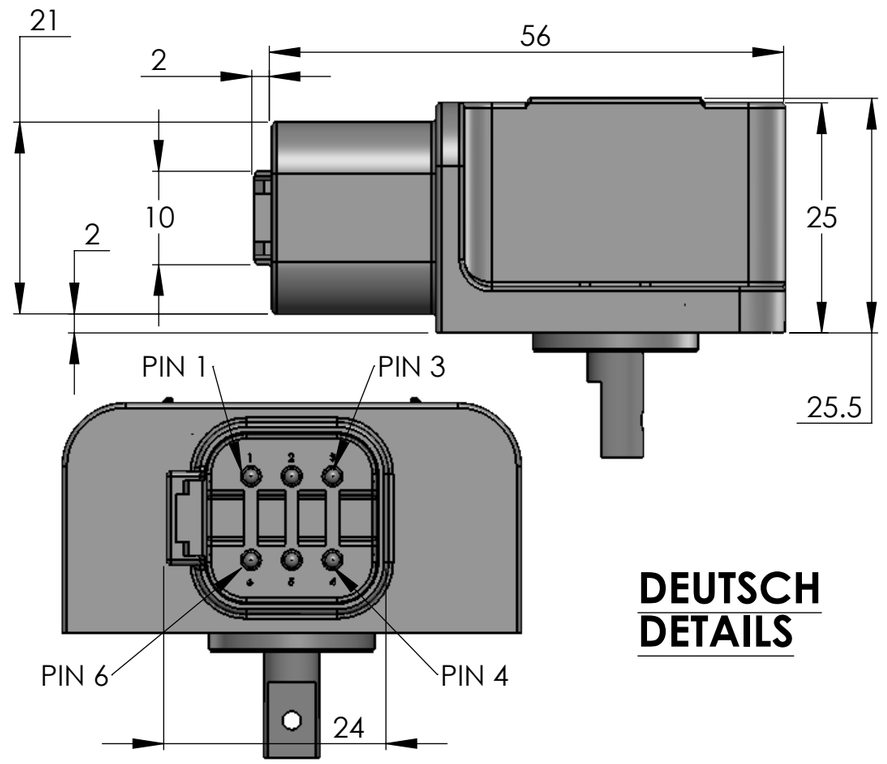
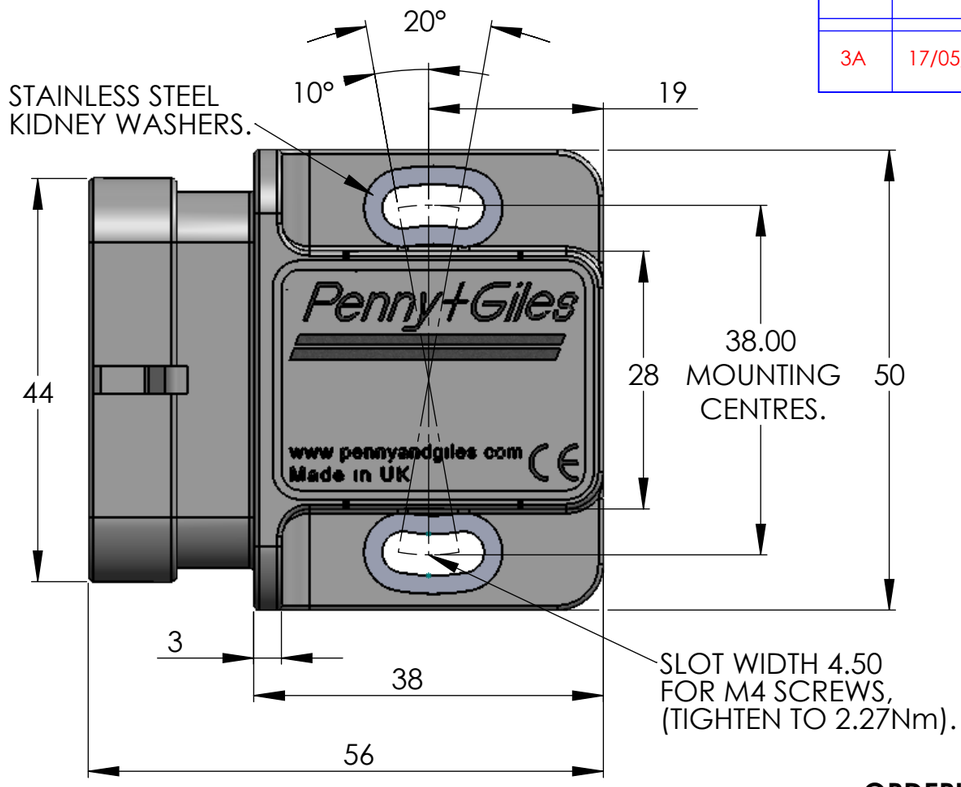
METRIC
IF IN DOUBT ASK

ISS	DATE	DRAWN	ECR No.	CHK	APP
3A	17/05/10	K.T	C10593-9	M.B	M.B



DEUTSCH DETAILS

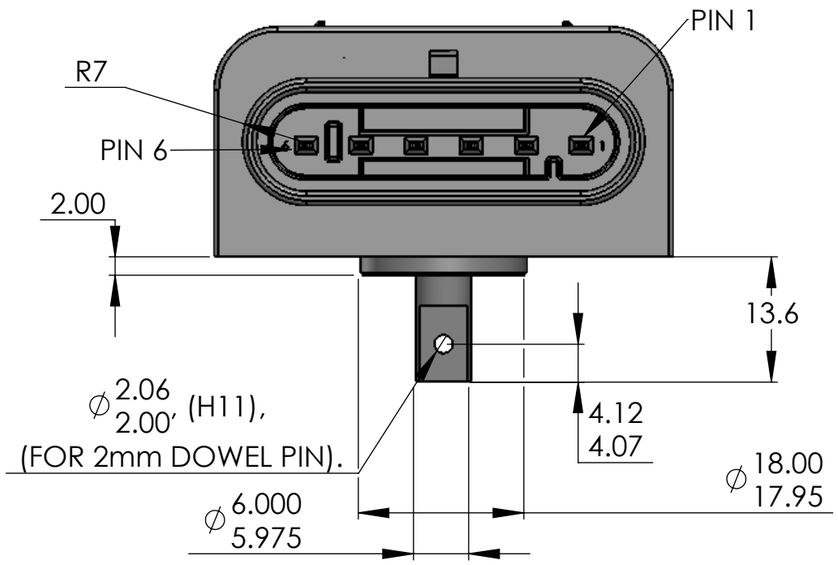


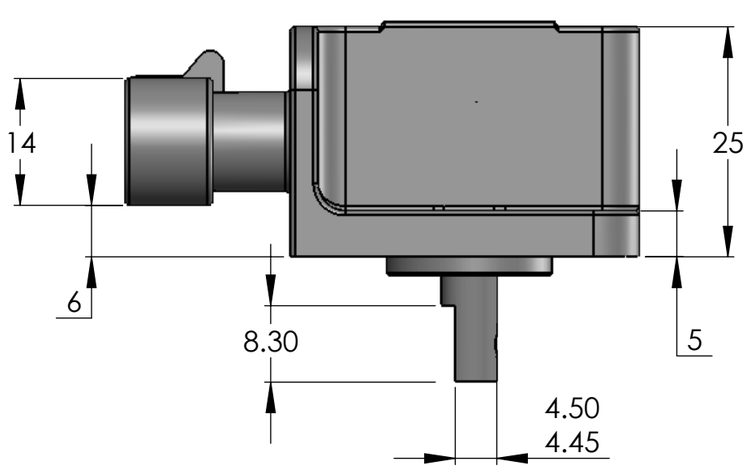
MATING CONNECTORS

AMP - 282090-1
DEUTSCH - DT06-6S

CONNECTIONS
(BOTH VERSIONS)

1. GROUND 1
2. +SUPPLY 1
3. OUTPUT 1
4. GROUND 2
5. +SUPPLY 2
6. OUTPUT 2





MAIN BODY AND AMP SUPERSEAL DETAILS.

ORDERING CODES

SRH220DR/__/__/__/__/__/__

ANGLE CHANNEL 1
ANGLE CHANNEL 2

OUTPUT
A1 - ANALOGUE 0.5 to 4.5V
A2 - ANALOGUE 0.2 TO 9.8V
A4 - ANALOGUE 0.1 to 4.9V
A6 - ANALOGUE 0.5 to 4.5V (0.15ms I/O DELAY).
A7 - ANALOGUE 0.1 to 4.9V (0.15ms I/O DELAY).
P1 - PWM - 244Hz (STANDARD).
P2 - PWM - 500 Hz.
P3 - PWM - 1KHz.

DIRECTION CODE
3. = BOTH CLOCKWISE
4. = BOTH ANTICLOCKWISE
5. = CH1-CW, CH2-ACW
6. = CH1-ACW, CH2-CW

SHAFT
D = 'D' SHAFT

PLUG
A = AMP
D = DEUTSCH

SCALE UNLESS STATED	IF CONTROL DIMENSIONS (Kc) ARE SPECIFIED THEY ARE TO BE SUBJECT TO 100% INSPECTION OR STATISTICAL PROCESS CONTROL.	D No FIRST USED ON	MATERIAL BODY - VECTRA A130 BLACK LCP PINS - BRONZE ` SHAFT - STAINLESS STEEL 316	TOLERANCES: IN-LINE WITH PENNY & GILES STANDARDS 55-301 SURFACE TEXTURE VALUES IN MICROMETRES (mm) TO BS1134:PT2. ALL MACHINED SURFACES TO BE 1.6 ALL SCREW THREADS TO BS3643 PT.2: EXTERNAL CLASS: 6g INTERNAL CLASS: 6H ANGULAR ± 1° / LINEAR 0, mm +/- 0,5 mm / 0,0 mm +/- 0,2 mm / 0,00mm +/- 0,1mm / 0,000mm +/- 0,01mm / (MACHINING) BREAK EDGE 0.05 - 0.15mm FILLET RADS 0.1 - 0.3mm UNLESS OTHERWISE STATED	TITLE DUAL REDUNDANT, SEALED ROTARY HALL SENSOR WITH AMP 1.5 SUPERSEAL OR DEUTSCH 'DT' CONNECTOR.	PENNY + GILES PART NUMBER: SRH220DR	A3 SHT 1 OF 3 SHTS
THIRD ANGLE PROJECTION TO BS 8888	MASS (g) / VOL. (mm^3)	REF.	FINISH CLEAN				

METRIC
IF IN DOUBT ASK

SRH220DR PERFORMANCE

ELECTRICAL DATA

MEASUREMENT RANGE	20° TO 360° IN 1° INCREMENTS.
SUPPLY VOLTAGE	9V TO 30Vdc UNREGULATED AND 5V ±0.5Vdc REGULATED.
SUPPLY CURRENT	≤25mA (12.5mA PER CHANNEL).
SUPPLY REVERSE POLARITY PROTECTION	YES.
SHORT CIRCUIT PROTECTION, OUTPUT TO GROUND	YES.
SHORT CIRCUIT PROTECTION, OUTPUT TO SUPPLY	IN 5V REGULATED MODE ONLY.
OVER VOLTAGE PROTECTION	UP TO 40VOLTS (-40 TO +60°C).
POWER ON SETTLEMENT	<1s.
RESOLUTION	12 BIT (0.025% OF MEASUREMENT RANGE).
NON LINEARITY	± 0.4%.
TEMPERATURE COEFFICIENT	< ±30ppm/°C IN 5V REGULATED MODE. < ±110ppm/°C IN 9 - 30V MODE.

OUTPUT

OPTIONS	RATIOMETRIC ANALOGUE, PWM OR ABSOLUTE ANALOGUE.
DIRECTION	FACTORY PROGRAMMED TO INCREASE OR DECREASE WITH CW SHAFT ROTATION.

A1, A6 (0.5 to 4.5V)

VOLTAGE OUTPUT RANGE (9-30V SUPPLY)	ABSOLUTE VOLTAGE FROM 0.5 TO 4.5V OVER MEASUREMENT RANGE, (± 3%).
VOLTAGE OUTPUT RANGE (5V SUPPLY)	RATIOMETRIC OUTPUT VOLTAGE FROM 10% TO 90%, (± 1%) OF V SUPPLY OVER MEARSUREMENT RANGE.
MONOTONIC RANGE	0.25V (5%) AND 4.75V (95%) NOMINAL.

A4, A7 (0.1 to 4.9V)

VOLTAGE OUTPUT RANGE (9-30V SUPPLY)	ABSOLUTE VOLTAGE FROM 0.1 TO 4.9V OVER MEASUREMENT RANGE, (± 3%).
VOLTAGE OUTPUT RANGE (5V SUPPLY)	RATIOMETRIC OUTPUT VOLTAGE FROM 2% TO 98%, (± 1%) OF V SUPPLY OVER MEARSUREMENT RANGE.
MONOTONIC RANGE	0.05V (1%) AND 4.95V (99%) NOMINAL.
LOAD RESISTANCE	10Kohms MINIMUM (RESISTIVE TO GROUND).
OUTPUT NOISE	≤1mV RMS.
INPUT/ OUTPUT DELAY	2.5ms TYP, 0.15ms (SEE ORDERING CODE).

P1, P2 AND P3 OUTPUT OPTION

PWM FREQUENCY	244Hz, (STANDARD) ± 20% OVER TEMPERATURE RANGE. FOR 500Hz AND 1KHz SEE ORDERING CODE.
PWM LEVELS (9-30V SUPPLY)	0V AND 5V NOMINAL, (± 3%).
PWM LEVELS (5V SUPPLY)	0V AND V SUPPLY, (± 1%).
DUTY CYCLE	10% TO 90% OVER MEASUREMENT RANGE.
MONOTONIC RANGE	5% 95% NOMINAL.
LOAD RESISTANCE	10Kohms MINIMUM (RESISTIVE TO GROUND).
RISE/FALL TIME (244, 500 AND 1000Hz)	<15 MICROSECONDS TYPICAL.

MECHANICAL DATA

MECHANICAL ANGLE	360° CONTINUOUS
TORQUE	120 gm.cm.
MAXIMUM OPERATING SPEED	3600°/SECOND.
WEIGHT	51gms.
MOUNTING	2 x M4 SCREWS.
PHASING	SEE FIG 1.

ENVIRONMENTAL DATA

OPERATIONAL TEMPERATURE RANGE (5V SUPPLY)	-40 TO + 140°C, (SEE FIG. 3).
OPERATIONAL TEMPERATURE RANGE (9 TO 30V SUPPLY)	-40 TO +135.7°C WITH V SUPPLY = 9Vdc, (SEE FIG.3). DERATE UPPER LIMIT BY 1.7°C FOR EACH 1V INCREASE IN V SUPPLY, e.g. -40 TO +100°C WITH V SUPPY = 30Vdc, (SEE NOTE BELOW). **NOTE.** EXCESSIVE TEMPERATURE WILL CAUSE THE INTERNAL VOLTAGE REGULATOR TO SHUT DOWN TO PROTECT THE CIRCUIT FROM DAMAGE DUE TO OVERHEATING.
SEALING	AMP CONNECTOR (WHEN FULLY MATED) - IP68, DEUTSCH CONNECTOR (WHEN FULLY MATED)- IP67.

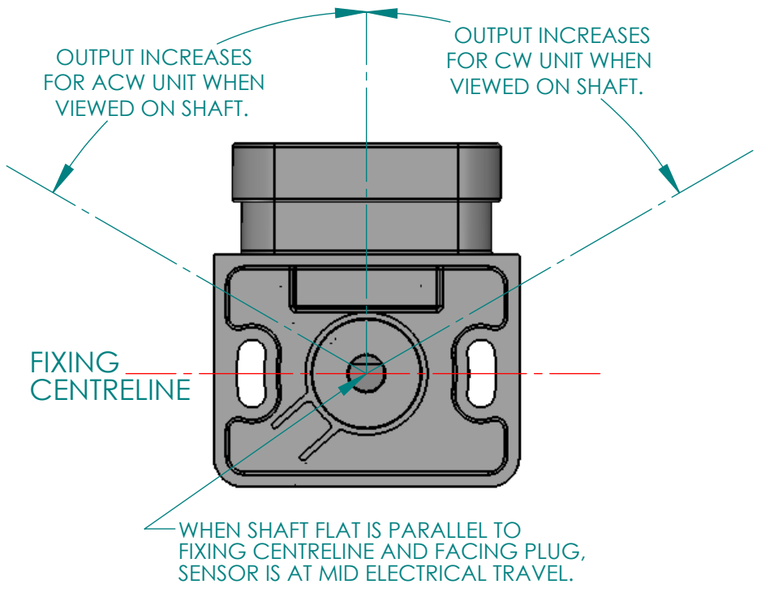
TESTED TO:

STORAGE TEMPERATURE	-55 TO +140°C.
VIBRATION	BS EN 60068-2-64; 1995 SEC 8.4 (31.4 gn rms,) 20 TO 2000Hz RANDOM.
SHOCK	3 METRE DROP ONTO CONCRETE AND 2500g.
LIFE	20 MILLION OPERATIONS, (10 MILLION CYCLES OF +/- 75°).
ELECTROMAGNETIC INTERFERENCE	BS EN 61000-4-3 (1999) TO (100V/METRE), 80MHz TO 1GHz AND 1.4GHz TO 2.7GHz.
EMC	COMPLIES TO DIRECTIVE 2004/108/EC

OEM OPTIONS

NON LINEAR LAW,
SWITCH OUTPUTS,
CLAMP VOLTAGES,
ALTERNATIVE PWM FREQUENCIES,
DIFFERENT OUTPUT PHASING CHI/CH2,
DIFFERENT INPUT/OUTPUT DELAY OPTIONS.

FIG 1.



ISS	DATE	DRAWN	ECR No.	CHK	APP
3A	17/05/10	K.T	10593/9	M.B	M.B

FIG. 2 OUTPUT LAW FOR 3 DIFFERENT ANGLES.

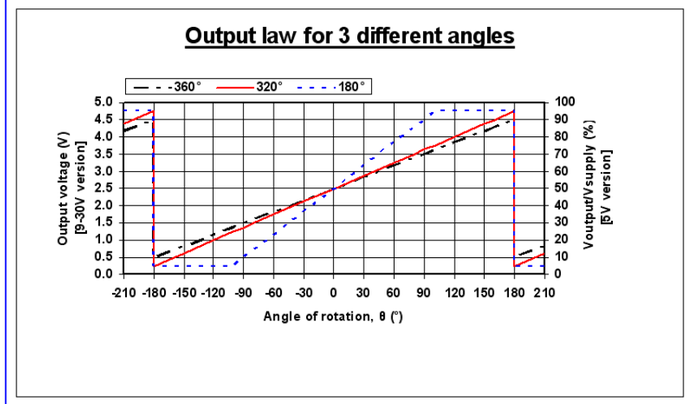


FIG. 3 MAXIMUM OPERATING TEMPERATURE DERATING.

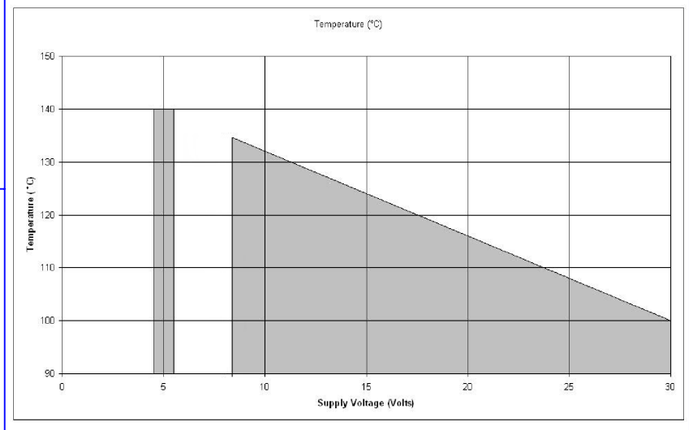
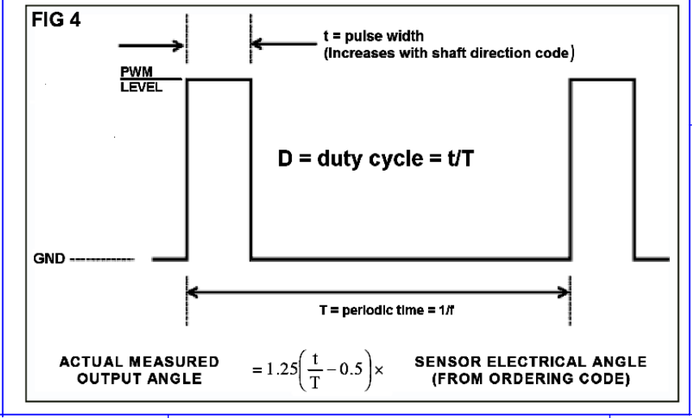


FIG. 4 PWM OUTPUT CHARACTERISTICS.



SCALE UNLESS STATED	IF CONTROL DIMENSIONS (Kc) ARE SPECIFIED THEY ARE TO BE SUBJECT TO 100% INSPECTION OR STATISTICAL PROCESS CONTROL.	D No FIRST USED ON	MATERIAL SEE ABOVE	TOLERANCES: IN-LINE WITH PENNY & GILES STANDARDS 55-301 SURFACE TEXTURE VALUES IN MICROMETRES (mm) TO BS1134:PT2. ALL MACHINED SURFACES TO BE 1.6 ALL SCREW THREADS TO BS3643 PT.2: EXTERNAL CLASS: 6g INTERNAL CLASS: 6H ANGULAR ± 1° · LINEAR 0, mm +/- 0,5 mm · 0,0 mm +/- 0,2 mm · 0,00mm +/- 0,1mm · 0,000mm +/- 0,01mm · (MACHINING) BREAK EDGE 0.05 - 0.15mm FILLET RADS 0.1 - 0.3mm UNLESS OTHERWISE STATED	TITLE DUAL REDUNDANT, SEALED ROTARY HALL SENSOR WITH AMP 1.5 SUPERSEAL OR DEUTSCH 'DT' CONNECTOR.	PENNY + GILES PART NUMBER: SRH220DR	A3 SHT 2 OF 3 SHTS
THIRD ANGLE PROJECTION TO BS 8888	MASS (g) · VOL. (mm^3)	REF.	FINISH CLEAN				

METRIC
IF IN DOUBT ASK

ISS	DATE	DRAWN	ECR No.	CHK	APP
3A	17/05/10	K.T	10593/9	M.B	M.B

SRH220DR PERFROMANCE A2 (0 - 10V) OUTPUT OPTION

ELECTRICAL DATA

MEASUREMENT RANGE	20° TO 360° IN 1° INCREMENTS
SUPPLY VOLTAGE	13.5 -30Vdc UNREGULATED
SUPPLY CURRENT	≤ 30mA (15mA PER CHANNEL).
SUPPLY REVERSE POLARITY PROTECTION	YES
OUTPUT SHORT CIRCUIT PROTECTION TO GND	YES
OUTPUT SHORT CIRCUIT PROTECTION TO SUPPLY	YES
POWER ON SETTLEMENT	≤ 10ms
RESOLUTION	12 BIT (0.025% OF MEASUREMENT RANGE)
NON-LINEARITY	≤ 0.4% OF RANGE
TEMPERATURE COEFFICIENT	<±125PPM/°C
OVER VOLTAGE PROTECTION	UP TO 40V (-40 TO +60°C)

OUTPUT(FIG 5)

DIRECTION	FACTORY PROGRAMMED TO INCREASE OR DECREASE WITH CW SHAFT ROTATION

A2 OUTPUT

VOLTAGE OUTPUT RANGE	NOMINALLY 0.2Vdc TO 9.8Vdc (±0.2V)
LOAD RESISTANCE	10KΩ MINIMUM (RESISTIVE TO GND)
OUTPUT NOISE	<1 mVRrms
INPUT / OUTPUT DELAY	3.5 ms

MECHANICAL DATA

MECHANICAL ANGLE	360° CONTINUOUS
TORQUE	120gm.cm.
WEIGHT	51gms
MOUNTING	2 x M4 SCREWS
PHASING	SEE FIG 1.

ENVIRONMENTAL

OPERATIONAL TEMPERATURE RANGE (FIG 6)	-40 TO 115°C WITH VSUPPLY = 13.5VDC DERATE UPPER TEMPERATURE LIMIT BY 0.91°C FOR EACH 1VDC INCREASE IN VSUPPLY E.G. -40 TO 100°C WITH VSUPPLY = 30VDC NOTE: EXCESSIVE TEMPERATURE WILL CAUSE THE INTERNAL VOLTAGE REGULATOR TO SHUT DOWN TO PROTECT THE CIRCUIT FROM DAMAGE THROUGH OVERHEATING.
SEALING	AMP CONNECTOR (WHEN FULLY MATED) – IP68 DEUTSCH CONNECTOR (WHEN FULLY MATED) – 1P67

TESTED TO:

STORAGE TEMPERATURE	-55 TO 140°C
VIBRATION	BS EN 60068-2-64; 1995 SEC 8.4 (31.4 gn rms) 20 TO 2000HZ RANDOM
SHOCK	3M DROP ONTO CONCRETE AND 2500g HIGHSHOCK
LIFE	20 MILLION OPERATIONS, (10 MILLION CYCLES OF +/- 75°).
ELECTROMAGNETIC INTERFERENCE	BS EN 61000-4-3(1999) TO 100V/M, 80MHZ TO 1GHZ AND 1.4GHZ TO 2.7GHZ
EMC	COMPLIES TO DIRECTIVE 2004/108/EC

FIG 5 OUTPUT LAW FOR 4 DIFFERENT ANGLES

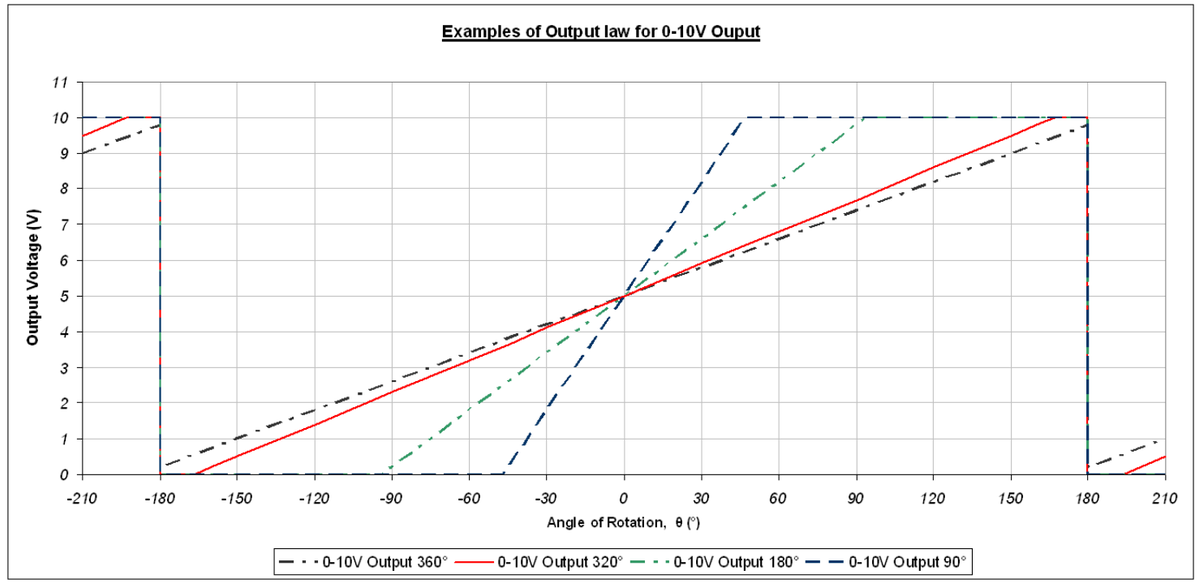
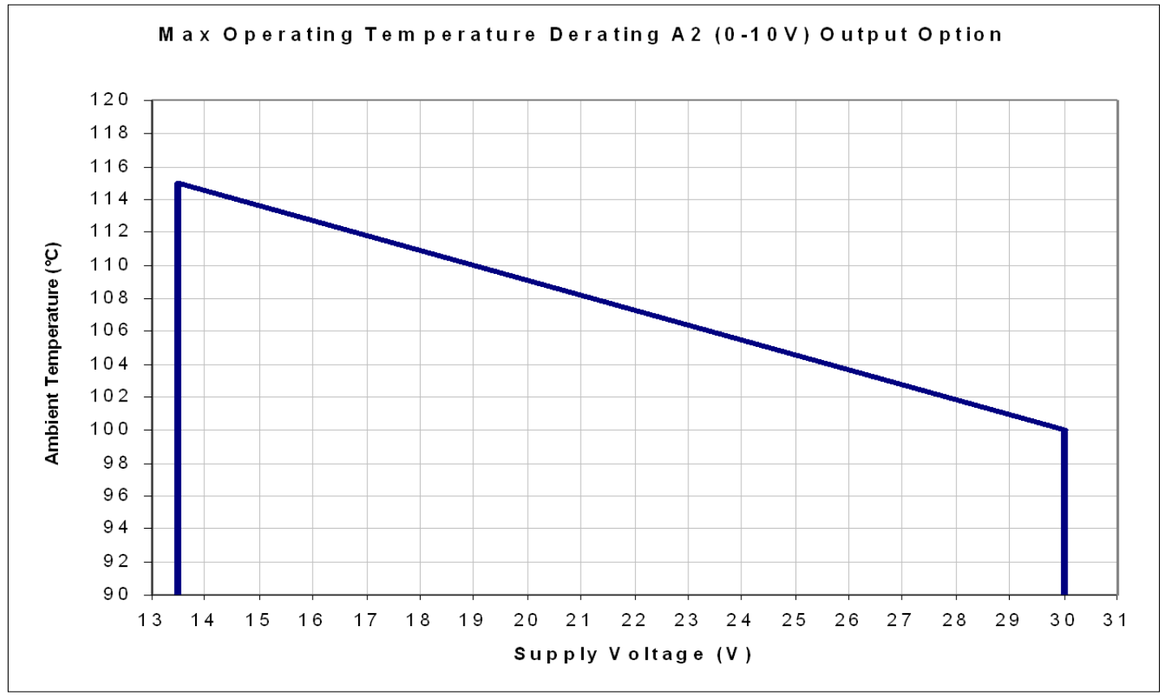


FIG 6 MAXIMUM TEMPERATURE DERATING



SCALE UNLESS STATED	IF CONTROL DIMENSIONS (Kc) ARE SPECIFIED THEY ARE TO BE SUBJECT TO 100% INSPECTION OR STATISTICAL PROCESS CONTROL.	D No FIRST USED ON	MATERIAL SEE ABOVE	TOLERANCES: IN-LINE WITH PENNY & GILES STANDARDS 55-301 SURFACE TEXTURE VALUES IN MICROMETRES (mm) TO BS1134:PT2. ALL MACHINED SURFACES TO BE 1.6 ALL SCREW THREADS TO BS3643 PT.2: EXTERNAL CLASS: 6g INTERNAL CLASS: 6H ANGULAR ± 1° LINEAR 0, mm 0,0 mm 0,00mm 0,000mm (MACHINING) +/- 0,5 mm +/- 0,2 mm +/- 0,1mm +/- 0,01mm BREAK EDGE 0.05 - 0.15mm FILLET RADS 0.1 - 0.3mm UNLESS OTHERWISE STATED	TITLE DUAL REDUNDANT, SEALED ROTARY HALL SENSOR WITH AMP 1.5 SUPERSEAL OR DEUTSCH 'DT' CONNECTOR.	**PENNY + GILES**	A3
THIRD ANGLE PROJECTION TO BS 8888	MASS (g) / VOL. (mm^3)	REF.	FINISH CLEAN			PART NUMBER: SRH220DR	SHT 3 OF 3 SHTS