

- Non-contacting Hall-effect technology
- Simple mounting, low-profile design
- Measurement angle 20-360°
- 5V or 9-30V supply options
- Single- or dual-redundant-output options
- Analog output – 0.5-4.5V or 0.2-4.8V
- PWM output option
- Fail-safe outputs
- Sealing to IP69K
- AMP or Deutsch connector options
- Flying-lead option
- Protective cable-conduit option



The SRH301 and SRH302 range of shaft-operated Rotary Position Sensors offers the optimal combination of performance, safety and cost. The sensor utilises proven Hall-effect, sensing technology in a low-profile (17.3mm) housing with integral magnet.

The circuit design allows the sensor to be run from a regulated 5V supply or a varying voltage in the range of 9-30V, such as a vehicle's battery.

The electrical output span can be set to correspond to rotations of 20° to 360°, and the positional information is determined by the angle of the integral magnet relative to the sensor. The integral magnet arrangement ensures a consistent sensor-magnet separation, avoiding errors associated with air-gap fluctuations.

The SRH301 range has a single output, while the SRH302 contains two completely independent measuring circuits, each with its own power supply, meaning high-performing, safety-critical applications can easily be addressed.

The versatile, factory-programmable electronics can be easily set to one of two analog voltage output ranges or one of three PWM frequencies. In addition, the polarities of each of the analog outputs can be independently set.

The SRH301 and SRH302 both contain on-board diagnostic functions that mean the outputs can be put into safe, pre-defined states should an internal sensor error be detected.

The sealed design offers exceptional levels of performance with respect to water and dust, shock, vibration and temperature, meaning the sensor is ideal for use in hostile, on- and off-highway vehicle environments.

Connection options are industry-standard AMP Superseal or Deutsch DT04 series connectors, or simple flying leads for customer termination. The sensor can also be supplied with a protective conduit for the cabling.



CONFIGURATION & ORDERING CODES

SRH30Y-XXX-XX-X-X-XX-XXX

Y = 1 for SRH301

Y = 2 for SRH302

Type	Angle	Output	Direction	Shaft	Cable	Connector
SRH30Y	XX	XX	X	X	X	XX
	20-360	A1	1	D	P2	NC0
		A5	2	S		NC1
		P1	3			NC2
		P2	4			CC0
		P3	5			CC1
						CC2

MEASUREMENT ANGLE

SRH30Y-XXX-XX-X-X-XX-XXX

Code	Description
XXX	20-360° in 1° increments

OUTPUT

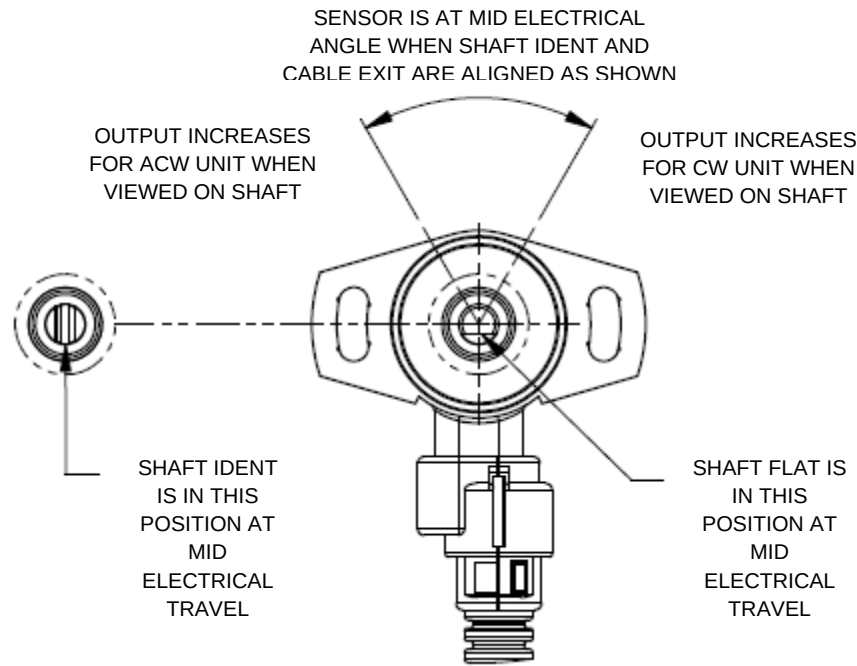
SRH30Y-XXX-XX-X-X-XX-XXX

Code	Description
A1	Analog voltage: 10-90% of 5V supply or 0.5-4.5V of 9-30V supply
A5	Analog voltage: 4-96% of 5V supply or 0.2-4.8V of 9-30V supply
P1	PWM: 244Hz
P2	PWM: 500Hz
P3	PWM: 1kHz

**DIRECTION**

SRH30Y-XXX-XX-X-X-XX-XXX

Code	Description
1	SRH301: clockwise
2	SRH301: anti-clockwise
3	SRH302: both clockwise
4	SRH302: both anti-clockwise
5	SRH302: Output 1 clockwise, Output 2 anti-clockwise

**SHAFT**

SRH30Y-XXX-XX-X-X-XX-XXX

Code	Description
D	'D' shaft
S	Sprung shaft

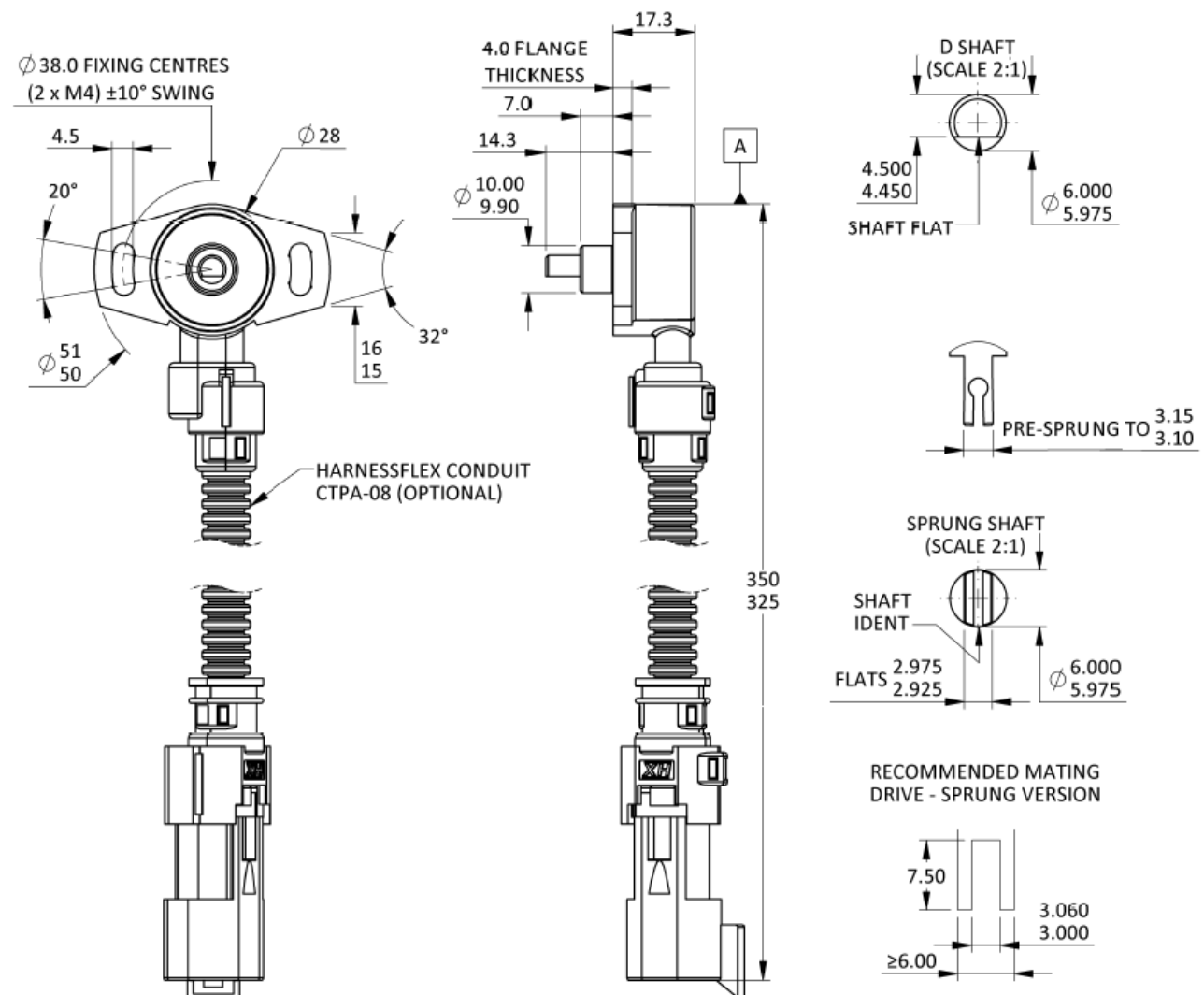
CABLE

SRH30Y-XXX-XX-X-X-XX-XXX

Code	Description
P2	0.2m cable

**CONNECTOR****SRH30Y-XXX-XX-X-X-XX-XXX**

Code	Description
NC0	No conduit, no connector (flying-leads)
NC1	No conduit, Deutsch DT04 connector
NC2	No conduit, AMP Superseal connector
CC0	Conduit fitted, no connector (flying-leads)
CC1	Conduit fitted, Deutsch DT04 connector
CC2	Conduit fitted, AMP Superseal connector

INSTALLATION**MECHANICAL**

Deutsch connector shown

AMP connector option cable length as per illustrated for Deutsch connector

Flying-lead option cable length 250-300 from datum A

Dimensions in mm unless stated otherwise



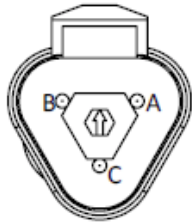
ELECTRICAL CONNECTIONS

Flying-Leads (XC0)

Color	Function	
RED	SRH301: Vsupply	SRH302: Vsupply 1
BLACK	SRH301: GND (0V)	SRH302: GND (0V) 1
YELLOW	SRH301: Output	SRH302: Output 1
BLUE		SRH302: Vsupply 2
GREEN		SRH302: GND (0V) 2
WHITE		SRH302: Output 2

Deutsch DT04 (XC1)

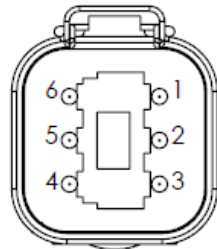
SRH301



Deutsch DT04 3P-CE03 with gold contact 0460-202-1631

Mating Part No: DT06-3S-**** (plug) & 0462-201-1631 (pins)

SRH302



Deutsch DT04 6P-CE03 with gold contact 0460-202-1631

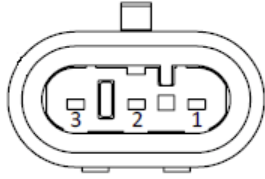
Mating Part No: DT06-6S-**** (plug) & 0462-201-1631 (pins)

Pin	Function	
1/A	SRH301: GND (0V)	SRH302: GND (0V) 1
2/B	SRH301: Output	SRH302: Vsupply 1
3/C	SRH301: Vsupply	SRH302: Output 1
4		SRH302: GND (0V) 2
5		SRH302: Vsupply 2
6		SRH302: Output 2



AMP Superseal (XC2)

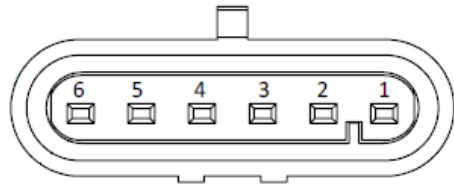
SRH301



AMP 1.5 Superseal 282105-1

Mating Part No: 282087-X (plug) & 183025-1 (pins)

SRH302



AMP 1.5 Superseal 282108-1

Mating Part No: 282090-X (plug) & 183025-1 (pins)

Pin	Function	
1	SRH301: GND (0V)	SRH302: GND (0V) 1
2	SRH301: Vsupply	SRH302: Vsupply 1
3	SRH301: Output	SRH302: Output 1
4		SRH302: GND (0V) 2
5		SRH302: Vsupply 2
6		SRH302: Output 2



SPECIFICATIONS

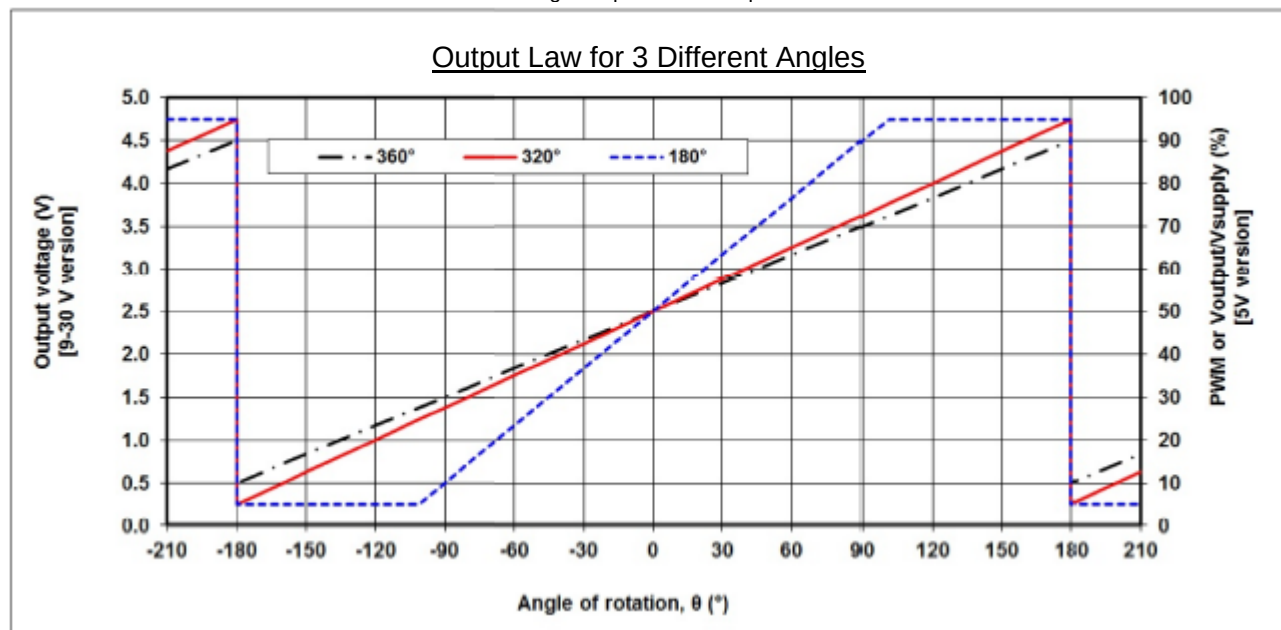
ELECTRICAL

MEASUREMENT RANGE	20-360° in 1° increments
SUPPLY VOLTAGE	5Vdc ± 0.5 Vdc and 9-30Vdc unregulated – auto-selects
SUPPLY CURRENT	SRH301: <17.5mA SRH302: <35mA
SUPPLY REVERSE POLARITY PROTECTION	Yes
SHORT-CIRCUIT PROTECTION TO GND	Yes
SHORT-CIRCUIT PROTECTION TO SUPPLY	when used with 5V supply only
OVER-VOLTAGE PROTECTION	Up to 40Vdc
POWER-ON SETTLEMENT	<1s
RESOLUTION	12-bit (0.025% of measurement range)
LINEARITY (ABSOLUTE)	$\pm 0.4\%$
TEMPERATURE COEFFICIENT	<30ppm/°C in 5Vdc mode, <110ppm/°C in 9-30Vdc mode

VOLTAGE OUTPUTS

OUTPUT RANGE A1 (5Vdc SUPPLY)	10-90% $\pm 1\%$ of Vsupply over measurement range
OUTPUT RANGE A1 (9-30Vdc SUPPLY)	0.5-4.5V $\pm 3\%$ absolute over measurement range
MONOTONIC RANGE	5%/0.25V to 95%/4.75V nominal
OUTPUT RANGE A5 (5Vdc SUPPLY)	4-96% $\pm 1\%$ of Vsupply over measurement range
OUTPUT RANGE A5 (9-30Vdc SUPPLY)	0.2-4.8V $\pm 3\%$ absolute over measurement range
MONOTONIC RANGE	2%/0.1V to 98%/4.9V nominal

Voltage Output Law Examples



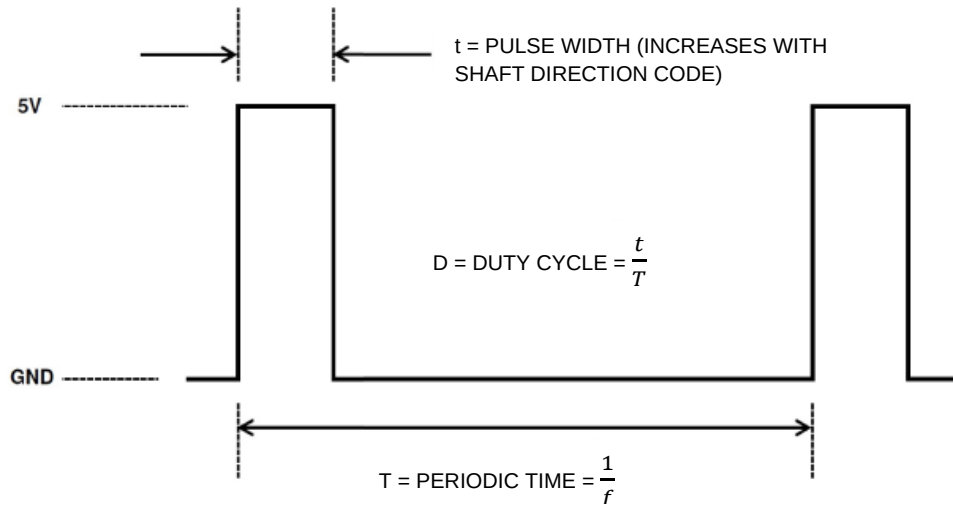
LOAD RESISTANCE	10k Ω min. (resistive to GND)
OUTPUT NOISE	<1mV rms
INPUT/OUTPUT DELAY	<2ms



PWM OUTPUTS

PWM FREQUENCY	244Hz, 500Hz or 1kHz $\pm 20\%$
PWM LEVELS (5Vdc SUPPLY)	0V and Vsupply $\pm 1\%$
PWM LEVELS (9-30Vdc SUPPLY)	0V and 5V $\pm 3\%$ nominal
DUTY CYCLE	10-90% over measurement range
MONOTONIC RANGE	5-95% nominal
LOAD RESISTANCE	10k Ω min. (resistive to GND)
RISE/FALL TIME	<15 μ s typical

PWM OUTPUT CHARACTERISTICS



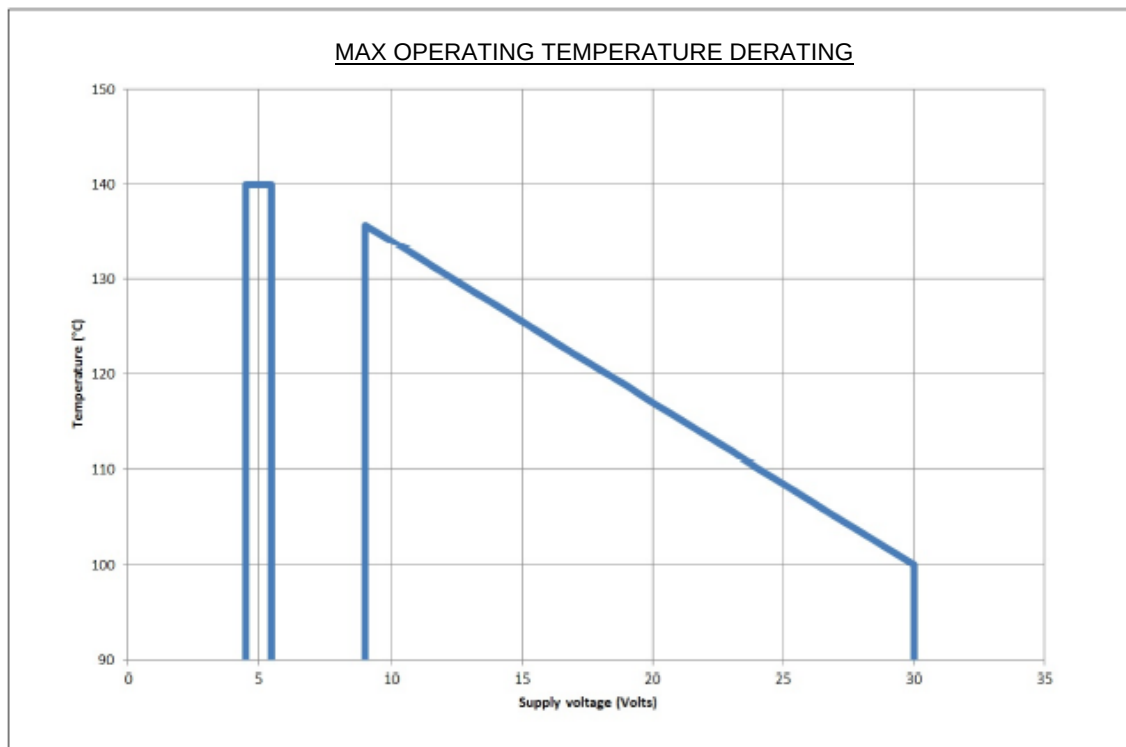
ACTUAL MEASURED OUTPUT ANGLE = 1.25 (D-0.5 x SENSOR ELECTRICAL ANGLE FROM ORDERING CODE)

MECHANICAL

MECHANICAL ANGLE	360° continuous
MAXIMUM OPERATING SPEED	3600°/s
TORQUE	120 gm cm max
WEIGHT	<70g
MOUNTING	2x holes to suit M4 screws tightened to 2.9Nm
CABLE	18AWG 1.65mm OD

**ENVIRONMENTAL**

OPERATING TEMPERATURE RANGE	
5V SUPPLY	-40°C to 140°C (-40°C to 120°C if conduit fitted)
9-30V SUPPLY	-40°C to 135.7°C at 9V, derate by 1.7°C for each 1V increase
STORAGE TEMPERATURE RANGE	-40°C to 140°C (-40°C to 120°C if conduit fitted)
SEALING	Sensor body IP69K with conduit, IP68 without conduit Manufacturer ratings apply for connectors
VIBRATION	EN 60068-2-64:1995 section 8.4 (31.4gn rms) 20-2000Hz random
SHOCK	Survival to 2500g all axes
LIFE	20 million operations
MTTFd	> 300 years
ELECTROMAGNETIC INTERFERENCE	EN 61000-4-3 to 100V/m 80-1000MHz & 1.4-2.7GHz

**IMPORTANT INFORMATION**

Whilst Curtiss-Wright Industrial Division - Penny & Giles has designed this sensor to meet a range of applications it is the responsibility of the customer to ensure it meets their specific requirement.

Penny & Giles Controls Ltd makes no warranty or representation in respect of product fitness or suitability for any particular design application, environment, or otherwise, except as may subsequently be agreed in contract for the sale and purchase of products. Customers should therefore satisfy themselves of the actual performance requirements and subsequently the product's suitability for any particular design application and the environment in which the product is to be used.

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