

Series 09TR 9 mm Trimmer Potentiometer

- Terminals: tinned brass or tinned steel.
- Flexible gull-wing / through hole / "J" bend terminal configurations
- Various rotor types and with optional shaft & Wheel configurations
- IP 54 according to IEC 60529

Description

9 mm carbon potentiometers with plastic housing. Plastic materials can be self-extinguishable according to UL 94 V-0 upon request. This product is ideal for dimmers, volume/lighting regulation, timers and relays in industrial, electronics and automotive applications.

Ordering Information

| OgTR 01 A A 101 A P R Features Accessor Rotor type (Page 4) Model type (Page 4-6) Model type (Page 4-6) Model type (Page 4-6) Resistance Value Terminal Material Extra Features Accessor 01: C-type A: H2.5 201:200Ω S: Tinned brass S: Tinned brass Track Detents 02: D-type B: H3.8 201:200Ω S: Tinned steel (Only available for Through- hole models) Detents 04: J-type D: H5 505:5MΩ Tol. Noter Wiper 06: M-type F: V7.5 Tol. Noter Noter 06: M-type G: V10 S: V10 Noter Noter Noter 08: KA-type J: VR10 C: ±20% Packaging Accessori 10: MT-type J: VR10 D: ±30% R: Tape&Reel Ref# 12: Y-type Taper A: Linear Color Flam B: Logarithmic C: Antilogarithmic Color Flam | Series | Rotor | Model | Taper | Resistance Value | Tol. | Terminal Material | Packg. | Special | Request* |
|--|---------|---------|----------|-------------|---------------------|-----------|----------------------|----------|---------------------------------------|-------------|
| ReduresAccessorModel type (Page 4)Model type (Page 4-6)Resistance ValueTerminal Material01: C-typeA: H2.5101:100Ω02: D-typeB: H3.8201:200Ω03: E-typeC: H53.804: J-typeD: H505: K-typeE: HSMD06: M-typeF: V7.507: P-typeG: V1008: KA-typeH: VK1009: MA-typeJ: VR1010: MT-typeJ: VR1011: R-typeTaperA: LinearB: LogarithmicB: LogarithmicC: Antilogarithmic | 09TR | 01 | А | А | 101 | А | Р | R | | Assembled |
| (Page 4)(Page 4-6)ValueMaterial01: C-typeA: H2.5101:100002: D-typeB: H3.8201:200003: E-typeC: HS3.804: J-typeD: H5505:5M005: K-typeE: HSMD06: M-typeF: V7.507: P-typeG: V1008: KA-typeH: VK1009: MA-typeJ: VR1010: MT-typeK: VSMD11: R-typeK: VSMD12: Y-typeTaperA: LinearB: LogarithmicB: LogarithmicC: Antilogarithmic | 00111 | 04 | | | 101 | | | | Features | Accessories |
| (Page 4)(Page 4-6)ValueMaterial01: C-typeA: H2.5101:100002: D-typeB: H3.8201:200003: E-typeC: HS3.804: J-typeD: H5505:5M005: K-typeE: HSMD06: M-typeF: V7.507: P-typeG: V1008: KA-typeH: VK1009: MA-typeJ: VR1010: MT-typeK: VSMD11: R-typeK: VSMD12: Y-typeTaperA: LinearB: LogarithmicB: LogarithmicC: Antilogarithmic | Ţ | | V | | Ļ | | Ļ | | | |
| 01: C-typeA: H2.5101:100ΩP: Tinned brass02: D-typeB: H3.8201:200ΩS: Tinned steel (Only available for Through- hole models)1,000 cycles)04: J-typeD: H5505:5MΩS: Tinned steel (Only available for Through- hole models)Detents05: K-typeE: HSMDTol.Rotor06: M-typeF: V7.5Tol.Terminal Type: SNP or SNJ.07: P-typeG: V10A: ±5%B: ±10%09: MA-typeJ: VR10C: ±20%Packaging Blank: Bulk11: R-typeTaperA: LinearB: LogarithmicC: how/-30%R: Tape&ReelB: LogarithmicC: AntilogarithmicColorC: AntilogarithmicOperating | | | | | Resistance | _ | | | Extra Featu | res |
| O2: D-typeB: H3.8201:200ΩS: Tinned steel (Only available for Through- hole models)TrackO3: E-typeC: HS3.8201:200ΩS: Tinned steel (Only available for Through- hole models)DetentsO4: J-typeD: H5505:5MΩFor Through- hole models)DetentsO5: K-typeE: HSMDTol.RotorO6: M-typeF: V7.5Tol.Terminal Type: SNP or SNJ.NP or SNJ.O8: KA-typeH: VK10B: ±10%D: ±30%Blank: Bulk R: Tape&ReelAccessori Assembly (Shaft & Whe Ref#11: R-typeTaperA: LinearB: LogarithmicC: hole or concet OperatingAccessori Assembly | | | | _ _ | | _ | | | Life (stand | ard |
| O3: 6 typeO: NoteO3: E-typeC: HS3.8O4: J-typeD: H5O5: K-typeE: HSMDO5: K-typeE: HSMDO6: M-typeF: V7.5O7: P-typeG: V10O8: KA-typeH: VK10O9: MA-typeJ: VR10O9: MA-typeJ: VR10O1: MT-typeK: VSMDD: H30%D: ±30%Blank: BulkR: Tape&ReelA: LinearE: +50%/-30%B: LogarithmicC: AntilogarithmicC: AntilogarithmicOperating | 01: C- | -type | A: H2.5 | _ _ | | _ | | | 1,000 cycles | s) |
| OS. E-typeC. 1133.804: J-typeD: H5505:5MΩfor Through- hole models)Housing Rotor05: K-typeE: HSMD505:5MΩHousing Rotor06: M-typeF: V7.5Tol.Wiper07: P-typeG: V10A: ±5%SNP or SNJ.08: KA-typeH: VK10B: ±10%SNP or SNJ.09: MA-typeJ: VR10C: ±20%Packaging Blank: BulkAccessori10: MT-typeK: VSMDD: ±30%Blank: BulkAssembly (Shaft & Whe R: Tape& ReelAssembly Color12: Y-typeTaper A: LinearA: LinearColorFlam ConnectB: LogarithmicC: AntilogarithmicOperating | 02: D- | -type | B: H3.8 | | 201:200Ω | | | | Track | |
| 04: J-typeD: H5505:5MΩhole models)Housing Rotor05: K-typeE: HSMD <td< td=""><td>03: E-</td><td>-type</td><td>C: HS3.8</td><td></td><td></td><td>-</td><td></td><td></td><td>Detents</td><td></td></td<> | 03: E- | -type | C: HS3.8 | | | - | | | Detents | |
| O5: K-typeE: HSMDRotor06: M-typeF: V7.5Tol.Wiper07: P-typeG: V10A: ±5%SNP or SNJ.08: KA-typeH: VK10B: ±10%C: ±20%Packaging09: MA-typeJ: VR10C: ±20%PackagingAccessori10: MT-typeK: VSMDD: ±30%Blank: BulkAssembly11: R-typeTaperE: +50%/-30%R: Tape&ReelRef#12: Y-typeTaperC: AntilogarithmicConnectOperating | 04: J-1 | type | D: H5 | | 505:5MΩ | - | | | Housing | |
| OO: Mi-type1: V7.3Iol.07: P-typeG: V10A: ±5%08: KA-typeH: VK1009: MA-typeJ: VR1010: MT-typeK: VSMD11: R-typeK: VSMD12: Y-typeTaperA: LinearB: LogarithmicB: LogarithmicC: AntilogarithmicC: AntilogarithmicC: Antilogarithmic | 05: K- | -type | E: HSMD | | | - | | | | |
| 07: P-typeG: V10A: ±5%Ierminal Type: SNP or SNJ.08: KA-typeH: VK10B: ±10%C: ±20%PackagingAccessori09: MA-typeJ: VR10C: ±20%D: ±30%Blank: BulkAssembly (Shaft & Whether R: Tape&ReelAssembly (Shaft & Whether Ref#10: MT-typeTaperE: +50%/-30%R: Tape&ReelAccessori12: Y-typeTaperColorFlamB: LogarithmicC: AntilogarithmicOperating | 06: M | 1-type | F: V7.5 | _ | | Tol. | | | · · · · · · · · · · · · · · · · · · · | |
| 08: KA-typeH: VK10B: ±10%Accessori09: MA-typeJ: VR10C: ±20%PackagingAssembly10: MT-typeK: VSMDD: ±30%Blank: BulkAssembly11: R-typeTaperE: +50%/-30%R: Tape&ReelRef#12: Y-typeTaperA: LinearColorFlamB: LogarithmicC: AntilogarithmicOperatingOperating | 07: P- | -type | G: V10 | _ | A | | | | | |
| 09: MA-typeJ: VR10C: ±20%PackagingAccessori10: MT-typeK: VSMDD: ±30%Blank: BulkAssembly11: R-typeTaperE: +50%/-30%R: Tape&ReelRef#12: Y-typeTaperFlamColorB: LogarithmicC: AntilogarithmicOperating | 08: KA | A-type | H: VK10 | _ | В | :±10% | | | SINF OF SINJ. | ↓ |
| 10: MT-type K: VSMD D: ±30% Blank: Bulk Assembly (Shaft & Whether Stress of the | 09: M | 1A-type | J: VR10 | _ | | | | Packagin | | Accessories |
| 11: R-type Image: Constant & When the second se | 10: M | 1T-type | K: VSMD | | D | : ±30% | | | As As | |
| 12: Y-type Taper Ref# A: Linear Color B: Logarithmic Flam C: Antilogarithmic Operating | 11: R- | -type | | _ ↓ | E | : +50%/-3 | 30% | | <u> </u> | |
| A: LinearFlamB: LogarithmicConnectC: AntilogarithmicOperating | 12: Y- | -type | | Taper | | , | | | | |
| B: Logarithmic Connect C: Antilogarithmic Operating | | | A: Lir | near | | | | | | |
| C: Antilogarithmic Operating | | | B: Lo | garithmic | | | | | | |
| | | | C: Ar | tilogarithn | nic | | | | | |
| temperature | | | | | | | | | | mperature |

*Please contact CTS representatives for the special requests.

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Sense



Series 09TR

Potentiometer

| Standard Configuration: | Through-hole | SMD | | |
|-------------------------|--|-------------------------------------|--|--|
| Dimensions: | 9mm | | | |
| Protection: | IP 54 (high level of protection against dust and also against water splashing) | | | |
| | On request: Self-extinguishable, to me | eet UL 94 V-0 | | |
| Substrate: | Carbon toobnology | Carbon technology, special for high | | |
| | Carbon technology | temperature | | |
| Color: | Blue housing + white rotor | Brown housing + grey rotor | | |
| Packaging: | Bulk or Tape & Reel | | | |
| Wiper position: | at | 50% ±15° | | |
| Terminals: * | Straight, without crimping. | | | |
| Marking: | Resistive value marked on housing. Others on request. | | | |
| | | | | |

* By default, terminals are always straight. CTS can provide crimped terminals (with snap in, "SNP" or "SNJ") to better hold the component to the PCB during the soldering operation.



SNP



SNJ

Electrical Specifications

| | Through-hole | SMD | | |
|--|--|---------------------------------|--|--|
| Range of resistance values | | | | |
| Lin (A) | $100\Omega \le Rn \le 5M\Omega$ | $100\Omega \le Rn \le 1M\Omega$ | | |
| Log (B) Antilog (C) | $1K\Omega \le Rn \le 2M2\Omega$ | $1K\Omega \le Rn \le 1M\Omega$ | | |
| Tolerance | +50%, -30% (out of range) | | | |
| Rn < 100Ω: | ±20% | - | | |
| $100\Omega \le Rn \le 100K\Omega$ | | ±30% | | |
| $100K < Rn \le 1M\Omega$: | ±20% | ±40% | | |
| $1M\Omega < Rn \leq 5M\Omega$: | ±30% | ±50% | | |
| Rn > 5ΜΩ: | +50%, -30% (out of range) | - | | |
| Variation laws | Lin (A), Log (B), Antilog (C). Other tapers available on request | | | |
| Residual Resistance | Rn ≤ 400Ω ≤ 2Ω; Rn > 400Ω 5*10-3* Rn | | | |
| CRV - Contact Resistance Variation | Lin (A) Electrical Angle 220°±20° ≤ 3%Rn. | | | |
| (dynamic) | Other tapers, please inquire | | | |
| | at 50°C | | | |
| Max. Power Dissipation | 0.15W Lin (A) | | | |
| | 0.10W Log (B) Antilog (C) | | | |
| Max Maltara | 200VDC Lin (A) | | | |
| Max. Voltage | 150VDC Log (B) Antilog (C) | | | |
| Operating temperature | -25°C +70°C (+85°C on request) | | | |
| Temperature Coefficient | | | | |
| $100\Omega \le \text{Rn} \le 10\text{K}\Omega$ | +200 / -300 ppm | +200 / -500 ppm | | |
| $10K\Omega \le Rn \le 5M\Omega$ | +200 / -500 ppm | +200 / -1000 ppm | | |

* Out of range ohm values and tolerances are available on request.

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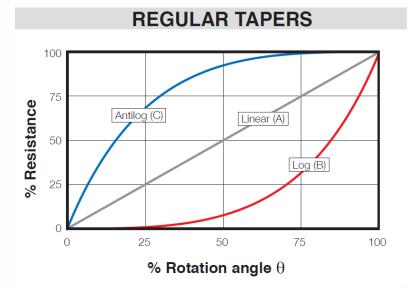
Mechanical and Environmental

| Actuation Life | 1,000 cycles. On Request: Long Life | | |
|----------------------------------|---------------------------------------|--|--|
| Angle of rotation (mechanical) | 240° ± 5° | | |
| Angle of rotation (electrical) | 220° ± 20° | | |
| Wiper standard delivery position | 50% ± 15° | | |
| Max. stop torque | 5 Ncm | | |
| Max. push/pull on rotor | 40 N | | |
| Winer Torque | < 2Ncm | | |
| Wiper Torque | Potentiometer with detents: < 2.5 Ncm | | |

Recommended Soldering Conditions (Lead free, RoHS compliant)

| Manual soldering | Reflow soldering SMD | Flow (wave) soldering |
|--|---|--|
| Soldering tools of 20W max. | Preheating temperature: Max 150ºC; 60-90 s | Recommended Alloy: SnAgCu |
| Maximum temperature of soldering tools: 280ºC | Temperature Ramp-up: 2-3ºC/s. | Preheating stage: Max 100ºC; 30-60 s. |
| Time: 3 s. max. | Over 220ºC:<40 s. | Temperature Ramp-up:1.2-2.5ºC/s. |
| | Solder temperature: 240ºC for 5 ± 1 s. | Max. wave temp.: 260ºC for 4s., (245ºC recommended) |
| | | Time within +0º-10ºC of peak: 10s. |
| | | Cooling rate: 5ºC/s. |

Tapers

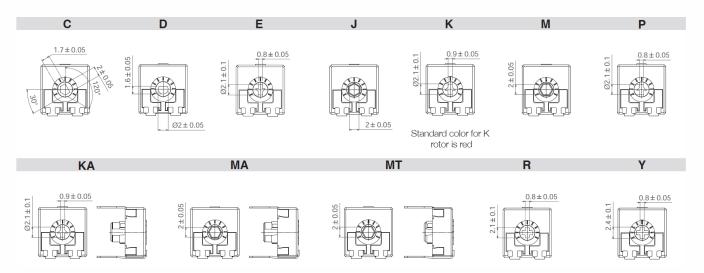


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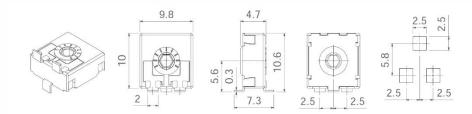
Mechanical Specifications Rotor

Rotors are drawn in their standard positioning, 50% of rotation. Alternative delivery positioning can be requested. Accessories in this catalogue are designed for the M rotor, unless otherwise stated.



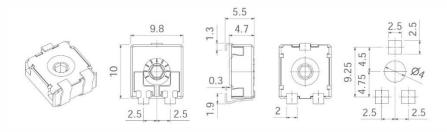
Surface Mount Gull wing Terminal

HSMD



Surface Mount J-bend Terminal

VSMD



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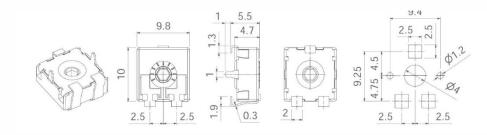
Page 4 of 11



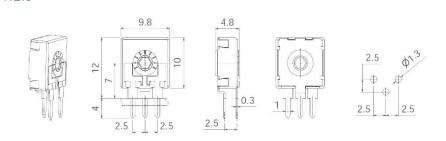
VSMD...CY

Series 09TR Potentiometer

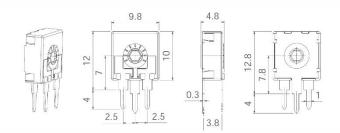
Page 5 of 11



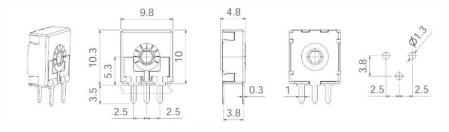
Through-Hole Terminal H2.5



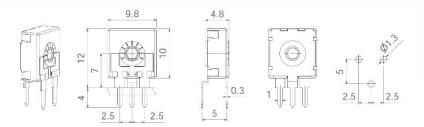
H3.8



HS3.8



H5

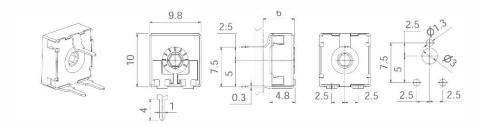


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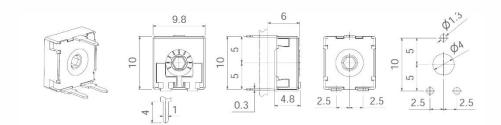
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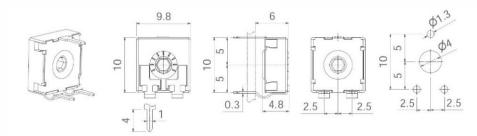




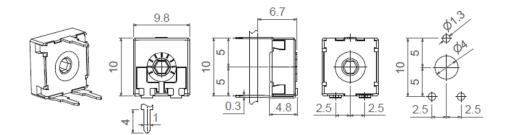
V10



VR10



VK10



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Page 6 of 11



Shaft

Shafts are available in different colors and with self-extinguishable property, according to UL 94 V-0, under request. CTS can study special shaft designs.

Shafts can be sold separately or delivered already mounted on the potentiometer at CTS.

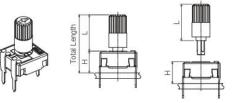
Unless otherwise stated, the arrow in the shafts is in line with the wiper and it points to 50% when assembled with M rotors.

When a shaft is mounted, the distance from the top of the potentiometer to the top of the shaft is marked with "L" in the table below, as shown in the drawings:

H potentiometer + shaft

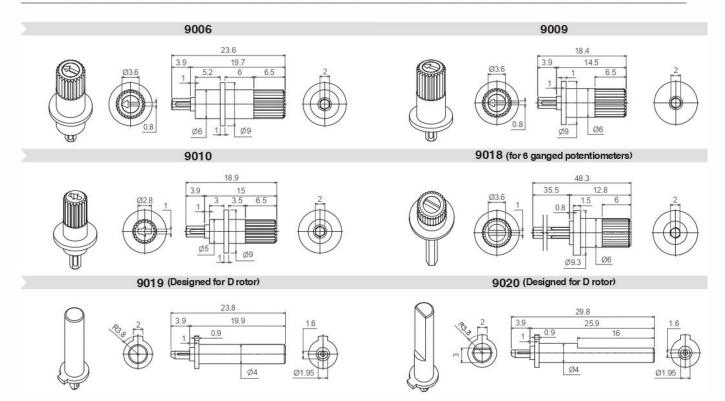
Total Length

V potentiometer + shaft



 Shaft
 9071
 9067
 9072
 9074
 9054
 9006
 9064
 9055
 9070
 9076
 9053
 9018
 9039
 9056
 9009
 9063
 9010
 9051
 9006
 9019
 9073
 9020
 9047

 L Dimension
 3.5
 5.5
 6.5
 9.3
 9.5
 10
 10
 10.8
 11.9
 12
 12.1
 12.8
 12.8
 12.8
 14.5
 14.5
 15
 15
 19.7
 19.9
 25.5
 25.9
 29.8



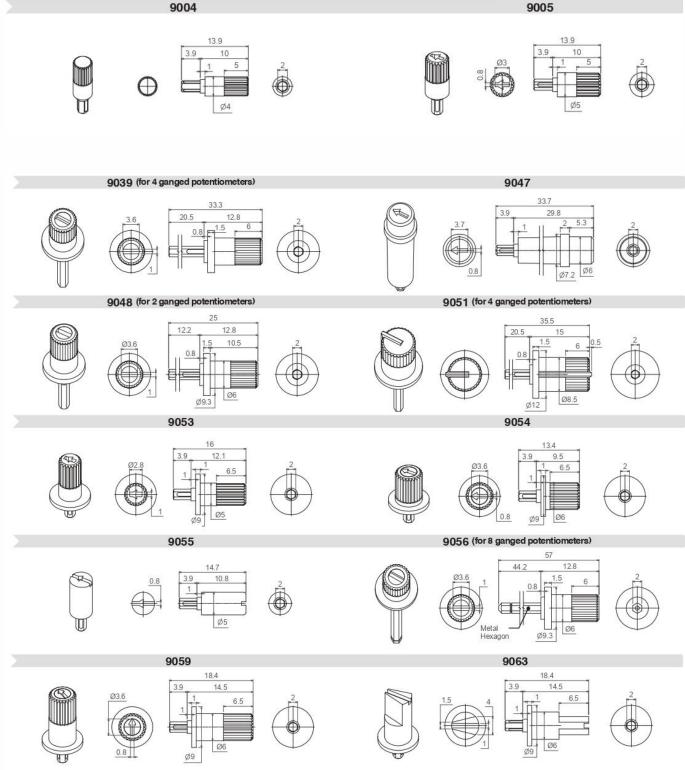
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Page 7 of 11



Series 09TR Potentiometer





The arrow is in line with the wiper when potentiometer has rotor J (with M rotor, there is a 30° difference).

09TR Rev. A

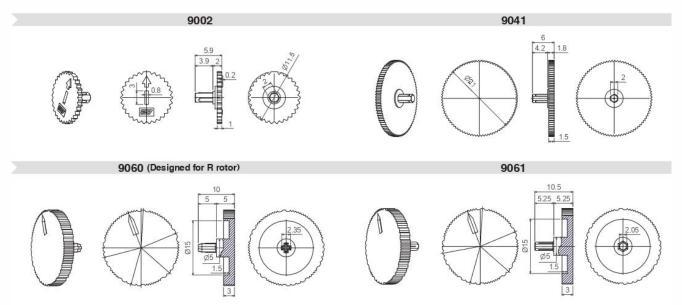
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Page 8 of 11



Wheel

Thumbwheels are available in different colors and with self-extinguishable property according to UL 94 V-0, under request. Thumbwheels can be mounted on the potentiometers at CTS or sold separately. CTS can study special thumbwheel designs.



Packaging

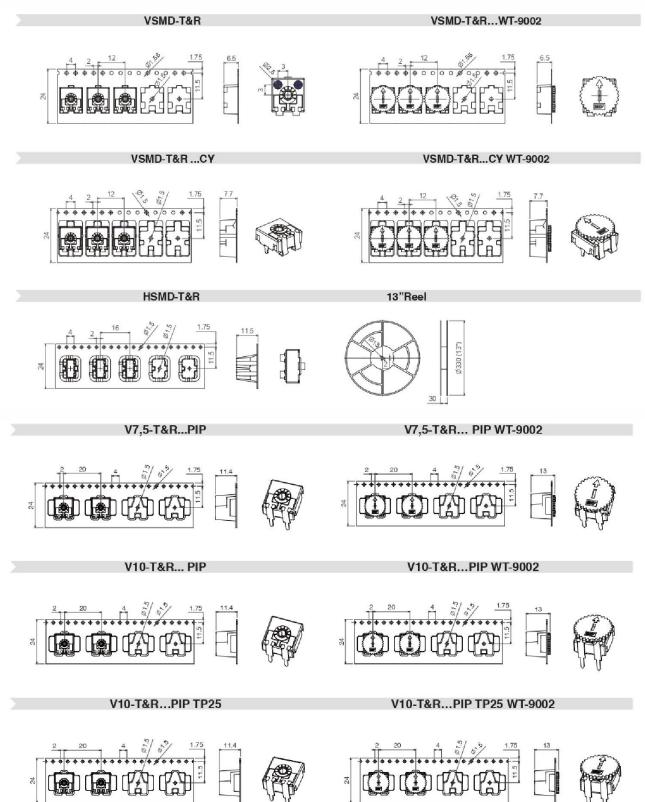
| Bulk packaging: | With shaft or thumbwheel inserted | Pieces per box |
|--|---|--|
| | None, only potentiometers. | 1000 |
| 2,5 - H3,8 - HS3,8 - H5 | 9002 | 750 |
| HSMD - V7,5 - V10 VK10 - VR10 - VSMD | 9004, 9005, 9006, 9009, 9010,9018, 9039, 9041, 9047, 9048,9051, 9053, 9055, 9056,9059, 9060, 9061, 9063, 9064,9067, 9070. | 450 |
| | 9054 | 500 |
| Tape & Reel packaging: With thumbwheel inserted? | | 13" Reel (Standard), with 24mm width tape |
| | None, only potentiometers. | 900 pcs per reel, 12mm step between cavities. |
| VSMD | 9002 | 700 pcs per reel, 12mm step between cavities. |
| VSMDCY | None, only potentiometers. | 750 pcs per reel, 12 mm step between cavities |
| | 9002 | To be determined |
| HSMD | | 350 pcs per reel, 16 mm step between cavities |
| H2,5PIP TP25 - H5PIP TP25 - HS3,8 PIP | None, only potentiometers — | 250 |
| V7,5PIP - V10PIP - V10PIP TP25 - VR10PIP | or 9002. | 250 |

09TR Rev. A

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Page 9 of 11

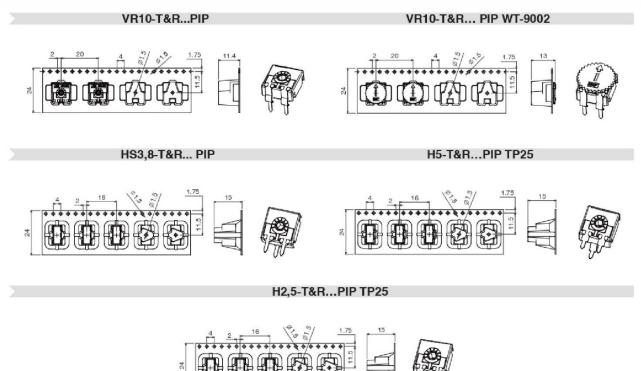




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Page 11 of 11



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