

Mechanical specifications

Mechanical rotation angle ¹			235° ± 5°		
	Electrical rota	ntion angle ²	220° ± 20°		
	Torque	rotational stop	0.4 to 2 Ncm. (0.6 to 2.7 in-oz) > 5 Ncm. (<7 in-oz)	• 3' n	
	Life ³		up to 100K cycles		
				De	

¹ 360° version available: ST10 ² 333° vers

² 333° version available: ST10

Others: check availability.

Electrical specifications

Range of values ¹	$100\Omega \leq Rn \leq 5M\Omega$ (Decad. 1.0 - 2.0 - 2.2 - 2.5 - 4.7 - 5.0)				
$ \begin{array}{ll} \mbox{Tolerance}^{\ 1} & 100\Omega \leq \mbox{Rn} \leq 1 M\Omega \\ & 1 M\Omega \leq \mbox{Rn} \leq 5 M\Omega \end{array} $	± 20% ± 30%				
Max. voltage	200 VDC (lin) 100 VDC (no lin)				
Nominal power 50°C (122°F) ³	0.15 W (lin) 0.07 W (no lin)				
Taper	Linear ; Log; Alog. (Log. & Alog. only $Rn \ge 1K$)				
Residual resistance	$\leq 0.5\%$ Rn (5 Ω min.)				
Equivalent noise resistance	\leq 3% Rn (3 Ω min.)				
Operating temperature ^{2,3}	-25°C to +70°C (-13°F to + 158°F)				

¹ Others: check availability. ² Up to 85°C depending on application.

³ For higher specifications please visit our PTC10 series.

For reflow soldering capable models please see our PS10 datasheet.

Piher Sensing Systems

Our product competencies and services: **Potentiometers** | **Position / Angle sensors** | Rotary switches | Incremental encoders Printed circuit resistors | Mechatronics | Value added assemblies

Main features

• Carbon resistive element.

- Dust proof enclosure.
- Polyester substrate.
- Wiper positioned at initial, 50% or fully clockwise.

Also upon request:

- Available in magazines for automatic insertion.
- Long life model for low-cost control potentiometer applications.
- Self-extinguishable plastic UL 94V-0.
- Cut track option (open circuit).
- Special tapers.
- Mechanical detents.
- Low torque version.
- Special switch option.
- 3% Linearity and 100K cycles mechanical life.

Description

The PT10 potentiometer offers control where frequent adjustment is required. The shaftless design allows for employment of different engagement mechanisms, such as a customized shaft, a motor control or a human interface adjustment.

This potentiometer can also control variable outputs including frequency, change in motor speed or volume.

Typical applications include test and measurement equipment, consumer electronics, appliances, small engines, robotics, motion controllers, and medical equipment control panels.

This datasheet shows you the basics of the PT10 potentiometer that is quite versatile and easy to taylor. Do not hesitate to contact Piher for advice.

PIHER sensing systems

How to order

Optional extras											
PT10 L		H01 -	101 A	20	20		•	·			•
Series	M	ounting	Таре	er	Li	ife	Dete	ents	Shaft/Thur	n. Shaft/rotor colo	ur Torque
Rotors B G K L	method H01 H02 H05 H07 H10 V05 V10 V11	A = Lin. B = Log. C = Alog. Value		- = 1K cycles E= 10K cycles (See note 5)		- = none PAI PAM PAF P1I P1F		- = none 1 = Fig. 1 2 = Fig. 2	AM = Yellow AZ = Blue BL = White CR = Cream GR = Grey MA = Brown	- = standard L= Low torque (See note 9)	
M R W inserted X shaft		101 = 100 Ω 504 = 500 K	Tolei 0505 0707	rance 5 = ± 5% 7 = ± 7%	P0 : P1	2	(See note 10)	NE = Black RO = Red VE = Green VI = Violet			
Y inserted Z knob	(Se	e note 2)	505 = 5 M	1010 =	= ± 10%	Cut	track	Pa	ackaging	(See note 8)	
(See note 1)	0		000 = CM	2020 =	= ± 20%	PCI =	none = Initial	- T =	 magazines 	Flammability	Wiper position
				(See note 4)		PCF = Final		(5	See note 6)	- = standard I = Non flammable (See note 7)	- = Initial PM = 50% PF = Final
NOTES	(1)	"7" adjustm	ont only availab	lo on "Li	"voroiono	Botor "		vailabla	in purple color	(aboff/rator calor ac	40 "\/!")
NUTES.	(1)	V05 & H07 terminals material: brass. SMD versions available (PS10 series). Endles rotation version available (ST									
	(3)	Value Ex	ample: Code:	10	1 100 └─→ Nur ──→ Firs	Ω mb of zer at two dig	os its of the	value.	000 = CM = S	witch version (con	tact us)
	(4)	Other tolerances: check availability. Example: +7% Code: 07 05 -5% -5% -5% -5% -5% -5% -5% -5% -5%									
	(5)	Standard: 1000 cycles. Long life "E": 10.000 cycles. Others: check availability.									
	(6)	Magazines	not available w	ith the H	10, V05 a	and V13 r	nodels, n	or with a	adjustment type	es X, W, Y, Z.	
	(7)	Non flammable: housing, rotor and shaft. According to UL 94V-0									
	(8)	Colour shat	ft/rotor: • Po	otentiom	eter witho	ut shaft:	only rotor	٠	Potentiometer	with shaft: only shaft	
	(9)	Low Torque: ≤ 1 Ncm No detent option available for low torque models.									
	(10)) If you wish to use your own custom plastic shaft/knob/actuator please contact Piher for advice about compatible materials.									

How to order example

PT10LH01-103A2020-S

10mm potentiometer with rotor "L" (arrow shape), H01 mounting method (horizontal adjustment), 10K value and 20% resistive tolerance.

PT10WV05-104A1010-9-NE-S

10mm potentiometer with rotor W (factory pre-inserted shaft), V05 mounting method (vertical adjustment), 100K value,10% resistive tolerance and black shaft.

Standard default options

Life	1000 cycles
Cut track	No
Detents	None
Packing	Bulk
Non flammable	No
Rotor colour	White
Shaft colour	Natural (not coloured)
Wiper send position	Initial
Torque	0.4 to 2 Ncm.

PIHER sensing systems

Piher Sensing Systems



Rotors (Default delivery is at initial position. Wipers are shown positioned at 50% for the picture)



Y = Adjustable from terminal side (default knob is 5034).

Mounting methods. Dimensions

Download 3D - STEP files here: https://piher.net/piher/?p=905



H = vertical mounting - horizontal adjustment

Z = Adjustable from collector side (default knob is 5034).





Piher Sensing Systems

Our product competencies and services: **Potentiometers** | **Position / Angle sensors** | Rotary switches | Incremental encoders Printed circuit resistors | Mechatronics | Value added assemblies

PIHER sensing systems

PIHER sensing systems

Automotive / Appliance control - sensor 10 mm carbon potentiometer PT10

Mounting methods. Dimensions



Piher Sensing Systems

Our product competencies and services: **Potentiometers** | **Position / Angle sensors** | Rotary switches | Incremental encoders Printed circuit resistors | Mechatronics | Value added assemblies

0.9-0.1

PIHER authorised distributor.

PIHER sensing systems

Automotive / Appliance control - sensor 10 mm carbon potentiometer PT10

Standard values - tolerances



For custom voltage outputs in any detent position see page 6.

Piher Sensing Systems

Our product competencies and services: **Potentiometers** | **Position / Angle sensors** | Rotary switches | Incremental encoders Printed circuit resistors | Mechatronics | Value added assemblies

Stepped outputs

Constant value zones can be combined with strategically located stops matching the flat areas of the output. If you require this feature, please, send us your requirements to sales@piher.net

Stepped outputs version example (10 steps version):



Improved repeatability

By combining the constant value zones with the detents, engineers can align the same voltage values with each of the detent stops when rotating the control both forward and backward.

This provides clear mechanical positions that are not only repeatable, but perfectly aligned electrical outputs at each of the (detent) angles.

Piher's detents also prevent output values from changing due to vibration or accidental rotor movements, furthering reliable control consistency.

Stepped outputs

PIHER's potentiometers can feature special stepped outputs or 'constant voltage zones' for the 10mm and 15mm product families.

These constant voltage zones can be combined with PIHER's mechanical detents to provide exact alignment between the electrical output (flat areas) and the mechanical detent position. The result is a higher level of precision in controlling lighting, temperature, motor or other electronic control systems.

In addition to established catalogue detent configurations, we will design and manufacture any other configuration on our tried-andtested carbon/cermet & THM/SMD potentiometer technology and processes.

With its precise control capabilities, our 10mm and 15mm potentiometers series are well suited for many consumer applications such as lighting (dimmers), power hand tools, relays, timers and HVAC systems.

Design tip. Cost-effectiveness

Main advantages

- ✓ Unique, non-overlapping values at each stop (detent position)
- ✓ It prevents changes in the output value due to light vibration or accidental rotor micro-movements
- ✓ Fully customisable according to customer's needs
- $\checkmark~$ Cost effective replacement for absolute encoders

Piher Sensing Systems

PIHER sensing systems

Shafts





Piher Sensing Systems





Knobs/thumbwheels

For G and M rotor types, top view.



Marking: configurable number of positions Example of four positions marking pictured For R rotor type only

Upon request

By default, shafts, knobs & thumweels are delivered unassembled. Mounted shafts, knobs &

thumbweels are delivered at random position but can be delivered at specific positions too (a drawing must be provided by the customer).

If you need the shaft or knob to be delivered assembled from the factory, please select the appropriate rotor in the part number: X, W, Y or Z.

The plastic color can be stated in the part number. Non flammable plastic can be ordered too.

If the potentiometer is ordered with non flamable plastic materials (UL 94V0) then the shaft or knob will be delivered with non flamable plastic too.

If you wish to use your own plastic shaft/knob/actuator, please, contact Piher for advice about compatible materials.

Positioning

5

Fig. 18 / Ref. 6064

25

Std. Position = CCW. Other delivery positions upon request.



Piher Sensing Systems

Our product competencies and services: **Potentiometers** | **Position / Angle sensors** | Rotary switches | Incremental encoders Printed circuit resistors | Mechatronics | Value added assemblies



Switch versions

They can be delivered with or withouth detents/stops.





Switch standard specs.

Power Rating: 24V / 15mA ON position resistance: $\leq 5 \Omega$ Insulation Resistance: $\geq 30 M\Omega$



(D48, rotor shown at final position)



Cut track (open circuit feature)



A = Initial S = Wiper E = Final. Other configurations available upon request.

Packaging

Default packaging is bulk (boxes).



Piher Sensing Systems

Magazines for automatic insertion are available with 50pcs per magazine.



12



0460

10H

540 +1.5

Magazines for PT10 H01 and H05 Also crimped term. H02

Magazines for PT10 V Also crimped term. V11



Our product competencies and services: **Potentiometers** | **Position / Angle sensors** | Rotary switches | Incremental encoders Printed circuit resistors | Mechatronics | Value added assemblies 13.5

Tests

Typical variations

Electrical life	1000 h. @ 50°C; 0.15 W	±5 %
Mechanical life (cycles)	1000 @ 10 CPM15 CPM	±3 % (Rn < 1 MΩ)
Temperature coefficient	-25°C; +70°C	±300 ppm (Rn <100 KΩ)
Thermal cycling	16 h. @ 85°C; 2h. @ -25°C	±2.5 %
Damp heat	500 h. @ 40°C @ 95% HR	±5 %
Vibration (for each plane x,y,z)	2 h. @ 10 Hz 55 Hz.	±2 %

Out of range values may not comply with these results. For other tests or the full range of tests, please, contact us.

Disclaimer

The product information in this catalogue is for reference purposes. Please consult for the most up to date and accurate design information.

Piher Sensors & Controls S.A., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Piher"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product described herein.

Piher disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Piher's terms and conditions of sale, including but not limited to the warranty expressed therein, which apply to these products.

No licence, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Piher.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Piher products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Piher for any damages arising or resulting from such use or sale. Please contact authorised Piher personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.

Information contained in and/or attached to this catalogue may be subject to export control regulations of the European Community, USA, or other countries. Each recipient of this document is responsible to ensure that usage and/or transfer of any information contained in this document complies with all relevant export control regulations. If you are in any doubt about the export control restrictions that apply to this information, please contact the sender immediately. For any Piher International Corp. Exports, Note: All products / technologies are EAR99 Classified commodities. Exports from the United States are in accordance with the Export Administration Regulations. Diversion contrary to US law is prohibited.

Piher is an AmphenolTM company.



All Piher products can be adapted to meet customer's requirements. Due to continuous process improvement, specifications are subject to change without notice. Please always use the datasheets published at our website www.piher.net for the most up-to-date information.

rev260619

Piher Sensing Systems





Online product configurato

Recommended connections

Recommended connection scheme for Piher´s position sensors (voltage divider)



R_L≈100 x R

Power rating curve



For higher nominal power please visit our PTC-10 cermet potentiometer.

Contact

Piher Sensors & Controls SA Polígono Industrial Municipal Vial T2, 22, 31500 Tudela - Spain. t. +34-948-820450 f. +34-948-824050

sales@piher.net

www.piher.net

