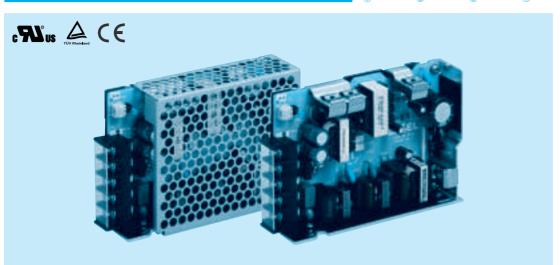
### PBA50F

**50** 



- (1)Series name
- ②Output wattage 3 Universal input
- 4 Output voltage

- © Optional
  C:with Coating
  G:Low leakage current
  (0.15mA max / ACIN 240V)
- E:Low leakage current and EMI class A (0.5mA max / ACIN 240V) T:Vertical terminal block
- J :Connector type R:with Remote ON/OFF

- N :with Cover (Only 24V UL508 is acquired) N1 :with DIN rail V :Output voltage setting potentiometer external-

Specification is changed at option. Please consult us

MODEL	PBA50F-3R3	PBA50F-5	PBA50F-9	PBA50F-12	PBA50F-15	PBA50F-24	PBA50F-36	PBA50F-48
MAX OUTPUT WATTAGE[W]	33	50	50.4	51.6	52.5	52.8	50.4	52.8
DC OUTPUT	3.3V 10A	5V 10A	9V 5.6A	12V 4.3A	15V 3.5A	24V 2.2A	36V 1.4A	48V 1.1A

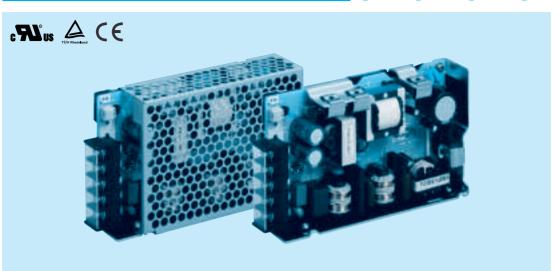
	MODEL		PBA50F-3R3	PBA50F-5	PBA50F-9	PBA50F-12	PBA50F-15	PBA50F-24	PBA50F-36	PBA50F-48		
	VOLTAGE[V]			or DC120 - 37	0 (AC50 or DC7	optionally avail	able *4)					
	CURRENT[A]	ACIN 100V	0.5typ	0.7typ								
	CURRENT[A]	ACIN 200V	0.3typ	0.4typ								
	FREQUENCY[Hz]		50/60 (47 - 63)									
	EEEIGIENGVIII/I	ACIN 100V	75typ	80typ	79typ	80typ	81typ	82typ	83typ	83typ		
INPUT	EFFICIENCY[%]	ACIN 200V	76typ	82typ	81typ	82typ	83typ	84typ	85typ	85typ		
	POWER FACTOR(Io=100%)	ACIN 100V	0.98typ	0.99typ								
	POWER FACTOR(IO=100%)	ACIN 200V	0.87typ	0.93typ								
	INRUSH CURRENT[A]	ACIN 100V	15typ (lo=100%	(a) (At cold start)								
	INKUSH CUKKENI[A]	ACIN 200V	30typ (lo=100%	(At cold start)								
	LEAKAGE CURRENT[r	nA]	0.4/0.75max (A	CIN 100V/240V	60Hz, lo=100%	According to IE	C60950-1)					
	VOLTAGE[V]		3.3	5	9	12	15	24	36	48		
	CURRENT[A]		10	10	5.6	4.3	3.5	2.2	1.4	1.1		
	LINE REGULATION[m\	/]	20max	20max	36max	48max	60max	96max	144max	192max		
	LOAD REGULATION[m	ıV]	40max	40max	100max	100max	120max	150max	240max	240max		
	RIPPLE[mVp-p]	0 to +50°C *1	80max	80max	120max	120max	120max	120max	150max	150max		
	KIPPLE[MVp-p]	-10 - 0°C <b>*</b> 1	140max	140max	160max	160max	160max	160max	200max	200max		
	DIDDLE MOIOEFV1	0 to +50°C *1	120max	120max	150max	150max	150max	150max	250max	250max		
OUTPUT	RIPPLE NOISE[mVp-p]	-10 - 0℃ *1	160max	160max	180max	180max	180max	180max	300max	300max		
	TEMPERATURE REQUILATIONS AND	0 to +50℃	50max	50max	90max	120max	150max	240max	360max	480max		
	TEMPERATURE REGULATION[mV]	-10 to +50°C	60max	60max	120max	150max	180max	290max	450max	600max		
	DRIFT[mV]	*2	20max	20max	36max	48max	60max	96max	144max	192max		
				00V, Io=100%)								
	HOLD-UP TIME[ms]		20typ (ACIN 100V, Io=100%)									
	OUTPUT VOLTAGE ADJUSTMENT	T RANGE[V]	2.85 - 3.63	4.00 - 5.50	7.50 - 10.0	10.0 - 13.2	13.2 - 18.0	19.2 - 27.0	28.8 - 39.6	39.0 - 53.0		
	OUTPUT VOLTAGE SET		3.20 - 3.40	4.90 - 5.20	8.70 - 9.30	11.5 - 12.5	14.5 - 15.5	23.5 - 24.5	35.5 - 36.5	47.0 - 49.0		
	OVERCURRENT PROT			% of rated curre	ent and recovers	automatically						
PROTECTION CIRCUIT AND	OVERVOLTAGE PROTEC	TION[V]	4.00 - 5.25	5.75 - 7.00	11.5 - 14.0	15.0 - 18.0	20.0 - 25.0	30.0 - 37.0	43.0 - 50.0	58.0 - 65.0		
OTHERS	OPERATING INDICATION	ON	LED (Green)									
	REMOTE ON/OFF			ired external por								
	INPUT-OUTPUT · RC	*3					(At Room Temp					
ISOLATION	INPUT-FG						(At Room Temp					
	OUTPUT · RC-FG	*3					At Room Tempe					
	OPERATING TEMP.;HUMID.AND	ALTITUDE			<u> </u>	·	g) 3,000m (10,00	00feet) max				
ENVIRONMENT	STORAGE TEMP.,HUMID.AND	ALTITUDE			n condensing) 3,							
LIVINONIILIVI	VIBRATION						ong X, Y and Z a	axis				
	IMPACT				each X, Y and Z							
CAFETY AND	AGENCY APPROVALS						s with DEN-AN		ut)			
NOISE	CONDUCTED NOISE					PR22-B, EN550	11-B, EN55022-	В				
REGULATIONS	CE MARKING		Low Voltage Directive, EMC Directive									
	HARMONIC ATTENUAT	ror	Complies with									
OTHERS	CASE SIZE/WEIGHT			m (without termi	nal block) (WXI	1×D) / 280g ma	ax (without cover	r)				
O.HERO	COOLING METHOD		Convection									

- Measured by 20MHz oscilloscope or Ripple-Noise meter(equivalent to KEISOKU-GIKEN : RM101).
- \*2 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25°C.
- \*3 Applicable when Remote ON/OFF(optional) is added. RC is insulated with input, output and FG.
- \*4 Derating is required. Consult us for details.

- Parallel operation with other model is not possible
- Derating is required when operated with cover.
- A sound may occur from power supply at peak loading.

### PBA75F

PBA 75 F -5



- (1)Series name
- ②Output wattage
- 3 Universal input Output voltage

- © Optional
  C:with Coating
  G:Low leakage current
  (0.15mA max / ACIN 240V)
- (0.13th Hax / Acin 240V)
  E :Low leakage current
  and EMI class A
  (0.5mA max / ACIN 240V)
  T :Vertical terminal block
- J :Connector type R:with Remote ON/OFF

- N :with Cover (Only 24V UL508 is acquired) N1: with DIN rail V :Output voltage setting potentiometer external-

Specification is changed at option. Please consult us

MODEL	PBA75F-3R3	PBA75F-5	PBA75F-9	PBA75F-12	PBA75F-15	PBA75F-24	PBA75F-36	PBA75F-48
MAX OUTPUT WATTAGE[W]	49.5	75	75.6	75.6	75	76.8	75.6	76.8
DC OUTPUT	3.3V 15A	5V 15A	9V 8.4A	12V 6.3A	15V 5A	24V 3.2A	36V 2.1A	48V 1.6A

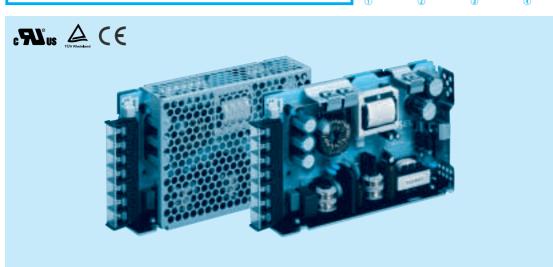
	MODEL		PBA75F-3R3	PBA75F-5	PBA75F-9	PBA75F-12	PBA75F-15	PBA75F-24	PBA75F-36	PBA75F-48		
	VOLTAGE[V]		AC85 - 264 1 ¢	or DC120 - 37	0 (AC50 or DC7	0 optionally avail	able *4)					
	CURRENT[A]	ACIN 100V	0.7typ	1.0typ								
	CURRENT[A]	ACIN 200V	0.4typ	0.5typ								
	FREQUENCY[Hz]		50/60 (47 - 63)									
	EFFICIENCY[%]	ACIN 100V		81typ	80typ	81typ	82typ	83typ	84typ	84typ		
INPUT	EFFICIENCI[///	ACIN 200V	78typ	83typ	82typ	83typ	84typ	85typ	86typ	86typ		
	POWER FACTOR(Io=100%)	ACIN 100V		0.99typ								
	POWER PACTOR(IO=10070)	ACIN 200V		0.93typ								
	INRUSH CURRENT[A]		15typ (lo=100%									
			30typ (Io=100%									
	LEAKAGE CURRENT[r	nA]				According to IE						
	VOLTAGE[V]		3.3	5	9	12	15	24	36	48		
	CURRENT[A]		15	15	8.4	6.3	5	3.2	2.1	1.6		
	LINE REGULATION[m\		20max	20max	36max	48max	60max	96max	144max	192max		
	LOAD REGULATION[m		40max	40max	100max	100max	120max	150max	240max	240max		
	RIPPLE[mVp-p]	0 to +50°C *1	80max	80max	120max	120max	120max	120max	150max	150max		
		-10 - 0℃ *1	140max	140max	160max	160max	160max	160max	200max	200max		
	RIPPLE NOISE[mVp-p]	0 to +50°C *1	120max	120max	150max	150max	150max	150max	250max	250max		
OUTPUT		-10 - 0℃ *1	160max	160max	180max	180max	180max	180max	300max	300max		
	TEMPERATURE REGULATION[mV]			50max	90max	120max	150max	240max	360max	480max		
		-10 to +50℃ *2	60max	60max	120max	150max	180max	290max	450max	600max		
	DRIFT[mV]	20max	20max	36max	48max	60max	96max	144max	192max			
	START-UP TIME[ms]		350typ(ACIN 100V, Io=100%) 20typ (ACIN 100V, Io=100%)									
	HOLD-UP TIME[ms]	- DANGERS	2.85 - 3.63		7.50 - 10.0	100 100	13.2 - 18.0	100 070	T 00 0 00 0	1000 500		
	OUTPUT VOLTAGE ADJUSTMENT	- 11		4.00 - 5.50 4.90 - 5.20	8.70 - 9.30	10.0 - 13.2		19.2 - 27.0	28.8 - 39.6	39.0 - 53.0		
	OUTPUT VOLTAGE SET OVERCURRENT PROT		3.20 - 3.40		ent and recovers	11.5 - 12.5	14.5 - 15.5	23.5 - 24.5	35.5 - 36.5	47.0 - 49.0		
PROTECTION	OVERVOLTAGE PROTECT		4.00 - 5.25	5.75 - 7.00	11.5 - 14.0	15.0 - 18.0	20.0 - 25.0	30.0 - 37.0	43.0 - 50.0	58.0 - 65.0		
CIRCUIT AND	OPERATING INDICATION		4.00 - 5.25 LED (Green)	3.75 - 7.00	11.5 - 14.0	15.0 - 16.0	20.0 - 25.0	30.0 - 37.0	43.0 - 50.0	36.0 - 65.0		
OTHERS	REMOTE ON/OFF	JN	, ,	ired external por	wor course)							
	INPUT-OUTPUT · RC	*3				500V 50MΩmin	(At Poom Tomp	erature)				
ISOLATION	INPUT-FG	40				500V 50MΩmin						
IOOLATION	OUTPUT · RC-FG	*3				00V 50MΩmin						
	OPERATING TEMP.;HUMID.AND	ALTITUDE				(Non condensing						
	STORAGE TEMP., HUMID.AND				<u>o</u> .	000m (10,000fe	<u> </u>	ocioci, max				
ENVIRONMENT	VIBRATION					minutes each ale		axis				
	IMPACT				each X, Y and Z		<u> </u>					
	AGENCY APPROVALS		UL60950-1, C-	UL(CSA60950-1	), EN60950-1, E	N50178 Complie	es with DEN-AN	(At only AC inp	ut)			
SAFETY AND	CONDUCTED NOISE					SPR22-B, EN550						
NOISE REGULATIONS	CE MARKING		Low Voltage Di	rective, EMC Dir	rective							
	HARMONIC ATTENUAT	ror	Complies with	EC61000-3-2								
OTHERS	CASE SIZE/WEIGHT		32 × 82 × 135m	m (without termi	nal block) (WXI	HXD) / 350g m	ax (without cove	r)				
OTHERS	COOLING METHOD		Convection									

- Measured by 20MHz oscilloscope or Ripple-Noise meter(equivalent to KEISOKU-GIKEN : RM101).
- \*2 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25°C.
- \*3 Applicable when Remote ON/OFF(optional) is added. RC is insulated with input, output and FG.
- \*4 Derating is required. Consult us for details.

- Parallel operation with other model is not possible
- Derating is required when operated with cover.
- A sound may occur from power supply at peak loading.

## **PBA100F**

PBA 100 F -5



- (1)Series name
- 2)Output wattage
- 3 Universal input Output voltage

- © Optional
  C:with Coating
  G:Low leakage current
  (0.15mA max / ACIN 240V)
- (0.5mA max / ACIN 240V)
  E :Low leakage current
  and EMI class A
  (0.5mA max / ACIN 240V)
  T :Vertical terminal block
- J :Connector type (Only -12,-15,-24,-36,-48) R :with Remote ON/OFF

- N :with Cover (Only 24V UL508 is acquired) N1 :with DIN rail
- V :Output voltage setting potentiometer external-

Specification is changed at option. Please consult us details.

MODEL	PBA100F-3R3	PBA100F-5	PBA100F-9	PBA100F-12	PBA100F-15	PBA100F-24	PBA100F-36	PBA100F-48
MAX OUTPUT WATTAGE[W]	66	100	94.5	102	105	108	100.8	100.8
DC OUTPUT	3.3V 20A	5V 20A	9V 10.5A	12V 8.5A	15V 7A	24V 4.5A	36V 2.8A	48V 2.1A

	MODEL		PBA100F-3R3	PBA100F-5	PBA100F-9	PBA100F-12	PBA100F-15	PBA100F-24	PBA100F-36	PBA100F-48	
	VOLTAGE[V]		AC85 - 264 1 ¢	or DC120 - 37	0 (AC50 or DC7	optionally avail	able *4)				
		ACIN 100V	0.9typ	1.3typ	,	·	,				
	CURRENT[A]	ACIN 200V		0.7typ							
	FREQUENCY[Hz]		50/60 (47 - 63)	71							
		ACIN 100V	77typ	82typ	80typ	81typ	83typ	84typ	84typ	84typ	
NPUT	EFFICIENCY[%]	ACIN 200V	79typ	84typ	82typ	83typ	86typ	86typ	86typ	86typ	
	DOWED FACTOR/L- 4000/	ACIN 100V	0.98typ	0.99typ							
	POWER FACTOR(Io=100%)	ACIN 200V	0.87typ	0.93typ							
	INRUSH CURRENT[A]	ACIN 100V	20typ (lo=100%	(At cold start)							
	INKUSH CUKKENT[A]	ACIN 200V	40typ (lo=100%	6) (At cold start)							
	LEAKAGE CURRENT[I	nA]	0.4/0.75max (A	CIN 100V/240V	60Hz, lo=100%	According to IE	C60950-1)				
	VOLTAGE[V]		3.3	5	9	12	15	24	36	48	
	CURRENT[A]		20	20	10.5	8.5	7	4.5	2.8	2.1	
	LINE REGULATION[m)	/]	20max	20max	36max	48max	60max	96max	144max	192max	
	LOAD REGULATION[m		40max	40max	100max	100max	120max	150max	240max	240max	
	RIPPLE[mVp-p]	0 to +50°C *1	80max	80max	120max	120max	120max	120max	150max	150max	
	I ZZ[IIIVP P]	-10 - 0℃ *1		140max	160max	160max	160max	160max	200max	200max	
	RIPPLE NOISE[mVp-p]	0 to +50°C *1		120max	150max	150max	150max	150max	250max	250max	
1		-10 - 0℃ *1	160max	160max	180max	180max	180max	180max	300max	300max	
	TEMPERATURE REGULATION[mV]		50max	50max	90max	120max	150max	240max	360max	480max	
		-10 to +50℃		60max	120max	150max	180max	290max	450max	600max	
	DRIFT[mV]	*2	20max	20max	36max	48max	60max	96max	144max	192max	
	START-UP TIME[ms]		350typ(ACIN 10								
	HOLD-UP TIME[ms]		20typ (ACIN 10		T	T		T		T	
	OUTPUT VOLTAGE ADJUSTMEN			4.00 - 5.50	7.50 - 10.0	10.0 - 13.2	13.2 - 18.0	19.2 - 27.0	28.8 - 39.6	39.0 - 53.0	
	OUTPUT VOLTAGE SET			4.90 - 5.20	8.70 - 9.30	11.5 - 12.5	14.5 - 15.5	23.5 - 24.5	35.5 - 36.5	47.0 - 49.0	
	OVERCURRENT PROT								100 500	T=0.0 0= 0	
PROTECTION			4.00 - 5.25	5.75 - 7.00	11.5 - 14.0	15.0 - 18.0	20.0 - 25.0	30.0 - 37.0	43.0 - 50.0	58.0 - 65.0	
CIRCUIT AND OTHERS	REMOTE SENSING	ON	LED (Green)	-3R3, -5 Option	14)						
	REMOTE ON/OFF			ired external por							
	INPUT-OUTPUT · RC	4.0				FOOV FOM O min	(At Room Temp	aratura)			
SOLATION	INPUT-FG	本の					(At Room Temp				
SOLATION	OUTPUT · RC-FG	<b>4</b> 3					(At Room Tempe				
	OPERATING TEMP. HUMID. AND	ALTITUDE					g) 3,000m (10,00				
	STORAGE TEMP.,HUMID.AND					000m (10,000fe		Joieet) Illax			
ENVIRONMENT	VIBRATION	ALITIODE					ong X, Y and Z a	avis			
	IMPACT				each X, Y and Z		ong X T und 2 t	axio			
	AGENCY APPROVALS						es with DEN-AN	(At only AC inpu	ıt)		
SAFETY AND									-/		
NOISE REGULATIONS	0= 111 51/1110		Complies with FCC Part15 classB, VCCI-B, CISPR22-B, EN55011-B, EN55022-B  Low Voltage Directive, EMC Directive								
KLOULATIONS	HARMONIC ATTENUAT	ГOR	Complies with								
OTHERS	CASE SIZE/WEIGHT				inal block) (W x I	1×D) / 440a ma	ax (without cover	r)			
	COOLING METHOD		Convection		, , , , , , , , , , , , , , ,			*			

- Measured by 20MHz oscilloscope or Ripple-Noise meter(equivalent to KEISOKU-GIKEN : RM101).
- \*2 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25°C. \*3 Applicable when Remote ON/OFF(optional) is added. RC is insulated with input, output and FG.
- \*4 Derating is required. Consult us for details.

- Parallel operation with other model is not possible
- Derating is required when operated with cover
- A sound may occur from power supply at peak loading.

# **PBA150F**

PBA 150 F -5



- (1)Series name
- ②Output wattage
- 3 Universal input Output voltage

- © Optional
  C:with Coating
  G:Low leakage current
  (0.15mA max / ACIN 240V)
- (0.5mA max / ACIN 240V)
  E :Low leakage current
  and EMI class A
  (0.5mA max / ACIN 240V)
  T :Vertical terminal block
- J :Connector type (Only -12,-15,-24,-36,-48) R :with Remote ON/OFF

- N :with Cover (Only 24V UL508 is acquired) N1 :with DIN rail
- V :Output voltage setting potentiometer external-

Specification is changed at option. Please consult us details.

MODEL	PBA150F-3R3	PBA150F-5	PBA150F-9	PBA150F-12	PBA150F-15	PBA150F-24	PBA150F-36	PBA150F-48
MAX OUTPUT WATTAGE[W]	99	150	150.3	156	150	156	154.8	158.4
DC OUTPUT	3.3V 30A	5V 30A	9V 16.7A	12V 13A	15V 10A	24V 6.5A	36V 4.3A	48V 3.3A

INPUT  POWER FAI  INRUSH (INCLUSION OF TAILS)  LEAKAGI VOLTAGE CURREN LINE REC LOAD RE RIPPLE IN  TEMPERATUR DRIFT[IM] START-UI HOLD-UF OUTPUT OVERCUL PROTECTION CIRCUIT AND OPERATI	NT[A] ENCY[Hz] ENCY[%] FACTOR(Io=100%) H CURRENT[A] GE CURRENT[ GE[V]	ACIN 200V	1.3typ 0.7typ 50/60 (47 - 63) 80typ 82typ 0.98typ 0.87typ	or DC120 - 370 2.0typ 1.0typ 83typ 86typ 0.99typ	82typ 85typ		able *4)							
INPUT  EFFICIEN  POWER FA  INRUSH O  LEAKAGG  VOLTAGE CURREN LINE REC LOAD RE  RIPPLE IN  TEMPERATUR  DRIFT[Im' START-UI HOLD-UF OUTPUT OUTPUT OUTPUT  OVERCU PROTECTION OVERVOL CIRCUIT AND OPERATI	ENCY[Hz] ENCY[%] FACTOR(Io=100%) I CURRENT[A] GE CURRENT[ SE[V] NT[A]	ACIN 200V  ACIN 100V  ACIN 200V  ACIN 100V  ACIN 200V  ACIN 100V  ACIN 200V	0.7typ 50/60 (47 - 63) 80typ 82typ 0.98typ 0.87typ	1.0typ 83typ 86typ		004:								
INPUT  EFFICIEN  POWER FA  INRUSH (  LEAKAGI  VOLTAGE  CURREN  LINE REC  LOAD RE  RIPPLE IN  TEMPERATUR  DRIFT[m'  START-UI  HOLD-UF  OUTPUT OUTPUT VOL  OUTPUT OUTPUT VOL  OUTPUT OUTPUT VOL  OUTPUT (  OUTPUT VOL  OUTPUT (  OUT	ENCY[Hz] ENCY[%] FACTOR(Io=100%) I CURRENT[A] GE CURRENT[ SE[V] NT[A]	ACIN 100V ACIN 200V ACIN 100V ACIN 200V ACIN 100V ACIN 200V	50/60 (47 - 63) 80typ 82typ 0.98typ 0.87typ	83typ 86typ		004								
INPUT  POWER FAI  INRUSH (INCUSH (INCU	ENCY[%]  FACTOR(Io=100%)  I CURRENT[A]  GE CURRENT[ GE[V]  NT[A]	ACIN 200V ACIN 100V ACIN 200V ACIN 100V ACIN 200V	80typ 82typ 0.98typ 0.87typ	86typ		004								
POWER FA  INRUSH O  LEAKAGI  VOLTAGE  CURREN  LINE REC  LOAD RE  RIPPLE[r  RIPPLE]r  OUTPUT  DRIFT[m'  START-UI  HOLD-UF  OUTPUT VOL  OUTPUT  OVERCU  PROTECTION OVERVOL  CIRCUIT AND OPERATI	FACTOR(Io=100%) I CURRENT[A] GE CURRENT[ GE[V] NT[A]	ACIN 200V ACIN 100V ACIN 200V ACIN 100V ACIN 200V	82typ 0.98typ 0.87typ	86typ		0.04								
POWER FA  INRUSH O  LEAKAGI  VOLTAGE  CURREN  LINE REC  LOAD RE  RIPPLE[r  RIPPLE]r  OUTPUT  DRIFT[m'  START-UI  HOLD-UF  OUTPUT VOL  OUTPUT  OVERCU  PROTECTION OVERVOL  CIRCUIT AND OPERATI	FACTOR(Io=100%) I CURRENT[A] GE CURRENT[ GE[V] NT[A]	ACIN 100V ACIN 200V ACIN 100V ACIN 200V	0.98typ 0.87typ		85tvn	83typ	84typ	85typ	85typ	85typ				
OUTPUT  INRUSH (  LEAKAGI  VOLTAGE CURREN LINE REC LOAD RE RIPPLE IN  TEMPERATUR  DRIFT[m' START-UI HOLD-UF OUTPUT VOL OUTPUT OVERCU PROTECTION OVERCU CIRCUIT AND OPERATI	I CURRENT[A] GE CURRENT[ GE[V] NT[A]	ACIN 200V ACIN 100V ACIN 200V	0.87typ	0.99tvp	OStyp	86typ	87typ	88typ	88typ	88typ				
OUTPUT  INRUSH (  LEAKAGI  VOLTAGE CURREN LINE REC LOAD RE RIPPLE IN  TEMPERATUR  DRIFT[m' START-UI HOLD-UF OUTPUT VOL OUTPUT OVERCU PROTECTION OVERCU CIRCUIT AND OPERATI	I CURRENT[A] GE CURRENT[ GE[V] NT[A]	ACIN 100V ACIN 200V												
OUTPUT  OUTPUT  DRIFT[m' START-U  HOLD-UF OUTPUT OVERCU  PROTECTION OVERVOL CIRCUIT AND OPERATIR	GE CURRENT[ BE[V] NT[A]	ACIN 200V	00: /: 1	0.93typ										
OUTPUT  OUTPUT  DRIFT[m' START-U  HOLD-UF OUTPUT OVERCU  PROTECTION CIRCUIT AND OPERATIR	GE CURRENT[ BE[V] NT[A]	ACIN 200V	20typ (Io=100%	(At cold start)										
OUTPUT  OUTPUT    Comparison	SE[V] NT[A]	mA1	40typ (lo=100%	6) (At cold start)										
OUTPUT  OUTPUT  RIPPLE N  TEMPERATUR  DRIFT[m' START-UI HOLD-UF OUTPUT VOL OUTPUT  PROTECTION OVERCU PROTECTION OPERATI	NT[A]		0.4/0.75max (A	CIN 100V/240V	60Hz, lo=100%	According to IE	C60950-1)							
OUTPUT  OUTPUT  RIPPLE IN  TEMPERATUR  DRIFT[m' START-UI HOLD-UF OUTPUT VOI OUTPUT OVERCU PROTECTION CIRCUIT AND OPERATI			3.3	5	9	12	15	24	36	48				
OUTPUT  OUTPUT  RIPPLE IN  TEMPERATUR  DRIFT[Im' START-UI HOLD-UF OUTPUT VOL UPPUT VOL VERCU PROTECTION CIRCUIT AND OPERATI	EGIII ATIONIm		30	30	16.7	13	10	6.5	4.3	3.3				
OUTPUT  OUTPUT  RIPPLE IN  TEMPERATUR  DRIFT[Im' START-UI HOLD-UF OUTPUT VOL UPPUT VOL VERCU PROTECTION CIRCUIT AND OPERATI		V]	20max	20max	36max	48max	60max	96max	144max	192max				
OUTPUT  RIPPLE N  TEMPERATUR  DRIFT[m' START-UI HOLD-UF OUTPUT VOL OUTPUT VOL OVERCU PROTECTION CIRCUIT AND OPERATI	REGULATION[n	nV]	40max	40max	100max	100max	120max	150max	240max	240max				
OUTPUT  RIPPLE N  TEMPERATUR  DRIFT[m' START-UI HOLD-UF OUTPUT VOL OUTPUT VOL OVERCU PROTECTION CIRCUIT AND OPERATI	· · · · · · · · · · · · · · · · · · ·	0 to +50℃ *1	80max	80max	120max	120max	120max	120max	150max	150max				
OUTPUT  TEMPERATUR  DRIFT[m' START-UI HOLD-UF OUTPUT VOL OUTPUT OVERCU PROTECTION OVERCU PROTECTION OVERVOL CIRCUIT AND OPERATI	[mvp-p]	-10 - 0℃ *1	140max	140max	160max	160max	160max	160max	200max	200max				
OUTPUT  TEMPERATUR  DRIFT[m' START-UI HOLD-UF OUTPUT VOL OUTPUT OVERCU PROTECTION OVERCU PROTECTION OVERVOL CIRCUIT AND OPERATI	NOISELVI	0 to +50°C *1	120max	120max	150max	150max	150max	150max	250max	250max				
DRIFT[m START-UI HOLD-UF OUTPUT VOL OUTPUT OVERCUIPROTECTION OVERVOL CIRCUIT AND OPERATI	NOISE[mvp-p]	-10 - 0℃ *1	160max	160max	180max	180max	180max	180max	300max	300max				
DRIFT[m START-UI HOLD-UF OUTPUT VOL OUTPUT OVERCUIPROTECTION OVERVOL CIRCUIT AND OPERATI		0 to +50℃	50max	50max	90max	120max	150max	240max	360max	480max				
START-UI HOLD-UF OUTPUT VOL OUTPUT OVERCU PROTECTION OVERVOL CIRCUIT AND OPERATI	JRE REGULATION[MV]	-10 to +50℃	60max	60max	120max	150max	180max	290max	450max	600max				
HOLD-UF OUTPUT VOL OUTPUT OVERCU PROTECTION OVERVOL CIRCUIT AND OPERATI	mV]	*2	20max	20max	36max	48max	60max	96max	144max	192max				
OUTPUT VOL OUTPUT OVERCU PROTECTION OVERVOL CIRCUIT AND OPERATI	UP TIME[ms]		350typ(ACIN 100V, lo=100%)											
OUTPUT OVERCU PROTECTION OVERVOL CIRCUIT AND OPERATI	JP TIME[ms]		20typ (ACIN 10	20typ (ACIN 100V, lo=100%)										
PROTECTION OVERVOL OVERVOL OPERATI	OLTAGE ADJUSTMEN	T RANGE[V]	2.85 - 3.63	4.00 - 5.50	7.50 - 10.0	10.0 - 13.2	13.2 - 18.0	19.2 - 27.0	28.8 - 39.6	39.0 - 53.0				
PROTECTION OVERVOLICIRCUIT AND OPERATION	T VOLTAGE SE	TTING[V]	3.20 - 3.40	4.90 - 5.20	8.70 - 9.30	11.5 - 12.5	14.5 - 15.5	23.5 - 24.5	35.5 - 36.5	47.0 - 49.0				
CIRCUIT AND OPERATI	URRENT PROT	ECTION	Works over 105	% of rated curre	ent and recovers	automatically		•						
CIRCUIT AND OPERATI	LTAGE PROTE	CTION[V]	4.00 - 5.25	5.75 - 7.00	11.5 - 14.0	15.0 - 18.0	20.0 - 25.0	30.0 - 37.0	43.0 - 50.0	58.0 - 65.0				
OTHERS DEMOTE	TING INDICATI	ON	LED (Green)			•		•	-	-				
CE.KO   REMOTE	E SENSING		Optional (Only	-3R3, -5 Option	-K)									
REMOTE	E ON/OFF		Optional (Requ	ired external por	wer source)									
INPUT-OL	OUTPUT · RC	*3	AC3,000V 1mir	nute, Cutoff curre	ent = 10mA, DC	500V 50MΩmin	(At Room Temp	erature)						
ISOLATION INPUT-FG	-G		AC2,000V 1mir	nute, Cutoff curre	ent = 10mA, DC	500V 50MΩmin	(At Room Temp	erature)						
OUTPUT	T · RC-FG	*3	AC500V 1minu	te, Cutoff curren	t = 100mA, DC5	00V 50MΩmin (	At Room Tempe	rature)						
OPERATING	G TEMP.,HUMID.ANI	ALTITUDE	-10 to +71°C (R	Required Deratin	g), 20 - 90%RH	(Non condensing	g) 3,000m (10,00	Ofeet) max						
STORAGE T	TEMP.,HUMID.AND	ALTITUDE	-20 to +75°C, 2	0 - 90%RH (Noi	n condensing) 3,	000m (10,000fee	et) max							
ENVIRONMENT VIBRATIO	ION		19.6m/s <sup>2</sup> (2G),	10 - 55Hz, 3mi	nutes period, 60	minutes each ald	ong X, Y and Z a	axis						
IMPACT			196.1m/s <sup>2</sup> (200	S), 11ms, once e	each X, Y and Z	axis								
	·	3	UL60950-1, C-I	UL(CSA60950-1	), EN60950-1, E	N50178 Complie	s with DEN-AN	(At only AC inpu	ut)					
SAFETY AND CONDUC	Y APPROVALS				sB, VCCI-B, CIS									
NOISE REGULATIONS CE MARK			Low Voltage Directive. EMC Directive											
	Y APPROVALS	TOD.	Complies with I											
CASE SIZ	Y APPROVALS	IOK					1							
OTHERS COOLING	Y APPROVALS ICTED NOISE RKING	IOR	34 × 93 × 168m	m (without termi	nal block) (W x h	1×D) / 560a ma	ax (without cover	·)						

- Measured by 20MHz oscilloscope or Ripple-Noise meter (equivalent to KEISOKU-GIKEN :
  - RM101).
- \*2 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25°C. \*3 Applicable when Remote ON/OFF(optional) is added. RC is insulated with input, output and FG.
- \*4 Derating is required. Consult us for details.

- Parallel operation with other model is not possible.
- Derating is required when operated with cover.
- A sound may occur from power supply at peak loading.

### PBA600F

**PBA 600** 



- ①Series name ②Output wattage ③Universal input ④Output voltage

- (a) Output voltage
  (b) Optional
  C: with Coating
  G: Low leakage current
  U: Operation stop voltage is set at a lower value
  - F1 :With Long-Life fan
- F3:Reverse air exhaust type F4:Low speed fan

Refer to instruction manual 7.1

MODEL		PBA600F-3R3	PBA600F-5	PBA600F-7R5	PBA600F-12	PBA600F-15	PBA600F-24	PBA600F-36	PBA600F-48
MAX OUTPUT WATTAGE[W]		396	600	600	636	645	648	648	624
DC OUTDUT	ACIN 100V	3.3V 120A	5V 120A	7.5V 80A	12V 53A	15V 43A	24V 27A	36V 18A	48V 13A
DC OUTPUT	ACIN 200V *3	3.3V 120A	5V 120A	7.5V 80A	12V 53A	15V 43A	24V 27(31)A	36V 18A	48V 13A

	MODEL		PBA600F-3R3	PBA600F-5	PBA600F-7R5	PBA600F-12	PBA600F-15	PBA600F-24	PBA600F-36	PBA600F-48
	VOLTAGE[V]		AC85 - 264 1 φ	or DC120 - 35	0 (AC50 or DC70	optionally avail	able *5)			
	CURRENT[A]	ACIN 100V	5.8typ	8.2typ						
	CORRENT[A]	ACIN 200V		4.1typ						
	FREQUENCY[Hz]		50/60 (47 - 63)							
	EFFICIENCY[%]	ACIN 100V	70typ	75typ	76typ	79typ	79typ	81typ	82typ	81typ
INPUT	EFFICIENCT[%]	ACIN 200V	72typ	77typ	79typ	82typ	82typ	84typ	84typ	83typ
	POWER FACTOR	ACIN 100V	0.98typ (lo=100	1%)						
	POWER FACIOR	ACIN 200V	0.95typ (lo=100	1%)						
	INRUSH CURRENT[A]	ACIN 100V	20/40typ (Io=10	00%) (Primary ir	rush current /Se	condary inrush	current) (More th	an 3 sec. to re-s	start)	
	INKUSH CUKKENI[A]	ACIN 200V	40/40typ (lo=10	00%) (Primary ir	rush current /Se	condary inrush	current) (More th	an 3 sec. to re-	start)	
	LEAKAGE CURRENT[r	nA]	0.45/0.75max (	ACIN 100V/240	V 60Hz, lo=100%	According to I	EC60950-1)			
	VOLTAGE[V]		3.3	5	7.5	12	15	24	36	48
	CUDDENTIAL	ACIN 100V	120	120	80	53	43	27	18	13
	CURRENT[A]	ACIN 200V *3	120	120	80	53	43	27(31)	18	13
	LINE REGULATION[m\	/]	20max	20max	36max	48max	60max	96max	144max	192max
	LOAD REGULATION[m	V]	40max	40max	60max	100max	120max	150max	150max	300max
	RIPPLE[mVp-p]	0 to +50°C *1	80max	80max	120max	120max	120max	120max	150max	150max
	KIPPLE[IIIVP-P]	-20 - 0℃ *1	140max	140max	160max	160max	160max	160max	160max	400max
OUTPUT	RIPPLE NOISE[mVp-p]	0 to +50°C *1	120max	120max	150max	150max	150max	150max	200max	200max
OUIPUI	KIPPLE NOISE[IIIVP-P]	-20 - 0℃ *1	160max	160max	180max	180max	180max	180max	240max	500max
	TEMPERATURE REGULATION[mV]	0 to +50°C *1	40max	50max	75max	120max	150max	240max	360max	480max
	TEMPERATURE REGULATION[IIIV]	-20 to +50°C <b>*</b> 1	60max	75max	120max	180max	180max	290max	440max	600max
1	DRIFT[mV]	*2	12max	20max	30max	48max	60max	96max	144max	192max
	START-UP TIME[ms]	400typ(ACIN 100	/200V, Io=100%)	Start-up time is 5	00ms typ for less	than 1minute of a	pplying input aga	in from turning off	the input voltage.	
			20typ (ACIN 10	0/200V, Io=100	%)					
	OUTPUT VOLTAGE ADJUSTMENT	FRANGE[V]	2.64 - 3.96	3.96 - 6.00	5.25 - 8.25	8.25 - 13.20	10.50 - 16.50	16.50 - 26.40	25.20 - 39.60	38.40 - 56.00
	<b>OUTPUT VOLTAGE SET</b>	TING[V]	3.30 - 3.40	5.00 - 5.15	7.50 - 7.80	12.00 - 12.48	15.00 - 15.60	24.00 - 24.96	36.00 - 37.44	48.00 - 49.92
	<b>OVERCURRENT PROT</b>	ECTION	Works over 105	% of rated curr	ent or 101% of p	eak current and	recovers automa	atically		
PROTECTION	OVERVOLTAGE PROTECT	ION[V] *4	Vo+0.66 - 1.32	Vo+1.0 - 2.0	Vo+1.5 - 3.0	Vo+2.4 - 4.8	Vo+3.0 - 6.0	Vo+4.8 - 9.6	Vo+7.2 - 14.4	Vo+4.8 - 12.0
	OPERATING INDICATION	ON	LED (Green)							
OTHERS	REMOTE SENSING		Provided							
	REMOTE ON/OFF		Provided							
	INPUT-OUTPUT · RC				ent = 10mA, DC5					
	INPUT-FG				ent = 10mA, DC5					
	OUTPUT · RC · AUX-F	G			nt = 100mA, DC5					
	OUTPUT-RC · AUX				nt = 100mA, DC1			erature)		
	OPERATING TEMP., HUMID.AND				n condensing) 3,					
ENVIRONMENT	STORAGE TEMP.,HUMID.AND	ALTITUDE			n condensing) 3,					
-	VIBRATION				inutes period, 60		ong X, Y and Z	axis		
	IMPACT				each X, Y and Z					
CAFETY AND	AGENCY APPROVALS				), EN60950-1, E				ıt)	
NOISE	CONDUCTED NOISE				ssB, VCCI-B, CIS	PR22-B, EN550	11-B, EN55022-	В		
REGULATIONS	CE MARKING		Low Voltage Di		rective					
	HARMONIC ATTENUAT	TOR	Complies with I			) <i>(</i> :				
OTHERS	CASE SIZE/WEIGHT				ninal block and s	crew) (W×H×D	D) /1.6kg max			
	COOLING METHOD		Forced cooling	(internal fan)						

- \*1 Measured by 20MHz oscilloscope or Ripple-Noise meter(equivalent to KEISOKU-GIKEN: RM101).
  \*2 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25°C.
  \*3 () means peak current. Peak loading for 10s. And Duty 35% max, refer to Instruction manual in detail.
- 44 Overvoltage protection circuit to follow to output voltage setting.
  45 Derating is required.Consult us for details.
  4 A sound may occur from power supply at pulse loading.

### PBA600F

**PBA 600** 



- ①Series name ②Output wattage ③Universal input ④Output voltage

- (a) Output voltage
  (b) Optional
  C: with Coating
  G: Low leakage current
  U: Operation stop voltage is set at a lower value
  - F1 :With Long-Life fan
- F3:Reverse air exhaust type F4:Low speed fan

Refer to instruction manual 7.1

MODEL		PBA600F-3R3	PBA600F-5	PBA600F-7R5	PBA600F-12	PBA600F-15	PBA600F-24	PBA600F-36	PBA600F-48
MAX OUTPUT WATTAGE[W]		396	600	600	636	645	648	648	624
DC OUTDUT	ACIN 100V	3.3V 120A	5V 120A	7.5V 80A	12V 53A	15V 43A	24V 27A	36V 18A	48V 13A
DC OUTPUT	ACIN 200V *3	3.3V 120A	5V 120A	7.5V 80A	12V 53A	15V 43A	24V 27(31)A	36V 18A	48V 13A

	MODEL		PBA600F-3R3	PBA600F-5	PBA600F-7R5	PBA600F-12	PBA600F-15	PBA600F-24	PBA600F-36	PBA600F-48
	VOLTAGE[V]		AC85 - 264 1 φ	or DC120 - 35	0 (AC50 or DC70	optionally avail	able *5)			
	CURRENT[A]	ACIN 100V	5.8typ	8.2typ						
	CORRENT[A]	ACIN 200V		4.1typ						
	FREQUENCY[Hz]		50/60 (47 - 63)							
	EFFICIENCY[%]	ACIN 100V	70typ	75typ	76typ	79typ	79typ	81typ	82typ	81typ
INPUT	EFFICIENCT[%]	ACIN 200V	72typ	77typ	79typ	82typ	82typ	84typ	84typ	83typ
	POWER FACTOR	ACIN 100V	0.98typ (lo=100	1%)						
	POWER FACIOR	ACIN 200V	0.95typ (lo=100	1%)						
	INRUSH CURRENT[A]	ACIN 100V	20/40typ (Io=10	00%) (Primary ir	rush current /Se	condary inrush	current) (More th	an 3 sec. to re-s	start)	
	INKUSH CUKKENI[A]	ACIN 200V	40/40typ (lo=10	00%) (Primary ir	rush current /Se	condary inrush	current) (More th	an 3 sec. to re-	start)	
	LEAKAGE CURRENT[r	nA]	0.45/0.75max (	ACIN 100V/240	V 60Hz, lo=100%	According to I	EC60950-1)			
	VOLTAGE[V]		3.3	5	7.5	12	15	24	36	48
	CUDDENTIAL	ACIN 100V	120	120	80	53	43	27	18	13
	CURRENT[A]	ACIN 200V *3	120	120	80	53	43	27(31)	18	13
	LINE REGULATION[m\	/]	20max	20max	36max	48max	60max	96max	144max	192max
	LOAD REGULATION[m	V]	40max	40max	60max	100max	120max	150max	150max	300max
	RIPPLE[mVp-p]	0 to +50°C *1	80max	80max	120max	120max	120max	120max	150max	150max
	KIPPLE[IIIVP-p]	-20 - 0℃ *1	140max	140max	160max	160max	160max	160max	160max	400max
OUTPUT	RIPPLE NOISE[mVp-p]	0 to +50°C *1	120max	120max	150max	150max	150max	150max	200max	200max
OUIPUI	KIPPLE NOISE[IIIVP-P]	-20 - 0℃ *1	160max	160max	180max	180max	180max	180max	240max	500max
	TEMPERATURE REGULATION[mV]	0 to +50°C *1	40max	50max	75max	120max	150max	240max	360max	480max
	TEMPERATURE REGULATION[IIIV]	-20 to +50°C <b>*</b> 1	60max	75max	120max	180max	180max	290max	440max	600max
1	DRIFT[mV]	*2	12max	20max	30max	48max	60max	96max	144max	192max
	START-UP TIME[ms]	400typ(ACIN 100	/200V, Io=100%)	Start-up time is 5	00ms typ for less	than 1minute of a	pplying input aga	in from turning off	the input voltage.	
			20typ (ACIN 10	0/200V, Io=100	%)					
	OUTPUT VOLTAGE ADJUSTMENT	FRANGE[V]	2.64 - 3.96	3.96 - 6.00	5.25 - 8.25	8.25 - 13.20	10.50 - 16.50	16.50 - 26.40	25.20 - 39.60	38.40 - 56.00
	<b>OUTPUT VOLTAGE SET</b>	TING[V]	3.30 - 3.40	5.00 - 5.15	7.50 - 7.80	12.00 - 12.48	15.00 - 15.60	24.00 - 24.96	36.00 - 37.44	48.00 - 49.92
	<b>OVERCURRENT PROT</b>	ECTION	Works over 105	% of rated curr	ent or 101% of p	eak current and	recovers automa	atically		
PROTECTION	OVERVOLTAGE PROTECT	ION[V] *4	Vo+0.66 - 1.32	Vo+1.0 - 2.0	Vo+1.5 - 3.0	Vo+2.4 - 4.8	Vo+3.0 - 6.0	Vo+4.8 - 9.6	Vo+7.2 - 14.4	Vo+4.8 - 12.0
	OPERATING INDICATION	ON	LED (Green)							
OTHERS	REMOTE SENSING		Provided							
	REMOTE ON/OFF		Provided							
	INPUT-OUTPUT · RC				ent = 10mA, DC5					
	INPUT-FG				ent = 10mA, DC5					
	OUTPUT · RC · AUX-F	G			nt = 100mA, DC5					
	OUTPUT-RC · AUX				nt = 100mA, DC1			erature)		
	OPERATING TEMP.,HUMID.AND				n condensing) 3,					
ENVIRONMENT	STORAGE TEMP.,HUMID.AND	ALTITUDE			n condensing) 3,					
-	VIBRATION				inutes period, 60		ong X, Y and Z	axis		
	IMPACT				each X, Y and Z					
CAFETY AND	AGENCY APPROVALS				), EN60950-1, E				ıt)	
NOISE	CONDUCTED NOISE				ssB, VCCI-B, CIS	PR22-B, EN550	11-B, EN55022-	В		
REGULATIONS	CE MARKING		Low Voltage Di		rective					
	HARMONIC ATTENUAT	TOR	Complies with I			) <i>(</i> :				
OTHERS	CASE SIZE/WEIGHT				ninal block and s	crew) (W×H×D	D) /1.6kg max			
	COOLING METHOD		Forced cooling	(internal fan)						

- \*1 Measured by 20MHz oscilloscope or Ripple-Noise meter(equivalent to KEISOKU-GIKEN: RM101).
  \*2 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25°C.
  \*3 () means peak current. Peak loading for 10s. And Duty 35% max, refer to Instruction manual in detail.
- 44 Overvoltage protection circuit to follow to output voltage setting.
  45 Derating is required.Consult us for details.
  4 A sound may occur from power supply at pulse loading.

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### **PBA1000F**

PBA 1000 F -5

- (1)Series name
- ②Output wattage
- 3 Universal input 4 Output voltage

- (a) Output voltage
  (b) Optional
  C: with Coating
  G: Low leakage current
  U: Operation stop voltage is set at a lower value
  - F1:With Long-Life fan
- F3:Reverse air exhaust type F4:Low speed fan

Refer to instruction manual

MODEL		PBA1000F-3R3	PBA1000F-5	PBA1000F-7R5	PBA1000F-12	PBA1000F-15	PBA1000F-24	PBA1000F-36	PBA1000F-48
MAX OUTPUT WATTAGE[W]		660	1000	1005	1056	1050	1056	1044	1056
DC CUTPUT	ACIN 100V	3.3V 200A	5V 200A	7.5V 134A	12V 88A	15V 70A	24V 44A	36V 29A	48V 22A
DC OUTPUT	ACIN 200V *3	3.3V 200A	5V 200A	7.5V 134A	12V 88A	15V 70A	24V 44(51)A	36V 29A	48V 22A

VOLTAGE[V]   AC85 - 284 1 \$\phi\$ or DC120 - 350 (AC50 or DC70 optionally available 3+6)		MODEL		PBA1000F-3R3	PBA1000F-5	PBA1000F-7R5	PBA1000F-12	PBA1000F-15	PBA1000F-24	PBA1000F-36	PBA1000F-48	
CURRENT  A    ACM 2009    Styp   Typ   School (17 - 68)		VOLTAGE[V]		AC85 - 264 1 φ	or DC120 - 35	0 (AC50 or DC70	optionally avail	able *6)				
CURRENTIA    ACM 2009   Styp   Typ			ACIN 100V	9typ	13typ		,					
		CURRENT[A]			typ 7typ							
		FREQUENCY[Hz]			- 71							
POWER FACTOR   ACM 2007 761yp   811yp   831yp   841yp   841yp   861yp   861y			ACIN 100V		79tvn	80tvn	82tvn	82tvn	84tvn	84tvn	84tvn	
POWER FACTOR	INDIT	EFFICIENCY[%]										
POWER FACTOR   Acin 2007   0.35typ (10=100%)   Firmary inrush current / Secondary inrush current) (More then 10 sec. to re-start)						ООТУР	Очтур	Очтур	оотур	Тоотур	оотур	
NRUSH CURRENT[A]   ACM 100V   2040/Up; (lo=100%) (Primary inrush current) (More then 10 sec. to re-start)		POWER FACTOR										
INKUSH CURRENT[ma]   IAON 2007   40/40/py (los-100%) (Primary inrush current) (More then 10 sec. to re-start)						ruch current /Co	aandarii inriiah a	urrant) (Mara th	on 10 ooo to ro	otort)		
LEAKAGE CURRENT ma		INRUSH CURRENT[A]										
VOLTAGE[V]   3.3   5   7.5   12   15   24   36   48				71 .					en 10 sec. to re-	·start)		
CURRENTIA    ACIN 160V   200   200   134   88   70   44   29   22			mAj							1		
CURRENT A		VOLTAGE[V]						-				
LINE REGULATION[mV]   20max   20max   36max   48max   60max   150max   15		CURRENTIAL						-		-		
COLIPUT   COL									1- /	1		
Name		LINE REGULATION[m)	<b>V</b> ]				48max					
OUTPUT   RIPPLE[mVp-p]		LOAD REGULATION[m	۱۷]	40max	40max	60max	100max	120max	150max	150max	300max	
August		DIDDI Elm\/n n1	0 to +50°C *1	80max	80max	120max	120max	120max	120max	150max	150max	
RIPPER NUISE(IMPP)   20 - 0° e *   160max   160max   180max   180max   180max   240max   500max   480max   180max   240max   500max   480max   180max   180max   240max   480max   480max   180max   240max   480max   480max   180max   240max   240max   480max   240max   480max   240max   2		KIPPLE[IIIVP-P]	-20 - 0℃ *1	140max	140max	160max	160max	160max	160max	160max	400max	
RIPPER NUSE(IMPP)   20 - 0°C **   160max   160max   180max   180max   180max   240max   500max   480max   180max   240max   500max   480max   180max   240max   480max   480max   480max   180max   240max   480max   480max   180max   240max   480max   480max   180max   240max   240max   480max   480max   180max   240max   240max   480max   480max   240max   24	OLITBUT		0 to +50°C *1	120max	120max	150max	150max	150max	150max	200max	200max	
TEMPERATURE REGULATION(NI)   286 x80 x   50 max   75 max   120 max   180 max   180 max   290 max   440 max   600 max	DUIPUI	RIPPLE NOISE[mVp-p]	-20 - 0℃ *1	160max	160max	180max		180max	180max	240max	500max	
TEMPERATURE REGULATION(NIV)   20 to 40°C s   60 max   75 max   120 max   180 max   180 max   290 max   440 max   60 max   96 max   144 max   192 max   30 max   44 max   492 max   30 max   44 max   492 max   400 ma			0 to +50℃ *1	40max	50max	75max	120max	150max	240max	360max	480max	
DRIFT[mV]		TEMPERATURE REGULATION[mV]				-						
START-UP TIME[ms]		DRIFT[mV]	*2									
HOLD-UP TIME[ms]   20tytp (ACIN 100/200V. lo=100%)												
OUTPUT VOLTAGE ADJUSTMENT RANGE[V]   2.64 - 3.96   3.96 - 6.00   5.25 - 8.25   8.25 - 13.20   10.50 - 16.50   16.50 - 26.40   25.20 - 39.60   38.40 - 56.				71 '			yp					
OUTPUT VOLTAGE SETTING[V]   3.30 - 3.40   5.00 - 5.15   7.50 - 7.80   12.00 - 12.48   15.00 - 15.60   24.00 - 24.96   36.00 - 37.44   48.00 - 49.				71			8 25 - 13 20	10.50 - 16.50	16.50 - 26.40	25 20 - 39 60	38 40 - 56 00	
OVERCURRENT PROTECTION   Works over 105% of rated current or 101% of peak current and recovers automatically												
OVERVOLTAGE PROTECTION[V] ** Vo+0.66 - 1.32   Vo+1.0 - 2.0   Vo+1.5 - 3.0   Vo+2.4 - 4.8   Vo+3.0 - 6.0   Vo+4.8 - 9.6   Vo+7.2 - 14.4   Vo+4.8 - 12   Vo+4.8 - 12   Vo+4.8 - 9.6   Vo+7.2 - 14.4   Vo+4.8 - 12   Vo+4.8 - 12   Vo+4.8 - 9.6   Vo+7.2 - 14.4   Vo+4.8 - 12   Vo+4.8 - 9.6   Vo+7.2 - 14.4   Vo+4.8 - 12   Vo+4.8 - 9.6   Vo+7.2 - 14.4   Vo+4.8 - 12   Vo+4.8 - 9.6   Vo+7.2 - 14.4   Vo+4.8 - 12   Vo+4.8 - 1										30.00 - 37.44	40.00 - 43.32	
OPERATING INDICATION REMOTE SENSING REMOTE SENSING REMOTE ON/OFF REMOTE SENSING REMOTE ON/OFF REMOTE ON/						<del></del>				1/0.72 111	1/01/19 12:0	
REMOTE SENSING   Provided					V0+1.0 - 2.0	V0+1.5 - 3.0	V0+2.4 - 4.6	V0+3.0 - 6.0	V0+4.6 - 9.6	V0+7.2 - 14.4	V0+4.6 - 12.0	
REMOTE ON/OFF   Provided			UN	, ,								
INPUT-OUTPUT · RC   AC3.000V 1minute, Cutoff current = 25mA, DC500V 50MΩmin (At Room Temperature)	OTTLETTO											
INPUT-FG								/ <del>-</del>	. \			
OUTPUT · RC · AUX-FG OUTPUT-RC · AUX AC100V 1minute, Cutoff current = 100mA, DC500V 50MΩmin (At Room Temperature) OUTPUT-RC · AUX AC100V 1minute, Cutoff current = 100mA, DC100V 50MΩmin (At Room Temperature)  OPERATING TEMP,HUMID.AND ALTITUDE -20 to +71°C, 20 - 90%RH (Non condensing) 3,000m (10,000feet) max  STORAGE TEMP,HUMID.AND ALTITUDE -20 to +75°C, 20 - 90%RH (Non condensing) 3,000m (10,000feet) max  VIBRATION 19.6m/s² (2G), 10 - 55Hz, 3minutes period, 60minutes each along X, Y and Z axis  IMPACT 196.1m/s² (20G), 11ms, once each X, Y and Z axis  BAFETY AND NOISE REGULATIONS CONDUCTED NOISE Complies with FCC Part15 classB, VCCI-B, CISPR22-B, EN55011-B, EN55022-B  CE MARKING Low Voltage Directive, EMC Directive HARMONIC ATTENUATOR Complies with IEC61000-3-2  CASE SIZE/WEIGHT 150 × 61 × 240mm (without terminal block and screw) (W×H×D) /2.2kg max												
OUTPUT-RC · AUX	ISOLATION											
OPERATING TEMP,HUMID.AND ALTITUDE   -20 to +71°C, 20 - 90%RH (Non condensing) 3,000m (10,000feet) max			G						· · · · · · · · · · · · · · · · · · ·			
STORAGE TEMP.HUMID.AND ALTITUDE -20 to +75°C, 20 - 90%RH (Non condensing) 3.000m (10.000feet) max  VIBRATION 19.6m/s² (20G), 10 - 55Hz, 3minutes period, 60minutes each along X, Y and Z axis  IMPACT 196.1m/s² (20G), 11ms, once each X, Y and Z axis  AGENCY APPROVALS UL60950-1, C-UL(CSA60950-1), EN60950-1, EN50178 Complies with DEN-AN (At only AC input)  CONDUCTED NOISE Complies with FCC Part15 classB, VCCI-B, CISPR22-B, EN55011-B, EN55022-B  CE MARKING Low Voltage Directive, EMC Directive  HARMONIC ATTENUATOR Complies with IEC61000-3-2  CASE SIZE/WEIGHT 150 x61 x 240mm (without terminal block and screw) (WxHxD) /2.2kg max									rature)			
VIBRATION  19.6m/s² (2G), 10 - 55Hz, 3minutes period, 60minutes each along X, Y and Z axis  IMPACT  196.1m/s² (20G), 11ms, once each X, Y and Z axis  AGENCY APPROVALS  LOBOSCO-1, C-UL(CSA60950-1), EN60950-1, EN50178 Complies with DEN-AN (At only AC input)  CONDUCTED NOISE  CONDUCTED NOISE  CE MARKING  Low Voltage Directive, EMC Directive  HARMONIC ATTENUATOR  CASE SIZE/WEIGHT  150 ×61 × 240mm (without terminal block and screw) (W×H×D) /2.2kg max		. , .										
VIBRATION  19.6m/s² (2G), 10 - 55Hz, 3minutes period, 60minutes each along X, Y and Z axis  IMPACT  196.1m/s² (20G), 11ms, once each X, Y and Z axis  AGENCY APPROVALS  UL60950-1, C-UL(CSA60950-1), EN60950-1, EN50178 Complies with DEN-AN (At only AC input)  CONDUCTED NOISE  CE MARKING  Low Voltage Directive, EMC Directive  HARMONIC ATTENUATOR  CASE SIZE/WEIGHT  150 × 61 × 240mm (without terminal block and screw) (W×H×D) /2.2kg max	ENVIDONMENT	STORAGE TEMP.,HUMID.AND	ALTITUDE	-20 to +75℃, 2	0 to +75℃, 20 - 90%RH (Non condensing) 3,000m (10.000feet) max							
AGENCY APPROVALS UL60950-1, C-UL(CSA60950-1), EN60950-1, EN50178 Complies with DEN-AN (At only AC input)  CONDUCTED NOISE CE MARKING Low Voltage Directive, EMC Directive HARMONIC ATTENUATOR COMPLIES CASE SIZE/WEIGHT UL60950-1, C-UL(CSA60950-1), EN60950-1, EN50178 Complies with DEN-AN (At only AC input)  Complies with FCC Part15 classB, VCCI-B, CISPR22-B, EN55011-B, EN55022-B  Low Voltage Directive, EMC Directive  Complies with IEC61000-3-2  CASE SIZE/WEIGHT 150 x 61 x 240mm (without terminal block and screw) (W x H x D) /2.2kg max	LITTING INITIAL			19.6m/s <sup>2</sup> (2G),	.6m/s² (2G), 10 - 55Hz, 3minutes period, 60minutes each along X, Y and Z axis							
CONDUCTED NOISE Complies with FCC Part15 classB, VCCI-B, CISPR22-B, EN55011-B, EN55022-B CE MARKING Low Voltage Directive, EMC Directive HARMONIC ATTENUATOR Complies with IEC61000-3-2 CASE SIZE/WEIGHT 150 x 61 x 240mm (without terminal block and screw) (W x H x D) /2.2kg max												
NOISE REGULATIONS  CE MARKING Low Voltage Directive, EMC Directive HARMONIC ATTENUATOR Complies with IEC61000-3-2  CASE SIZE/WEIGHT  150 x61 x 240mm (without terminal block and screw) (WxHxD) /2.2kg max						(At only AC inpu	t)					
REGULATIONS  CE MARKING Low Voltage Directive, EMC Directive HARMONIC ATTENUATOR Complies with IEC61000-3-2  CASE SIZE/WEIGHT  150 x 61 x 240mm (without terminal block and screw) (W x H x D) /2.2kg max	NOIGE			Complies with I	FCC Part15 clas	sB, VCCI-B, CIS	PR22-B, EN550	11-B, EN55022-	В			
HARMONIC ATTENUATOR Complies with IEC61000-3-2  CASE SIZE/WEIGHT 150 x 61 x 240mm (without terminal block and screw) (W x H x D) /2.2kg max	NUISE REGULATIONS	CE MARKING										
CASE SIZE/WEIGHT 150 x 61 x 240mm (without terminal block and screw) (W x H x D) /2.2kg max	KLOULATIONS	HARMONIC ATTENUAT	TOR									
OTHERS						ninal block and s	crew) (W×H×C	) /2.2kg max				
	OTHERS	COOLING METHOD				Diodit and o		, <b>_</b> yx				

- Measured by 20MHz oscilloscope or Ripple-Noise meter (equivalent to KEISOKU-GIKEN : RM101).
- Ripple and ripple noise is measured on measuring board with capacitor of 22 µ F within 150mm from the output terminal.

  \*2 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25°C.
- \*3 () means peak current. Peak loading for 10s. And Duty 35% max, refer to Instruction manual
- in detail.
- \*4 Overvoltage protection circuit to follow to output voltage setting.
- \*5 The output voltage is shutted down the over current protection circuit operates continuosly for about 5 sec.
- \*6 Derating is required.Consult us for details.
- A sound may occur from power supply at pulse loading.

## **PBA1500F**

PBA 1500 F -5



- (1)Series name
- ②Output wattage
- 3 Universal input
- 4 Output voltage
- (a) Output voltage
  (b) Optional
  C: with Coating
  G: Low leakage current
  U: Operation stop voltage
  - is set at a lower value F1 :With Long-Life fan
- F3:Reverse air exhaust type F4:Low speed fan

MODEL		PBA1500F-3R3	PBA1500F-5	PBA1500F-7R5	PBA1500F-12	PBA1500F-15	PBA1500F-24	PBA1500F-36	PBA1500F-48
MAX OUTPUT WATTAGE[W]		990	1500	1500	1500	1500	1680	1692	1680
DC CUITRUIT	ACIN 100V	3.3V 300A	5V 300A	7.5V 200A	12V 125A	15V 100A	24V 65A	36V 42A	48V 32A
DC OUTPUT	VCIN JUUN ~ 3	3 3// 300 /	5V 300 A	7 5V 200A	121/ 125 /	15V 100A	241/ 70(105)4	367 42(20)4	48V 35A

	MODEL		PBA1500F-3R3	PBA1500F-5	PBA1500F-7R5	PBA1500F-12	PBA1500F-15	PBA1500F-24	PBA1500F-36	PBA1500F-48	
	VOLTAGE[V]		AC85 - 264 1 φ	or DC120 - 37	0 (AC50 or DC70	optionally availa	able <b>*</b> 5)				
	CURRENT[A]	ACIN 100V	15typ	19typ							
	CORRENT[A]	ACIN 200V	8typ	10typ							
	FREQUENCY[Hz]		50/60 (47 - 63)								
	EFFICIENCY[%]	ACIN 100V	72typ	77typ	81typ	81typ	83typ	84typ	84typ	84typ	
INPUT	EFFICIENCI[%]	ACIN 200V	75typ	81typ	83typ	84typ	86typ	87typ	87typ	87typ	
	POWER FACTOR	ACIN 100V	0.98typ (lo=100	1%)							
	POWER FACTOR	ACIN 200V	0.95typ (lo=100	1%)							
	INRUSH CURRENT[A]				rush current /Se						
	INKOSH COKKENT[A]	ACIN 200V	40/40typ (lo=10	0%) (Primary ir	rush current /Se	condary inrush c	current) (More the	an 10 sec. to re-	start)		
	LEAKAGE CURRENT[r	mA]	0.9/1.5max (ACIN 100V/240V 60Hz, Io=100%, According to IEC60950-1)								
	VOLTAGE[V]		3.3	5	7.5	12	15	24	36	48	
	CUDDENTIAL	ACIN 100V	300	300	200	125	100	65	42	32	
	CURRENT[A]	ACIN 200V *3	300	300	200	125	100	70(105)	47(70)	35	
	LINE REGULATION[m\	/]	20max	20max	36max	48max	60max	96max	144max	192max	
	LOAD REGULATION[m	ıV]	40max	40max	60max	100max	120max	150max	150max	300max	
	RIPPLE[mVp-p]	0 to +50°C *1	80max	80max	120max	120max	120max	120max	150max	150max	
	KIPPLE[IIIVP-P]	-20 - 0℃ *1	140max	140max	160max	160max	160max	160max	160max	400max	
OUTPUT	DIDDI E NOISEImVa al	0 to +50°C *1	120max	120max	150max	150max	150max	150max	200max	200max	
OUIPUI	RIPPLE NOISE[mVp-p]	-20 - 0°C *1	160max	160max	180max	180max	180max	180max	240max	500max	
	TEMPERATURE REQUILATIONSVI	0 to +50°C *1	40max	50max	75max	120max	150max	240max	360max	480max	
	TEMPERATURE REGULATION[mV]	-20 to +50°C <b>*1</b>	60max	75max	120max	180max	180max	290max	440max	600max	
	DRIFT[mV]	*2	12max	20max	30max	48max	60max	96max	144max	192max	
	START-UP TIME[ms]		600typ(ACIN 100	/200V, Io=100%)	Start-up time is 5	00ms typ for less	than 1minute of a	pplying input agai	n from turning off	the input voltage.	
	HOLD-UP TIME[ms]		20typ (ACIN 10	0/200V, Io=100	%)						
	OUTPUT VOLTAGE ADJUSTMENT	T RANGE[V]	2.64 - 3.96	3.96 - 6.00	5.25 - 8.25	8.25 - 13.20	10.50 - 16.50	16.50 - 26.40	25.20 - 39.60	38.40 - 56.00	
	OUTPUT VOLTAGE SET	TING[V]	3.30 - 3.40	5.00 - 5.15	7.50 - 7.80	12.00 - 12.48	15.00 - 15.60	24.00 - 24.96	36.00 - 37.44	48.00 - 49.92	
	OVERCURRENT PROT	ECTION	Works over 105	% of rated curr	ent or 101% of p	eak current and	recovers automa	atically			
PROTECTION	OVERVOLTAGE PROTECT	ION[V] *4	Vo+0.66 - 1.32	Vo+1.0 - 2.0	Vo+1.5 - 3.0	Vo+2.4 - 4.8	Vo+3.0 - 6.0	Vo+4.8 - 9.6	Vo+7.2 - 14.4	Vo+4.8 - 12.0	
	OPERATING INDICATION	ON	LED (Green)								
OTHERS	REMOTE SENSING		Provided								
	REMOTE ON/OFF		Provided								
	INPUT-OUTPUT · RC				ent = 25mA, DC5						
ISOLATION ⊢	INPUT-FG				ent = 25mA, DC5						
	OUTPUT · RC · AUX-F	G			t = 100mA, DC5						
	OUTPUT-RC · AUX				t = 100mA, DC1			rature)			
OPERATING TEMP, HUMID.AND ALTITUDE -20 to +71°C, 20 - 90%RH (Non condensing) 3.000m (10.000feet) max											
FNVIRONMENT⊢	STORAGE TEMP.,HUMID.AND	ALTITUDE	-20 to +75℃, 20 - 90%RH (Non condensing) 3,000m (10,000feet) max								
	VIBRATION			19.6m/s <sup>2</sup> (2G), 10 - 55Hz, 3minutes period, 60minutes each along X, Y and Z axis							
	IMPACT		196.1m/s <sup>2</sup> (20G), 11ms, once each X, Y and Z axis								
	AGENCY APPROVALS				), EN60950-1, E						
NOISE +	CONDUCTED NOISE				B, VCCI-B, CISP	R22-B, EN55011	-B, EN55022-B,	additional noise t	ilter required for I	meeting class B.	
REGULATIONS	CE MARKING			rective, EMC Di	rective						
HARMONIC ATTENUATOR Complies with IEC61000-3-2											
OTHERS +	CASE SIZE/WEIGHT				ninal block and s	crew) (W×H×D	) /3.4kg max				
JL.	COOLING METHOD		Forced cooling	(internal fan)							

- \*1 Measured by 20MHz oscilloscope or Ripple-Noise meter(equivalent to KEISOKU-GIKEN: RM101).
  - Ripple and ripple noise is measured on measuring board with capacitor of 22 µ F within
- 150mm from the output terminal.

  \*2 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25°C.
- \*3 () means peak current. Peak loading for 10s. And Duty 35% max, refer to Instruction manual
- in detail.
- \*4 Overvoltage protection circuit to follow to output voltage setting.
- \*5 Derating is required. Consult us for details.
- A sound may occur from power supply at pulse loading.



### **Basic Characteristics Data**

### **Basic Characteristics Data**

Madal	Oimerrit are ether al	Switching	Input	Rated	Inrush current	PCB/F	attern			Parallel availability
Model	Circuit method	frequency [kHz]	current [A]	input fuse	protection circuit	Material	Single sided	Double sided	Series operation	Parallel operation
PBA50F	Active filter	60-550	0.7	2501/24	Thermistor	CEM-3	Yes		.,	
PBASUF	Forward converter	130	0.7	250V 2A	Thermistor	CEIVI-3	res		Yes	*1
DDAZEE	Active filter	60-550	4.0	250\/ 2.45A	Thermister	CEM 2	Vaa		Vaa	.1.4
PBA75F	Forward converter	120	1.0	250V 3.15A	Thermistor	CEM-3	Yes		Yes	*1
DD 4 400E	Active filter	60-550	4.0	050\/ 0.454	<b>T</b> I	OFMO	Yes		V	.1. 4
PBA100F	Forward converter	120	1.3	250V 3.15A	Thermistor	CEM-3			Yes	<b>*</b> 1
DDA4505	Active filter	60-550	0.0	250V 4A	Thermistor	OFM 0	V		Voo	
PBA150F	Forward converter	120	2.0		THEITHISIO	CEM-3	Yes		Yes	<b>*</b> 1
DD A 200E	Active filter	230	4.4		COD	ED 4		V	V	\/
PBA300F	Forward converter	330	4.1	250V 10A	SCR	FR-4		Yes	Yes	Yes
DD A COOF	Active filter	130	0.0	050)/454	COD	ED 4		V	V	\/
PBA600F	Forward converter	330	8.2	250V 15A	SCR	FR-4		Yes	Yes	Yes
DD 44000F	Active filter	130	13	050)/ 004	COD	ED 4		.,	.,	V
PBA1000F	Forward converter	280		250V 30A	SCR	FR-4		Yes	Yes	Yes
DD 445005	Active filter	130	40	250V 30A	000	ED 4		\ ,,	,,	\/
PBA1500F	Forward converter	200	19		SCR	FR-4		Yes	Yes	Yes

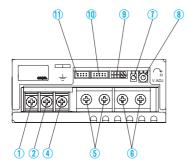
 <sup>\*1</sup> Refer to Series/Parallel Operation of Instruction Manual.
 \* The value of input current is at ACIN 100V and rated load.

1	Terminal Block						
2	Function	A-23					
	2.1 Input voltage range  2.2 Inrush current limiting  2.3 Overcurrent protection  2.4 Overvoltage protection  2.5 Thermal protection  2.6 Output voltage adjustment  2.7 Remote ON / OFF  2.8 Remote sensing  2.9 Alarm	A-23 A-23 A-23 A-23 A-24 A-24					
3	Peak Current	A-25					
4	Series / Parallel Operation	A-25					
	4.1 Series operation  4.2 Parallel operation / Master-slave operation  4.3 Parallel redundancy operation	A-25 A-26 A-26					
5	Assembling and Installation Method	A-27					
	5.1 Installation method						
6	Others	A-28					
	6.1 Output current monitor  6.2 Isolation  6.3 Auxiliary power  6.4 External components (PBA1500F)	A-28 A-29 A-29 A-29					
7	Option	A-29					
	7.1 Ontion outline	A_29					

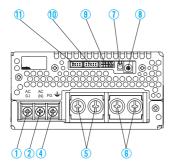
### 1 Terminal Block

\* This content describes PBA300F - 1500F. Please see External view about PBA50F - 150F.

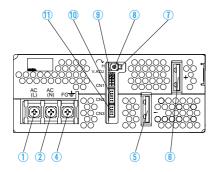
#### PBA300F



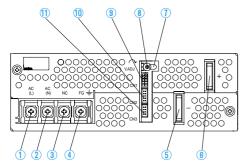
#### PBA600F



#### PBA1000F



#### PBA1500F



#### 1)AC (L)

2AC (N)

③N.C.

(4) Frame Ground

(5)-Output

(6)+Output

(7)LED

(8)Output voltage adjustable potentiometer

(10)CN2 Connector for functions

(1)CN3

#### Pin connection and function of CN1

Pin No.		Function
1	+M	: +Output voltage monitoring
2	+S	: +Remote sensing
3	-M	: -Output voltage monitoring
4	-S	: -Remote sensing
5	VB	: Voltage balance
6	СВ	: Current balance
7	TRM	: Adjustment of output voltage
8	-S	: -Remote sensing
9	RC2	: Remote ON / OFF
10	RCG	: Remote ON / OFF ground

#### Pin connection and function of CN2

Pin No.		Function
1	+M	: +Output voltage monitoring
2	+S	: +Remote sensing
3	-M	: -Output voltage monitoring
4	-S	: -Remote sensing
5	VB	: Voltage balance
6	CB	: Current balance
7	TRM	: Adjustment of output voltage
8	-S	: -Remote sensing
9	RC2	: Remote ON / OFF
10	RCG	: Remote ON / OFF ground

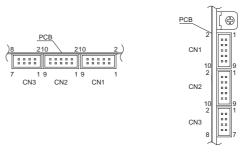
#### Pin connection and function of CN3

Pin No.	Function			
1	-S	: -Remote sensing		
2	-S	: -Remote sensing		
3	AUX	: Auxiliary output (12V 0.1A)		
4	RC1	: Remote ON / OFF		
5	AUXG	: AUX ground		
6	N.C.	: No connection		
7	PG : Power good signal			
8	PGG : Power good ground			
T : : ON ( ON ) ON ( ON )				

<sup>\*</sup> The common signs in CN1, CN2 and CN3 as -S are same potential.

#### Mating connector and terminal of CN1, CN2 and CN3

Connector	Mating Connector	Terminal	Mfr.
CN1 CN2 S10B-PHDSS	PHDR-10VS	Reel : SPHD-002T-P0.5 Loose : BPHD-001T-P0.5	J.S.T
CN3 S8B-PHDSS	PHDR-8VS	LOOSE . BPHD-0011-P0.5	



● PBA300F/600F

● PBA1000F / 1500F The pin No. of CN1 to CN3



### 2 Function

#### 2.1 Input voltage range

■The range is from AC85 - 264V or DC(Refer to SPECIFICA-TIONS).

Only AC input is available to comply with agency approval.

■A low input potential can correspond more than AC85V and DC120V by the option (Refer to 7 Option).

The decrease of load factor is needed, and consult us detailed.

■If the wrong input is applied, the unit will not operate properly and / or may be damaged. Avoid the followings to cause failure of the unit to apply square wave form input voltage, which is commonly used in UPS and inverters.

#### 2.2 Inrush current limiting

- ■Inrush current limiting is built-in.
- ■If a switch on the input side is installed, it has to be the one handling the input inrush current.

#### PBA50F, 75F, 100F, 150F

■The thermistor is used for protection from inrush current. When power is turned ON / OFF repeatedly within a short period of time, it is necessary to have enough time for power supply to cool down.

#### PBA300F, 600F, 1000F, 1500F

- ■The thyristor technique is used for protection from inrush current.

  If power is turned ON / OFF repeatedly within a short period of time, that may cause failure. It is necessary to have enough time between power ON and OFF.
- ■When the switch of the input is turned on, the primary inrush current and secondary inrush current are generated.

#### 2.3 Overcurrent protection

- ■Overcurrent protection is built-in and activated at 105% of the rated current or 101% of the peak current.
  - Overcurrent protection protects the unit from short circuit and overcurrent condition. The unit automatically recovers when the fault condition is removed.
- ■If the output voltage drops more than 50% of the rated voltage in an overcurrent protection mode, the average current will also be reduced by the intermittent operation.

#### PBA1000F, 1500F

■The output voltage is shut down when the overcurrent protection circuit operates continuously for 5 sec in PBA1000F, PBA1500F. The minimum interval of AC recycling for recovery is 3 minutes. The recovery time varies depending on input voltage and load condition.

#### 2.4 Overvoltage protection

#### PBA50F, 75F, 100F, 150F, 300F

- ■The overvoltage protection circuit is built-in. The AC input should be shut down if overvoltage protection is in operation. The minimum interval of AC recycling for recovery is 3 minutes.
  - \*The recovery time varies depending on input voltage.

#### PBA600F, 1000F, 1500F

- ■Overvoltage protection circuit to follow to output voltage is built-in.

  The AC input should be shut down if overvoltage protection is activated. The minimum interval of AC recycling for recovery is more than 3 minutes. The recovery time varies depending on input voltage.
  - \*Overvoltage protection circuit to follow to output voltage is not built into PBA300F. It corresponds by the option. Please consult us detailed.

#### Remarks

Please avoid applying the over-rated voltage to the output terminal. Power supply may operate incorrectly or fail. In case of operating a motor etc., please install an external diode on the output terminal to protect the unit.

#### 2.5 Thermal protection

#### PBA300F, 600F, 1000F, 1500F

- ■Thermal protection circuit is built-in and shut down under following condition.
  - When the current and the temperature which exceed from the derating curve.
  - The case FAN stops or air flow is interrupted and the amount of the wind decreases.

After cut off input voltage and cooling down inside of power supply, turns on the input of the power supply again.

#### 2.6 Output voltage adjustment

Output voltage is increased by turning potentiometer clockwise and is decreased by turning potentiometer counterclockwise.

#### PBA50F, 75F, 100F, 150F

■A built-in potentiometer is lost, and there is an option : -V to be able to do a changeable output voltage in the potentiometer put on the outside (Refer to 7 Option).

than 3.0V.

#### PBA300F, 600F, 1000F, 1500F

■The external output voltage control function is provided.

Adjustment of output voltage is possible in 110% from almost 0V of the rated output voltage by following.

· Applying the voltage externally

between TRM and -S on CN1 or CN2

■The output voltage level is able to calculated by ①.

However external voltage should not be less than -0.7V and more

$$\label{eq:output_voltage} \text{Output voltage} = \frac{ \begin{array}{c} \text{The voltage between} \\ \hline \text{TRM and -S} \\ \hline 2.5 \, [\text{V}] \end{array}} \; \text{$\times$ rated output voltage} \; \cdots \; \textcircled{1}$$

The output voltage decrease when sourcing current from TRM.

■When the output voltage is decreased to about 0V, the fans may stop,ripple may increase and the PG signal may turn to be "High".

#### 2.7 Remote ON / OFF

- PBA50F, 75F, 100F, 150F
- ■Option "-R" is available for remote ON / OFF (Refer to 7 Option).
- PBA300F, 600F, 1000F, 1500F
- ■Remote ON / OFF control becomes available by applying voltage in CN1. Remote ON / OFF circuit (RC2, RCG) is isolated from input, output, FG and AUX.

Table 2.1 shows the specification of remote ON / OFF.

Fig.2.1 shows the example to connect remote ON / OFF control, and followings are notes when you use the remote control.

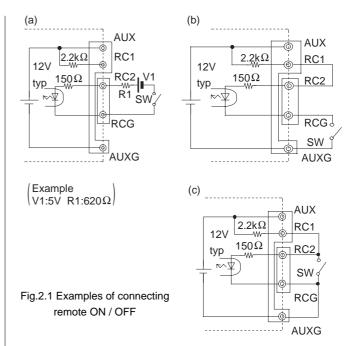
- 1)The output stops when the current is sank in RC2.
- (2) The current sinking RC2 is 5mA typ and less than 12mA max.
- ③Built-in fans stop if the output is turned off with remote ON / OFF circuit.

The fans of PBA300F become low speed when the output voltage is turned off with remote ON / OFF circuit.

- (4) The PG signal is turns to be "High" when the output voltage is turned off with remote ON / OFF.
- (§) In parallel operation and several use, please note a necessary voltage and current because the content of Table 2.1 description is a value at only one use.
- ®When the voltage or the current other than showing in Table 2.1 between RC2-RCG are applied, the output voltage might not be normally output.

Table 2.1 Specifications of remote ON / OFF

Connection	Connection method		Fig.2.1 (b)	Fig.2.2 (c)
CW Logio	Output on	SW open (0.1mA max)	SW open (0.1mA max)	SW close (0.5V min)
SW Logic	Output off	SW close (3mA min)	SW close (3mA min)	SW open (0.1mA max)
pin		RCG	AUXG	RCG, AUXG



#### 2.8 Remote sensing

(It is not in PBA50F and PBA75F.)

#### PBA100F, 150F

■It corresponds by the option: -K. The correspondence model is -3R3 and -5. Please refer to 7 Option.

#### PBA300F, 600F, 1000F, 1500F

■Remote sensing circuit is built-in.

Wiring method without using remote sensing is shown in Fig.2.2. When you do not use the remote sensing, connect between +S and +M and between -S and -M with CN1.

When the power supply is shipped from a factory, a special harness (H-SN-19) is mounted on CN1.

- ■Wiring method with remote sensing is shown in Fig.2.3.
- When you use the remote sensing, follow instruction as below.
- ①Note connecting wires enough because the load current flows to sensing line and an internal circuit of power supply is damaged occasionally, when defective contact of the screw such as loosening happens in the load line.
- ②Confirm line drop should be at 0.3V or less using a thick wire from the power supply to the load.
- (3)Do not draw the output current from ±M at CN2.
- (4)When remote sensing is used, output voltage might become unstable because of a impedance of wiring and load condition.

And the power supply should be evaluated enough.

Following are examples to improve it.

- -S sensing wire is removed and terminals between -M and -S are shorted.
- $\cdot$  C1, R1 and R2 are connected as below figure.

Please ask details to us.



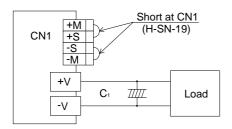


Fig.2.2 When not using remote sensing function

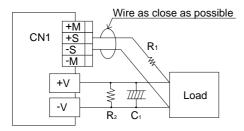


Fig.2.3 When using remote sensing function

#### 2.9 Alarm

#### PBA300F, 600F, 1000F, 1500F

■ Table 2.2 shows the alarm function built-in the power supply.

Please note that the alarm signal might take several seconds and be output.

Table 2.2 Explanation of alarm

	Alarm	Output of alarm
	The PG signal is "Low" when the power supply operates correctly.	Open collector method Good: Low
PG	The signal turns to be "High" when the fan stops or the power	(0.5V max at 10mA) Bad : High or Open
	supply stops.	50V 10mA max

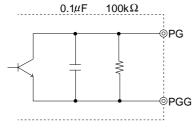


Fig.2.4 Internal circuit of PG

- ■Notes when you use PG signal are shown below.
  - The PG signal turns to be "High" when the output voltage is turned off with remote ON / OFF.
  - The PG signal may turn to be "High" when the output current becomes 10% or less of the ratings current in parallel operation. Then, the fans, too, stop.
  - 3The PG signal may turn to be "High" when the output voltage is varied to about 0V and varied rapidly by external adjustment at few output current.
- ■The PG signal circuit (PG, PGG) is isolated from input, output, FG, RC and AUX.

### 3 Peak Current

- PBA300F-24, PBA600F-24, PBA1000F-24, PBA1500F-24 / 36 (There is not setting in other models.)
- ■Peak current can output by the following conditions.
  - · AC170 264V
  - · t1 ≤ 10 [sec]
  - · Ip≦Rated peak current
  - · lave≦Rated current

· Duty=
$$\frac{t1}{t1+t2}$$
 × 100 [%] ≤35%

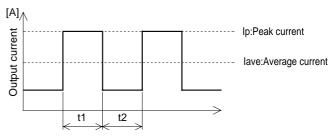


Fig.3.1 Peak current

# 4 Series / Parallel Operation

#### 4.1 Series operation

■Series operation is possible by connecting as shown in Fig.4.1.

Output current in series connection should be lower than the lowest rated current in each unit.

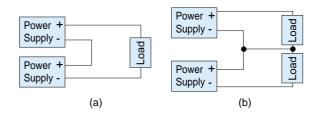


Fig.4.1 Examples of connecting in series operation



#### 4.2 Parallel operation / Master-slave operation

#### PBA50F, 75F, 100F, 150F

■Parallel redundancy operation is available by connecting the units as shown below.

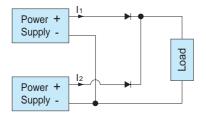


Fig.4.2 Example of connecting in parallel operation

#### Remarks:

This product is not good at parallel operation by which the OR diode is not put because the synchronous rectification method is

■Values of l<sub>1</sub> and l<sub>2</sub> become unbalanced by a slight difference of the output voltage. Make sure that the output voltage of units is of equal value and the output current from each power supply does not exceed the rated current.

 $l_1, l_2 \le$  the rated current value

#### PBA300F, 600F, 1000F, 1500F

■Parallel operation is available by connecting the units as shown in Fig.4.3.

±S, VB and CB are connected mutually in parallel, and ±S and ±M are connected with CN1 of the master power supply.

When the power supply is shipped out of a factory, special harness (H-SN-19) mounts on CN1 of each power supply.

Remove special harness (H-SN-19) mounted on CN1 of the slave power supply. Please use optional harnes: H-PA-3 to connect ±S. VB and CB in parallel.

As variance of output current drew from each power supply is maximum 10%, the total output current must not exceed the value determined by the following equation.

(Output current at parallel operation)

= (the rated current per unit) X (number of unit) X 0.9

■When the number of units in parallel operation increases, input current increases at the same time.

Adequate wiring design for input circuitry is required, such as circuit pattern, wiring and current capacity for equipment.

- ■In parallel operation, the maximum operative number of units is 5.
- ■Please consult us the harness for a parallel operation.
- ■The wiring impedance of the load from each power supply must become even so that the output current balance circuit may operate normally.

■Output voltage in parallel operation is adjustable by using the potentiometer of the "master" unit. Select one power supply to be the master, and turn the potentiometer of the other, slave power supplies, clockwise to the end.

Then use the potentiometer of the mater to adjust output voltage.

■When remote sensing is used in parallel operation, the sensing wire must be connected only to master.

Terminals +S and -S of slave power supplies must be connected to master.

■It is impossible parallel operation with the other model.

**Instruction Manual** 

- ■The output voltage changes by about 5% in a parallel operation when one stops by the fail of input side.
- ■When the output current becomes less than 10% of the rated current, the PG signal may become High and the fans may stop.

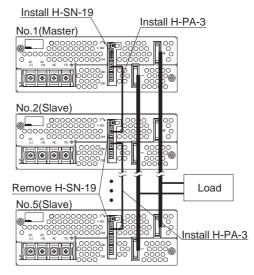


Fig.4.3 Examples of connecting parallel operation (The case of PBA1500F)

#### 4.3 Parallel redundancy operation

#### PBA300F, 600F, 1000F, 1500F

- ■N+1 redundancy is possible for reliability.
- ■The system can be operated in a normal power supply even if one of power supplies breaks down when using in parallel by power supply number +1 necessary for the system.
- ■Consult us about parallel redundancy.

### 5 Assembling and **Installation Method**

#### 5.1 Installation method

■The screw should be inserted up to 6mm max from outside of the power supply to keep a distance between inside parts and an isolation.

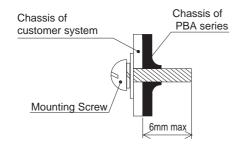


Fig.5.1 Mounting screw

#### PBA50F, 75F, 100F, 150F

■When two or more power supplies are used by side, position them with proper intervals to allow enough air ventilation. Ambient temperature around each power supply should not exceed the temperature range shown in derating curve.

#### PBA300F, 600F, 1000F, 1500F

■Fans for forced cooling are built-in.

Do not block the ventilation at suction side (terminal block side) and its opposite side.

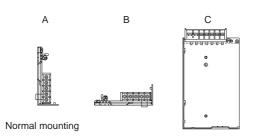
Fix firmly, considering weight, though it can be used by the installation

■Install the air filter so that the effect of cooling by the fan does not decrease when the power supply is used in a dusty place.

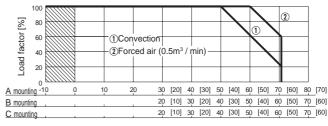
#### 5.2 Derating

#### PBA50F, 75F, 100F, 150F

#### (1)Mounting method



#### (2)Derating curve



Ambient temperature[℃]

case cover

- ■Specifications inside the hatched area, Ripple · Ripple Noise is
- ■Standard of cooling

Please use do to become below the temperature which the temperature of Point A shows in Table 5. Point A is displayed on thechassis (Refer to External view).

	Point A		
	Ambient temperature:50°C	Ambient temperature:71℃	
PBA50F	72°C or less	82°C or less	
PBA75F	83°C or less	84°C or less	
PBA100F	87°C or less	83°C or less	
PBA150F	89°C or less	85°C or less	

#### PBA300F, 600F, 1000F, 1500F

■Derating curve depending on ambient temperature is shown in Fig.5.2.

In the hatched area, the specifications of Ripple and Ripple Noise are different from other, refer to specifications.

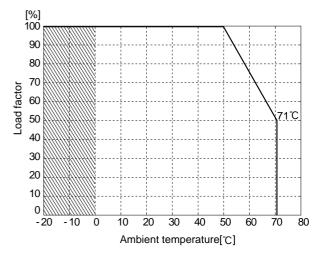


Fig.5.2 Derating curve depending on ambient temperature

■Derating curve depending on input voltage of PBA1500F is shown in Fig.5.3.

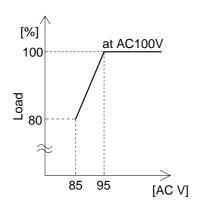


Fig.5.3 Derating curve depending on input voltage (PBA1500F)

#### 5.3 Expectancy life and warranty

#### ■Expectancy life

The expectancy life is as follows.

Installation	Average ambient	Load factor		
condition	temperature(year)	50%	100%	
PBA50F -	Ta=30℃ More than 10 years		More than 10 years	
150F	Ta=40°C	More than 10 years	6 years	
(Installation A)	Ta=50°C	5 years	3 years	
PBA300F -	Ta=40°C	7 years*	7 years*	
1500F	Ta=50°C	6 years*	5 years	

\*It is a value to which the maintenance of the fan is required.

#### PBA300F, 600F, 1000F, 1500F

■Regular exchange is necessary for the fan, because the life expectancy (R (t) =90%) of the fan depending on the use condition is shown in Fig.5.4.

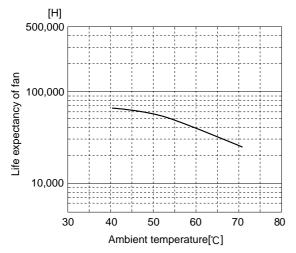


Fig.5.4 Life expectancy of fan

#### ■Warranty

#### PBA50 - 150F:

The warranty is 5 years when average ambient temperature of year is  $Ta=40^{\circ}C$  or less and load factor is average 50% or less. However, the warranty is 3 years when average ambient temperature of year is  $Ta=50^{\circ}C$  or less and load factor is series 100%.

#### PBA300 - 1500F:

The warranty is 5 years if it is derating curve.

### 6 Others

#### 6.1 Output current monitor

#### PBA300F, 600F, 1000F, 1500F

- ■It is possible to know the output current to measure the voltage between CB to -S in CN1 or CN2.
- ■The relation between CB voltage and load current is shown in Fig.6.1.

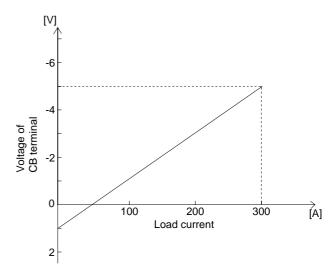


Fig.6.1 Load current conversion graph(PBA1500F-5)

#### Remarks:

Fig.6.1 is nominally, not guarantee.

Please ask to us if the characteristic of the other model is necessary.

- ■Note the following when you measure the voltage of CB terminal.
  - Please note wiring so as not to malfunction because of the noise.
  - · Please use the input impedance of measurement equipment must be  $500 k\Omega$  or more.
  - Please note internal parts might be damaged when CB terminal and -S terminal are short circuit.



#### 6.2 Isolation

■For a receiving inspection, such as Hi-Pot test, gradually increase (decrease) the voltage for start (shut down). Avoid using Hi-Pot tester with the timer because it may generate voltage a few times higher than the applied voltage, at ON / OFF of a timer.

If the unit is tested on the isolation between input & output and output & FG must be shorted output, RCG, PGG and AUXG.

#### 6.3 Auxiliary power (AUX)

#### PBA300F, 600F, 1000F, 1500F

- ■Auxiliary power (AUX: 12V0.1A) is possible for remote ON / OFF and its attached circuit from CN3.
- ■AUX circuit (AUX, AUXG) is isolated from input, output, FG, PG
- ■Please do not take out the current which exceeds 0.1A from AUX to avoid the breakdown of the power supply and the malfunction. Do not exceed 0.1A on starting up when you connect the DC-DC converter with AUX.

#### 6.4 External components (PBA1500F)

■This power supply complies with FCC Part15 class B and EN55022-B in connecting a noise filter with the external.

Example of value of external noise filter

L1:0.45mH L2: 0.45mH

C1 :  $0.1 \mu F$ C2:  $0.1 \mu F$ C3:  $0.1\mu$ F

C4:4700pF C5: 4700pF  $\text{R1}:\text{2M}\Omega$  $R2:2M\Omega$ 

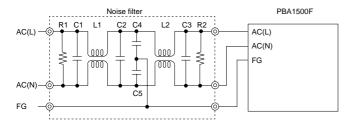


Fig.6.2 External noise filter Recommendation noise filter: ZRAC2220-11 (TDK)

### 7 Option

#### 7.1 Option outline

- ■Consult us detailed option and delivery before hand.
- ■It is possible a combination of the option, and consult us that it is not possible to do according to the option for the combination occasionally.

#### O-C

· -C means internal PCB is coated. (Humidity improvement goods)

- · Low leakage current type.
- · The difference from standard is shown Table 7.1.

Table 7.1 Low leakage type

	-E(PBA50F - 150F)	-G
Leakage current(AC240V)	0.5mA max	0.15mA max
Conducted Noise	Class A	Not available
Ripple Noise	1.5 times standard	2.0 times standard

· Operation stop voltage is set at a lower value than standard ver-

PBA300F / 600F / 1000F / 1500F correspond by option : -U. PBA50F / 75F / 100F / 150F correspond by standard.

Use condition

#### Output

PBA50F	15W	(10W)	PBA300F	125W	(83W)
PBA75F	35W	(20W)	PBA600F	250W	(165W)
PBA100F	50W	(30W)	PBA1000F	500W	(330W)
PBA150F	65W	(40W)	PBA1500F	750W	(495W)
				( )3.3\	Output

#### Input

AC50V (DC70V) Duty 1s / 30s

\* Avoid continuously operating about 1[sec] and more so that the power supply is broken.

#### -F1 (PBA600F / 1000F / 1500F)

- · Long-lived fan type (PBA300F is not set).
- · The difference from standard is shown Fig.7.1.
- · Externals change into PBA600F. Please refer to externals chart for details.

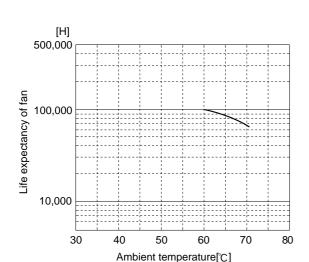


Fig.7.1 Life expectancy of long-lived fan

#### ●-F3 (PBA300F / 600F / 1000F / 1500F)

- · Reverse air exhaust type.
- · The difference from standard is shown Fig.7.2 and Fig.7.3.



Fig.7.2 Air flow(-F3)

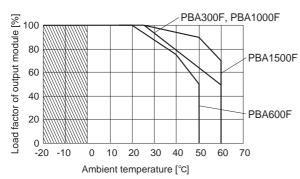


Fig.7.3 Derating curve depending on ambient temperature(-F3)

#### -F4 (PBA300F / 600F / 1000F / 1500F)

- · Low speed fan for reducing sound.
- · The difference from standard is shown Fig.7.4.

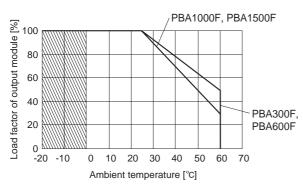


Fig.7.4 Derating curve depending on ambient temperature(-F4)

#### ●-T (PBA50F / 75F / 100F / 150F)

- · -T means terminal block is changed from horizontal to vertical position.
- · Consult us external view in details.

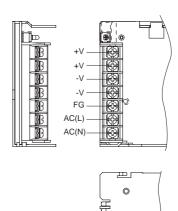


Fig.7.5 Example of option -T (PBA100F)

#### •-J (PBA50F / 75F / 100F / 150F)

- · -J means terminal block is changed to connector.
- · Special harness is prepared. Refer to option parts.
- · Consult us external view in details.
- · PBA100F / 150F corresponds to -12, -15, -24, -36 and -48 models.

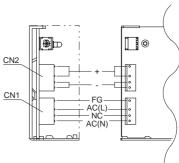


Fig.7.6 Image of option -J

I / O Connector		Mating Connector	Terminal
CN1	5289-4A	5199-04	Chain: 5194PBT
			Loose : 5194PBTL
CN2	5277-4A (PBA50F)	5196-04 (PBA50F)	Chain: 5194PBT
			Loose : 5194PBTL
	5277-6A (PBA50/100/150F)	5196-06 (PBA75/100/150F)	Chain: 5194PBT
			Loose : 5194PBTL

\*Maximum 5A per pin of CN2 can be applied

(Mfr. Molex)



#### -R (PBA50F / 75F / 100F / 150F)

■Option "-R" is available for remote ON / OFF.

Between RC (+) and RC (-)	Output
SW ON (4.5 - 12.5V)	ON
SW OFF (0 - 0.5V)	OFF

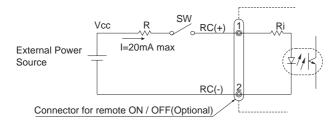


Fig.7.7 Example of using remote ON / OFF

■When external power source is in the range of 4.5 - 12.5V, current limit resistance R is not requierd. However, when external power source exceeds 12.5V, current limit resistance R must be connected.

To calculate the current limit resistance use following equation :

$$R[\Omega] = \frac{Vcc-(1.1+Ri \times 0.005)}{0.005}$$

Where;

Vcc=External Power Source

Ri=The internal resistance (780 $\Omega$ )

- ■A wrong connection may damage the internal components of the unit.
- ■Remote ON / OFF circuit (RC (+), RC (-) ) is isolated from input, output and FG.

#### -N (PBA50F / 75F / 100F / 150F)

- · With case cover.
- · External size is changed and refer to External view.
- · Derating curve changes from the standard (Refer to 5.2).
- · Only -24 model is applying for the UL508 standard.

#### -N1

- · -N1 means DIN rail attachment is attached to standard model.
- · Consult us external view in details.
- · -N1 becomes a type with case cover.

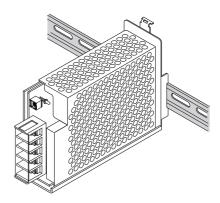


Fig.7.8 Image of installation option -N1

#### -V (PBA50F / 75F / 100F / 150F)

- · A built-in potentiometer is lost, and connector which can be connected with outside potentiometer is installed.
- · Consult us external view in details.
- · Please note that the output voltage becomes unstable when CN5 is energized while opened.

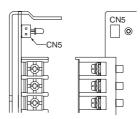


Fig.7.8 Upper view of option -V

#### ●-K (PBA100F / 150F / only -3R3 / -5)

- · Remote sensing function can be used for option "-K".
- · Please note the correspondence model.
- · Consult us details.