

AC METALLIZED POLYPROPYLENE FILM CAPACITORS FOR MOTOR APPLICATIONS

APPLICATION

The MKSP-I18 capacitors for motor run applications are designed to use in single-phase electric motors as running capacitors. They provide the reliable and safe operation. Due to their very low loss level, they can also be used for applications in energy electronics, provided the specified operating conditions and permissible loads are not exceeded.

TECHNICAL DATA

The technical data are given in the sheets enclosed for particular capacitor versions. The detailed technical requirements are specified in the Technical Specifications WT-04/MIFLEX/MKSP-I18. All capacitor versions have the application class A for the service life of 30000 hours and the safety class P2. The safety class P2 means that capacitor is equipped with overpressure protection (break-action mechanism) which disconnects the capacitor from the mains in case of its failure. The MKSP-I18 capacitors meet the requirements of Low Voltage Directive 73/23/EWG and EN 60252-1. They have been approved by the VDE Testing and Certification Institute in Germany (VDE approval mark - Certificate no 40010043).

CAPACITOR VERSIONS

The MKSP-I18 capacitors are made of self-healing metallized polypropylene film having low dielectric loss. The winding element is placed into an aluminium case, filled with polyurethane resin and sealed with special terminal cover. The capacitors can be fixed by an M8 bottom stud or special quick-fixing stud.

The basic versions of capacitor are as follow:

VERSION 1:

- Sub-version 0
 - aluminium case equipped with M8 stud
 - solder terminals; 2,8x0,8mm
- Sub-version 1
 - aluminium case equipped with M8 stud
 - tab connectors; 6,3x0,8mm

VERSION 2:

- Sub-version 0
 - aluminium case equipped with M8 stud
 - twin cable equipped with receptacles 6,3 or 4,8 mm
 - insulating cap to provide the IP64

VERSION 3:

- Sub-version 0
 - aluminium case equipped with quick-fixing stud
 - tab connector 6,3x0,8mm

Note:

The MKSP-I18 capacitors do not contain PCB or any other toxic impregnating material.



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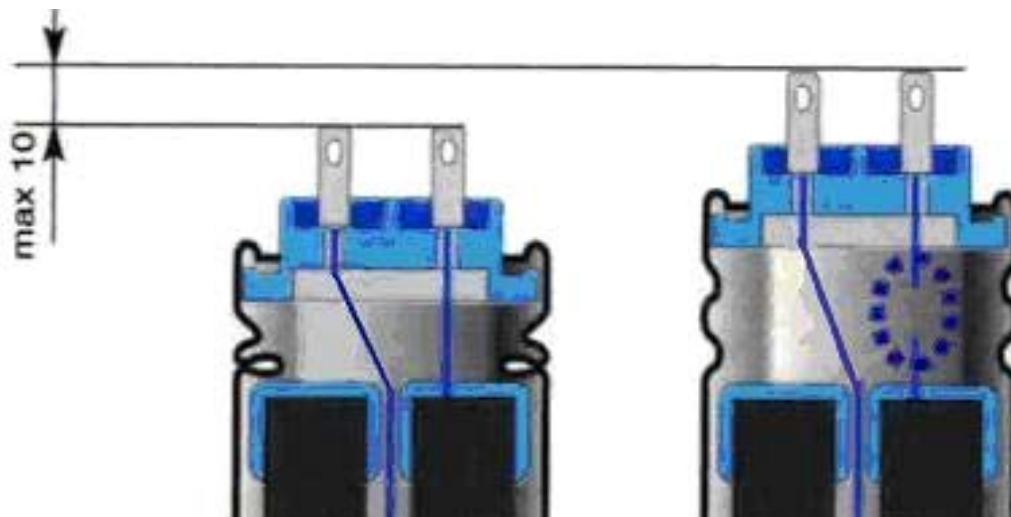
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MOUNTING INSTRUCTIONS

All capacitor versions can be mounted without restrictions in any position. In order to ensure proper operation of break-action mechanism, a clearance of at least 10mm must be provided above the terminals as shown in the figure below:



In case of permanent short-circuit or ageing at the end of the capacitor's useful service life, an increasing number of self-healing breakdowns may cause rising pressure inside the capacitor. With rising pressure the case begins to expand by opening the fold crimp. As a result, the connecting wires are separated at the attenuated spots and the current path is interrupted irreversibly.

Note:

The connection cables or leads used for these capacitors should have the appropriate length and flexibility so as not to impede the expanding of the break-action mechanism.

OPERATING CONDITIONS

The MKSP-I18 capacitors have been designed for continuous operation at the rated voltage, temperature and humidity according to climatic category.



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SERVICE LIFE

In accordance with EN 60252-1, the capacitors are subjected to endurance test with the test voltage of 573,75VAC and the test temperature of +85°C for 3000h. The above mentioned endurance test is equivalent to the service life expectancy of 30000h at the rated voltage of 425VAC 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 60252-1
 U_1 - test voltage eg.: 1,35 U_r for $L_1 = 3000h$
 U_2 - working voltage eg.: rated voltage $U_r = 425VAC$

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

where: T_1 - endurance test temperature (eg. +85°C)
 T_2 - working temperature (temperature of capacitor case eg. +85°C)

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

Example

In case of the rated voltage of 425VAC and the capacitor case temperature of +70°C, the designed service life shall be 90000 hours and is equivalent to the capacitor lifetime of about 10 years.

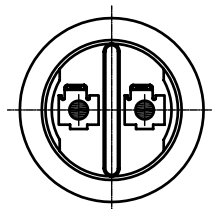
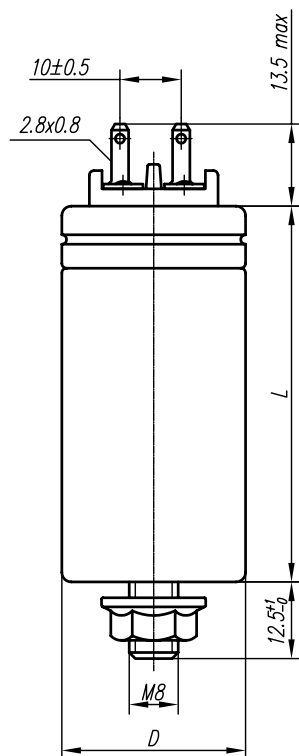
Notes:

1. The excessive temperatures, overvoltages and harmonic distortions may reduce the service life expectancy or increase the failure rate.
2. No vapour condensation on the capacitor surface is allowed (excluding the version 2). The limit value of temperature and humidity shall not be exceeded even during storage.

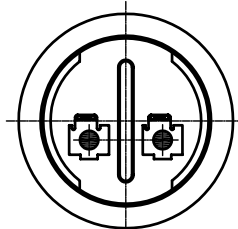
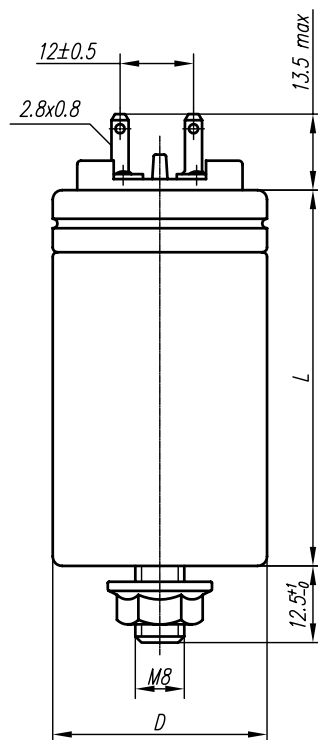


AC METALLIZED POLYPROPYLENE FILM CAPACITORS FOR MOTOR APPLICATIONS

Version 1 Sub-version 0



$D=30$



$D=35$

Capacitor dimensions

Capacitance	Dimensions	
	D_{-0}^{+1}	$L \pm 2$
μF	mm	mm
2	30	62
2,5		
3		
3,5		
4		
4,5		
5	35	62
5,5		
6		
7	35	62
8		

TECHNICAL DATA:

- Capacitance tolerance: $\pm 5\%$ or $\pm 10\%$,
- Rated voltage U_R : 425V / 50Hz,
- Climatic category: 40/085/56 acc. to EN 60068-1,
- Tangent of the loss angle: $\leq 0,0010 / U_R - 50\text{Hz}$,
- Dielectric strength:
 - between terminals - $2 U_R - 60\text{s}$,
 - between terminals connected together and case - 2kV / 50Hz - 60s,
- Case: aluminium,
- Specifications: WT-04/MIFLEX/MKSP-I18,
- Application class: 425VAC - A (30000h),
- Safety class: P2,
- Protection degree: IP00,
- The capacitors meet the requirements of: EN 60252-1, VDE 0560 part 8,
- Approval mark: VDE.

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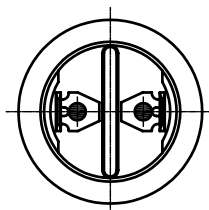
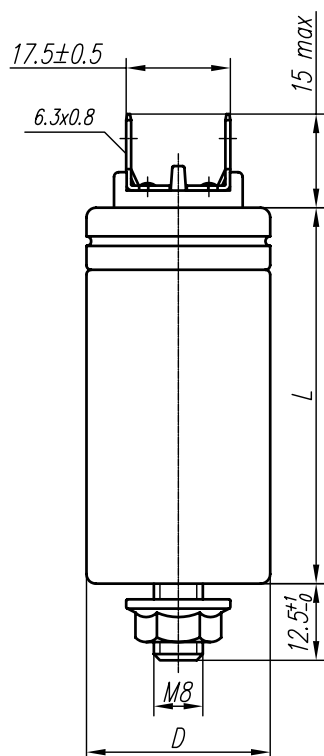
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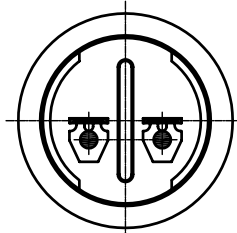
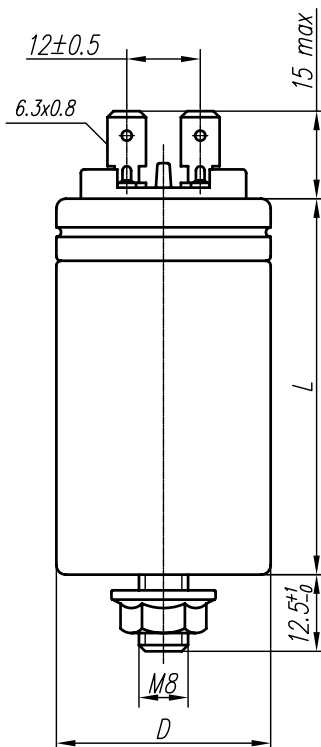
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AC METALLIZED POLYPROPYLENE FILM CAPACITORS FOR MOTOR APPLICATIONS

Version 1
Sub-version 1



$D=30$



$D=35$

Capacitor dimensions

Capacitance μF	Capacitor dimensions	
	D_{-0}^{+1} mm	$L \pm 2$ mm
2	30	62
2,5		
3		
3,5		
4		
4,5		
5	35	76
5,5		
6		
7		
7,5	30	76
8		
7,5		

TECHNICAL DATA:

- Capacitance tolerance: $\pm 5\%$ or $\pm 10\%$,
 - Rated voltage U_R : - 425V / 50Hz,
 - Climatic category: - 40/085/56 acc. to EN 60068-1,
 - Tangent of the loss angle: - $\leq 0,0010 / U_R - 50\text{Hz}$,
 - Dielectric strength:
 - between terminals - 2 $U_R - 60\text{s}$,
 - between terminals connected together and case - 2kV / 50Hz - 60s,
 - Case: - aluminium,
 - Specifications: - WT-04/MIFLEX/MKSP-I18,
 - Application class: - 425VAC - A (30000h),
 - Safety class: - P2,
 - Protection degree: - IP00,
 - The capacitors meet the requirements of: - EN 60252-1, VDE 0560 part 8,
 - Approval mark: - VDE.
- This product fulfils the requirements of the RoHS Directive (2002/95/EC).

Upon customer's request these capacitors may be delivered without the hexagonal teathed flange nut.

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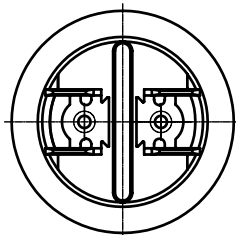
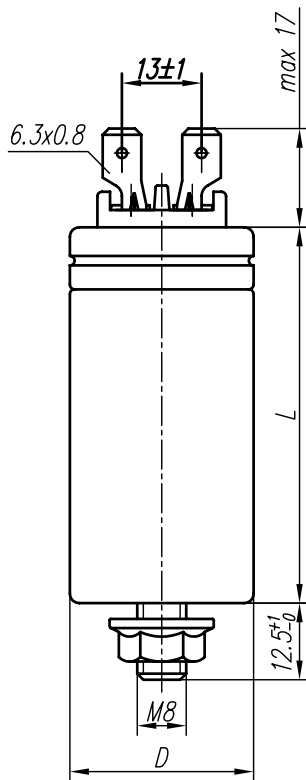
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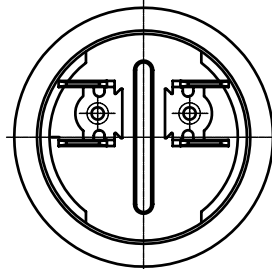
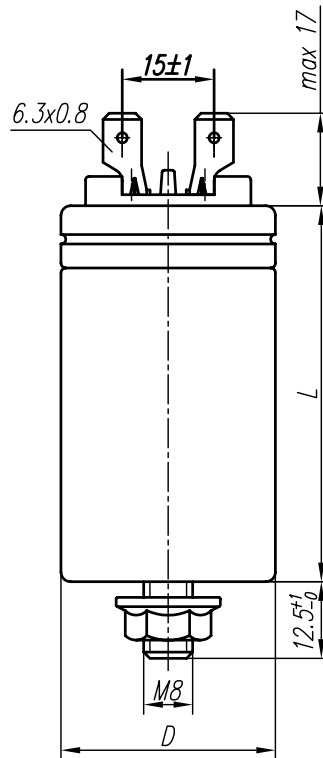
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AC METALLIZED POLYPROPYLENE FILM CAPACITORS FOR MOTOR APPLICATIONS

Version 1
Sub-version 2



D=30



D=35

Capacitor dimensions

Capacitance	Dimensions	
	D ₀ ⁺¹	L±2
μF	mm	mm
2	30	62
2,5		
3		
3,5		
4		
4,5		
5	35	76
5,5		
6		
7	30	76
7,5		
8		
7,5		

TECHNICAL DATA:

- Capacitance tolerance:
 - ± 5% or ± 10%,
 - Rated voltage U_R:
 - 425V / 50Hz,
 - Climatic category:
 - 40/085/56 acc. to EN 60068-1,
 - Tangent of the loss angle:
 - ≤0,0010 / U_R - 50Hz,
 - Dielectric strength:
 - between terminals
 - 2 U_R - 60s,
 - between terminals connected together and case
 - 2kV / 50Hz - 60s,
 - Case:
 - aluminium,
 - Specifications:
 - WT-04/MIFLEX/MKSP-I18,
 - Application class:
 - 425VAC - A (30000h),
 - Safety class:
 - P2,
 - Protection degree:
 - IP00,
 - The capacitors meet the requirements of:
 - EN 60252-1, VDE 0560 part 8,
 - Approval mark:
 - VDE.
- This product fulfils the requirements of the RoHS Directive (2002/95/EC).

Upon customer's request these capacitors may be delivered without the hexagonal teathed flange nut.

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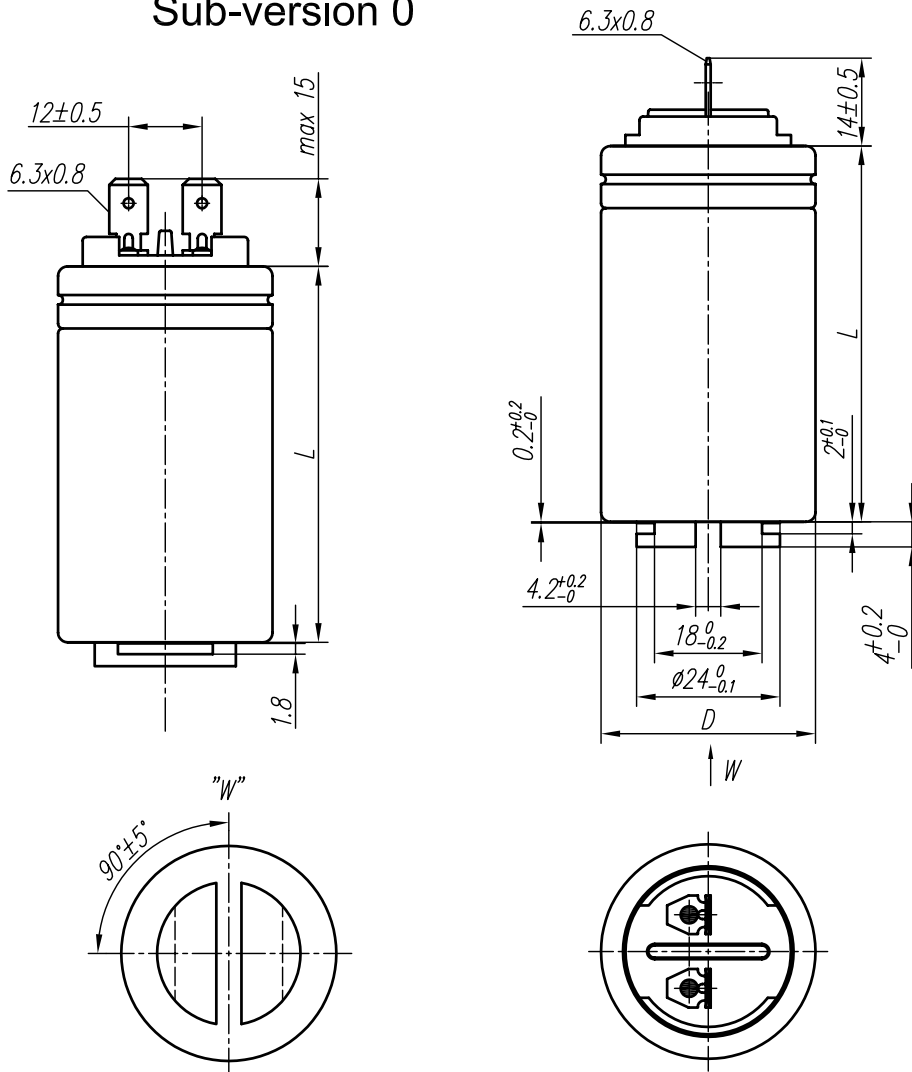
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AC METALLIZED POLYPROPYLENE FILM CAPACITORS FOR MOTOR APPLICATIONS

Version 3 Sub-version 0



Capacitor dimensions

Capacitance	Dimensions	
	D ^{+0.5} _{-0.5}	L±2
μF	mm	mm
2	35.5	62
2,5		
3		
3,5		
4		
4,5		
5		
5,5		
6		
7		
7,5		
8		

TECHNICAL DATA:

- Capacitance tolerance:
 - ± 5% or ± 10%,
- Rated voltage U_R :
 - 425V / 50Hz,
- Climatic category:
 - 40/085/56 acc. to EN 60068-1,
- Tangent of the loss angle:
 - ≤0,0010 / U_R - 50Hz,
- Dielectric strength:
 - between terminals
 - between terminals connected together and case
 - 2 U_R - 60s,
 - 2kV / 50Hz - 60s,
- Case:
 - aluminium,
- Specifications:
 - WT-04/MIFLEX/MKSP-I18,
- Application class:
 - 425VAC - A (30000h),
- Safety class:
 - P2,
- Protection degree:
 - IP00,
- The capacitors meet the requirements of:
 - EN 60252-1, VDE 0560 part 8,
- Approval mark:
 - VDE.

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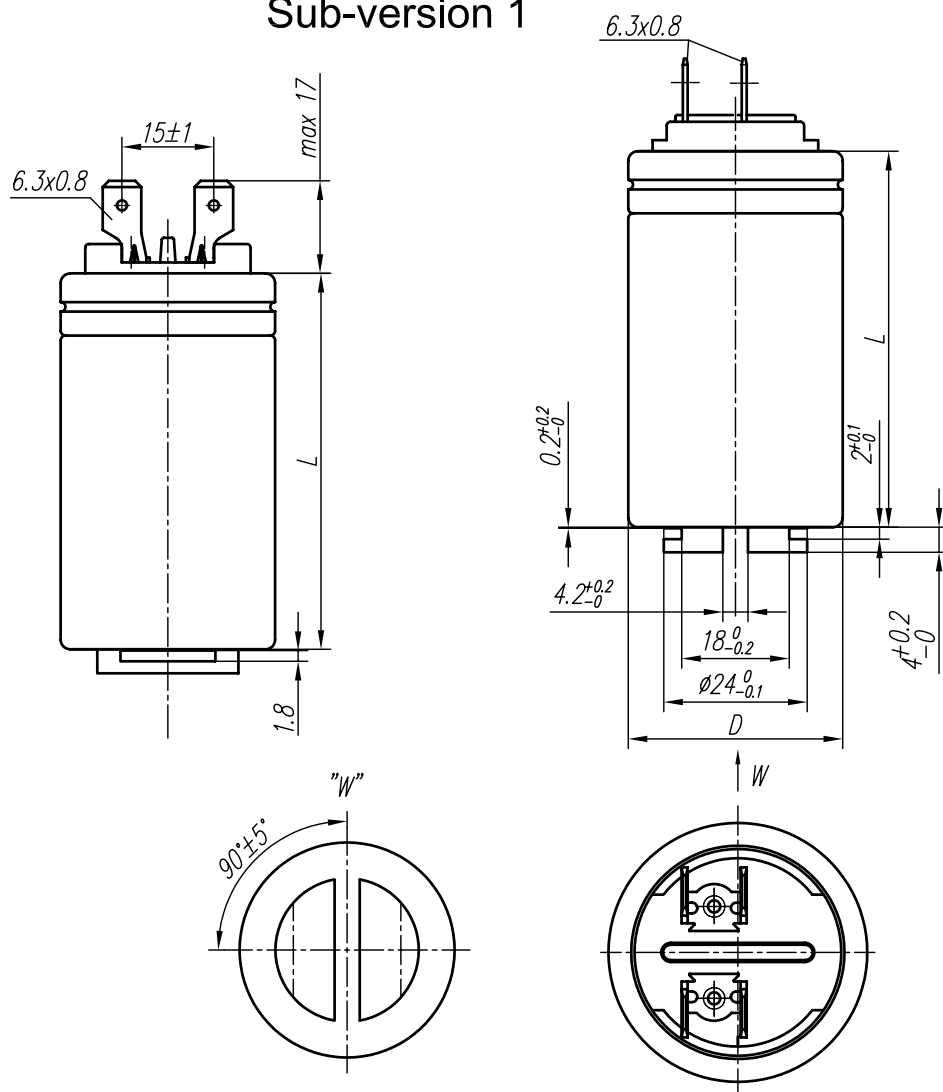
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AC METALLIZED POLYPROPYLENE FILM CAPACITORS FOR MOTOR APPLICATIONS

Version 3 Sub-version 1



Capacitor dimensions

Capacitance μF	Dimensions	
	D ^{+0.5} _{-0.5} mm	L±2 mm
2	35.5	62
2,5		
3		
3,5		
4		
4,5		
5		
5,5		
6		
7		
7,5		
8		

TECHNICAL DATA:

- Capacitance tolerance:
 - ± 5% or ± 10%,
- Rated voltage U_R:
 - 425V / 50Hz,
- Climatic category:
 - 40/085/56 acc. to EN 60068-1,
- Tangent of the loss angle:
 - ≤0,0010 / U_R - 50Hz,
- Dielectric strength:
 - between terminals
 - 2 U_R - 60s,
 - between terminals connected together and case
 - 2kV / 50Hz - 60s,
- Case:
 - aluminium,
- Specifications:
 - WT-04/MIFLEX/MKSP-I18,
- Application class:
 - 425VAC - A (30000h),
- Safety class:
 - P2,
- Protection degree:
 - IP00,
- The capacitors meet the requirements of:
 - EN 60252-1, VDE 0560 part 8,
- Approval mark:
 - VDE.

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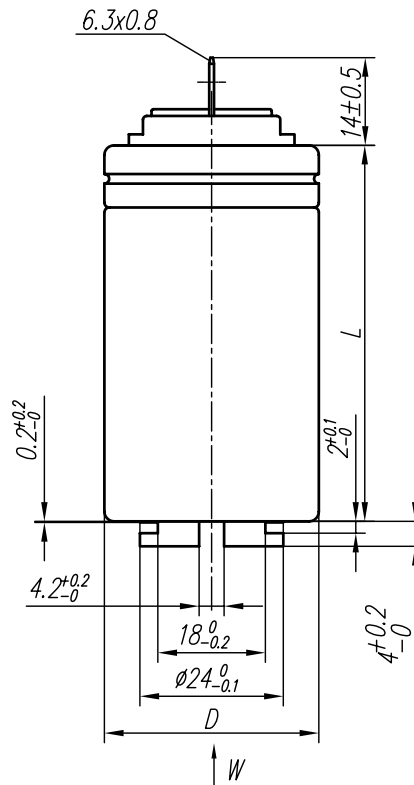
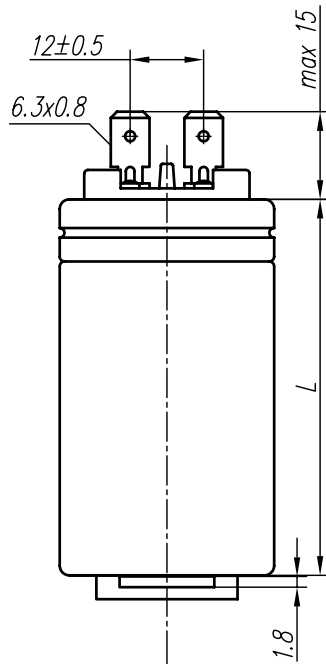
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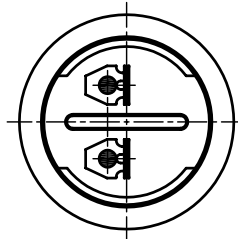
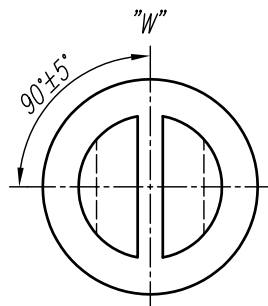
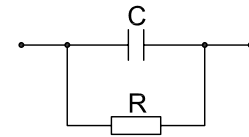
Version 3

Sub-version 0 with discharge resistor



Capacitor dimensions

Capacitance	Dimensions	
	D ^{+0.5} _{-0.5}	L±2
μF	mm	mm
2	35.5	62



TECHNICAL DATA:

- Capacitance tolerance:
 - ± 5% or ± 10%,
- Rated voltage U_R :
 - 425V / 50Hz,
- Climatic category:
 - 40/085/56 acc. to EN 60068-1,
- Tangent of the loss angle:
 - $\leq 0,0010 / U_R - 50\text{Hz}$,
- Dielectric strength:
 - between terminals
 - between terminals connected together and case
 - $2 U_R - 60\text{s}$,
 - 2kV / 50Hz - 60s,
- Case:
 - aluminium,
- Specifications:
 - WT-04/MIFLEX/MKSP-I18,
- Application class:
 - 425VAC - A (30000h),
- Safety class:
 - P2,
- Protection degree:
 - IP00,
- The capacitors meet the requirements of:
 - EN 60252-1, VDE 0560 part 8,
- Upon customer's request:
 - discharge resistor 330kΩ 1W.

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