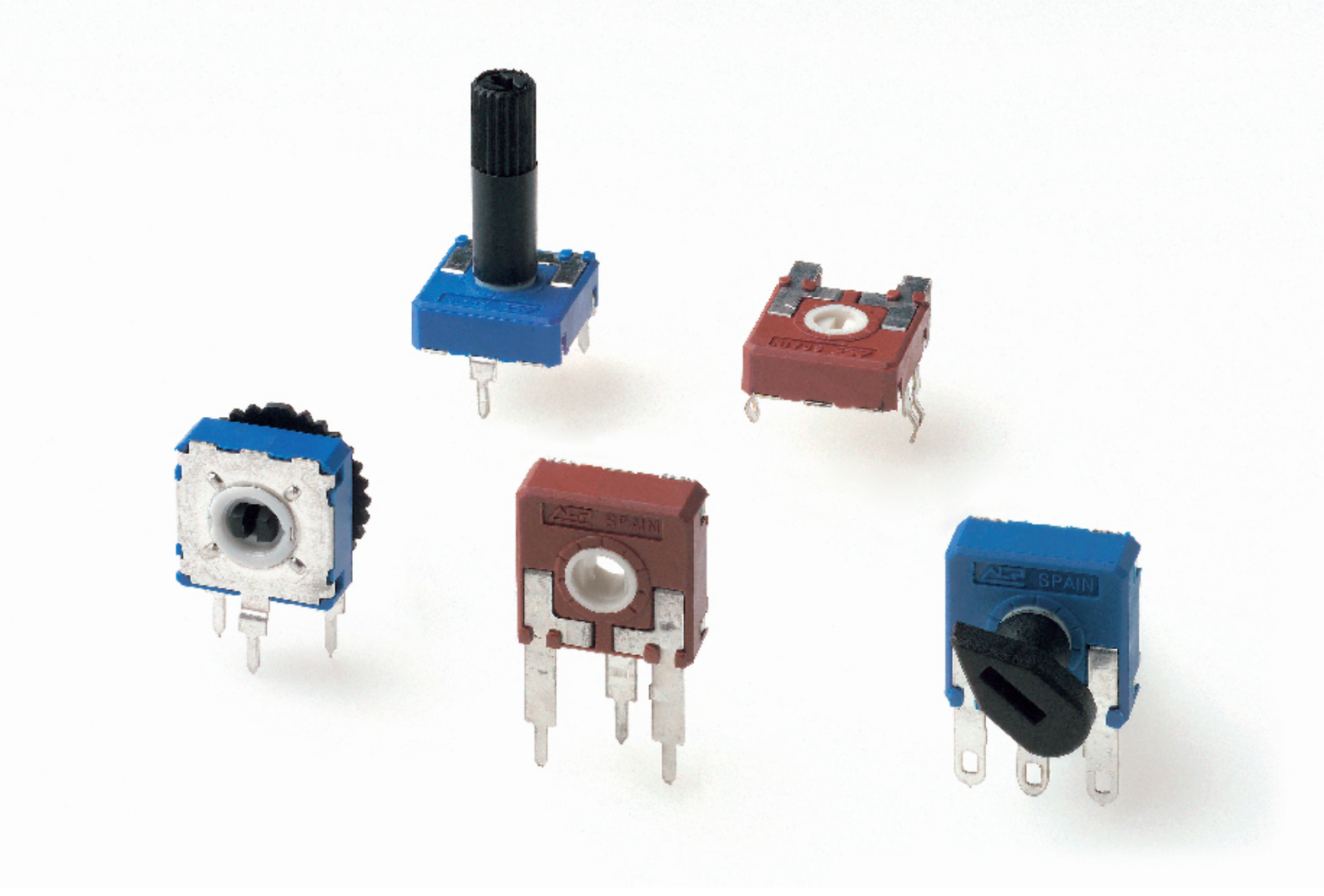
CA14 CE14

Carbon Potentiometers CA

Cermet Potentiometers CE



sales@prom-elec.com / ООО ПРОМЭЛЕКТРОНИКА

CA14

14mm carbon potentiometers with plastic housing 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.

Thumbwheels and shafts can be provided either separately or already inserted in the potentiometer.

ACP’s potentiometers can be adjusted from either side, both in the horizontal and the vertical adjustment types. There is a guide on the housing to simplify the manual adjusting operations.

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

- Resistance value.
- Tolerance.
- Tapers / variation laws.
- Pitch.
- Positioning of the wiper (standard is at 50%).
- Housing and rotor color.
- Mechanical life.
- Pause effect (up to 38 detents available).
- Self-extinguishable plastic parts according to UL 94 V-0.

Applications
- Electronic appliances: white goods, brown goods, small house-hold appliances
- Heating and air conditioning equipment and thermostats.
- Automotive: dimmers, climate controls, lighting regulation (position adjustment and sensing).
- Measurement and test equipment.

CE14

14mm cermet potentiometers with plastic housing and protection type IP 5 (dust-proof). Self-extinguishable 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.

Thumbwheels and shafts can be provided either separately or already inserted in the potentiometer.

ACP’s potentiometers can be adjusted from either side, both in the horizontal and the vertical adjustment types. There is a guide on the housing to simplify the manual adjusting operations.

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

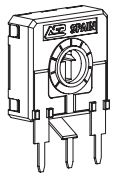
- Resistance value.
- Tolerance.
- Tapers / variation laws.
- Pitch.
- Positioning of the wiper (the standard is at 50%).
- Housing and rotor color.
- Mechanical life.
- Pause effect (up to 38 detents available).

Applications
- Electronic appliances: white goods, brown goods, small house hold appliances, boilers, water heaters, etc.
- Heating and air conditioning equipment and thermostats.
- Automotive: dimmers, climate controls, position sensors.
- Industrial electronic: multimeters, oscilloscopes, test equipment, time relay.

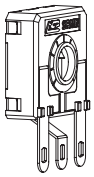
CA14 CE14

Models

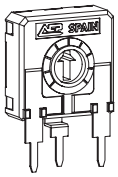
All models shown here have the standard rotor for the 14mm series, the arrow (P). Models can be manufactured with any rotor listed on the rotor menu. The color of the housing or rotor can also be modified. SMD configuration can be available on request.



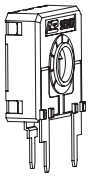
CA14 H0
CE14 H0



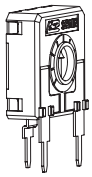
CA14 HC0
CE14 HC0



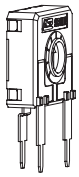
CA14 H2,5
CE14 H2,5



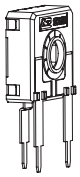
CA14 H4
CE14 H4



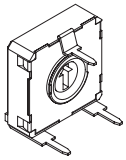
CA14 H5
CE14 H5



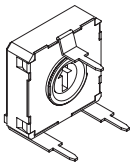
CA14 HA5
CE14 HA5



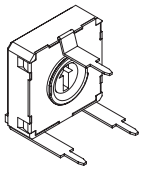
CA14 HL5
CE14 HL5



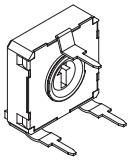
CA14 V12,5
CE14 V12,5



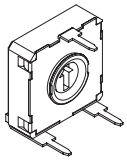
CA14 VA12,5
CE14 VA12,5



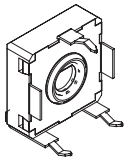
CA14 VL12,5
CE14 VL12,5



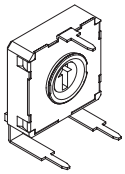
CA14 VR12,5
CE14 VR12,5



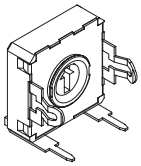
CA14 V15
CE14 V15



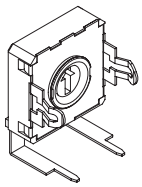
CA14 V15...CFF
CE14 V15...CFF



CA14 V17,5
CE14 V17,5



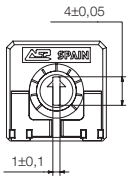
CA14 VD7,5
CE14 VD7,5



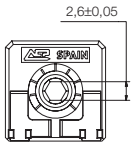
CA14 VD11
CE14 VD11

Rotors

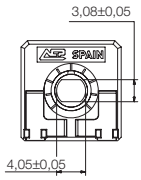
The rotor by default is the arrow (P). Accessories are designed for the N, Z and T rotors, unless otherwise stated.



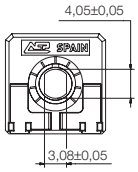
P



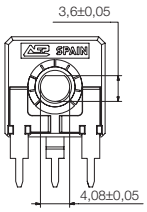
M



N



Z



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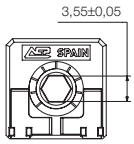

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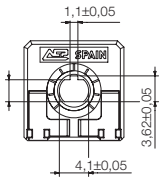
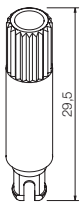


T

Shafts

- **CA14.** Shafts are available in different colors. They can also be provided in accordance with UL 94 V-0.
Potentiometers can be supplied with shafts already inserted in. ACP can also study special shafts.

- **CE14.** Shafts provided in accordance with UL 94 V-0 are available in different colors.
Potentiometers can be supplied with shafts already inserted in. ACP can also study special shafts.



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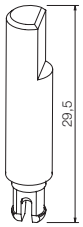

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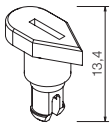

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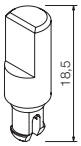

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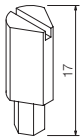
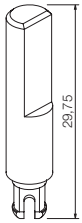


14065
For the M rotor



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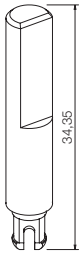

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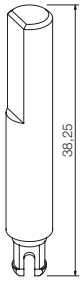

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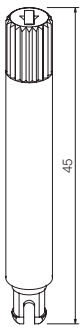

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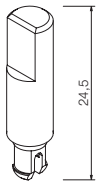

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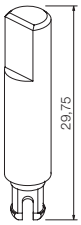

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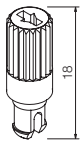

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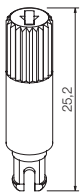

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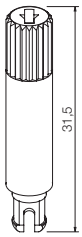


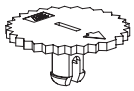
14250

Complete drawings can be found on pages 81-83

Thumbwheels

• **CA14.** This thumbwheel is available in different colors. It can also be provided in accordance with UL 94 V-0.
Potentiometers can be supplied with thumbwheels already inserted in. ACP can also study special requests for thumbwheels.

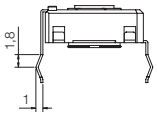
• **CE14.** This thumbwheel in accordance with UL 94 V-0 is available in different colors.
Potentiometers can be supplied with thumbwheels already inserted in. ACP can also study special requests for thumbwheels.



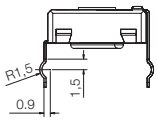
14003

Terminals

By default, terminals are always straight for the 14mm size, as shown on the “models” menu.
ACP can provide crimped terminals (with “snap in”), to better hold the component to the board prior to soldering.



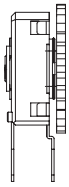
SNP



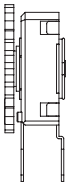
SNR

Adjustment possibilities

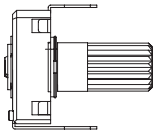
ACP’s potentiometers can be adjusted through either the front side (WT) or the collector side (WTI):



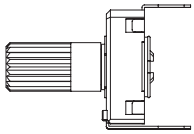
WTI
Collector side



WT
Front side



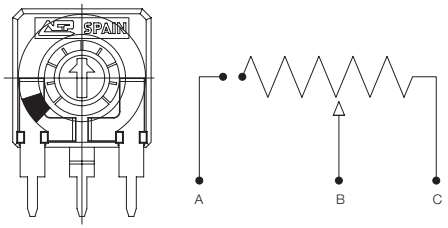
WTI
Collector side



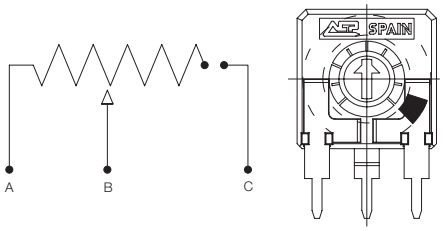
WT
Front side

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

Packaging

Bulk packaging: Potentiometers are first bagged and then introduced in boxes:

Potentiometer model	+ Shaft or thumbwheel inserted	Pieces per box (130 x 60 x 90)
H2,5 - H4 - H5 - HA5 - HL5 -HC0 - H0 V12,5 - VA12,5 - VL12,5 - V15 - V17,5* - VD11* VD7,5 - VR12,5	- (only potentiometers)	200 (models with * : 150)
	14003, 14117, 14042	100
	14008, 14015, 14250, 14187, 14056, 14065 14066, 14067, 14072, 14073, 14081, 14084	75

Tape and reel (T&R) packaging will be available for SMD configurations, on request.

Complete drawings can be found on pages 81-83

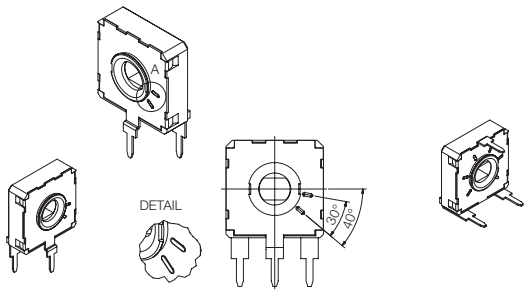
CA14 CE14

Potentiometers with detents

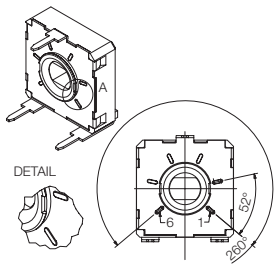
ACP's "detent" (DT) feature is specially suitable for control applications. Our patented design has improved the performance of these potentiometers:

- Longer mechanical life: 10.000 cycles.
- More stable electrical parameters.
- Improved reliability and Contact Resistance Variation (CRV).
- Narrower tolerances for detent positioning.

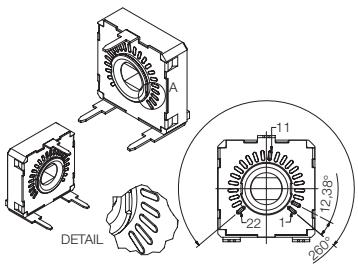
Detents can be lighter or stronger, or even a combination of both feelings. They can also be evenly distributed along the angle (standard) or tailored to match customers' request. They can also be combined with special tapers: constant value areas, different slopes, etc.
Examples:



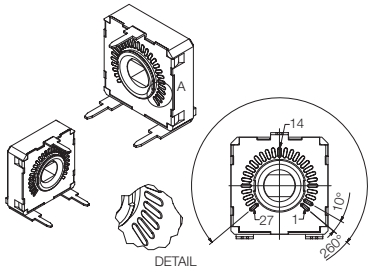
2DT



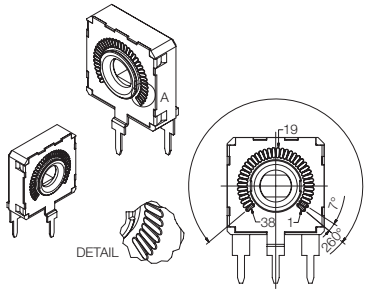
6DT



22DT



27DT



38DT

CA14. Electric Specifications

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

Range of resistance values Lin (A) Log (B) Antilog (C)	 100Ω ≤ Rn ≤ 5MΩ 1 KΩ … 2,2 MΩ
Tolerance Special tolerances available on request	100Ω … 1MΩ ±20% >1MΩ … 5MΩ ±30% Out of range: Rn> 5MΩ: +50%, -30%
Variation laws	Lin (A), Log (B), Antilog (C) Other tapers available on request
Residual resistance	Lin (A), Log (B), Antilog (C) ≤ $5*10^{-3}$*Rn Minimum value 2Ω
CRV - Contact Resistance Variation (dynamic)	≤3%Rn
CRV - Contact Resistance Variation (static)	≤5%Rn
Maximum power dissipation at 40º C. Lin (A) No Lin (B, C)	 0,25W 0,13W
Maximum voltage at 40ºC Lin (A) No Lin (B, C)	 250VDC 200VDC
Operating temperature	-25°C … +70°C
Temperature coefficient	100Ω - 10KΩ → +200/ -300 ppm. >10KΩ - 5MΩ → +200/ -500 ppm

CE14. Electric Specifications

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

Range of resistance values Lin (A) Log (B) and Antilog(C)	 100Ω ≤ Rn ≤ 5MΩ 1KΩ … 2,2MΩ
Tolerance Special tolerances available on request	100Ω … 1MΩ ±20% >1MΩ … 5MΩ ±30% Out of range: Rn> 5MΩ: +50%, -30%
Variation laws	Lin (A) Log (B), Antilog (C) and other tapers available on request
Residual resistance	Lin (A) ≤ 2Ω
CRV - Contact Resistance Variation (dynamic)	≤3%Rn
CRV - Contact Resistance Variation (static)	≤5%Rn
Maximum power dissipation at 70º C. Lin (A) Non Lin (B, C)	 0,7W *See note 1*
Maximum voltage at 40ºC Lin (A) Non Lin (B, C)	 250VDC *See note 1*
Operating temperature	-40°C … +125°C
Temperature coefficient	±100ppm.

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

CA14. Mechanical Specifications

Resistive element	Carbon technology
Angle of rotation (mechanical)	265º ± 5º
Wiper position	Middle position: 50% ± 15º
Angle of rotation (electrical)	245º ± 20º
Max. stop torque	10 Ncm
Max. push/pull on rotor	50 N
Wiper torque	< 2,5 Ncm (0,5 ... 3,5Ncm for pots. with detents)
Mechanical life	1000 cycles (more available on request) (10.000 cycles for pots. with detents)

CE14. Mechanical Specifications

Resistive element	Cermet
Angle of rotation (mechanical)	265º ± 5º
Wiper position	Middle position: 50% ± 15º
Angle of rotation (electrical)	245º ± 20º
Max. stop torque	10 Ncm
Max. push/pull on rotor	50 N
Wiper torque	< 2,5 Ncm (0,5 ... 3,5Ncm for pots. with detents)
Mechanical life	1000 cycles (more available on request) (10.000 cycles for pots. with detents)

CA14. Test

Test // Conditions // Typical variation of Nominal Resistance

Damp heat // 500 h. at 40°C and 95% RH // +5%; -2%

Thermal cycles // 16h at 85ºC, plus 2h at –25ºC // ±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 ± 2°C // ±3%

Soldering effect // 2 seconds at 350°C // ±1%

Storage (3 years) // at 23°C ± 2°C // ±3%

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

CE14. Test

Test // Conditions // Typical variation of Nominal Resistance

Damp heat // 500 h. at 40°C and 95% RH // ±2%

Thermal cycles // 16h at 90ºC, plus 2h at –40ºC // ±2%

Load life // 1.000 h. at 70°C // ±2%

Mechanical life // 1000 cycles at 10 c.p.m. and at 23°C ± 2°C // ±2%

Soldering effect // 2 seconds at 350°C // ±1%

Storage (3 years) // at 23°C ± 2°C // ±1%

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

All specifications are given at 23°C ± 2°C and 50% ± 25% RH.

CA14 CE14 HOW TO ORDER

- **EXAMPLE: CA14NH2,5-10KA2020 10DT SNP PI WT14117-BA**
- **EXAMPLE: CE14NH2,5-10KA2020 10DT SNP PI WT14117-BAV0**

Standard features

Series	Rotor	Model	Packg	Ohm value	Taper	Tol	Life
1	2	3	4	5	6	7	8
CA14/CE14	N	H2,5		-10K	A	2020	

Extra features

Track	Detents	Snap in	Housing	Rotor	Wiper	Lin
9	10	11	12	13	14	15
	10DT	SNP			PI	

Assembled accessory

Assembly	Ref #	Color	Flam.
	16		17
WT	14117	-BA	-V0

Standard configuration

Dimensions:	14mm
Protection:	• **CA14:** IP 5 (dust-proof)
	• **CE14:** IP 5 (dust-proof). Self-extinguishable, to meet UL 94 V-0
Substrate:	• **CA14:** Carbon technology
	• **CE14:** Cermet
Color:	• **CA14:** Blue housing with white rotor
	• **CE14:** Brown housing with white rotor
Packaging:	Bulk
Wiper position:	at 50% ±15º
Terminals:	Straight, without SNAP IN.
Marking:	Resistive value marked on housing. Others on request

Customized products

A drawing is requested to order a customized product. The code assigned will include all special specifications.

Series, rotor, model and total resistive value are given before the special code: CA14PH2,5 10K CODE C00111.

1 - Series

- CA14 • CE14

2 - Rotors

P (standard)	M	N	Z	D	E	T	F

3 - Model and pitch

H0	HC0	H2,5	H4	H5	HA5	HL5	V12,5
VA12,5	VL12,5	VR12,5	VD11	VD7,5	V15	V17,5	V15...CFF
HSMD and VSMD models can be available on request.							

4 - Packaging

	Through-hole	SMD models
Bulk	(blank)...(1)	On request
T&R (Tape and reel)	(N.A.)(2)	On request

(1) If blank, bulk packaging is implied.
(2) N.A. - Not Available: Tape and Reel packaging is only available for SMD terminals.

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.

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.

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.	

8 - Operating life (cycles)

Standard (1000cycles)	-(leave blank)
Long life: LV + the number of cycles. ex: LV10 for 10000 cycles(1)	LVXX: ex: LV10

(1) Others on request.

9 - Cut track

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

10 - Detents (DT)

One detent at the beginning	DTI
One detent at the end	DTF
X number of detents	XDT: 10DT

Detents readily available: 1, 2, 3, 4, 5, 6, 8, 9, 17, 22, 27, up to 38 -evenly distributed along 260º±3º.
Others on request.

11 - Crimped terminals (SNAP IN)

SNAP IN P	SNP
SNAP IN R	SNR

12 - Housing color

- **CA14:** standard is blue
- **CE14:** standard is brown

With other colors -See color chart below-, for example, red CJ-color, ex.: CJ-RO

13 - Rotor color

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

14 - Wiper

Wiper position (Standard: 50% ± 15º)	(leave blank)
Initial or CCW	PI
Final or CW	PF
Others: following clock positions; at 3hours: P3H	PXH, ex: P3H
Wiper torque (Standard: <2,5Ncm)	(leave blank)
Low torque (< 1.5Ncm)	PGB

15 - Linearity

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

16 - Potentiometers with assembled accessories

Assembled from terminal side	WT
Assembled from collector side	WTI
Accessory Reference See list of shafts and thumbwheels available	XXXXX Example: 14117
Color of shaft or thumbwheel	-YY Example, white: BA

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

• **CA14:** 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
• **CE14:** All accessories assembled with cermet potentiometers will have the self-extinguishable property according to standard UL 94	-V0

For ordering spare accessories

Accessory reference - color- flammability. Ex. 14117-AZ-V0 is a blue self-extinguishable 14117 thumbwheel	XXXX-YY-_ _

Color chart for rotor, housing and accessories

Black [1]	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.

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

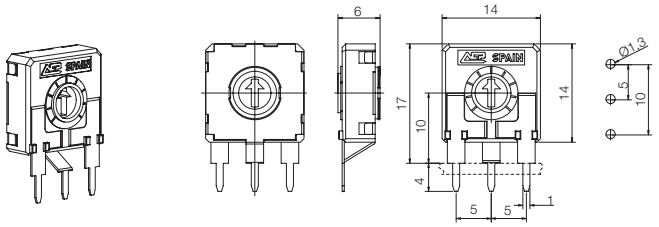
DRAWINGS CA14 // CE14

Tolerances 14 mm (in mm.):

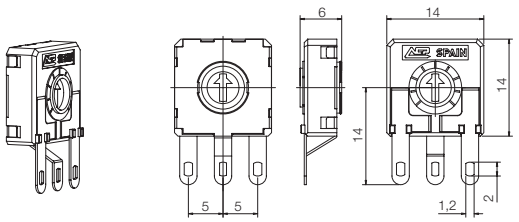
<1	±0,1
1...<10	±0,3
10...	±0,5

Model types. CA14 // CE14

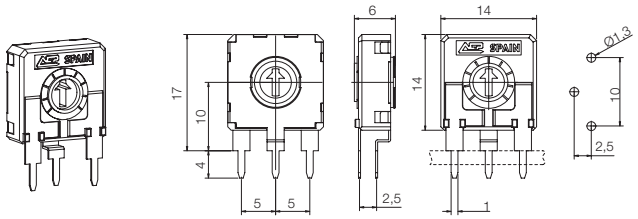
CA14 H0 // CE14 H0



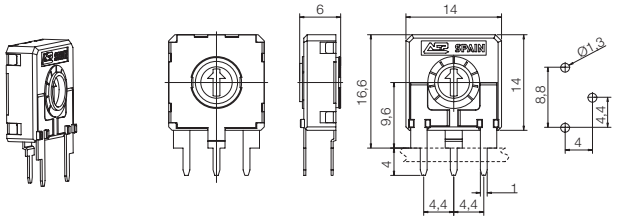
CA14 HC0 // CE14 HC0



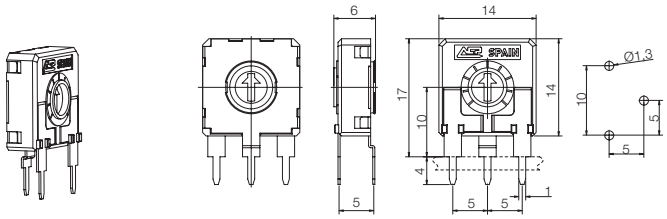
CA14 H2,5 // CE14 H2,5



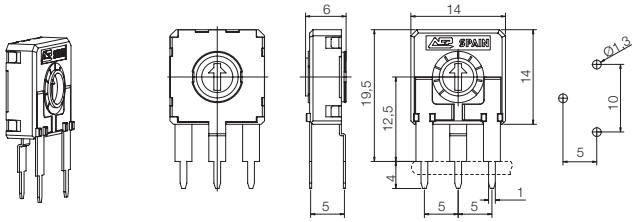
CA14 H4 // CE14 H4



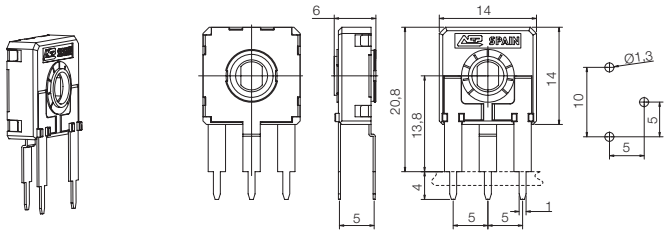
CA14 H5 // CE14 H5



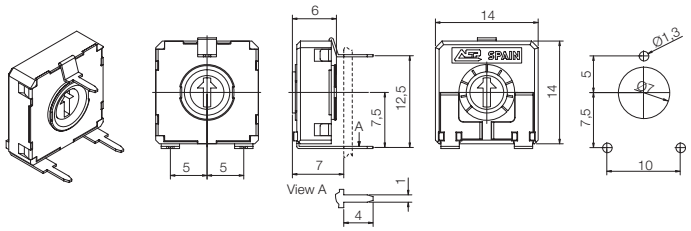
CA14 HA5 // CE14 HA5



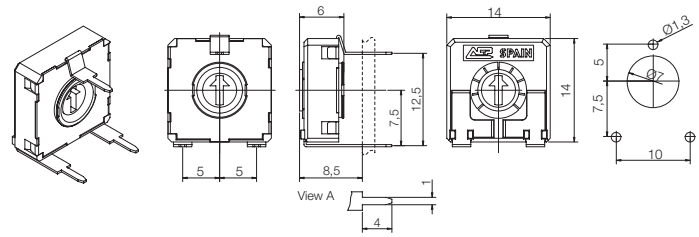
CA14 HL5 // CE14 HL5



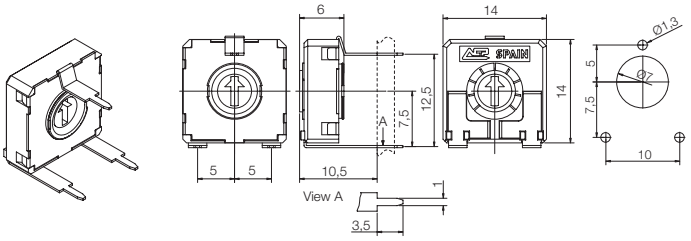
CA14 V12,5 // CE14 V12,5



CA14 VA12,5 // CE14 VA12,5



CA14 VL12,5 // CE14 VL12,5



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

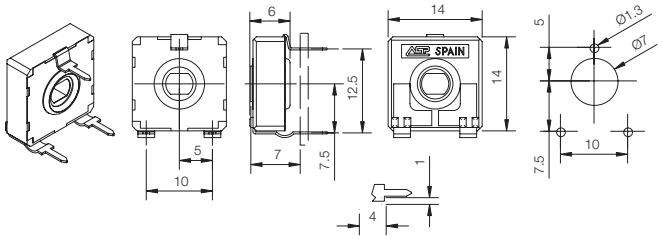
DRAWINGS CA14 // CE14

Tolerances 14 mm (in mm.):

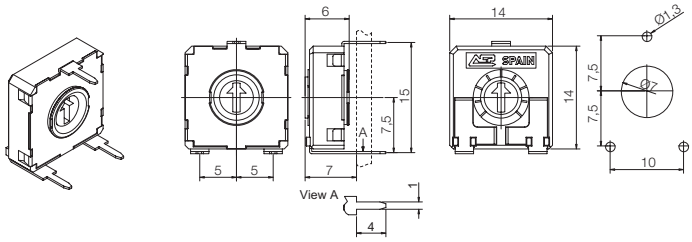
<1	±0,1
1...<10	±0,3
10...	±0,5

Model types. CA14 // CE14

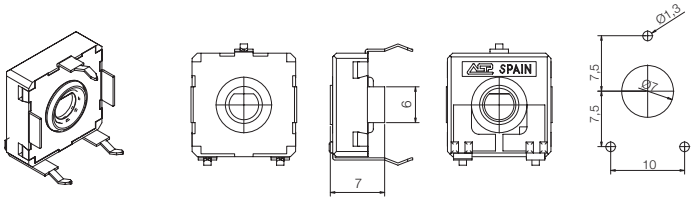
CA14 VR12,5 // CE14 VR12,5



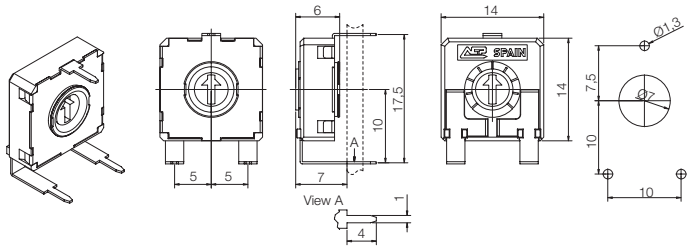
CA14 V15 // CE14 V15



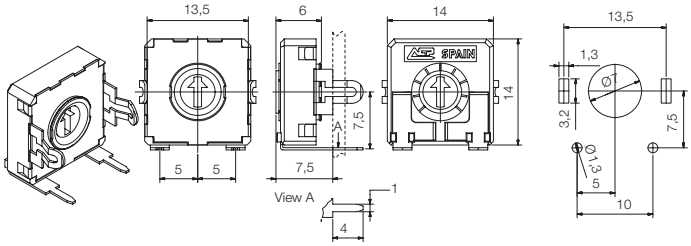
CA14 V15...CFF // CE14 V15...CFF



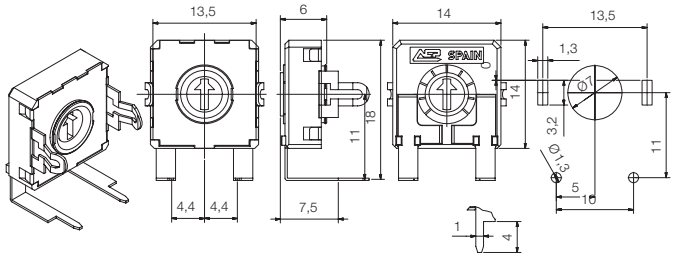
CA14 V17,5 // CE14 V17,5



CA14 VD7,5 // CE14 VD7,5

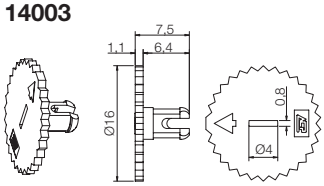


CA14 VD11 // CE14 VD11



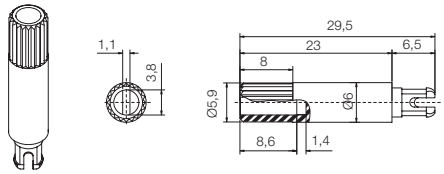
Thumbwheels. CA14 // CE14

14003

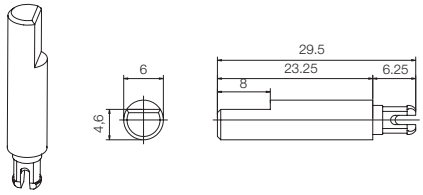


Shafts. CA14 // CE14

14008



14015



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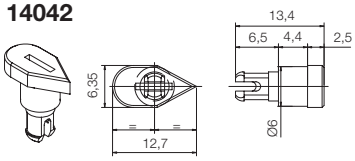

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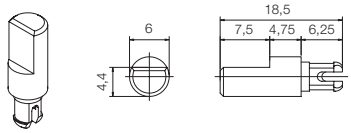


Specifications on this catalogue are for reference only; they are subject to change without notice.

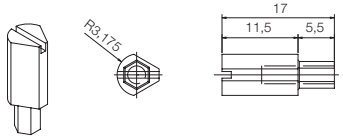
DRAWINGS CA14 // CE14

Tolerances 14 mm (in mm.):

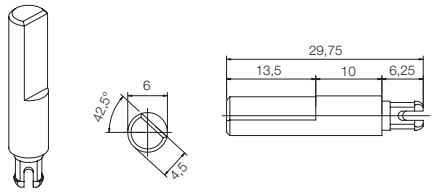
<1	±0,1
1...<10	±0,3
10...	±0,5

Shafts. CA14 // CE14

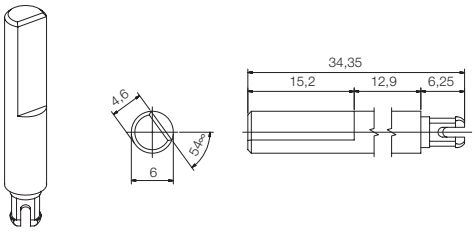
14065



14066



14067



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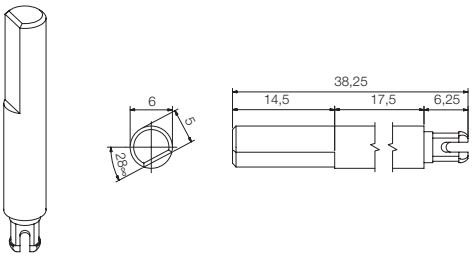

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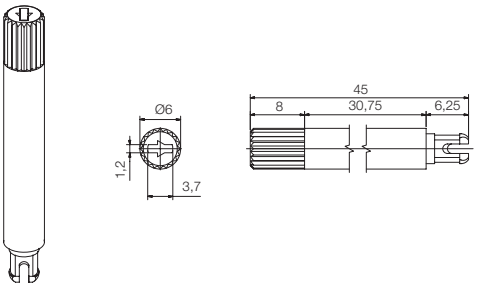

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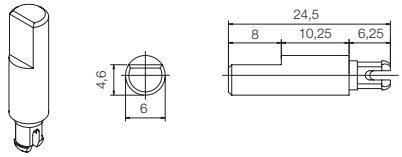

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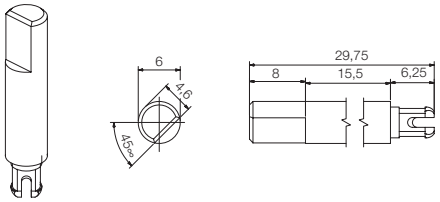

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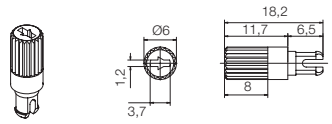

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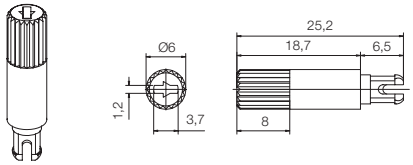

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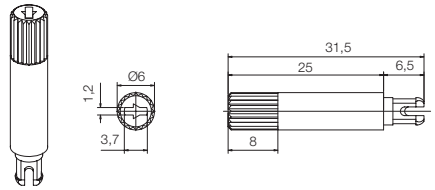

Specifications on this catalogue are for reference only; they are subject to change without notice.