

TOKO 150 W AC-DC Converters

MK-Family

Single output

- Ultra compact, high power density
- High efficiency up to 80%
- Overload and overvoltage protection
- Highest grade components for highest reliability
- Surge protection
 - Lightning 4 kV
 - Strong electric fields 50 V/m
- Noise standards: Meets FCC Class B and VCCI, Class 2

Safety according to UL 478

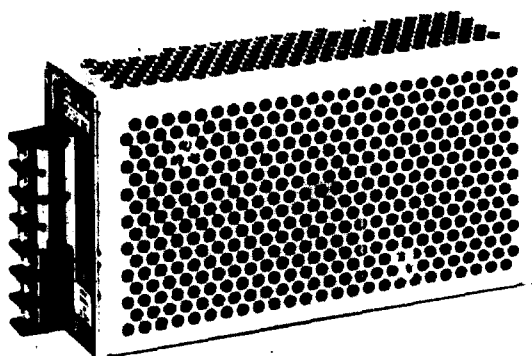


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Type Survey

Table 1: Type survey

Output configuration		Input voltage range $U_{\min} \dots U_{\max}$	Rated power $P_{O \text{ tot}}$ $T_A = 40^\circ\text{C}$	Type designation
$U_O \text{ nom}$ V DC	$I_O \text{ nom}$ A			
5	30.0	90...132 V AC	150 W	MK 150-05
6	25.0			MK 150-06
12	12.5	47...440 Hz		MK 150-12
15	10.0	or		MK 150-15
18	8.4	120...175 V DC		MK 150-18
24	6.3			MK 150-24

Description

Modules to application of new inductive technology the switching frequency of the MK 150 has been boosted to 250 kHz. The design allows for the use of smaller inductive components and filtering circuitry. The use of power MOSFET technology also reduces size and increases power density. For a new generation product or as a running design change, a manufacturer can replace a conventional 100-watt supply with a 150-watt type MK 150. This permits the use of more power-intensive peripherals without mechanical design changes.

Key applications

The smaller-than-usual size of the MK 150 series makes them well suited to newer, smaller footprint personal computers as well as telecommunications equipment, instrumentation and control systems.

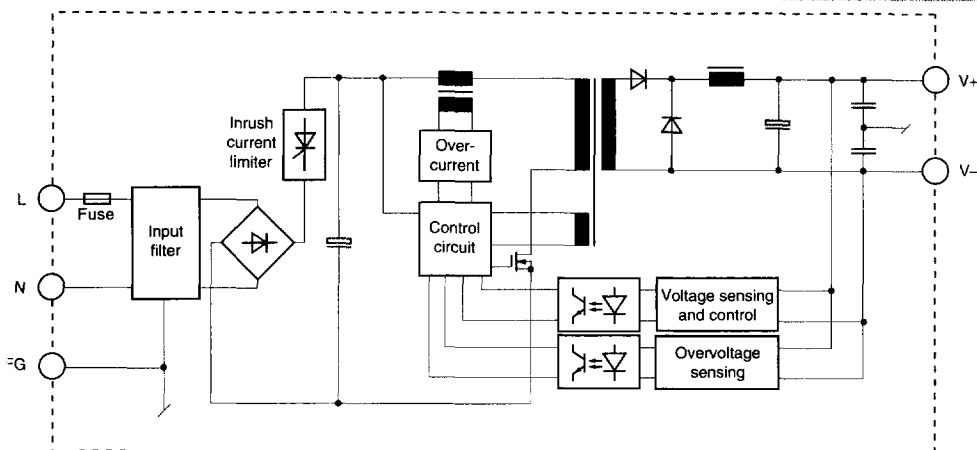


Fig. 1
Block diagram MK 150

Electrical Input and Output Data

General condition: $T_A = 25^\circ\text{C}$ unless otherwise specified

Table 2: Input Data

Characteristics			MK 150	Unit
U_i	Rated input voltage		115	V AC
	Input voltage range		90...132	V DC
			120...175	
f_i	Line frequency		47...440	Hz
I_{leak}	Leakage current (max.)	115 V AC, 50 Hz	0.5	mA

General condition: $T_A = 25^\circ\text{C}$ unless otherwise specified

Table 3: Output data

Characteristics		MK 150-05	MK150-06	MK150-12	MK150-15	MK150-18	MK150-24	Unit
$U_{o\text{ nom}}$	Output voltage	5	6	12	15	18	24	V
	Adjustable output range	± 10						%
U_{oL}	Overvoltage protection	6.9	8.0	15.5	20.0	24.0	31.0	V
I_o	Output current	30.0	25.0	12.5	10.0	8.4	6.3	A
I_{oL}	Overcurrent protection ¹	105						%
u_o	Ripple-noise max.	120	120	120	150	180	200	mVp
ΔU_{oL}	Line regulation	± 3						%
ΔU_{oI}	Load regulation 0...100%	± 3						%
t_{or}	Rise time max.	150						ms
t_{oh}	Hold up time min.	20						ms
η	Efficiency ² typ.	78	78	80	80	82	82	%

¹ Operate at 105% of rated current, CC method, automatic reset

² At rated input and output

Operating Instructions

Derating of Output Power

The output power derating depends on the structure of the power supply. The derating characteristics are shown in fig. 2.

Output Voltage Adjustment

The output voltage adjustment range (V_{ADJ} at the front panel) is $\pm 10\%$ of $U_{o\text{ nom}}$. The actual output power should not exceed the specified maximum output power.

Overcurrent Protection

When the output current exceeds 105% of the rated current the overcurrent protection circuit operates (see fig. 3). The output will recover automatically as soon as the overload condition is removed. The overload condition should remain as short as possible.

Overvoltage Protection

When there is an overvoltage condition at the output, the internal latch circuit will operate and the output will be cut off. In this instance, turn off the input. At least 90 seconds should be allowed as recovery time.

Inrush Current

A thyristor is built-in to protect against excessive inrush current. Appropriate selection of the AC input switch is recommended. Repeating switching cycles should be avoided i.e. permit at least two minutes recovery time.

Insulation and Dielectric Strength Test

Preshipment tests have been applied at the factory and further tests are not necessary.

Series Operation

Two power supplies, PS-1 and PS-2 for example, may be operated in series connection as shown in fig. 4a and 4b.

Parallel Operation

Do not connect the power supplies for parallel operation.

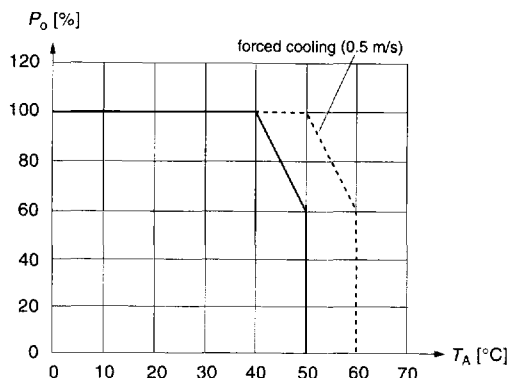


Fig. 2
Output power vs. ambient temperature

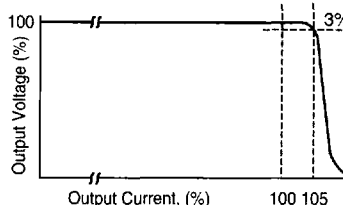


Fig. 3
Output voltage vs. output current

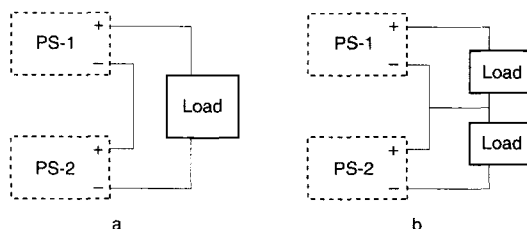


Fig. 4
Power supplies connected in series

Immunity to Environmental Conditions

Table 4: Temperature specifications

Characteristic		min	max	Unit
T_A	Operating ambient temperature range without derating	0	40	°C
T_A	Operating ambient temperature range with derating (see fig. 3)	0	60	
T_S	Storage temperature range	-20	75	

Table 5: Humidity

Test	Parameters
Ca	Humidity (no dew condensation)
	Relative humidity: 30...85%
	Unit operating/storage

Table 6: Isolation

Test	Input to output	Input to frame	Output to frame
Dielectric strength test ¹	1500 V AC, 1 minute	1500 V AC, 1 minute leakage current <10 mA.	–
Insulation resistance ¹	–	–	>100 MΩ at 500 V DC

¹ At normal temperature and humidity

Table 7: MTBF

Ratings at specified Ambient temperature	MK 150 40°C	Unit
MTBF	103'000	h

Mechanical Data

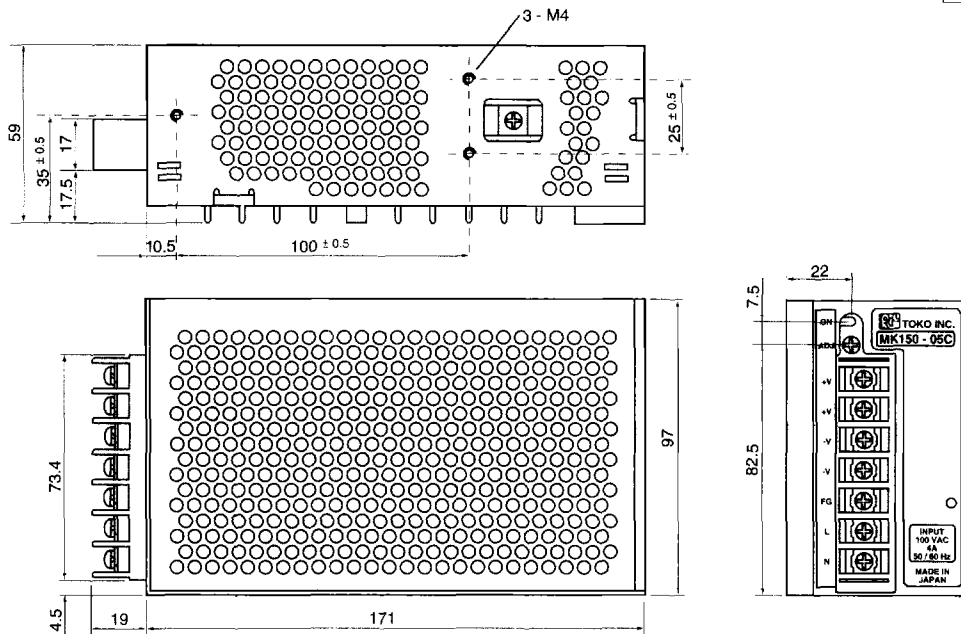
Dimensions in mm. Tolerances ± 1 mm unless otherwise indicated.

Fig. 5

MK 150: For vertical installation only. Maximum length of M4 mounting screws inside the power supply 6 mm.

Type Key and Product Marking

Type Key

Family MK
 Blank
 Nominal output power [W] 150
 Dash
 Nominal output voltage [V] 5...24

MK 150 - 12

Example: MK 150-12 = AC-DC converter providing 12 V/12.5 A, 150 W in a case with terminal strip

Product Marking

Label: Type designation, applicable safety approvals and recognition marks, specific type designation, input voltage range, nominal output voltage and current and pin allocation.