



MCA9

Control  
Carbon  
Potentiometers  
CA



MCE9

Control  
Cermet  
Potentiometers  
CE



 **MCA9**

9mm carbon control potentiometers with low cost plastic enclosure and shaft and protection type IP 5 (dust-proof).

Standard tapers available include linear, log and antilog. ACP can also study special requests.

Terminals are manufactured in tinned brass to guarantee better soldering and higher resistance to corrosion. They can be provided straight or crimped (with “snap in”), recommended to hold the potentiometer to the board prior to the soldering operation. SMD configuration can be available on request.

Our potentiometers can be manufactured in a wide range of possibilities regarding:

- Resistance value.
- Tolerance.
- Tapers / variation laws.
- Pitch.
- Positioning of the wiper (the standard is at 50%).
- Housing and rotor color.
- Mechanical life.
- Pause effect (up to 20 detents available).
- Self-extinguishable plastic parts according to UL 94 V-0.

**Applications**

- Electronic appliances: white and brown goods, small household appliances.
- Measurement and test equipment. Timers and relays.
- Lighting regulation.

 **MCE9**

9mm cermet control potentiometers with low cost plastic enclosure and shaft and protection type IP 5 (dust-proof). Self-extinguishable plastic parts according to UL 94 V-0.

Standard taper is linear. Log, Antilog and other tapers are available on request. Laser trimming equipment in-house, allowing for very low tolerances.

Terminals are manufactured in tinned brass to guarantee better soldering and higher resistance to corrosion. They can be provided straight or crimped (with “snap in”), recommended to hold the potentiometer to the board prior to the soldering operation. SMD configuration can be available on request.

Our potentiometers can be manufactured in a wide range of possibilities regarding:

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- Positioning of the wiper (the standard is at 50%).
- Housing and rotor color.
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- Pause effect (up to 20 detents available).

**Applications**

- Electronic appliances: white and brown goods, small household appliances.
- Measurement and test equipment. Timers and relays.



## Adjustment possibilities

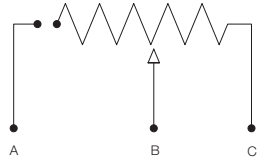
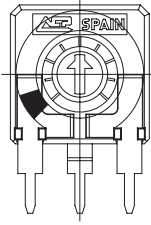
Should the shaft need to be positioned differently than shown on the “models” section, please, enclose a drawing.

## Potentiometers with cut track

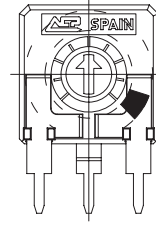
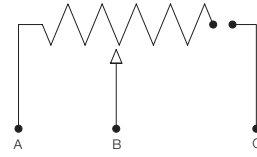
The resistive element in this potentiometer has an area with very high resistive values, resulting in an open circuit. Recommended for lighting regulation.

With cut at the beginning of the track CCW: Off-On.

With cut at the end of track- CW: On-Off. Others position available on request.



**CCW: Off-On**



**CW: On-Off**



## MCA9. Electric Specifications

These are standard features; other specifications can always be studied on request.

Range of resistance values Lin (A) Log (B) Antilog (C)	$100\Omega \leq R_n \leq 5M\Omega$ $1\text{ K}\Omega \dots 2,2\text{ M}\Omega$
Tolerance Special tolerances available on request	$100\Omega \dots 1M\Omega \pm 20\%$ $>1M\Omega \dots 5M\Omega \pm 30\%$ Out of range: $R_n > 5M\Omega$ : +50%, -30%
Variation laws	Lin (A), Log (B), Antilog (C) Other tapers available on request
Residual resistance	Lin (A), Log (B), Antilog (C) $\leq 5 \cdot 10^{-3} R_n$ Minimum value $2\Omega$
CRV - Contact Resistance Variation (dynamic)	$\leq 3\% R_n$
CRV - Contact Resistance Variation (static)	$\leq 5\% R_n$
Maximum power dissipation at 40° C. Lin (A) Non Lin (B, C)	$0,15W$ $0,10W$
Maximum voltage at 40° C Lin (A) Non Lin (B, C)	$200VDC$ $150VDC$
Operating temperature	$-25^\circ C \dots +70^\circ C$
Temperature coefficient	$100\Omega - 10K\Omega \rightarrow +200/ -300\text{ ppm}$ $>10K\Omega - 5M\Omega \rightarrow +200/ -500\text{ ppm}$



## MCA9. Mechanical Specifications

Resistive element	Carbon technology
Angle of rotation (mechanical)	$240^\circ \pm 5^\circ$
Wiper position	Middle position: $50\% \pm 15^\circ$
Angle of rotation (electrical)	$220^\circ \pm 20^\circ$
Wiper torque	$< 2\text{ Ncm}$ ( $0,4 \dots 3,5\text{Ncm}$ for pots. with detents)
Mechanical life	10.000 cycles (more available on request)
Max. stop torque	25Ncm
Max. push/pull on shaft	40N / 50N
Max. torque on the nut	50Ncm



## MCA9. Test

### Test // Conditions // Typical variation of Nominal Resistance

Damp heat // 500 h. at 40°C and 95% RH // +5%; -2%
Thermal cycles // 16h at 85°C, plus 2h at -25°C // $\pm 2,5\%$
Load life // 1.000 h. at 40°C // +0%; -5%
Mechanical life // 1000 cycles at 10 c.p.m. and at 23°C $\pm 2^\circ C$ // $\pm 3\%$
Soldering effect // 2 seconds at 350°C // $\pm 1\%$
Storage (3 years) // at 23°C $\pm 2^\circ C$ // $\pm 3\%$

For further information on tests, go to TESTS AND RELIABILITY on pages 10-11.



## MCE9. Electric Specifications

These are standard features; other specifications can always be studied on request.

Range of resistance values Lin (A) Log (B) Antilog (C)	$100\Omega \leq R_n \leq 5M\Omega$ $1\text{ K}\Omega \dots 2,2\text{ M}\Omega$
Tolerance Special tolerances available on request	$100\Omega \dots 1M\Omega \pm 20\%$ $>1M\Omega \dots 5M\Omega \pm 30\%$ Out of range: $R_n > 5M\Omega$ : +50%, -30%
Variation laws	Lin (A) Log (B), Antilog (C) and other tapers available on request
Residual resistance	Lin (A), Log (B), Antilog (C) $\leq 5 \cdot 10^{-3} R_n$ Minimum value $2\Omega$
CRV - Contact Resistance Variation (dynamic)	$\leq 3\% R_n$
CRV - Contact Resistance Variation (static)	$\leq 5\% R_n$
Maximum power dissipation at 40° C. Lin (A) Non Lin (B, C)	$0,5W$ <i>See note 1</i>
Maximum voltage at 40° C Lin (A) Non Lin (B, C)	$200VDC$ <i>See note 1</i>
Operating temperature	$-40^\circ C \dots +125^\circ C$
Temperature coefficient	$\pm 100\text{ppm}$ .

Note 1: Value depends on taper, please, inquire.



## MCE9. Mechanical Specifications

Resistive element	Cermet
Angle of rotation (mechanical)	$240^\circ \pm 5^\circ$
Wiper position	Middle position: $50\% \pm 15^\circ$
Angle of rotation (electrical)	$220^\circ \pm 20^\circ$
Wiper torque	$< 2\text{ Ncm}$ ( $0,4 \dots 3,5\text{Ncm}$ for pots. with detents)
Mechanical life	10.000 cycles (more available on request)
Max. stop torque	25Ncm
Max. push/pull on shaft	40N / 50N
Max. torque on the nut	50Ncm



## MCE9. Test

### Test // Conditions // Typical variation of Nominal Resistance

Damp heat // 500 h. at 40°C and 95% RH // $\pm 2\%$
Thermal cycles // 16h at 85°C, plus 2h at -25°C // $\pm 2\%$
Load life // 1.000 h. at 40°C // $\pm 2\%$
Mechanical life // 1000 cycles at 10 c.p.m. and at 23°C $\pm 2^\circ C$ // $\pm 2\%$
Soldering effect // 2 seconds at 350°C // $\pm 1\%$
Storage (3 years) // at 23°C $\pm 2^\circ C$ // $\pm 3\%$

For further information on tests, go to TESTS AND RELIABILITY on pages 10-11.

# MCA9 MCE9 HOW TO ORDER

- **EXAMPLE: MCA9DH5-10KA2020 SNP PI WT9006-BA**
- **EXAMPLE: MCE9DH5-10KA2020 SNP PI WT9006-V0BA**

Standard features								Extra features							Assembled accessory			
Series	Rotor	Model	Packg	Ohm value	Taper	Tol	Life	Track	Detents	Snap in	Housing	Rotor	Wiper	Lin	Assembly	Ref #	Color	Flam.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		16		17
MCA9/MCE9	D	H5		-10K	A	2020				SNP			PI		WT	9006	-BA	

Standard configuration		Customized products	
Dimensions:	9mm	A drawing is requested to order a customized product. The code assigned will include all special specifications.	
Protection:	<ul style="list-style-type: none"> <li>• <b>MCA9:</b> IP 5 (dust-proof)</li> <li>• <b>MCE9:</b> IP 5 (dust-proof) Self-extinguishable, to meet UL 94 V-0</li> </ul>	Series, rotor, model and total resistive value are given before the special code: MCA9DH2,5 10K CODE C00111.	
Substrate:	<ul style="list-style-type: none"> <li>• <b>MCA9:</b> Carbon technology</li> <li>• <b>MCE9:</b> Cermet</li> </ul>		
Color:	<ul style="list-style-type: none"> <li>• <b>MCA9:</b> Blue housing with white rotor</li> <li>• <b>MCE9:</b> Brown housing with white rotor</li> </ul>		
Packaging:	Blister		
Wiper position:	at 50% ±15°		
Terminals:	Straight, without SNAP IN.		
Marking:	Resistive value marked on housing. Others on request.		

## 1 - Series

- MCA9
- MCE9

## 3 - Model and pitch

H2,5	H3,8	H5	V7,5	V10	VR10
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## 5 - Resistance value

Taper:	Lin (A)	Log (B), Antilog (C)
Value Rn	100 Ω / 100 ... / ... 5 MΩ / 5M	1KΩ / 1K ... / ... 2,2 MΩ / 2M2

Other resistive values available on request.

## 7 - Tolerance

100 Ω ≤ Rn ≤ 1MΩ: ±20%	2020
1 MΩ ≤ Rn ≤ 5MΩ: ±30%	3030
For out of range values: Rn > 5MΩ, tol : +50% - 30%	5030
Special tolerances available: <5% ... 10%, etc.	

## 9 - Cut track

At beginning of track, CCW: Off - On	PCI
At end of track, CW: On - Off	PCF

## 11 - Crimped terminals (SNAP IN)

SNAP IN P	SNP
SNAP IN J	SNJ

## 2 - Rotors

D
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## 4 - Packaging

Blister	84 units per blister
	420 units per box of 430 x 270 x 120

## 6 - Resistance law / taper

Lin - Linear	A
Log - Logarithmic	B (on request for CE)
Antilog - Antilogarithmic	C (on request for CE)
- Special tapers have codes assigned:	CODE YXXXXX

Please, indicate terminal position when ordering a special taper.

## 8 - Operating life (cycles)

Standard (10.000cycles)	(leave blank)
Long life: LV + the number of cycles. ex: LV45 for 45000 cycles <sup>(1)</sup>	LVXX: ex: LV45

(1) Others on request.

## 10 - Detents (DT)

One detent at the beginning CCW	DTI
One detent at the end CW	DTF
X number of detents. Ex., 10	XDT: 10DT

Detents readily available: 3, 4, 6, 7, 9, 10, up to 20 -evenly distributed along 240°±5°. Others on request.

## 12 - Housing color

- **MCA9:** standard is blue
  - **MCE9:** standard is brown
- With other colors -see color chart below-, for example, red CJ-color, ex: CJ-R0

**13 - Rotor color**

Standard is white	
With other colors -see color chart below-, for example, red	RT-color; ex: RT-RO

**15 - Linearity**

Independent linearity controlled & below x%, for example, 3%: LN3%	LNx%; ex: LN3%
Absolute linearity controlled & below x%	LAx%

**17 - Flammability (according to UL 94 V-0)**

• <b>MCA9:</b> Not self-extinguishable	(leave blank)
Self-extinguishable according to standard UL 94 (including all plastic parts of the potentiometer: rotor, housing and accessory. If only one part needs to be V0, please, inform)	-V0
• <b>MCE9:</b> All accessories assembled with cermet potentiometers will have the self-extinguishable property according to standard UL 94	-V0

**14 - Wiper position**

Standard is at 50% ± 15°	(leave blank)
Initial or CCW	PI
Final or CW	PF
Others: following clock positions; at 3hours: P3H	PXH, ex: P3H

**16 - Assembled accessories**

Assembled	WT
Reference (9006 or 9019)	9XXX Example: 9006
Color of shaft (standard is black)	-YY Example, white: BA

**Color chart for rotor, housing and accessories**

Black <sup>(1)</sup>	NE
White	BA
Neutral	IN
Transparent	TA
Red	RO
Green	VE
Yellow	AM
Blue	AZ
Grey	GS
Brown	MR

(1) Black is not an option for housings.

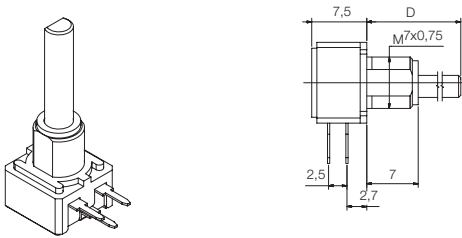
# DRAWINGS MCA9 // MCE9

## Tolerances 9 mm (in mm.):

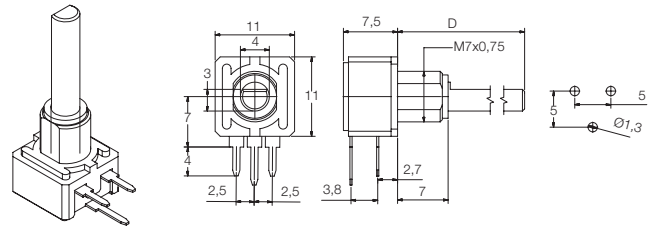
<1	±0,1
1...<5	±0,3
5...	±0,5

## Model types. MCA9 // MCE9

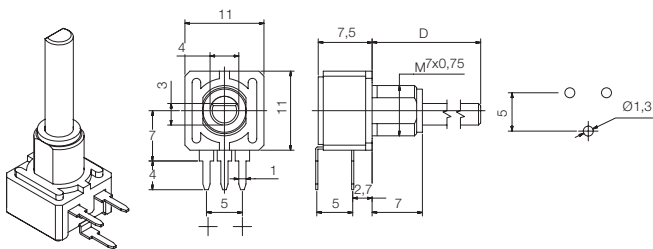
### MCA9 H2,5 // MCE9 H2,5



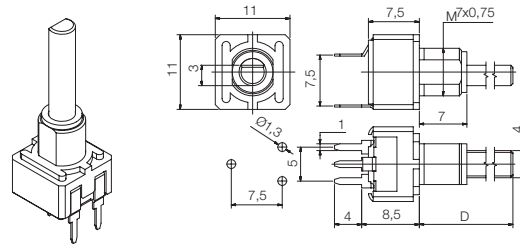
### MC9 H3,8 // MCE9 H3,8



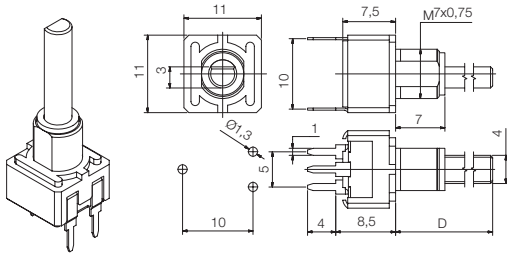
### MCA9 H5 // MCE9 H5



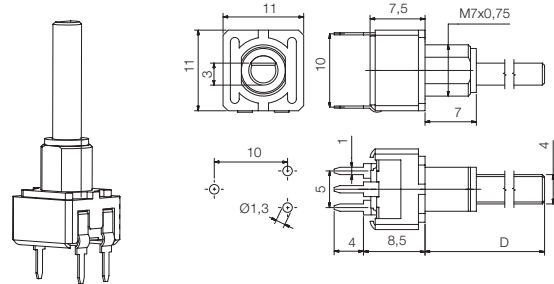
### MCA9 V7,5 // MCE9 V7,5



### MCA9 V10 // MCE9 V10

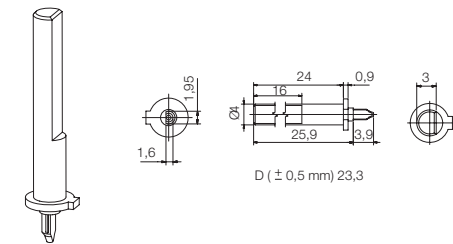


### MCA9 VR10 // MCE9 VR10

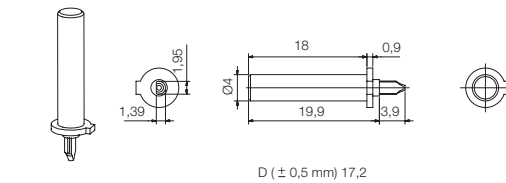


## Shafts. MCA9 // MCE9

### 9006

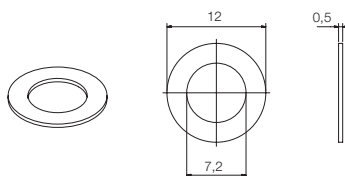


### 9019

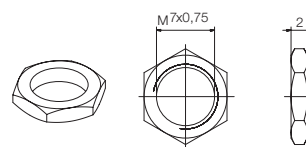


## Washer and nut. MCA9 // MCE9

### WASHER



### NUT



Specifications on this catalogue are for reference only; they are subject to change without notice.