

# (Specifications)

<b>Product.</b>	SMPS	<b>Date.</b>	2007. 8. 16
<b>Model.</b>	MSF60-S	<b>Rev.</b>	A
<b>Customer.</b>	STANDARD	<b>Page.</b>	1 / 2

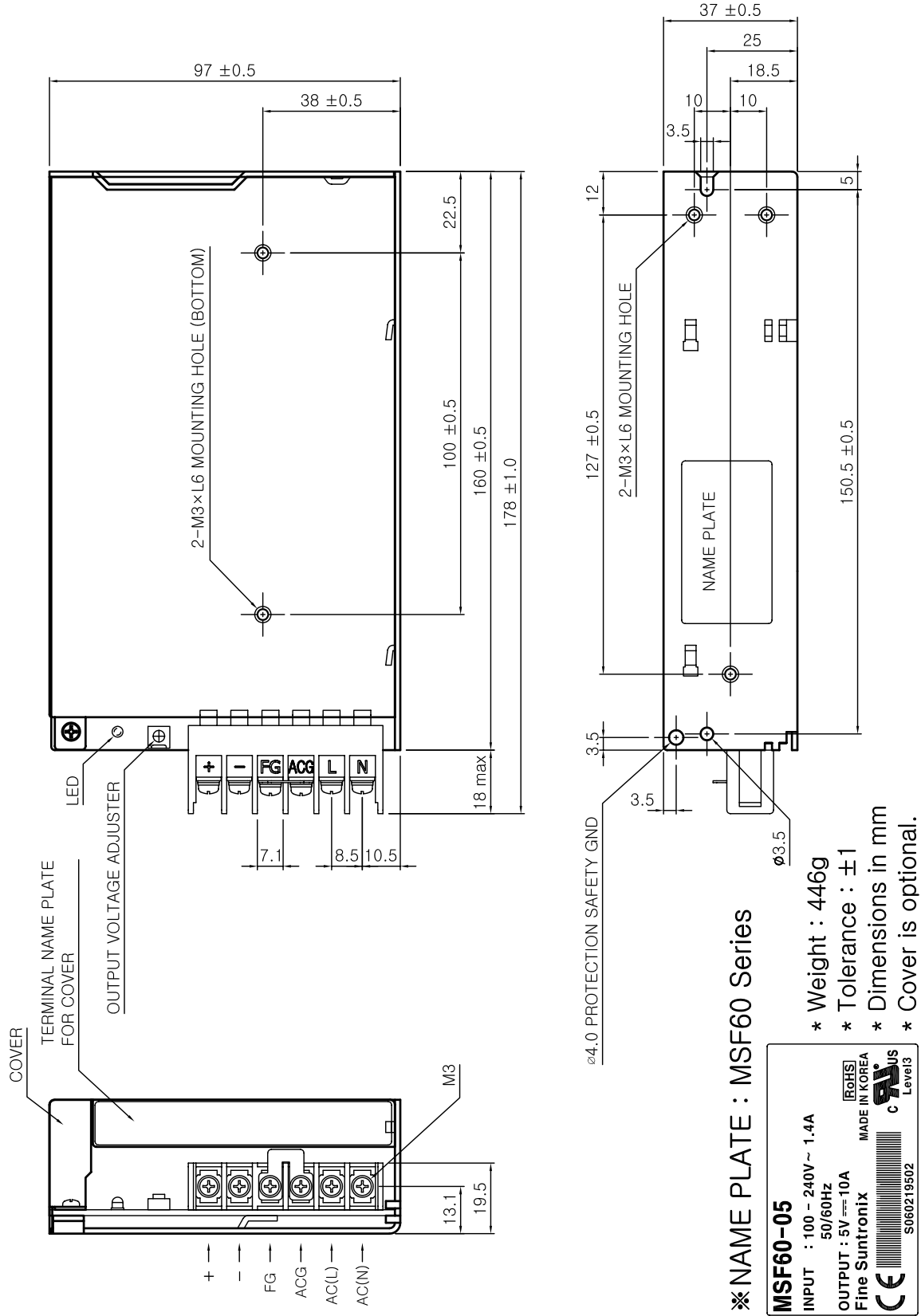
MODEL/CHANNEL		Unit.	3R3	04	05	09	
<b>INPUT</b>	Voltage , Frequency	[V]	AC 100 240 (AC 85 264), 50/60Hz				
	Current	110V	1.7				
	Typ.	220V	0.85				
	Efficiency	220V	67	70	72	75	
	Typ.	220V	-				
	Power factor	220V	-				
<b>OUTPUT</b>	Norminal Voltage	[V]	3.3	4	5	9	
	Setting Voltage Range	[V]	3.27 3.33	3.96 4.04	4.95 5.05	8.91 9.09	
	current	[A]	12	12	12	6.6	
<b>Function</b>	Line Regulations	[mV]	25	25	25	45	
	Load Regulations	[mV]	50	50	50	90	
	Cross Regulations	[mV]	-	-	-	-	
	Temperature Drift	[mV]	50	60	75	135	
	Ripple(pk-pk)	[mV]	50	50	50	90	
	Ripple & Noise(pk-pk)	[mV]	100	100	100	140	
	Turn-on Time max	[ms]	1000 (AC IN 110V, Io = 100%)				
	Hold-up Time typ.	[ms]	16 (AC IN 110V, Io = 100%)				
	<b>Electrical Isolation</b>	Over Voltage Protection	[V]	3.795 4.62	4.6 5.6	5.75 7.0	10.35 12.6
		Over Current Protection	[A]	13.2 17.4	13.2 17.4	13.2 17.4	7.26 9.57
Remote ON.OFF		-	-				
Remote Sensing		-	-				
Power Fail Signal		-	-				
Parallel/Series Operation		-	-				
Cooling / O.T.P		-	-				
<b>Environment</b>	(1) Input - Output	-	AC 3.0KV 1min, cut-off: 20mA / DC 500V 100MΩ				
	(2) Input - F.G	-	AC 2.0KV 1min, cut-off: 20mA / DC 500V 100MΩ				
	(3) Output - F.G	-	AC 0.5KV 1min, cut-off:100mA / DC 500V 100MΩ				
<b>Dimension</b>	Operating temp. & Humidity	-	- 10 50 , 20 90% RH (Non Condensing)				
	Storage temp. & Humidity	-	- 20 75 , 20 90% RH (Non Condensing)				
	Vibration	-	10 55Hz at 1G 3minutes period, 30minutes along X,Y and Z axis				
<b>Safety</b>	Size(WxHxD) / Weight	mm / g	97 x 37 x 178		/ 500		
<b>Emission</b>	Safety Regulation	-	UL, C-UL, CE	UL, C-UL, CE	UL, C-UL, CE	UL, C-UL, CE	
<b>PFHC</b>	Conducted Emission	-	Complied with FCC Part15 and EN55022 Class A Limits				
	-	-	-				

# (Specifications)

<b>Product.</b>	SMPS	<b>Date.</b>	2007. 8. 16
<b>Model.</b>	MSF60-S	<b>Rev.</b>	A
<b>Customer.</b>	STANDARD	<b>Page.</b>	2 / 2

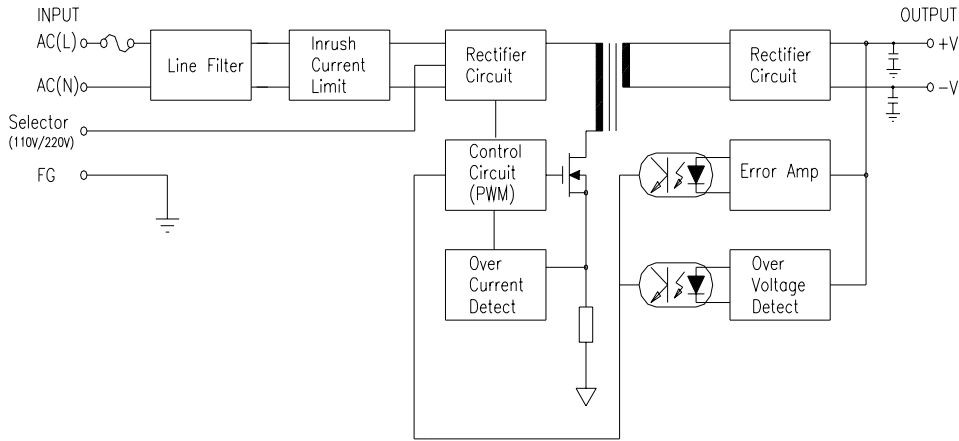
MODEL/CHANNEL		Unit.	10	12	15	24	48
<b>INPUT</b>	Voltage , Frequency	[V]	AC 100 240 (AC 85 264), 50/60Hz				
	Current	110V	1.7				
	Typ.	220V	0.85				
	Efficiency	220V	75	78	78	80	80
	Typ.	220V	-				
	Power factor	220V	-				
<b>OUTPUT</b>	Inrush Current	110V	20 ( Ta=25 , Cold Start )				
	Typ.	220V	40 ( Ta=25 , Cold Start )				
	Leakage Current	220V	3.5				
Max.	220V	3.5					
<b>OUTPUT</b>	Norminal Voltage	[V]	10	12	15	24	48
	Setting Voltage Range	[V]	9.9 10.1	11.88 12.12	14.85 15.15	23.76 24.24	47.52 48.48
	current	[A]	6	5	4	2.5	1.3
	Line Regulations	[mV]	50	60	75	120	240
	Load Regulations	[mV]	100	20	150	240	480
	Cross Regulations	[mV]	-	-	-	-	-
	Temperature Drift	[mV]	150	180	225	360	720
	Ripple(pk-pk)	[mV]	100	120	150	240	480
	Ripple & Noise(pk-pk)	[mV]	150	170	200	290	530
	Turn-on Time max	[ms]	500 (AC IN 110V, Io = 100%)				
	Hold-up Time typ.	[ms]	16 (AC IN 110V, Io = 100%)				
<b>Function</b>	Over Voltage Protection	[V]	11.5 14	13.8 16.8	17.25 21	27.6 33.6	55.2 67.2
	Over Current Protection	[A]	6.6 8.7	5.5 7.25	4.4 5.8	2.75 3.75	1.43 2.08
	Remote ON.OFF	-	-				
	Remote Sensing	-	-				
	Power Fail Signal	-	-				
	Parallel/Series Operation	-	-				
	Cooling / O.T.P	-	-				
<b>Electrical Isolation</b>	(1) Input - Output	-	AC 3.0KV 1min, cut-off: 20mA / DC 500V 100MΩ				
	(2) Input - F.G	-	AC 2.0KV 1min, cut-off: 20mA / DC 500V 100MΩ				
	(3) Output - F.G	-	AC 0.5KV 1min, cut-off:100mA / DC 500V 100MΩ				
<b>Environment</b>	Operating temp. & Humidity	-	- 10 50 , 20 90% RH (Non Condensing)				
	Storage temp. & Humidity	-	- 20 75 , 20 90% RH (Non Condensing)				
	Vibration	-	10 55Hz at 1G 3minutes period, 30minutes along X,Y and Z axis				
<b>Dimension</b>	Size(WxHxD) / Weight	mm / g	178 x 37 x 97		/ 500		
<b>Safety</b>	Safety Regulation	-	UL, C-UL, CE	UL, C-UL, CE	UL, C-UL, CE	UL, C-UL, CE	UL, C-UL, CE
<b>Emission</b>	Conducted Emission	-	Complied with FCC Part15 and EN55022 Class A Limits				
<b>PFHC</b>	-	-	-				

# Dimension



# User's guide

## 1. BLOCK DIAGRAM



## 2. Terminal Connection

Mark	Pin Connection	Function
L	AC L	SMPS AC Terminal ( Fuse in Line)
N	AC N	SMPS AC Terminal
ACG	AC Frame ground	SMPS AC , CASE
F.G	Frame ground	SMPS AC , CASE
+V	DC Output (+)	DC (+) Terminal
-V	DC Output (-)	DC (-) Terminal

## 3. Function

3-1. (Adjustable output voltage range)

o 가 5%

3-2. (O.C.P : Over Current Protection)

o SMPS 가 110%  
o short 가

3-3. ( O.V.P : Over Voltage Protection)

o 115% SMPS  
o AC 3 A/S

# User's guide

## 4. / ( Series operation / Parallel operation)

4-1. A (Fig 1.) B (Fig 2.)

4-2. 가 가 , , SMPS (Fig 4.) 가

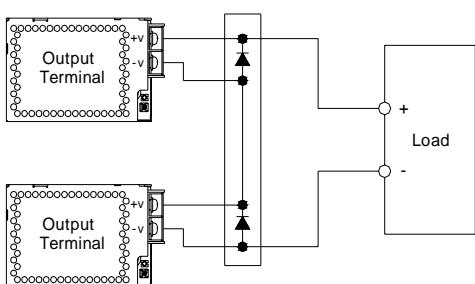


Fig 1. A

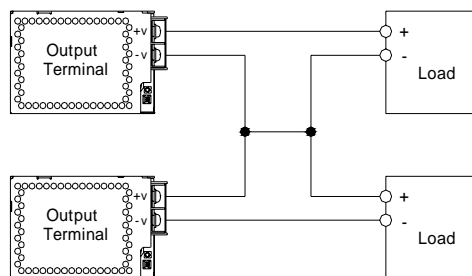


Fig 2. B

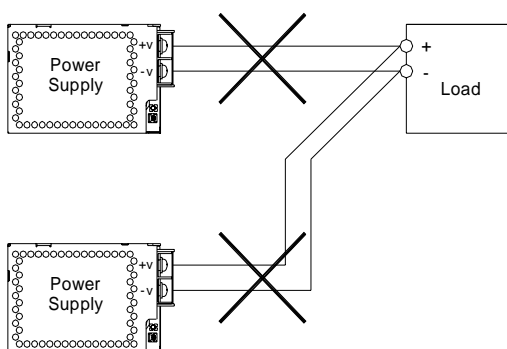


Fig 3. A ( 가)

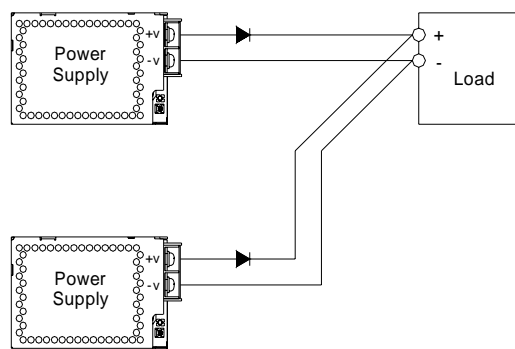


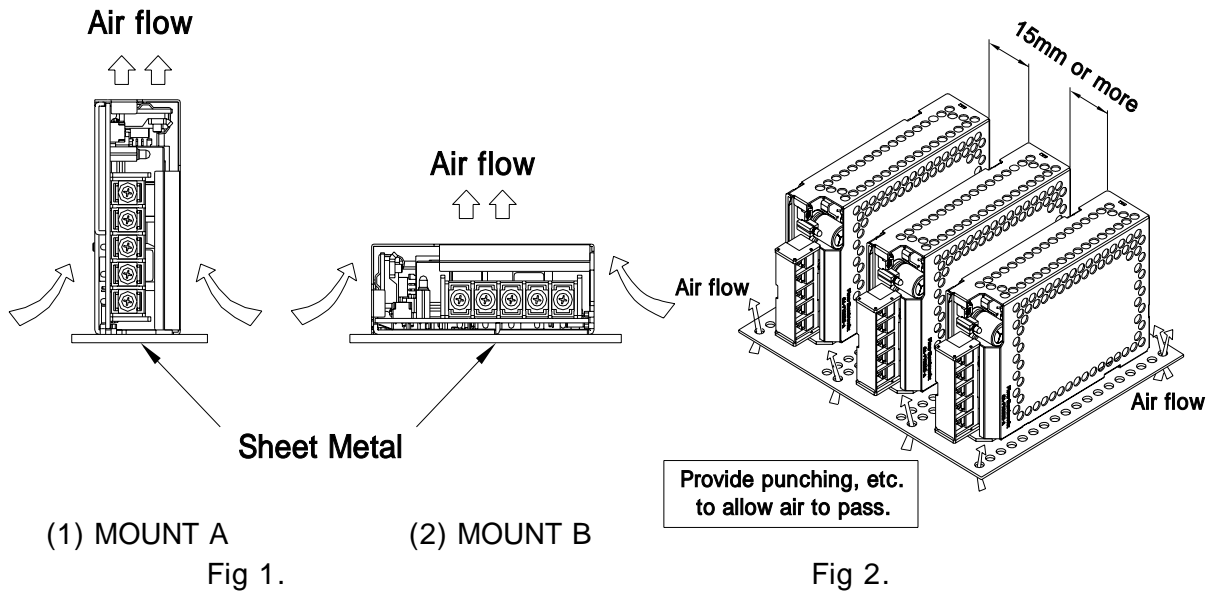
Fig 4. B (Back up )

# User's guide

## 5. (Mounting method)

5-1.

o  
o  
o

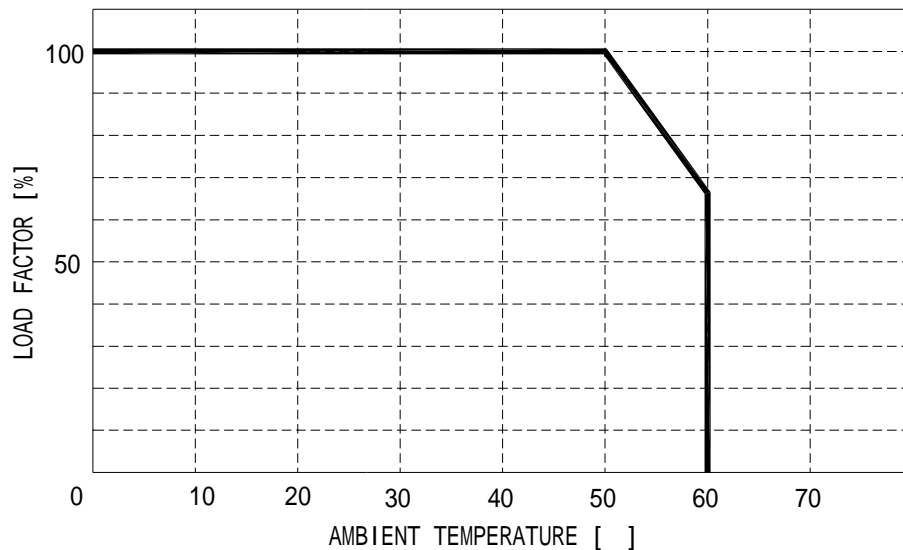


## 6. Output derating curve

6-1. (Mount A, Mount B) TOP CASE output derating curve

6-2. Output derating curve ( Mount A, Mount B, Convection Cooling )

6-2-1. MSF60-S



# User's guide

---

7.

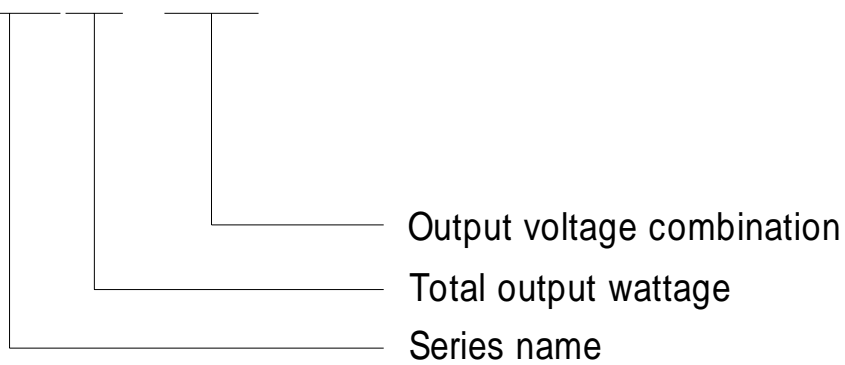
- 
- 가
- 가
- - 가
  - 가
  - 가
  - 가
  - 가
  - 가

8.

- , ,
- 2 ,

## 9. ORDERING INFORMATION

**MSF60- 3R3**



---

## INPUT ( )

- o Input Voltage ( ): AC( ) (110VAC, 220VAC ) DC( )  
(5VDC, 12VDC )
- o Input Current ( ): 가
- o Input Wattage ( ): SMPS
- o Input Frequency ( ): AC( ) 50Hz, 60Hz( 60Hz)
- o Input Efficiency ( ):
- o Inrush Current ( ):
- o Leakage Current ( ): 1 Capacitor
- o Power Factor ( ):

## OUTPUT ( )

- o Output Voltage ( ): DC( )
- o Output Current ( ): DC( )
- o Output Wattage ( ): SMPS가 DC ( X )
- o Line Regulation ( ): AC( ) DC( )  
DC( )
- o Load Regulation ( ): min~100% DC( )
- o Cross Regulation ( ): SMPS min~100%  
DC( )
- o Temperature Drift ( ): SMPS DC( )
- o Ripple & Noise ( ): DC( )
- o Turn on Time ( ): DC( ) 90%
- o Hold up Time ( ): DC( ) 90%



---

**FUNCTION ( )**

o Over Current Protection (OCP, ) : SMPS  
SMPS

o Over Voltage Protection (OVP, ) : SMPS가 DC( )  
SMPS가 DC( )

o Over Temperature Protection (OTP, ) : SMPS 가

o Remote ON/OFF (RC or CNT, ) : SMPS ON/OFF

o Remote Sensing (+S, -S, ) : SMPS 가

o Load Detect (LD, ) :

o Adjustable Output Voltage (V.R, ) : SMPS  
가 TRM

o Power Fail Signal (P.F, )

1) P.F : 가

2) P.F : SMPS

o Low Voltage alarm (LV alarm, ) : SMPS

o Power alarm (PR alarm, ) : SMPS AC , FAN  
(P.F, LV alarm, FAN alarm )

o Parallel / Series Operation ( / ) : SMPS  
가

o Voltage Balance (VB, ) : 가

o Current Balance (CB, ) : 가  
가

o Frame Gnd(FG), AC Gnd(ACG) : Frame Ground, AC Ground

---

**ELECTRICAL ISOLATION ( )**

o Electrically Isolated Input-Output ( - ) : AC( )  
DC( ) .

o Electrically Isolated Input-Case, FG ( - , ) : AC( )  
,

o Electrically Isolated Output-Case, FG ( - , ) : DC( )  
.

**ENVIRONMENT ( )**

o Operating Temp and Humidity ( & ) : SMPS  
.

o Storage Temp and Humidity ( & ) : SMPS ,  
.

o Vibration ( ) : SMPS가 .

**ETC ( )**

o Safety ( ) :

o Safety Regulation ( ) :

o Line Conducted RF Voltage ( ) : .