

## AC METALLIZED POLYPROPYLENE FILM CAPACITORS FOR USE IN DISCHARGE LAMP CIRCUITS (TYPE A)

### APPLICATION

The MKSP-025P capacitors, type A, rated voltage 250VAC, meet the requirements of EN 61048:2000/A2 and are designed for parallel power factor correction of discharge lamps (e.g. fluorescent lamps, metal halide lamps, mercury-vapour lamps and sodium-vapour lamps) supplied from mains with a frequency of 50 or 60 Hz.

### TECHNICAL DATA

The technical data are specified in the following pages enclosed for particular capacitor versions. The detailed technical requirements are specified in the Technical Specifications WT-03/MIFLEX/MKSP-025 and MKSP-025P.

### CAPACITOR VERSIONS

The MKSP-025P capacitors, type A are made of metallized polypropylene film having low dielectric loss. The winding element is placed into plastic case and sealed with special terminal cover. Depending on capacitor case, these capacitors can be fixed by an M8 stud or special quick-fixing clips. The capacitors have a discharge resistor which discharges the capacitor to a voltage not exceeding 50V within 1 minute from the capacitor turn-off from the mains.

The basic versions of capacitor are as follows:

#### VERSION 5 (Page 4):

- capacitor cover with integral terminal block (WAGO) equipped with internal discharge resistor suitable for currents with the value of 10A, to connect wire terminals 0.5 to 1.5 mm<sup>2</sup>
- case without quick-fixing clip and stud
- version with termal fuse on the customer's request

#### VERSION 6 (Page 5):

- capacitor cover with integral terminal block as in the version 5
- case with metal M8 fixing stud
- version with termal fuse on the customer's request

#### VERSION 7 (Page 6):

- capacitor cover with integral terminal block as in the version 5
- case with quick-fixing clip

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### VERSION 9 (Page 7):

- insulated wire leads; 0.5mm<sup>2</sup>
- the capacitors have a discharge resistor inside
- case with quick-fixing clip
- version with thermal fuse on the customer's request

### VERSION 10 (Page 8):

- insulated wire leads; 0.5mm<sup>2</sup>
- the capacitors have a discharge resistor inside
- case with metal M8 fixing stud
- version with thermal fuse on the customer's request

Note: The MKSP-025P capacitors do not contain PCB's.

### MOUNTING INSTRUCTIONS

All capacitor versions can be mounted without restrictions in any position. Nevertheless, during the mounting it must be considered that these capacitors do not have a specific fail-safe device which would disconnect them from the mains in case of their failure. Although the capacitor cover and case are made of flame retardant materials (UL94 V0 or V2), the winding element is made of inflammable metallized polypropylene film. These capacitors have a self-healing feature but during the service life of capacitor, especially under conditions of permanent overloading, the ability of the dielectric to regenerate (self-healing) may deteriorate. As a result, the risk of a non-healing breakdown with continuous short circuit may occur. The winding element may overheat rapidly and melt, smoke and even ignite. It is, therefore, necessary to undertake proper measures to provide reliable safety for people and property by locate the capacitors in the lamp luminaires so as to avoid the ignition of inflammable materials in their surroundings.

### NOTE:

**A full protection from fire is guaranteed by the MKSP-I60 capacitors, type B, sealed hermetically in Al case, and equipped with the overpressure disconnecter.**



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## AC METALLIZED POLYPROPYLENE FILM CAPACITORS FOR USE IN DISCHARGE LAMP CIRCUITS (TYPE A)

### OPERATING CONDITIONS

The MKSP-025P capacitors have been designed for continuous operation at the rated voltage, temperature and humidity according to technical data given for particular versions.

### SERVICE LIFE

In accordance with EN 61049, the capacitors are subjected to endurance test with the test voltage of 337,5VAC and the test temperature of +85°C for 2000 hours.

The above mentioned endurance test is equivalent to the service life expectancy of 30000h at the rated voltage of 250VAC and the temperature of +85°C in accordance with the following relation:

$$L_2 = L_1 \left( \frac{U_1}{U_2} \right)^9 \cdot 2^x$$

where:

- $L_2$  - service life expectancy (hours)
- $L_1$  - test duration acc. to EN 61049
- $U_1$  - test voltage e.g.  $1,35U_R$  for  $L_1 = 2000h$
- $U_2$  - working voltage e.g.  $U_R = 250VAC$

$$X = \frac{T_1 - T_2}{10}$$

where:

- $T_1$  - endurance test temperature (e.g. +85°C)
- $T_2$  - working temperature (temperature of capacitor case e.g. +85°C)

In accordance with the above relation, the service life of capacitors increases markedly as a result of temperature and voltage decrease.

#### Example:

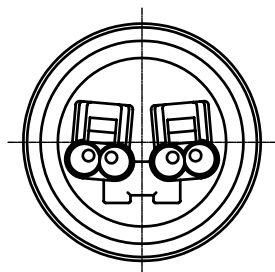
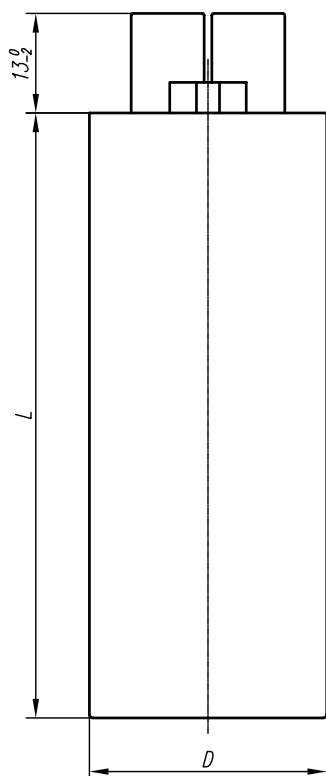
In case of rated voltage of 250VAC and the capacitor case temperature of +70°C, the designed service shall be about 85000h and is equivalent to the capacitor lifetime of 10 years.

#### Notes:

1. The excessive temperatures, overvoltages, humidity and harmonic distortions may reduce the service life expectancy or increase the failure rate.
2. No vapour condensation on the capacitor surface is allowed. The humidity class and climatic category is given in Technical Specifications. The limit values of humidity shall not be exceeded even during storage.
3. Only capacitors with overpressure safety mechanism are suitable for use under conditions of the increased humidity. In case of doubt regarding the character of the ambient conditions, the capacitors with overpressure safety mechanism should be given preference.
4. In case of other doubts please contact the manufacturer.

## AC METALLIZED POLYPROPYLENE FILM CAPACITORS FOR USE IN DISCHARGE LAMP CIRCUITS (TYPE A)

Version 5



Rated capacitance $C_N$	Capacitor dimensions	
	$D_{\pm 0.1}$ mm	$L_{\pm 2}$ mm
μF		
3	25	58
3.5		
4		
4.5		
5		
6		
7	30	73
8		
9		
10		
12		
12.5		
14	35	83
16		
18		
20		
20		
22.5		
25	40	83
30		
32		
35		
40	45	83
45		

Other dimensions and capacitances from the given range are available on the customer's request.

### TECHNICAL DATA:

- Capacitance tolerance:  $\pm 10\%$ ,
- Rated voltage: 250V/50Hz,
- Rated frequency: 50 - 60Hz,
- Temperature range (temp of capacitor surface):  $-40 \pm 85^\circ\text{C}$ ,
- Climatic category: 40/085/10 acc. to EN 60068-1,
- Relative humidity in capacitor's ambience at  $20 \pm 25^\circ\text{C}$ : 65% mean annual value, 85% max value during 30 days, not allowed,  $\leq 0.003$  at 50Hz / 250V~,
- Dewing of capacitor:
- Dissipation factor ( $\text{tg } \delta$ ):  $\leq 0.003$  at 50Hz / 250V~,
- Dielectric strength:
  - between terminals  $2U_R - 60\text{s}$ ,
  - between terminals connected together and case  $2.5\text{kV} / 50\text{Hz} - 60\text{s}$ ,
- Case: plastic case,
- Filling material: PUR resin,
- Specifications: WT-03/MIFLEX/MKSP-025 and MKSP-025P,
- The capacitors meet the requirements of: EN 61048/A2, EN 61049.

This product fulfils the requirements of the RoHS Directive (2011/65/EC).



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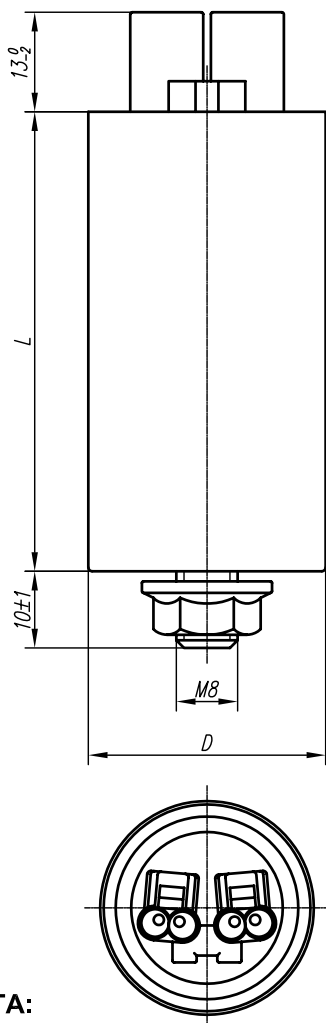
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## AC METALLIZED POLYPROPYLENE FILM CAPACITORS FOR USE IN DISCHARGE LAMP CIRCUITS (TYPE A)

Version 6



Rated capacitance $C_N$	Capacitor dimensions	
	$D_{\pm 1}$ mm	$L_{\pm 2}$ mm
μF		
3	25	58
3.5		
4		
4.5		
5		
6		
7	30	73
8		
9		
10		
12	35	83
12.5		
14		
16		
18		
20		
20	40	83
22.5		
25		
30		
32		
35		
40	45	83
45		

Other dimensions and capacitances from the given range are available on the customer's request.

### TECHNICAL DATA:

- Capacitance tolerance:  $\pm 10\%$ ,
- Rated voltage: 250V/50Hz,
- Rated frequency: 50 - 60Hz,
- Temperature range (temp of capacitor surface):  $-40 \pm 85^\circ\text{C}$ ,
- Climatic category: 40/085/10 acc. to EN 60068-1,
- Relative humidity in capacitor's ambience at  $20 \pm 25^\circ\text{C}$ : 65% mean annual value,
- Dewing of capacitor: 85% max value during 30 days,
- Dissipation factor ( $\text{tg } \delta$ ): not allowed,
- Dielectric strength:  $\leq 0.003$  at 50Hz / 250V~,  $2U_R - 60\text{s}$ ,
- Metal stud: 2.5kV / 50Hz - 60s,
- Case: tightening-up strength 4 Nm,
- Filling material: plastic case,
- Specifications: PUR resin,
- The capacitors meet the requirements of: WT-03/MIFLEX/MKSP-025 and MKSP-025P,
- EN 61048/A2, EN 61049.

This product fulfils the requirements of the RoHS Directive (2011/65/EC).



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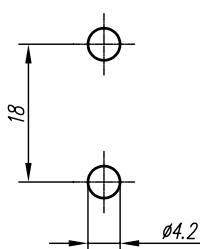
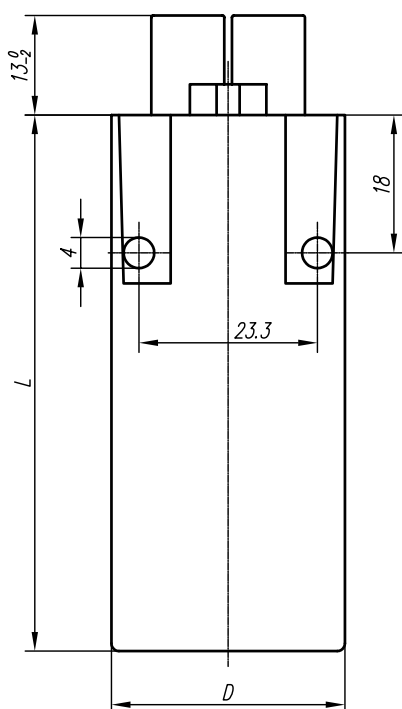
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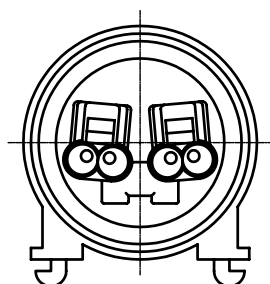
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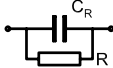
## AC METALLIZED POLYPROPYLENE FILM CAPACITORS FOR USE IN DISCHARGE LAMP CIRCUITS (TYPE A)

Version 7



Mounting holes



Rated capacitance $C_N$	Capacitor dimensions	
		
	$D_{\text{ø}}$	$L \pm 2$
$\mu\text{F}$	mm	mm
3	30	70
3.5		
4		
4.5		
5		
6		
7		
8		
9		
10		
12		
12.5		
14		

Other dimensions and capacitances from the given range are available on the customer's request.

### TECHNICAL DATA:

- Capacitance tolerance:  $\pm 10\%$ ,
- Rated voltage: 250V/50Hz,
- Rated frequency: 50 - 60Hz,
- Temperature range (temp of capacitor surface):  $-40 \div +85^\circ\text{C}$ ,
- Climatic category: 40/085/10 acc. to EN 60068-1,
- Relative humidity in capacitor's ambience at  $20 \div +25^\circ\text{C}$ : 65% mean annual value, 85% max value during 30 days, not allowed,
- Dewing of capacitor:  $\leq 0.003$  at 50Hz / 250V~,
- Dissipation factor ( $\text{tg } \delta$ ):  $2U_R - 60\text{s}$ ,
- Dielectric strength: 2.5kV / 50Hz - 60s,
- between terminals plastic case,
- between terminals connected together and case PUR resin,
- Case: WT-03/MIFLEX/MKSP-025 and MKSP-025P,
- Filling material: EN 61048/A2, EN 61049.
- Specifications:
- The capacitors meet the requirements of:

This product fulfils the requirements of the RoHS Directive (2011/65/EC).



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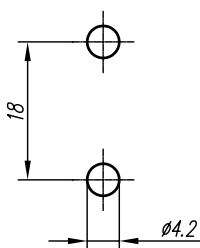
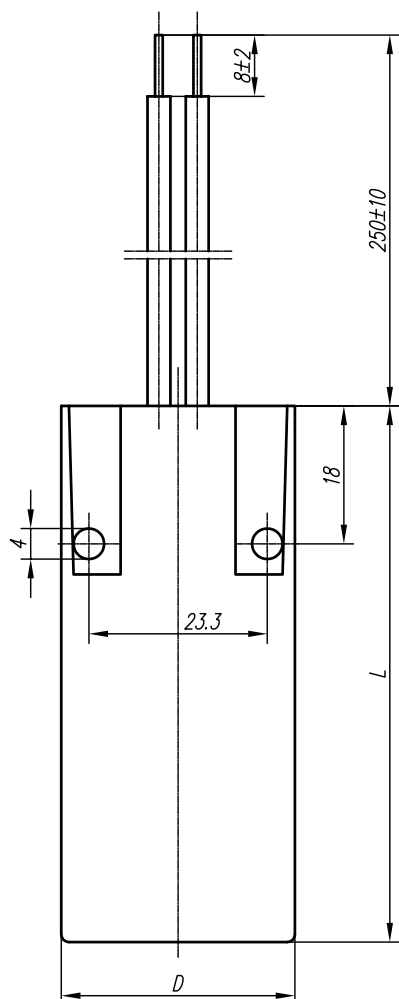
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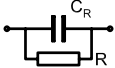
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## AC METALLIZED POLYPROPYLENE FILM CAPACITORS FOR USE IN DISCHARGE LAMP CIRCUITS (TYPE A)

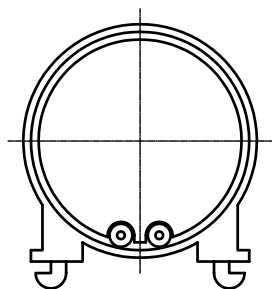
Version 9



Mounting holes

Rated capacitance $C_N$	Capacitor dimensions	
		
	$D_{\text{max}}$	$L \pm 2$
$\mu\text{F}$	mm	mm
3	30	70
3.5		
4		
4.5		
5		
6		
7		
8		
9		
10		
12		
12.5		
14		

Other dimensions and capacitances from the given range are available on the customer's request.



### TECHNICAL DATA:

- Capacitance tolerance:
  - Rated voltage:
  - Rated frequency:
  - Temperature range (temp of capacitor surface):
  - Climatic category:
  - Relative humidity in capacitor's ambience at  $20 \pm 25^\circ\text{C}$ :
  - Dewing of capacitor:
  - Dissipation factor ( $\text{tg } \delta$ ):
  - Dielectric strength:
    - between terminals
    - between terminals connected together and case
  - Case:
  - Filling material:
  - Specifications:
  - The capacitors meet the requirements of:
- $\pm 10\%$ ,
  - 250V/50Hz,
  - 50 - 60Hz,
  - $-40 \pm 85^\circ\text{C}$ ,
  - 40/085/10 acc. to EN 60068-1,
  - 65% mean annual value,
  - 85% max value during 30 days,
  - not allowed,
  - $\leq 0.003$  at 50Hz / 250V~,
  - $2U_R - 60\text{s}$ ,
  - 2.5kV / 50Hz - 60s,
  - plastic case,
  - PUR resin,
  - WT-03/MIFLEX/MKSP-025 and MKSP-025P,
  - EN 61048/A2, EN 61049.

This product fulfils the requirements of the RoHS Directive (2011/65/EC).

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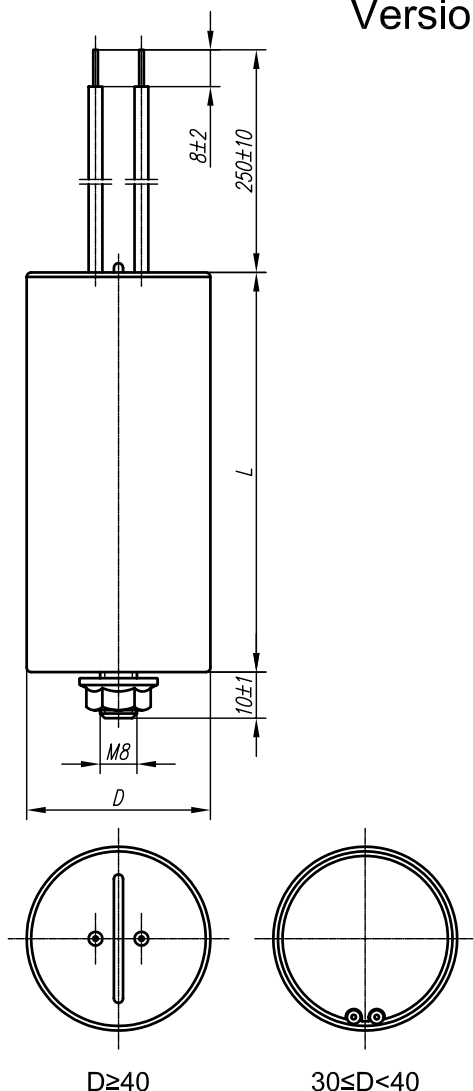
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
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## AC METALLIZED POLYPROPYLENE FILM CAPACITORS FOR USE IN DISCHARGE LAMP CIRCUITS (TYPE A)

### Version 10

Capacitor dimensions in case with  
metal stud



Rated capacitance $C_N$	Capacitor dimensions		
			
	$D_0^{+1}$	$L \pm 2$	
	mm	mm	
$\mu F$			
4,5	30	58	
6			
7			
8			
9			
10			
12	35	73	
12,5			
14			
16			
18			
20			
20	40	83	
25			
30			
32			
35			
40			
45	45		
50			
60	50		

Other dimensions and capacitances from the given  
range are available on the customer's request.

### TECHNICAL DATA:

- Capacitance tolerance:
  - $\pm 10\%$ ,
- Rated voltage:
  - 250V/50Hz,
- Rated frequency:
  - 50 - 60Hz,
- Temperature range (temp of capacitor surface):
  - $-40 \div 85^\circ C$ ,
- Climatic category:
  - 40/085/10 acc. to EN 60068-1,
- Relative humidity in capacitor's ambience at  $20 \div 25^\circ C$ :
  - 65% mean annual value,
  - 85% max value during 30 days,
  - not allowed,
  - $\leq 0.003$  at 50Hz / 250V~,
- Dewing of capacitor:
  - $2U_R - 60s$ ,
- Dissipation factor ( $\tan \delta$ ):
  - 2.5kV / 50Hz - 60s,
- Dielectric strength:
  - tightening-up strength 4 Nm,
  - plastic case,
  - PUR resin,
  - WT-03/MIFLEX/MKSP-025 and MKSP-025P,
  - EN 61048, EN 61049.
- Metal stud M8
- Case:
  - between terminals
  - between terminals connected together and case
- Filling material:
- Specifications:
- The capacitors meet the requirements of:

This product fulfils the requirements of the RoHS Directive (2011/65/EC).

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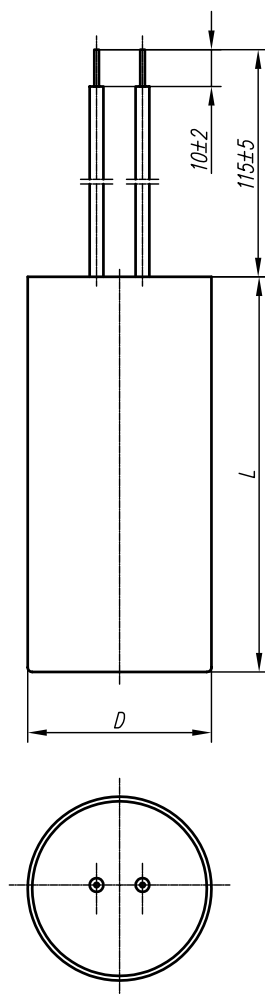
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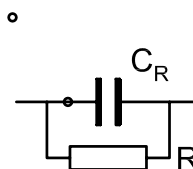
## AC METALLIZED POLYPROPYLENE FILM CAPACITORS FOR USE IN DISCHARGE LAMP CIRCUITS (TYPE A)

Version 11



Capacitor dimensions

Item	Rated capacitance	Capacitor dimensions	
		D <sub>1</sub> <sup>0</sup>	L±1
1.	45	mm	mm
2.	60	50	78



### TECHNICAL DATA:

- Capacitance tolerance:
- Rated voltage:
- Rated frequency:
- Temperature range (temp of capacitor surface):
- Climatic category:
- Relative humidity in capacitor's ambience at 20 ÷ 25 °C:
- Dewing of capacitor:
- Dissipation factor (tg δ):
- Dielectric strength:
  - between terminals
  - between terminals connected together and case
- Lead:
- Case:
- Filling material:
- Specifications:
- The capacitors meet the requirements of:
- ±10%,
- 250V<sub>AC</sub>,
- 50 - 60Hz,
- -40 ÷ 85 °C,
- 40/085/10 acc. to EN 60068-1,
- 65% mean annual value,
- 85% max value during 30 days,
- not allowed,
- ≤0.003 at 50Hz / 250V-,
- 2U<sub>R</sub> - 2sec,
- 2,5kV / 50Hz - 2sec,
- insulated wire leads; 0.5mm<sup>2</sup>
- plastic case,
- PUR resin,
- WT-03/MIFLEX/MKSP-025 and MKSP-025P,
- EN 61048, EN 61049.

-This product fulfils the requirements of the RoHS Directive (2011/65/EC).



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