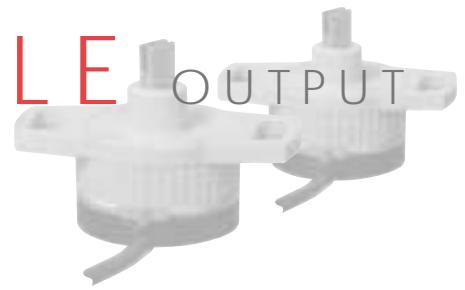


SRH 280P SINGLE OUTPUT

contactless rotary sensor



PERFORMANCE

ELECTRICAL

Measurement range	°	20 to 360 in 1° increments
Supply voltage	Vdc	9 to 30 (unregulated) and 5 ±0.5 (regulated)
Over voltage protection	Vdc	Up to 40 (-40 to +60°C)
Maximum supply current	mA	<12.5
Reverse polarity protection		Yes
Short circuit protection		
Output to GND		Yes
Output to supply		In 5V regulated mode only
Power-on settlement time	S	<1
Resolution	%	0.025 of measurement range (12 bit)
Non-linearity*	%	<±0.4
Temperature coefficient	ppm/°C	<±30 in 5V supply mode; <±90 in 9-30V supply mode

*Non-linearity is measured using the least-squares method on a computerised calibration system

Analogue Output option (Order code A) - See graph on page 17

Voltage output range		
9-30V supply	Vdc	Absolute voltage, 0.5 to 4.5 over measurement range (±3%)
5V supply	Vdc	Ratiometric output voltage - 10 to 90% of Vs over measurement range (±1%)
Monotonic range	Vdc	0.25 (5%) and 4.75 (95%) nominal
Load resistance	Ω	10k minimum (resistive to GND)
Output noise	mVrms	<1
Input/output delay	mS	2.5 (see note in OEM options)

PWM Output option (Order code P) - See output characteristics on page 17

PWM frequency	Hz	244 ±20% over temperature range
PWM levels	9-30V supply Vdc	0 and 5 nominal (±3%)
	5V supply Vdc	0 and Vs (±1%)
Duty cycle	%	10 to 90 over measurement range
Monotonic range	%	5 and 95 nominal
Load resistance	Ω	10k minimum (resistive to GND)
Rise/fall time	µS	<20

MECHANICAL

Mechanical angle	°	360, continuous
Operating torque - maximum		
sealed shaft IP68	gm cm	120
unsealed shaft IP50	gm cm	100
Shaft velocity maximum	°/sec	3600
Weight	g	<35
Mounting		Use 2 x M4 socket head cap screws and M4 washer - maximum tightening torque 2Nm
Phasing		When shaft flat (or shaft ident mark) is facing toward the cable exit, output is at mid travel. The sensor housing allows for ±20° adjustment via the mounting flange slots.

ENVIRONMENTAL

Protection class		IP68 or IP50
Life		20 million operations (10x10 ⁶ cycles) of ±75° Sensing element life is essentially infinite (contactless); the SRH280P life figure refers to the operating shaft seal. Mechanical load (axial and radial) on the shaft should also be considered.
Dither life		Contactless - no degradation due to shaft dither
Operational temperature[†]	°C	-40 to +140 (5V supply) -40 to +137 (9V supply) Derate upper temperature limit by 0.57°C for every 1V increase in supply; e.g. -40 to +125 @30V
Storage temperature	°C	-55 to +140
Vibration		BS EN 60068-2-64:1995 Sec 8.4 (14gn rms) 20 to 2000Hz Random
Shock		3m drop onto concrete
EMC Immunity level		BS EN 61000-4-3:1999, to 100V/m, 80MHz to 1GHz and 1.4GHz to 2.7GHz (2004/108/EC)

[†] See Maximum Operating Temperature – Derating graph on page 17

If the maximum operating temperature is exceeded, the voltage regulator will shut down to protect the device from overheating

OPTIONS

Measurement range (angle)		Select from 20° to 360° in 1° increments (factory programmed)
Output		Analogue voltage (A) or PWM (P)
Output direction		Clockwise or Anticlockwise shaft rotation with increasing output
Shaft style		D section, sprung shaft (S) or 2.4mm blade shaft (H)
Shaft sealing		IP50 or IP68
Cable length	m	0.2 or 0.5
Custom housing		Synchro mount style with ball race bearings - ask our technical sales team for details
OEM options		Output can be programmed to provide: non linear law; switch output; clamp voltages; alternative PWM frequencies; faster input/output delay; extended analogue range; and output mapping for potentiometer replacements in motorsport gearbox applications

AVAILABILITY

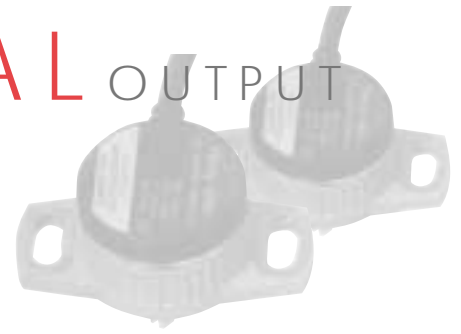
All standard configurations can be supplied within five days from the factory

ORDERING CODES

		SRH280P/...../...../...../...../...../.....
Measurement range	= angle in °	
Output	A = Analogue P = PWM	
Direction	1 = Clockwise 2 = Anticlockwise	
Shaft style	D = D shaft S = Sprung shaft H = 2.4mm blade shaft	
Shaft sealing	50 = IP50 68 = IP68	
Cable length	P2 = 0.2m P5 = 0.5m	

SRH280DP DUAL OUTPUT

contactless rotary sensor



PERFORMANCE

ELECTRICAL

Measurement range	°	20 to 360 in 1° increments
Supply voltage	Vdc	9 to 30 (unregulated) and 5 ±0.5 (regulated)
Over voltage protection	Vdc	Up to 40 (-40 to +60°C)
Maximum supply current	mA	<25 (12.5 each channel)
Reverse polarity protection		Yes
Short circuit protection		
Output to GND		Yes
Output to supply		In 5V regulated mode only
Power-on settlement time	S	<1
Resolution	%	0.025 of measurement range (12 bit)
Non-linearity*	%	< ±0.4
Temperature coefficient	ppm/°C	< ±30 in 5V supply mode; < ±90 in 9-30V supply mode

*Non-linearity is measured using the least-squares method on a computerised calibration system

Analogue Output option (Order code A) – See graph on page 17

Voltage output range		
9-30V supply	Vdc	Absolute voltage, 0.5 to 4.5 over measurement range (±3%)
5V supply	Vdc	Ratiometric output voltage - 10 to 90% of Vs over measurement range (±1%)
Monotonic range	Vdc	0.25 (5%) and 4.75 (95%) nominal
Load resistance	Ω	10k minimum (resistive to GND)
Output noise	mVrms	<1
Input/output delay	mS	2.5 (see note in OEM options)

PWM Output option (Order code P) – See output characteristics on page 17

PWM frequency	Hz	244 ±20% over temperature range
PWM levels	Vdc	0 and 5 nominal (±3%)
5V supply	Vdc	0 and Vs (±1%)
Duty cycle	%	10 to 90 over measurement range
Monotonic range	%	5 and 95 nominal
Load resistance	Ω	10k minimum (resistive to GND)
Rise/Fall time	µS	<20

MECHANICAL

Mechanical angle	°	360, continuous
Operating torque - maximum		
sealed shaft IP68	gm cm	120
unsealed shaft IP50	gm cm	100
Shaft velocity maximum	°/sec	3600
Weight	g	<35
Mounting		Use 2 x M4 socket head cap screws and M4 washer - maximum tightening torque 2Nm
Phasing		When shaft flat (or shaft ident mark) is facing toward the cable exit, output is at mid travel. The sensor housing allows for ±20° adjustment via the mounting flange slots.

SRH280DP

ENVIRONMENTAL

Protection class		IP68 or IP50
Life		20 million operations (10 x 10 ⁶ cycles) of ±75° Sensing element life is essentially infinite (contactless); the SRH280DP life figure refers to the operating shaft seal. Mechanical load (axial and radial) on the shaft should also be considered.
Dither life		Contactless - no degradation due to shaft dither
Operational temperature[†]	°C	-40 to +140 (5V supply) -40 to +135.7 (9V supply) Derate upper temperature limit by 1.7°C for every 1V increase in supply: e.g. -40 to +100 @30V
Storage temperature	°C	-55 to +140
Vibration		BS EN 60068-2-64:1995 Sec 8.4 (31.4gn rms) 20 to 2000Hz Random
Shock		3m drop onto concrete
EMC Immunity level		BS EN 61000-4-3:1999, to 100V/m, 80MHz to 1GHz and 1.4GHz to 2.7GHz (2004/108/EC)

[†] See Maximum Operating Temperature – Derating graph on page 17.
If the maximum operating temperature is exceeded, the voltage regulator will shut down to protect the device from overheating

OPTIONS

Measurement range (angle)		Select from 20° to 360° in 1° increments (factory programmed)
Output		Analogue voltage (A) or PWM (P)
Output direction		Both clockwise, both anticlockwise or one CW, one ACW
Shaft style		D section, sprung shaft (S) or solid blade (H)
Shaft sealing		IP50 or IP68
Cable length	m	0.2 or 0.5
Custom housing		Synchro mount style with ball race bearings - ask our technical sales team for details
OEM options		Output can be programmed to provide: non linear laws; switch outputs; clamp voltages; alternative PWM frequencies; different output phasing CH1/CH2; faster input/output delay; extended analogue range; and output mapping for potentiometer replacements in motorsport gearbox applications

AVAILABILITY

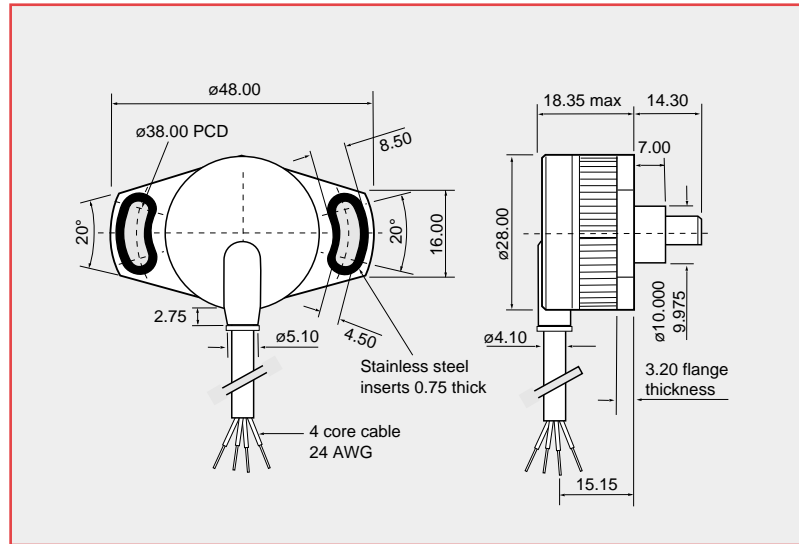
All standard configurations can be supplied within five days from the factory

ORDERING CODES

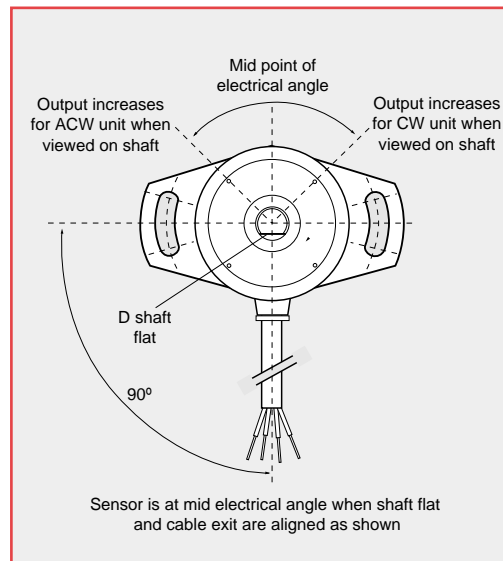
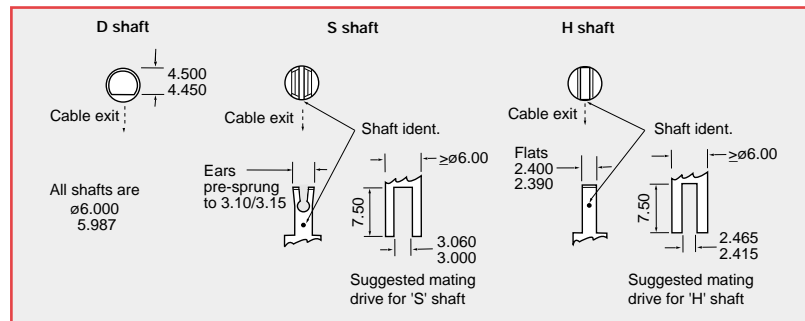
		SRH280DP/...../...../...../...../...../.....
Measurement range	CH1 = angle in °	
Measurement range	CH2 = angle in °	
Output	A = Analogue P = PWM	
Direction	3 = Both clockwise 4 = Both anticlockwise 5 = CH1 CW, CH2 ACW	
Shaft style	D = D shaft S = Sprung shaft H = 2.4mm blade shaft	
Shaft sealing	50 = IP50 68 = IP68	
Cable length	P2 = 0.2m P5 = 0.5m	

DIMENSIONS

Note: drawings not to scale



SHAFT OPTIONS



ELECTRICAL CONNECTIONS

200 or 500mm of 4-core cable: DR-25 sheathed, with 55A spec (24AWG) cores

Cable colour	Description
Red	+V Supply
Yellow	Output 1
White	Output 2
Black	0V Supply (GND)

When connecting the sensor, care should be taken with the correct connections. The sensor is provided with reverse polarity protection and short circuit protection between outputs (Yellow & White) to GND (Black), **but if the outputs (Yellow & White) are connected to the supply this will result in device failure.**

Output increases with CW or ACW rotation viewed on shaft - depending on selected order code.