

1		2		3		4		5		6	
METRIC IF IN DOUBT ASK		NRH280DP Performance									
ISS		DATE	DRAWN	ECR No.	CHK	APP					
2		23/03/10	DR	10583/7	MWB	MWB					

Electrical Data

Measurement range: 20° - 360° in 1° increments
 Supply voltage: 9V to 30Vdc Unregulated $\pm 0.5Vdc$ Regulated
 Supply current: $\leq 25mA$ (12.5mA Per Channel)
 Supply reverse polarity protection: Yes
 Short circuit protection output to GND: Yes
 Short circuit protection output to supply: In 5V regulated mode only
 Over voltage protection: Up to 40V (-40 to +80°C)
 Power on settlement: $< 1s$
 Resolution: 12 Bit (0.025% of measurement range)
 Non-linearity (See Fig 1): $\leq 0.4\%$
 Temperature coefficient: $\leq 30ppm/^\circ C$ in 5V regulated supply mode
 $\leq 90ppm/^\circ C$ in 9-30V supply mode

Output

Options: Ratimetric analogue, PWM or Absolute Analogue
 Direction: Factory programmed to increase or decrease with CW shaft rotation

Analogue Output Option (0.5V - 4.5V)

Voltage output range (9-30V Supply): Absolute voltage from 0.5V to 4.5V over measurement range ($\pm 3\%$)
 Voltage output range (5V Supply): Ratimetric output voltage from 10% to 90% ($\pm 1\%$) of VSupply over measurement range
 0.25V (5%) and 4.75V (95%) nominal

Monotonic range

Analogue Output Option (0.1V - 4.9V)

Voltage output range (9-30V Supply): Absolute voltage from 0.1V to 4.9V over measurement range ($\pm 3\%$)
 Voltage output range (5V Supply): Ratimetric output voltage from 2% to 98% ($\pm 1\%$) of VSupply over measurement range
 0.05V (1%) and 4.85V (99%) nominal

Monotonic range

Load resistance: 10K Ω minimum (relative to GND)
 Output noise: $\leq 1mVrms$
 Input/Output Delay: 2.5ms Typ.
 0.15ms (See Ordering Code)

PWM Output Option

PWM frequency: 244Hz (STD) $\pm 20\%$ over temperature range. For 500Hz & 1000Hz see ordering code
 PWM levels (9-30V Supply): 0V and VSupply ($\pm 1\%$)
 PWM levels (5V Supply): 0V and VSupply ($\pm 1\%$)
 Duty cycle: 10% to 90% over measurement range
 Monotonic range: 5% 95% nominal
 Load resistance: 10K Ω minimum (relative to GND)
 Rise/Fall time (244Hz, 500Hz & 1000Hz): $< 15\mu s$ typical

Mechanical Data

Mechanical angle: 360° continuous
 Mtx. operating speed: 3600 Tps
 Weight: $< 55g$ (With Bolt Type magnet carrier)
 Mounting: 2 x M4 screws
 Cable exit: 500mm 4-core cable FDR-25 Sheathed 55A Spec Wire (Black = GND, Red = V_{Supply}, Yellow = Output 1, White = Output 2)
 Phasing: Sensor is at mid electrical angle when the ident on the magnet carrier is in line and cable exit are aligned shown in Fig 5

Environmental

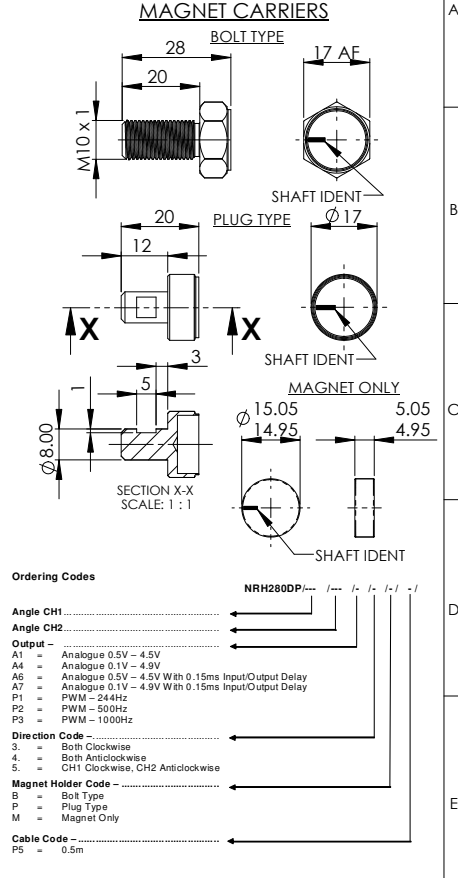
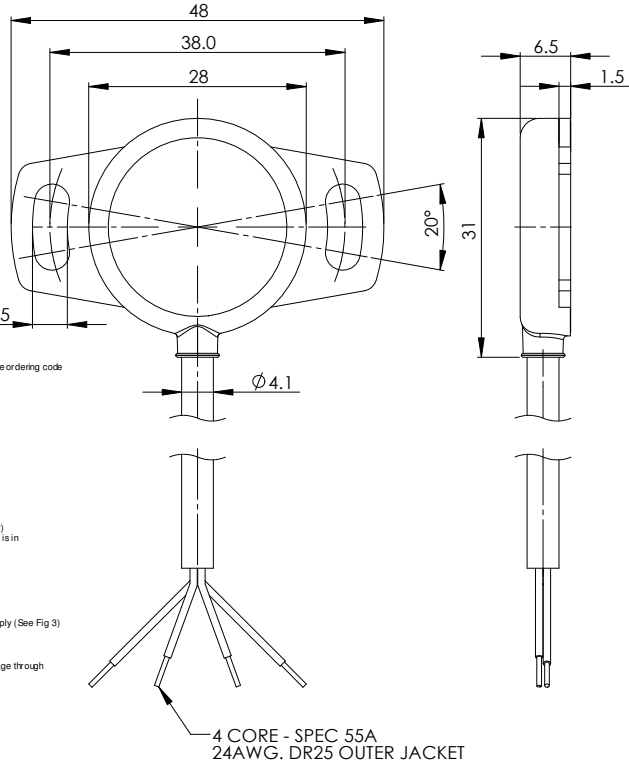
Operational temperature range (5V Version): -40 to +140°C (See Fig 3), 170°C for 72 Hours
 Operational temperature range (9-30V Version): -40 to +135.2°C with VSupply = 9Vdc
 Derate upper temperature limit by 1.7°C for each 1V increase in VSupply (See Fig 3)
 e.g. -40 to 100°C with VSupply = 30Vdc (see note below)
 IP68, IP56K

Note: Excessive temperature will cause the internal voltage regulator to shut down to protect the circuit from damage through overheating.

Treated to:

Storage temperature: -55 to +140°C
 Vibration: BS EN 60068-2-64; 1995 Sec 8.4 (31.4gn rms) 20 to 2000Hz random
 3m drop onto concrete and 250g
 MTBF = 12,853 years, Failure Rate = 0.07922 per year TBC
 Life: BS EN 1000-4-3 (1999)
 2004 I/BS/EC
 to (100W/m) 80MHz to 1GHz and 1.4GHz to 2.7GHz
 2004 I/BS/EC

Salt spray: BS EN 60068-2-11; 1999 Severity 48 Hours
 Fluid Susceptibility: Ethylene Glycol
 Brake Fluid
 Engine Oil (Mineral)
 Engine Oil (Synthetic)
 Engine Degreaser
 Screen Wash
 Petroleum Spirit
 Diesel



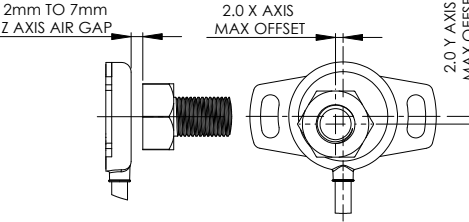
SCALE 2:1		D No		MATERIAL MIG PLATE - 316 ST/STEEL BODY - POLYMER MAGNET HOLDER - 316 ST/STEEL		TOLERANCES: IN LINE WITH PENNY & GILES STANDARDS SS-301 SURFACE TEXTURE: VALUES IN MICROMETRES (µm) TO BS1134PT2 ALL MACHINED SURFACES TO BE		TITLE NON CONTACT ROTARY HALL SENSOR		PENNY + GILES PART NUMBER: NRH280DP		A3 SHT 1 OF 2 SHTS	
UNLESS STATED		FIRST USED ON		FINISH		ALL SCREW THREADS TO BS41 PT2 EXTERNAL CLASS: 4H INTERNAL CLASS: 4H ANGULAR ± 1° LINEAR 0.1mm 0.05mm 0.025mm 0.01mm (MACHINING) +0.05mm +0.02mm +0.01mm +0.005mm BREAK EDGE 0.05 - 0.15mm RILET EDGES 0.1 - 0.3mm UNLESS OTHERWISE STATED							

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METRIC
IF IN DOUBT ASK

ISS	DATE	DRAWN	ECR No.	CHK	APP
2	23/03/10	D.R.	10583/7	MWB	MWB

MAGNET MISALIGNMENT



NRH280 Magnet Misalignment Vs Linearity

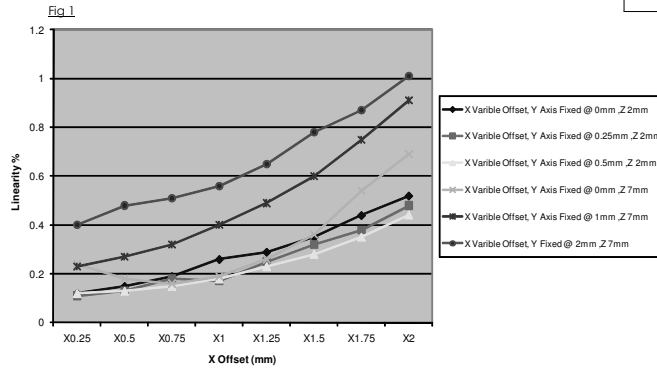
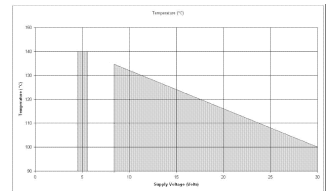
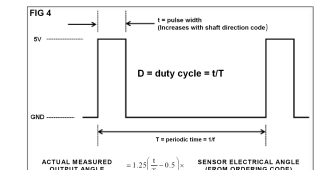


Fig 3



MAX OPERATING TEMPERATURE DERATING



PWM OUTPUT CHARACTERISTICS

Fig 5

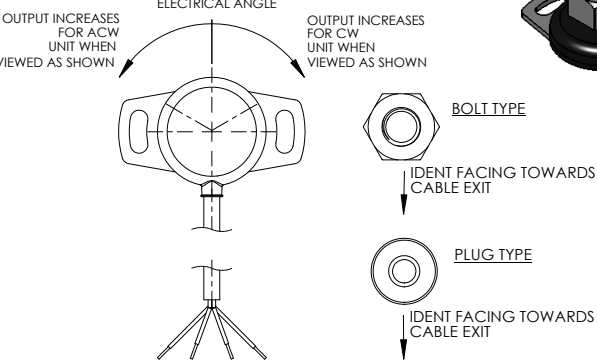
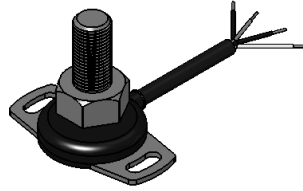
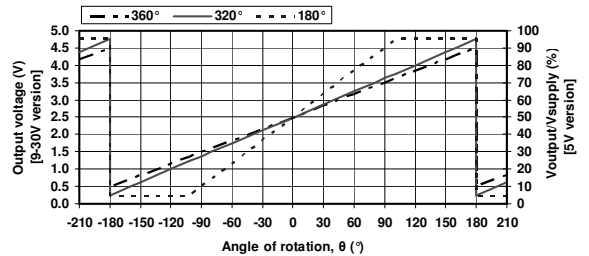


Fig 2



Output law for 3 different angles



SCALE 2:1 UNLESS STATED	IF CONTROL DIMENSIONS (RC) ARE SPECIFIED THEY ARE TO BE SUBJECT TO 100% INSPECTION OR STATISTICAL PROCESS CONTROL.	D No -	MATERIAL MTG PLATE - 316 ST. STEEL BODY - POLYMER MAGNET HOLDER - 316 ST/STEEL	TOLERANCES: IN LINE WITH PENNY & GILES STANDARDS (S-301) SURFACE TEXTURE VALUES IN MICROMETRES (µm) TO BS1134P2.2. ALL MACHINED SURFACES TO BE ALL SCREW THREADS TO BS40 P2.2. EXTERNAL CLASS: #4 INTERNAL CLASS: #H	TITLE NON CONTACT ROTARY HALL SENSOR	PENNY + GILES	A3
THIRD ANGLE PROJECTION TO BS 8888	MASS (g)	VOL. (mm ³)	REF.	FINISH		PART NUMBER: NRH280DP	SHT 2 OF 2 SHTS
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