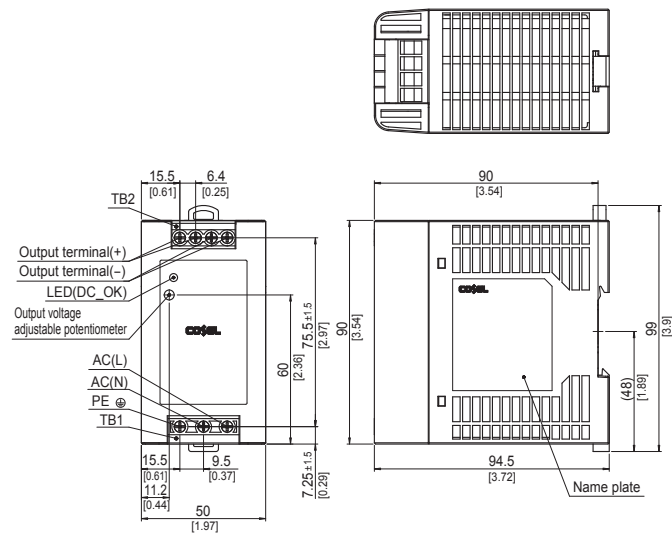
\* Parallel operation is not possible with this model.

\* Acoustic noise may be heard from the power supply when used for pulse load.

## Block diagram



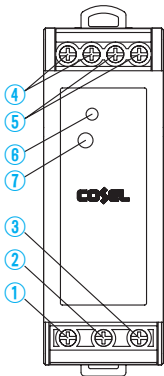
## External view



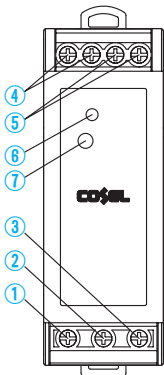
※ Tolerance :  $\pm 1$  [ $\pm 0.04$ ]  
 ※ Weight : 350g max  
 ※ Chassis · Case material : PBT  
 ※ Din rail attachment material : PC/ABS  
 ※ Dimensions in mm, [ ] = inches  
 ※ Screw tightening torque : 1N · m max

Terminal Blocks

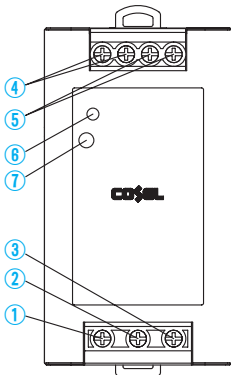
WDA30F



WDA60F



WDA90F



Terminal Number	Terminal Name	Function
①	PE	Protective earth Terminal
②	AC (N)	Input Terminals
③	AC (L)	
④	+VOUT	+Output Terminals
⑤	-VOUT	-Output Terminals
⑥	DC_OK	LED for output voltage confirmation
⑦	TRM	Adjustment of output voltage



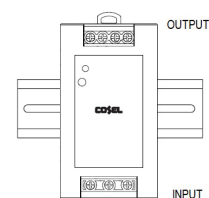
## Assembling and Installation Method

### Installation method

■ About DIN-Rail Attachment available with DIN EN60715 TH 35 (35×7.5mm or 35×15mm) (Top hat shaped DIN rail)

■ Below shows mounting orientation.

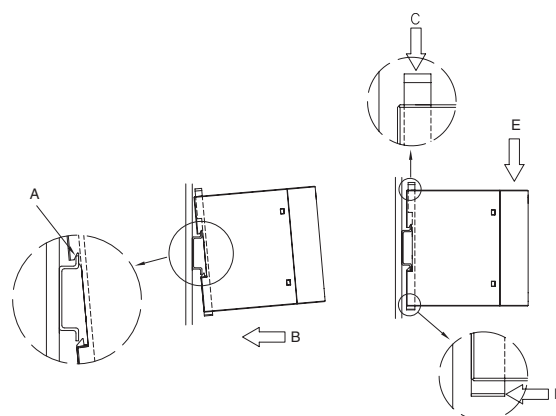
If install other than standard mounting orientation (A), please fix the power supply for withstand the impact and vibration.



(A) Standard

■ When you mount a power supply on a DIN rail, have the area marked A catch one side of the rail and push the unit to the direction of B. To remove the power supply from the rail, either push down the area marked C or insert a tool such as driver to the area marked D and pull the unit apart from the rail.

When you couldn't remove the unit easily, push down the area marked C while lightly pushing the unit to the direction of E.



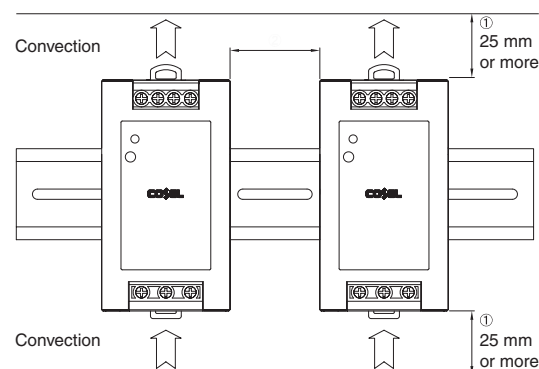
■ Shown below the notes about installation clearance of a unit.

① Installation clearance at above and below the unit.

Please have clearance of at least 25mm above and below the unit to avoid heat accumulation.

② Installation clearance at the side of the unit.

Please have clearance of at least 5mm side the unit to insulating the internal components. However, refer to right figure, if adjacent device of the unit (including power supply) is a heat source.

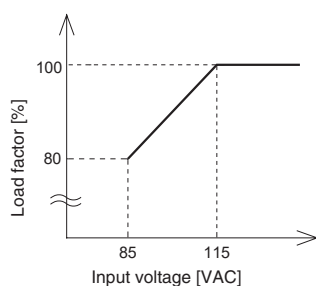


No.	Model	Adjacent device of the unit	
		Non-heat source	Heat source(*)
1	WDA30F/60F/90F	5mm or more	15mm or more

\* Reference value when same power units are adjacent.

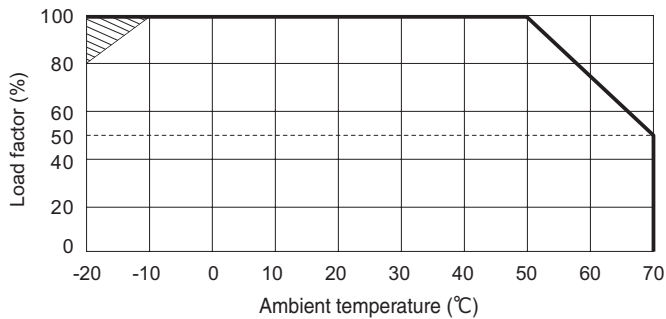
## Derating

### Derating curve for input voltage

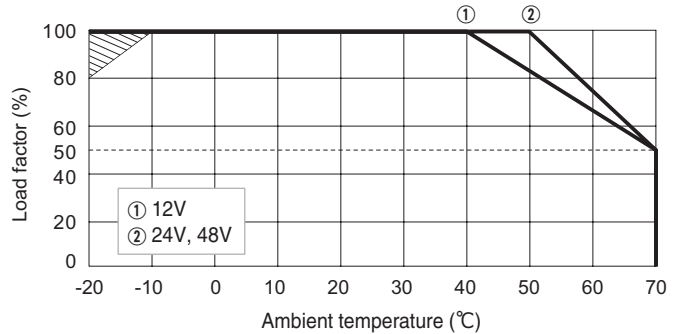


## Derating Curve

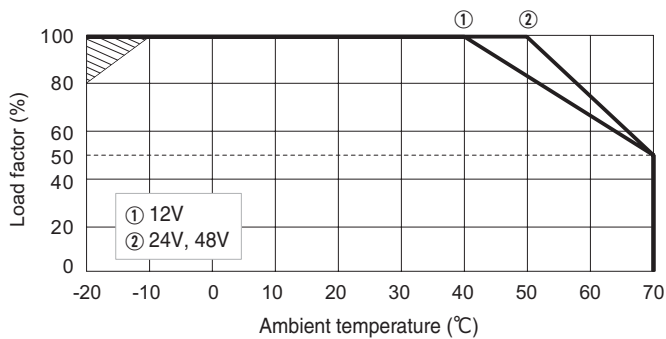
- WDA30F  
Ambient temperature derating curve at rated input



- WDA60F  
Ambient temperature derating curve at rated input



- WDA90F  
Ambient temperature derating curve at rated input



- The ambient temperature should be measured 5 to 10 cm away from the power supply so that it won't be influenced by the heat from the power supply. Please consult us for more details.
- The shaded area is the derating required at start-up.

## Instruction Manual

- ◆ It is necessary to read the “Instruction Manual” and “Before using our product” before you use our product.

Instruction Manual      <https://www.cosel.co.jp/redirect/catalog/en/WDA/>  
 Before using our product      <https://en.cosel.co.jp/technical/caution/index.html>

WDA



NOTICE



## Basic Characteristics Data

Model	Circuit method	Switching frequency [kHz]	Input current [A]	Rated input fuse	Inrush current protection circuit	PCB/Pattern			Parallel operation
						Material	Single sided	Double sided	
WDA30F	Flyback converter	50 to 120	0.6	250V 2.5A	Thermistor	CEM-3/FR4	Yes	Yes	No
WDA60F	Flyback converter	50 to 120	1.2	250V 2.5A	Thermistor	CEM-3/FR4	Yes	Yes	No
WDA90F	Flyback converter	50 to 120	1.8	250V 3.15A	Thermistor	CEM-3/FR4	Yes	Yes	No

\* The value of input current is at ACIN 115V and 100%.

\* Burst operation at light loading, frequency is change by use condition.  
Please contact us about detail.