PIHER

PSC-360

Contactless Sensor

STANDARD SPECIFICATIONS

- Linearity: ±1% absolute (0.5% upon request)
- Simple & Robust Magnetic Design
- Programmable Angular Range from 15 to 360 Degrees (without dead band)
- Programmable Linear Transfer Characteristic

  (some positive slopes & one negative slope can be programmed in the same transfer characteristic; up to 4 programmable points; *see last page*)
- Selectable Analog (Ratiometric), PWM, Serial Protocol
- Programmable switch output
- Angular Resolution (depends on electrical angle and rotational speed)

  Analog & PWM: up to 12 bits
  Serial Protocol (SPI): up to 14 bits
- Full Redundant option upon request
- Self-Diagnostic features
- Rotational life: up to 50.000.000 cycles (depending on application and mounting)
- Operating temperature: up to -40ºC to +150ºC
- +10V over voltage protection and –10V reverse voltage protection
- Supply voltage: 5V ±10% (others upon request)
- Supply current

  Typ 8.5mA for single version.
  Typ 17mA for redundant version.
- IP67 (others upon request)

APPLICATION EXAMPLES

- Non-Contacting long life angle/position sensor
- Absolute Rotary Position Sensor
- Pedal Position Sensor
- Throttle/EGR Valve and Gear Position Sensor
- Height & suspension Sensor
- Non-Contacting Potentiometer
- Float-Level Sensor
- Motor-shaft Position Sensor
- Precision Robotics,industrial equipment, HVAC monitoring & control...

DESCRIPTION

The PSC-360 is a vertical Hall-effect magnetic rotary sensor that is designed to overcome the limitations of potentiometer-based devices in a wide range of applications. The performance of magnetic sensors has traditionally been limited by their poor tolerance to thermal and magnetic fluctuations. And although these limitations can be overcome by careful circuit design, the complexity this has entailed has often discouraged OEMs from designing with these sensors.

The technology used by Piher is only sensitive to the flux density coplanar with the IC surface. This allows to precise feedback the absolute position from 15 to 360 degrees. It enables the design of low-cost high performance non-contacting rotary position sensors for both automotive and industrial applications whithout the limitations of potentiometric solutions (wear, limited electrical angles...) A configurable switch ouptput is integrated within the sensor too.

Furthermore full redundancy can be achieved by employing a dual core version or the simple placement of two sensors within the housing.

The robust PSC360 is sealed and flange mounted for easy positioning when necessary. It provides high stability under harsh environment conditions such as vibration, shock, extreme temperatures / humidity, dither, moisture or dirt. Featuring a modular architecture, electrical & mechanical characteristics can be fully customised to customer´s needs as well as connector configurations. Panel mount package for bush mounting is also available.

This product shows Piher´s competences in sensors for use in harsh environments and custom product tailoring for use on Tier One and OEM platforms.

STANDARDS

- EN 55022 class B, emission radiated (30 ... 230 MHz)
- EN 55022, class B, emission radiated (230 ... 1000MHz)
- EN 61000-4-2, ESD on housing and connections (contact / air)
- EN 61000-4-3, immission HF radiated (80 ... 1000MHz)
- EN 61000-4-4, Burst (on supply lines / signal lines)
- EN 61000-4-5, Surge (on supply lines / signal lines)
- EN 61000-4-6, immission HF conduted (0.15 ... 80MHz)
- EN 61000-4-8. immission magnetic field (50Hz)
- IEC 60393-1, Insulation resistance (500VDC, 1bar, 2s)
- IEC 60393-1, Dielectric strenght (VAC, 50Hz, 1min, 1bar)
- IEC 68-2-6, Vibration (Amax=0.75mm, f=5 ... 2000 Hz)
- IEC 68-2-27 Shock

NOTE: The information contained here should be used for reference purposes only.

HOW TO ORDER

OPTIONAL EXTRAS

PSC360	-	F	1	A	-	W	-	180	-	1	-	360	-	05	-	E	-	800
Series		Shaft	Type	Output		Switch		Switch ON		Output function		ERA		V supply		Temp. range		PWM Frecuency (Hz.)
		F = with flat	1 = simple 2 = redundant 3 = full redundancy	A = Analogic P = PWM S = SPI		N = None W = switch 2 = 2 switches		000 016 ... 360		0 1 2 3		015 016 ... 360		05 = 5V 12 = 12V 15 = 15V		E = -40 to +85ºC K = -40 to +125ºC L = -40 to +150ºC		100 ... 999
				(See note 1)		(See note 2)		(See note 3)		(See note 4)						(See note 5)		(See note 6)

HOW TO ORDER CUSTOM DRAWING

SERIES - BUSHING+SHAFT - DRAWING NUMBER(16 digits) - REST OF HOW TO ORDER

This way of ordering should be used for options which are not included in the "How to order" standard and optional extras.
Example:

PSC360-F-123456----------1PN-0008-XXX-5-E-800

123456 is the drawing number
Non redundant 800 Hz. PWM output
Special angle
Special output function

NOTES:

(1) Switch available only for Analogic & PWM output types. For PWM output please select the desired frequency from 100 to 999 Hz

(2) In redundant models, please select two output types according to the following table:

Available options (1) non redundant (2) redundant (3) full redundancy:

(1)	ANN
(1)	ANW
(1)	PNN
(1)	PNW
(1)	SNN
(2)(3)	AAN
(2)(3)	AAW
(2)(3)	AA2
(2)(3)	PPN
(2)(3)	PPW
(2)(3)	PP2
(2)(3)	APN
(2)(3)	APW
(2)(3)	AP2
(2)(3)	SSN

(3) If switch option is selected please state where it changes its state to ON.

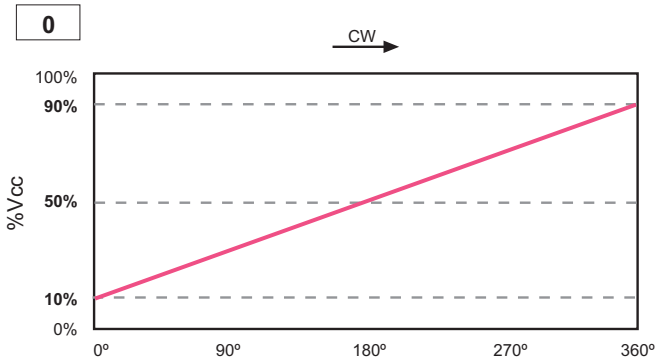
(4) Others upon request. Electrical rotation angle (ERA) to be centered in the output function.

(5) Standard Temperature range: -40 to +85ºC

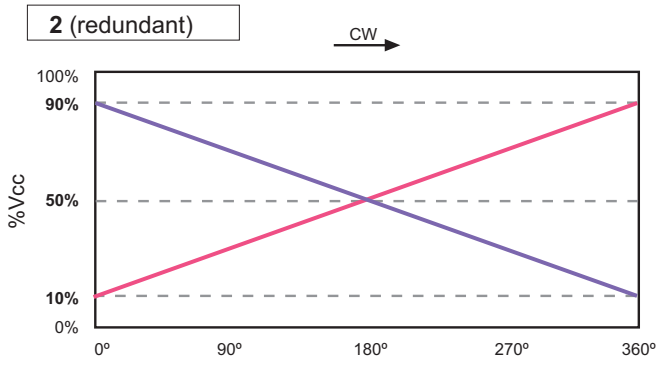
(6) Default PWM frequency: 200 Hz. For redundant models (PP) please select two frequencies.
Example: PSC360-123456----------2PP2-180-180---XXX-0008-E-800-800

STANDARD OUTPUT FUNCTIONS

0



2 (redundant)



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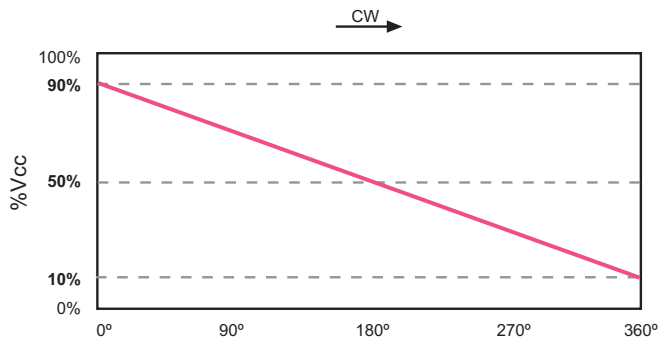
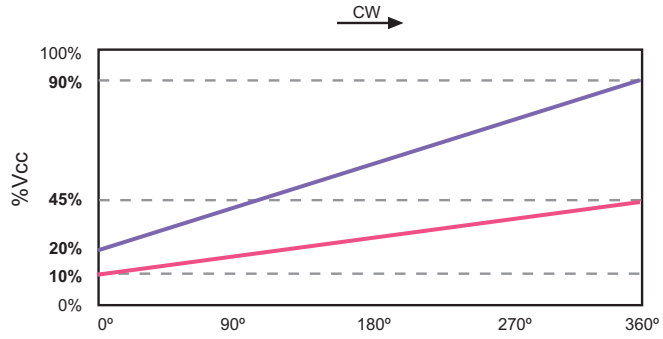
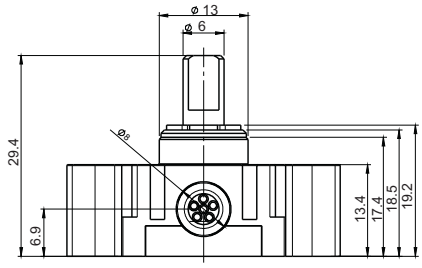
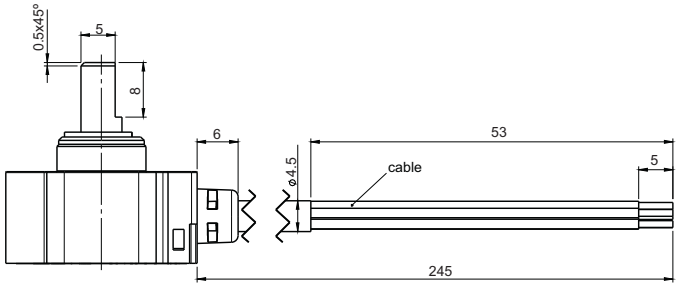


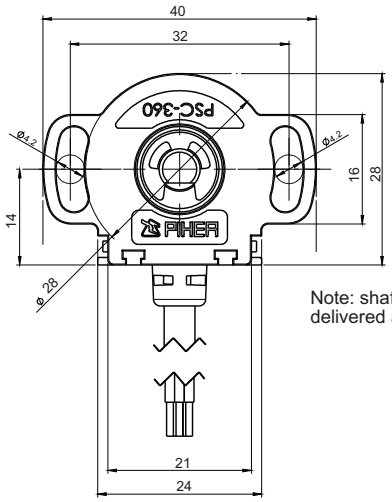
3 (redundant)



DIMENSIONS







Note: shaft is shown at zero position. Sensor is delivered at random position.

Simple analog output connection scheme

Brown = Power supply
Blue = Ground
Black = Signal output
White* = Not used

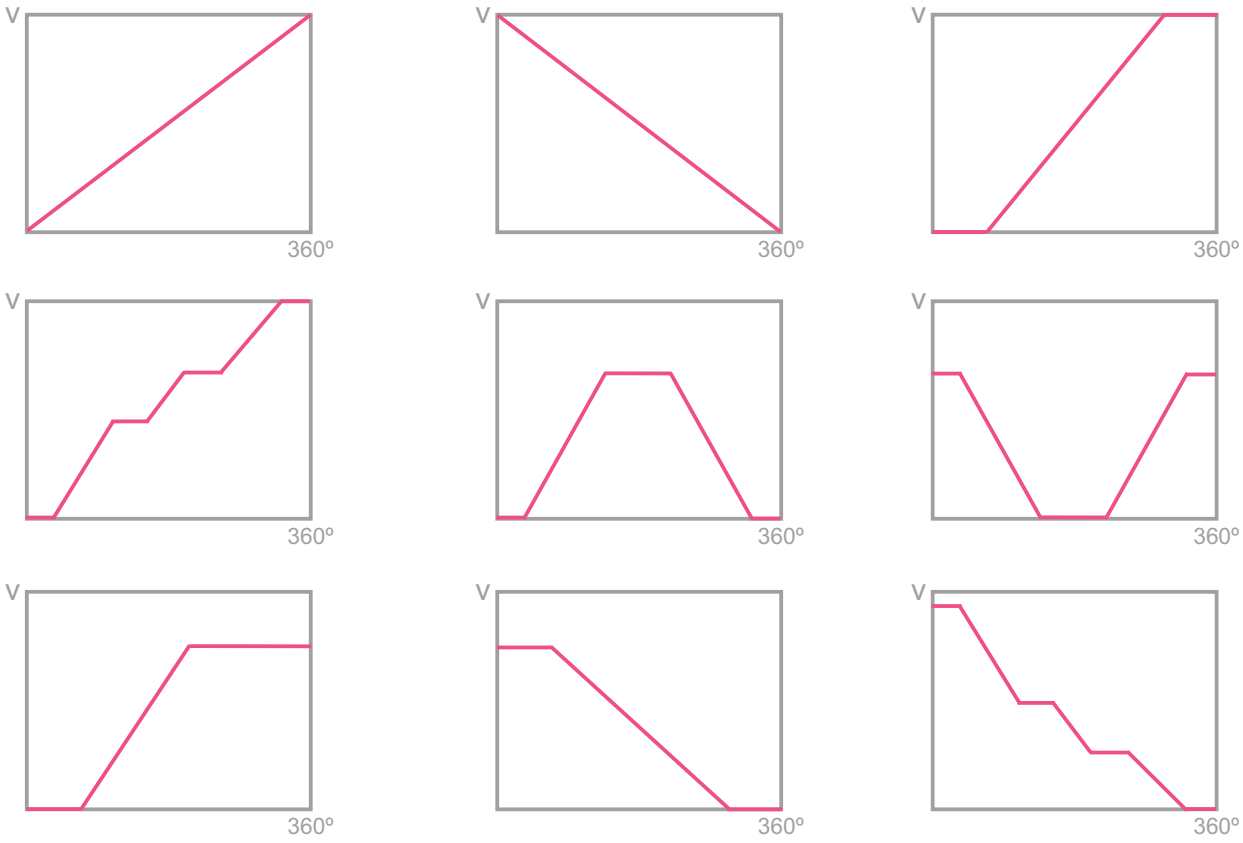
Cable length: 253mm

* The output pin needs to be connected to the ground

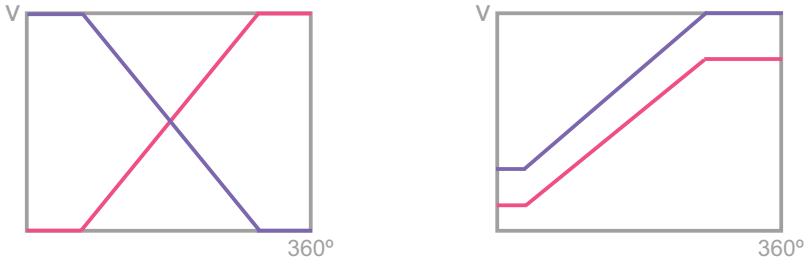
HOW TO ASSEMBLE THE SENSOR - RECOMMENDED INSTRUCTIONS

1.- Place the component on a flat surface
2.- Fasten the two M4 screws (M4 washers are recommended)
3.- Fit the actuator onto the shaft avoiding any mechanical play/wobble

OUTPUT FUNCTION EXAMPLES



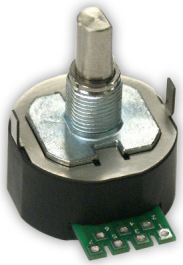
Redundant examples:



PIHER

PSC-360U

Contactless Sensor



STANDARD SPECIFICATIONS

- Linearity: ±1% absolute (0.5% upon request)
- Simple & Robust Magnetic Design
- Programmable Angular Range from 15 to 360 Degrees (without dead band)
- Programmable Linear Transfer Characteristic

  (some positive slopes & one negative slope can be programmed in the same transfer characteristic; up to 4 programmable points; *see last page*)
- Selectable Analog (Ratiometric), PWM, Serial Protocol
- Programmable switch output
- Angular Resolution (depends on electrical angle and rotational speed)

  Analog & PWM: up to 12 bits
  Serial Protocol (SPI): up to 14 bits
- Full Redundant option upon request
- Self-Diagnostic features
- Rotational life: up to 50.000.000 cycles (depending on application and mounting)
- Operating temperature: up to -40ºC to +150ºC
- +10V over voltage protection and –10V reverse voltage protection
- Supply voltage: 5V ±10% (others upon request)
- Supply current

  Typ 8.5mA for single version.
  Typ 17mA for redundant version.
- IP67 (others upon request). Customer to seal the PCB connections.

APPLICATION EXAMPLES

- Non-Contacting long life angle/position sensor
- Absolute Rotary Position Sensor
- Pedal Position Sensor
- Throttle/EGR Valve and Gear Position Sensor
- Height & suspension Sensor
- Non-Contacting Potentiometer
- Float-Level Sensor
- Motor-shaft Position Sensor
- Precision Robotics,industrial equipment, HVAC monitoring & control...

DESCRIPTION

The PSC-360U is a vertical Hall-effect magnetic rotary sensor that has been designed to overcome the limitations of potentiometer-based devices in a wide range of applications. The performance of magnetic sensors has traditionally been limited by their poor tolerance to thermal and magnetic fluctuations. And although these limitations can be overcome by careful circuit design, the complexity this has entailed has often discouraged OEMs from designing with these sensors.

The technology used by Piher is only sensitive to the flux density coplanar with the IC surface. This allows to precise feedback the absolute position from 15 to 360 degrees. It enables the design of low-cost high performance non-contacting rotary position sensors for both automotive and industrial applications whithout the limitations of potentiometric solutions (wear, limited electrical angles...) A configurable switch ouptput is integrated within the sensor too.

Furthermore full redundancy can be achieved by employing a dual core version or the simple placement of two sensors within the housing.

The robust PSC360U is sealed and delivered in panel mount package for easy bush mounting. It provides high stability under harsh environment conditions such as vibration, shock, extreme temperatures / humidity, dither, moisture or dirt. Featuring a modular architecture, electrical & mechanical characteristics can be fully customised to customer´s needs. Flange mount package for easy positioning is also available.

This product shows Piher´s competences in sensors for use in harsh environments and custom product tailoring for use on Tier One and OEM platforms.

STANDARDS

- EN 55022 class B, emission radiated (30 ... 230 MHz)
- EN 55022, class B, emission radiated (230 ... 1000MHz)
- EN 61000-4-2, ESD on housing and connections (contact / air)
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- IEC 60393-1, Insulation resistance (500VDC, 1bar, 2s)
- IEC 60393-1, Dielectric strenght (VAC, 50Hz, 1min, 1bar)
- IEC 68-2-6, Vibration (Amax=0.75mm, f=5 ... 2000 Hz)
- IEC 68-2-27 Shock

NOTE: The information contained here should be used for reference purposes only.

HOW TO ORDER

OPTIONAL EXTRAS

PSC360U	-	F	1	A	-	W	-	180	-	1	-	360	-	05	-	E	-	800
Series		Shaft	Type	Output		Switch		Switch ON		Output function		ERA		V supply		Temp. range		PWM Frecuency (Hz.)
		F = with flat L = with slot	1 = simple 2 = redundant 3 = full redundancy	A = Analogic P = PWM S = SPI		N = None W = switch 2 = 2 switches		000 016 ... 360		0 1 2 3		015 016 ... 360		05 = 5V 12 = 12V 15 = 15V		E = -40 to +85ºC K = -40 to +125ºC L = -40 to +150ºC		100 ... 999
				(See note 1)		(See note 2)		(See note 3)		(See note 4)		(from 15º to 360º)				(See note 5)		(See note 6)

HOW TO ORDER CUSTOM DRAWING

SERIES - BUSHING+SHAFT - DRAWING NUMBER(16 digits) - REST OF HOW TO ORDER

This way of ordering should be used for options which are not included in the "How to order" standard and optional extras.
Example:

PSC360U-F-123456----------1PN-0008-XXX-5-E-800

123456 is the drawing number
Non redundant 800 Hz. PWM output
Special angle
Special output function

NOTES:

(1) Switch available only for Analogic & PWM output types. For PWM output please select the desired frequency from 100 to 999 Hz

(2) In redundant models, please select two output types according to the following table:

Available options (1) non redundant (2) redundant (3) full redundancy:

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(3) If switch option is selected please state where it changes its state to ON.

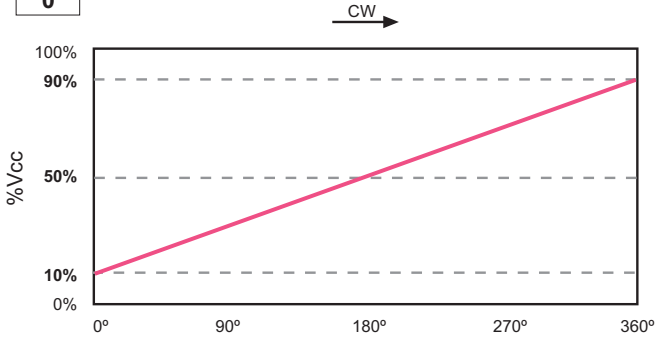
(4) Others upon request. Electrical rotation angle (ERA) to be centered in the output function.

(5) Standard Temperature range: -40 to +85ºC

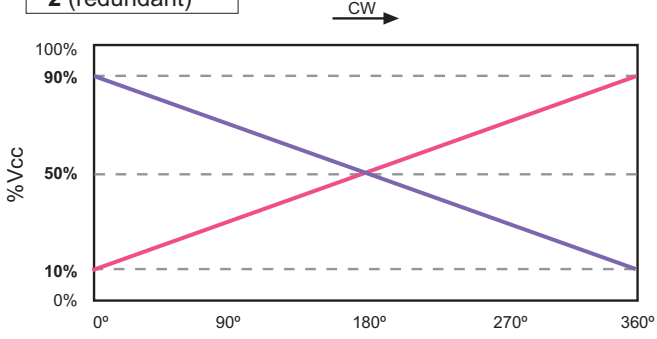
(6) Default PWM frequency: 200 Hz. For redundant models (PP) please select two frequencies.
Example: PSC360U-123456----------2PP2-180-180--XXX-0008-E-800-800

STANDARD OUTPUT FUNCTIONS

0



2 (redundant)



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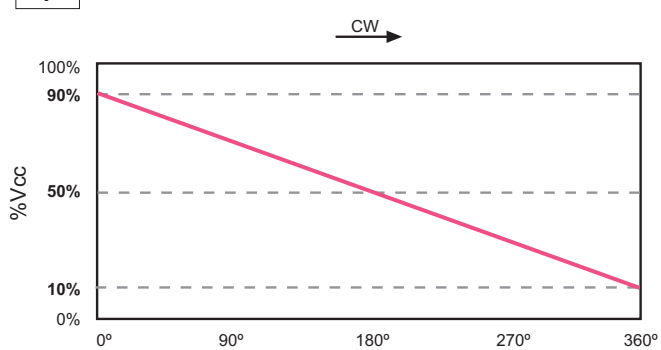
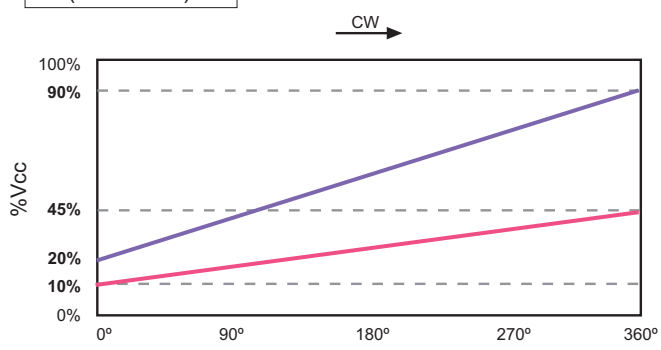
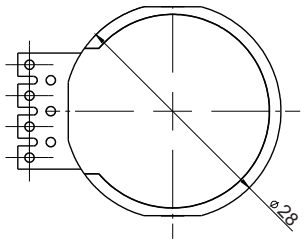


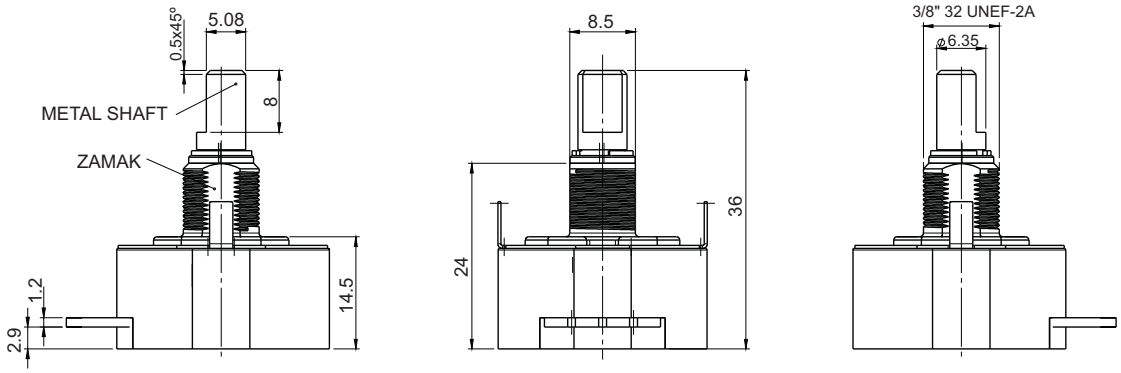
3 (redundant)

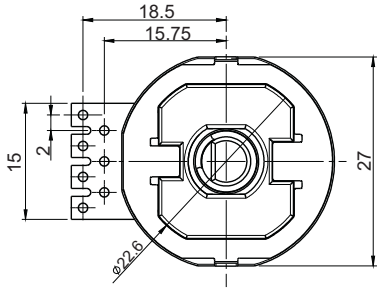


DIMENSIONS

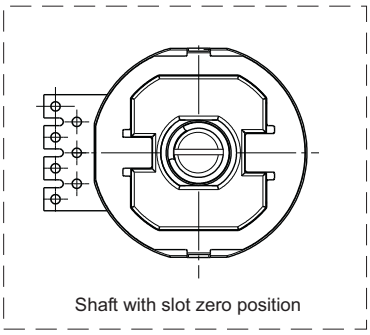
Nut & washer included







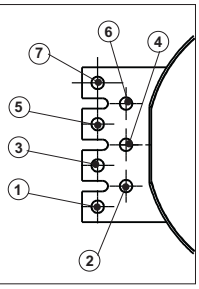
Note: shaft at zero position



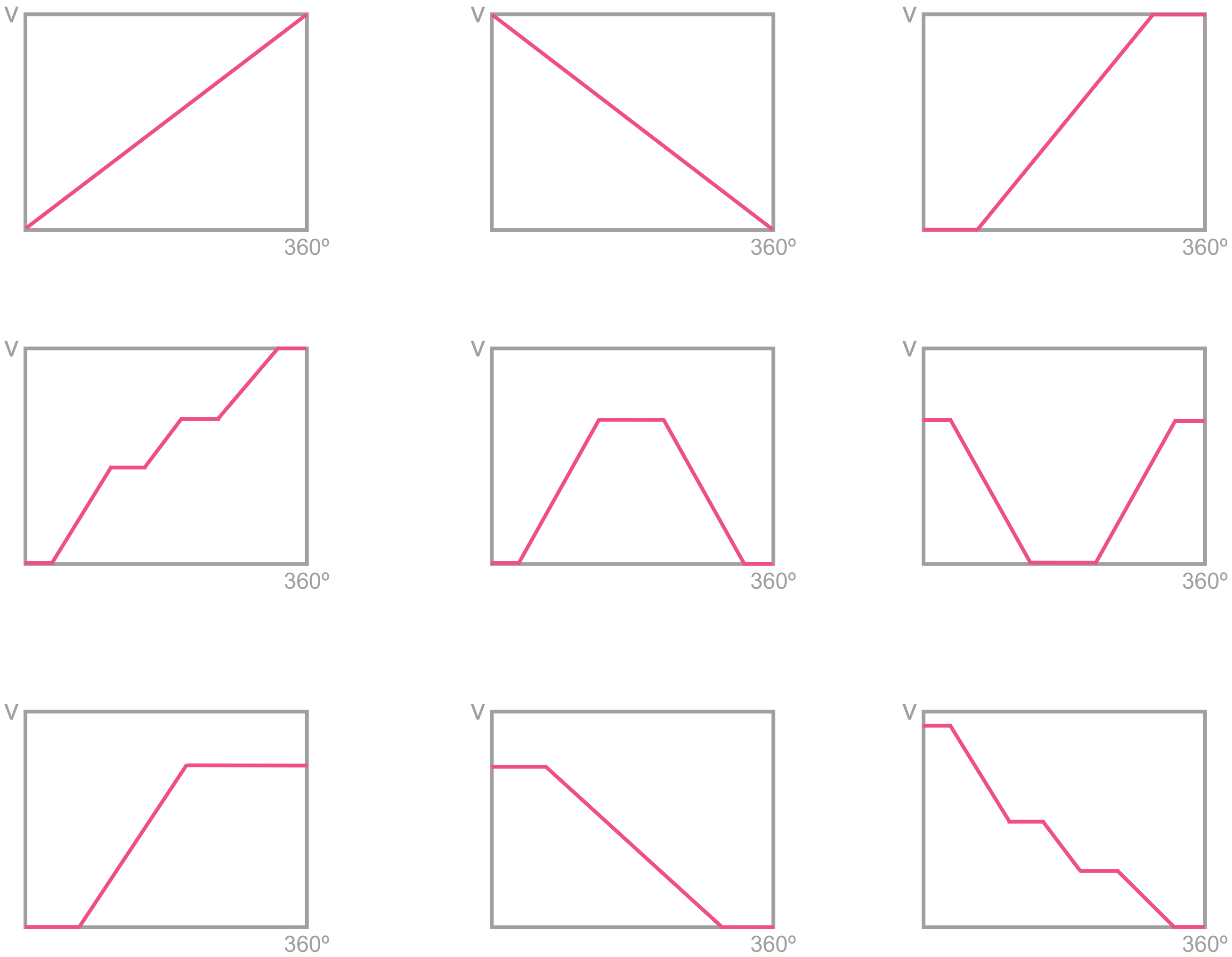
Shaft with slot zero position

Simple analog output connection scheme

1.- Supply voltage
2.- Not used *
3.- Not used *
4.- Not used
5.- Not used
6.- Ground
7.- Analog output



* The output pin needs to be connected to the ground



Redundant examples: