

SRH220DR DUAL REDUNDANT OUTPUT

contactless rotary sensor



PERFORMANCE

Output options

A1 | A4 | P1 | P2 | P3
0.5-4.5 or 0.1-4.9Vdc | PWM

A2
0-10Vdc

ELECTRICAL

Measurement range	°	20 to 360 in 1° increments	20 to 360 in 1° increments
Supply voltage	Vdc	9 to 30 (unregulated) and 5 ±0.5 (regulated)	13.5 to 30 (unregulated)
Over voltage protection	Vdc	Up to 40 (-40 to +60°C)	Up to 40 (-40 to +60°C)
Maximum supply current	mA	<12.5 each independent supply (<25 total)	<30 (15 each channel)
Reverse polarity protection		Yes	Yes
Short circuit protection			
Output to GND		Yes	Yes
Output to supply		In 5V regulated mode only	Yes
Power-on settlement time	S	<1	<1
Resolution	%	0.025 of measurement range (12 bit)	0.025 of measurement range (12 bit)
Non-linearity*	%	<±0.4	<±0.4
Temperature coefficient	ppm/°C	<±30 (5V supply mode) <±110 (9-30V supply mode)	<±125

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

Analog Voltage Output (order code A1, A4) – see graph on page 31

Voltage output range

9-30V supply	Vdc	Absolute voltage, 0.5 to 4.5 (A1) or 0.1 to 4.9 (A4) over measurement range (±3%)
5V supply	Vdc	Ratiometric output voltage - 10 to 90% (A1) or 2 to 98% (A4) of Vs over measurement range (±1%)
Monotonic range	Vdc	0.25 (5%) and 4.75 (95%) nominal (A1)
	Vdc	0.05 (1%) and 4.95 (99%) nominal (A4)
Load resistance	Ω	10k minimum (resistive to GND)
Output noise	mVrms	<1
Input/output delay	mS	<2

Analog Voltage Output (order code A2) – see typical graph on page 31

Voltage output range	Vdc	Absolute voltage, nominally 0.2 to 9.8 (±0.2V)
Load resistance	Ω	10k minimum (resistive to GND)
Output noise	mVrms	<1
Input/output delay	mS	3.5

PWM Output (order code Pn) – see output characteristics on page 31

PWM frequency	Hz	244 (P1); 500 (P2); or 1000 (P3) ±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	<15

MECHANICAL

Mechanical angle	°	360, continuous
Operating torque	g-cm	120
Maximum rotational speed	°/sec	3600
Weight	g	<51
Mounting		Use 2 x M4 socket head cap screws and M4 washer - maximum tightening torque 2Nm
Phasing		When shaft drive detail is aligned as shown in Electrical Angle Diagram (page 12) output is at mid travel. The sensor housing allows for $\pm 10^\circ$ adjustment via the mounting flange slots.

ENVIRONMENTAL

Protection class		IP68 - with AMP connector option (when recommended mating part is fully connected) IP67 - with Deutsch connector option (when recommended mating part is fully connected)
Life		20 million operations (10 x 10 ⁶ cycles) of $\pm 75^\circ$; sensing element life is essentially infinite (contactless)
Dither life		Contactless - no degradation due to shaft dither
Operational temperature†	°C	
Output A1, A4, P1-3		-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
Output A2		-40 to +115 (13.5V supply) Derate upper temperature limit by 0.91°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 and 2500g
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 30.

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) for each output channel
Output	Analog voltage (An) or PWM (Pn)
Output direction	Both clockwise, both anticlockwise or one CW, one ACW
Shaft style	D section shaft
Connector	AMP Superseal 1.5 (A) or Deutsch DT04-6P 6-way integrated connectors
Operating lever	An operating lever kit can be supplied separately. See details on page 12
OEM options	Outputs can be programmed to provide: non linear laws; switch outputs; clamp voltages; different output phasing CH1/CH2; faster input/output delay; extended analog range; and output mapping for potentiometer replacements. We can also supply mating connectors, subject to minimum quantities

AVAILABILITY

All standard configurations can be supplied rapidly from the factory – check with your local supplier for more details

ORDERING CODES

		SRH220DR/...../...../...../...../...../.....
Measurement range	CH1 = angle in °	
Measurement range	CH2 = angle in °	
Output	A1 = Analog 0.5-4.5Vdc A2 = Analog 0-10Vdc A4 = Analog 0.1-4.9Vdc P1 = PWM, 244 Hz P2 = PWM, 500 Hz P3 = PWM, 1000 Hz	
Direction	3 = Both clockwise 4 = Both anticlockwise 5 = CH1 CW; CH2 ACW 6 = CH1 ACW; CH2 CW	
Shaft style	D = D shaft	
Connector	A = AMP 1.5 Superseal D = Deutsch DT04-6P	

Accessories (order separately)

Drive lever kit – SA208983 (includes lever and dowel pin)

Recommended Mating Connectors (can be supplied for OEM customers)

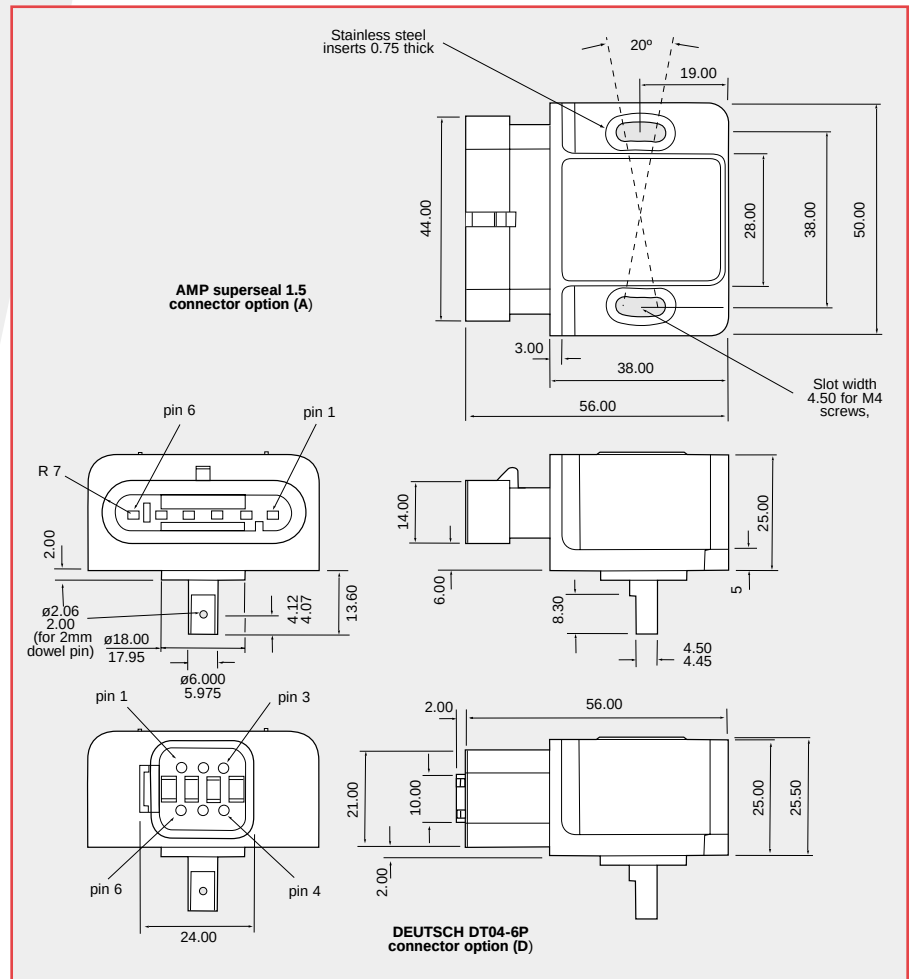
AMP Superseal 1.5 Plug – Part 282090-1 (plus 6 x receptacle contacts to match your wire size)

Deutsch DT06 Plug – Part DT06-6S (plus 6 x socket contacts to match your wire size)

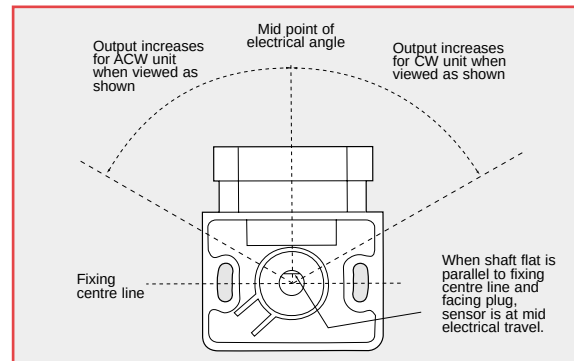
SRH220DR

DIMENSIONS

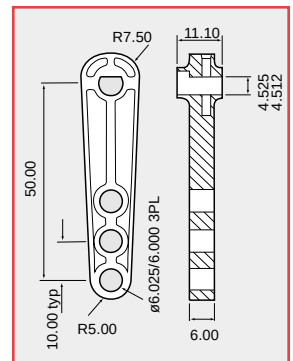
Note: drawings not to scale



ELECTRICAL ANGLE



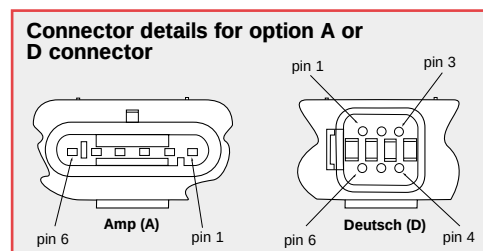
LEVER OPTION



ELECTRICAL CONNECTIONS

Option A - AMP Superseal 1.5 connector
Option D - Deutsch DT04-6P connector

Mating connectors are not supplied



Pin No	Description
1	CH1 - 0V Supply (GND)
2	CH1 - +V supply
3	CH1 - Output
4	CH2 - 0V Supply (GND)
5	CH2 - +V Supply
6	CH2 - Output

When connecting the sensor, care should be taken with the correct connections. The sensor is provided with indefinite reverse polarity protection and short circuit protection between output to GND (Black), **but if the outputs 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.