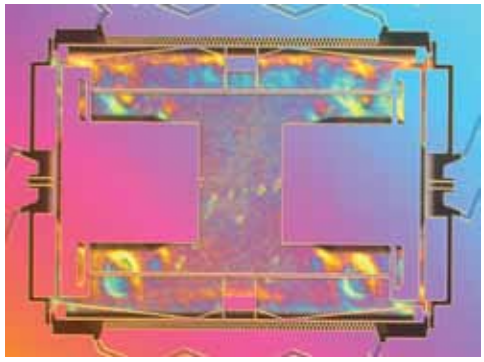
GE
Measurement & Control

RPS/DPS 8000

High Accuracy Resonant Pressure Sensor



For over 40 years, Druck has manufactured precision pressure sensors with a capability to meet critical applications in industrial, aerospace, oil and gas, and research environments. Today, Druck is part of GE Measurement & Control and has continually worked to develop and improve on the performance of our pressure sensors to meet customer's requirements.

The RPS/DPS 8000 is the first product to incorporate the exciting new TERPS technology. TERPS is a resonant silicon pressure sensor technology platform that provides an order of magnitude greater accuracy and stability than current pressure measurement technologies available. The new TERPS technology also extends the pressure range capability to high pressures and by incorporating true pressure media isolation greatly improves its suitability for use in harsh environments.

In addition to providing the performance and packaging improvements available with TERPS, the RPS/DPS 8000 product line takes advantage of best practices to offer a wide range of pressure and electrical connections to enable a level of customization for your specific requirements never before available in the performance class of this sensor.

The combination of the power of the TERPS technology and the quality, reliability and flexibility of the RPS/DPS 8000 Series offer a truly unique solution for high accuracy and high stability pressure measurement requirements.

Features:

- High Precision, ±0.01% FS over compensated temperature range
- High Stability, ±100 ppm FS/year
- Wide temperature range, -40°C to +85°C (-40° to 185°F)
- Media isolated construction, suitable for use in harsh environments
- Multiple Output configurations, RS-232, RS-485, Frequency & Diode (TTL)
- Wide selection of pressure & electrical connections to suit specific requirements

GE imagination at work

Specifications

Measurement

Base Pressure Ranges

- 0 to 2 bar (0 to 30 psi) absolute
- 0 to 7 bar (0 to 100 psi) absolute
- 0 to 14 bar (0 to 200 psi) absolute
- 0 to 20 bar (0 to 300 psi) absolute
- 0 to 35 bar (0 to 500 psi) absolute
- 0 to 70 bar (0 to 1000 psi) absolute

(Values in psi are approximate.)
The base range selected is the next range up from the requested calibrated range. Units are converted to bar for selection; e.g., 30 psi = 2.07 bar. A 7 bar base pressure range will be selected.

Calibrated Ranges

- Any zero-based range between 1 and 70 bar (14.5 to 1000 psi) can be specified. (Performance will be of the full scale of the base pressure range selected.)

Barometric ranges are available in the RPS/DPS 8100 series. The lowest calibrated pressure is 35 mbar absolute.

Overpressure

1.5X FS

Sensor Failure Pressure

2.0X FS

Pressure Containment

- Ranges to 7 bar, (100 psi), 70 bar (1,000 psi)
- Ranges to 70 bar (1,000 psi), 200 bar (3,000 psi)

Supply and Output

Electronics Option	Supply Voltage (V)	Output	Current Consumption*** (mA)
0	6 to 28	Frequency^ & Diode^^ (Low Power)*	3.5
1	6 to 28	Frequency^ & Diode^^ (Low Noise)**	10
A	7 to 28	RS485	16.5 quiescent, 32 max
B	7 to 28	RS232	16.5 quiescent, 32 max

* Low Power has Jitter of <120 ns
** Low Noise has Jitter of <75 ns
*** At 25°C (77°F)
^ Square wave pressure signal, 25 kHz nominal, 4-10 kHz span
^^ Forward voltage diode, 0.5 to 0.7 V @ 25°C (77°F), typically –2 mV/°C nominal

Response Time

< 300 msec for pressure change from 10% to 90% FS

Supply Response

Frequency & Diode: Accurate to specification within 500 ms of supply switch on, over all operating temperatures
RS 232/485: First stable reading within 20 sec of supply switch on

Electrical Protection

Connecting V_{supply} and GND between any combinations of pins on the connector will not damage the unit

Insulation

500 V dc

Performance

There are two levels of performance specification: standard and Improved

Specifications include combined effects of non-linearity, hysteresis, repeatability and temperature errors over the compensated temperature range, and over the base pressure range. 35 mbar to the full scale pressure.

Accuracy Code	Precision
A1- Standard	0.02% FS
A2- Improved	0.01% FS

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For Frequency & Diode output the above accuracies are achievable by using a polynomial curve fit algorithm and coefficient data supplied with sensor.
Sensors are calibrated against standards traceable to UKAS operating to better than 100 ppm.

Compensated Temperature Ranges:

There are two compensated temperature ranges available:
-10 to +50°C
-40 to +85°C

Temperature Effects

All temperature effects are included in the accuracy statement.

Long Term Stability

Standard: ±0.02% FS/annum
Improved: ±0.01% FS/annum

Note: Unless otherwise specified, specifications are at reference conditions: 25°C (77°F) ±5°C (±9°F).

Orientation (g) Sensitivity

Less than 0.2 mbar/g

Physical Specifications

Storage Temperature Range
As compensated temperature range.

Operating Temperature Range
As compensated temperature range

Pressure Media
Media compatible with 316L Stainless Steel and Hastelloy C276

Ingress Protection
See Electrical Connector Section

Vibration
DO-160E Curve W Sine sweeps 5 Hz to 2 kHz, levels to $20g_n$
<0.2 mbar/g_n (<0.003 psi/g_n) output change

Shock
DO-160E 9 (Figure 7.2) 20 g_n 11 ms terminal saw-tooth profile
Negligible calibration change

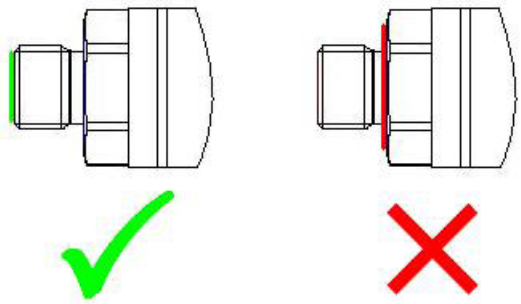
Humidity
MIL-STD-810D Method 507.2 Procedure III (Aggravated humidity environment, 65°C, 95% RH)

Pressure Connector
Available Options are

- G1/4 Female
- G1/4 Male Flat
- G1/4 Male 60 degree Cone
- G1/8 Male 60 degree Cone
- 1/4 NPT Female
- 1/4 NPT Male
- 1/8 NPT Male
- M20 x 1.5
- M14 x 1.5 60 degree Internal Cone
- M12 x 1 Internal Cone
- 7/16 UNF Male
- G1/2 Male
- G1/4 Quick Connect
- 1/2 NPT Male
- G1/4 Male Flat Long
- 7/16-20 UNF Female
- Depth Cone (G1/4 Female)
- 7/16-20 UNF Male Short Flat
- Other pressure connectors may be available. Contact GE to discuss your requirement.

Please ensure that only the intended sealing face is used when mounting the sensor. Failure to comply with this requirement may affect performance or calibration accuracy.

Male threaded pressure connectors must not be sealed or constrained against the face at the base of the thread. The forward cone or flat face should always be used, as indicated below.



Electrical Connector

Code Number	Description	Max Operating temp range		IP rating
		°C	°F	
0	No Connector	-55 to +125	-67 to +257	-
1	Cable Gland	-40 to +80	-40 to +176	65
2	Raychem Cable	-55 to +125	-67 to +257	65
3	Polyurethane Depth	-40 to +80	-40 to +176	68
4	Hytrel Depth	-40 to +80	-40 to +176	68
6	Bayonet MIL-C-26482	-55 to +125	-67 to +257	*
C	1/2 NPT Conduit	-40 to +80	-40 to +176	67
G	M12 X 1 5-pin	-55 to +125	-67 to +267	*
H	PTFE Cable (Orange)	-55 to +125	-67 to +267	54

*Hermetically sealed connectors with a maximum leak rate of 1×10^{-6} cc/s at 1 atmosphere. High IP rated mating connectors are available.

Connection Details

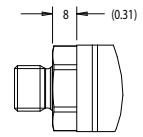
Option	Code	Connection	Function		
			Frequency & Diode	Digital- RS485	Digital - RS232
Flying Leads	0	RED	SUPPLY +VE	SUPPLY +VE	SUPPLY +VE
		YELLOW	FREQ	RS485 B	Rx
		GREEN	+VE TEMP	RS485 A	Tx
		BLUE	GROUND	GROUND	GROUND
		ORANGE	EEPROM	-	-
		BLACK	-VE TEMP	-	-
CABLE	1, 3, 4, C	RED	SUPPLY +VE	SUPPLY +VE	SUPPLY +VE
		YELLOW	FREQ	RS485 B	Rx
		BLUE	+VE TEMP	RS485 A	Tx
		WHITE	GROUND	GROUND	GROUND
		ORANGE	EEPROM	-	-
		BLACK	-VE TEMP	-	-
		SCREEN	-	-	-
			-		
RAYCHEM	2	RED	SUPPLY +VE	SUPPLY +VE	SUPPLY +VE
		WHITE	FREQ	RS485 B	Rx
		GREEN	+VE TEMP	RS485 A	Tx
		BLUE	GROUND	GROUND	GROUND
		BLACK	EEPROM	-	-
		SCREEN	-	-	-
MIL-C	6	A	SUPPLY +VE	SUPPLY +VE	SUPPLY +VE
		B	FREQ	RS485 B	Rx
		C	+VE TEMP	RS485 A	Tx
		D	GROUND	GROUND	GROUND
		E	EEPROM	-	-
		F	-VE TEMP	-	-
M12	G	1	SUPPLY +VE	SUPPLY +VE	SUPPLY +VE
		2	FREQ	RS485 B	Rx
		3	GROUND	GROUND	GROUND
		4	+VE TEMP	RS485 A	Tx
		5	EEPROM	-	-
PTFE	H	RED	SUPPLY +VE	SUPPLY +VE	SUPPLY +VE
		YELLOW	FREQ	RS485 B	Rx
		GREEN	+VE TEMP	RS485 A	Tx
		BLUE	GROUND	GROUND	GROUND
		BLACK	EEPROM	-	-
		WHITE	-VE TEMP	-	-
		SCREEN	CASE	CASE	CASE

Certification

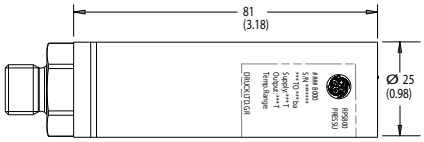
- CE Marked
- RoHS
- EMC Standards

BS EN 61000-6-1: 2007 Susceptibility - Light Industrial
BS EN 61000-6-2: 2005 Susceptibility - Heavy Industrial (except mV versions)
BS EN 61000-6-3: 2007 Emissions - Light Industrial
BS EN 61000-6-4: 2007 Emissions - Heavy Industrial
BS EN 61326-1: 2006 Electrical Equipment for Measurement, Control and Laboratory Use - EMC requirements
BS EN 61326-2-3:2006 Requirements for pressure transducers

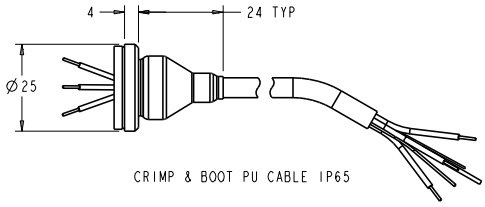
Mechanical Drawings

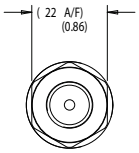


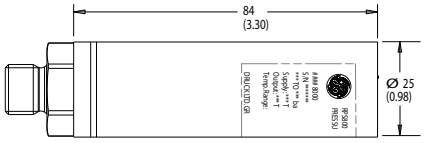
MALE PRESSURE CONNECTION



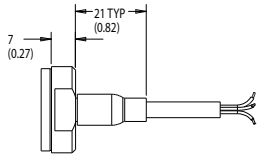
MEDIUM PRESSURE CONSTRUCTION



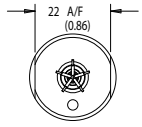


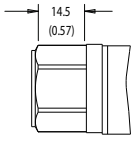


LOW PRESSURE CONSTRUCTION

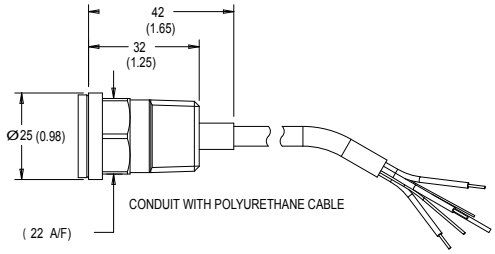


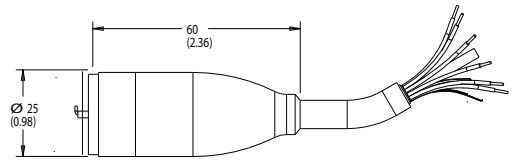
RAYCHEM CABLE



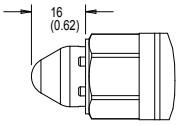


FEMALE PRESSURE CONNECTION

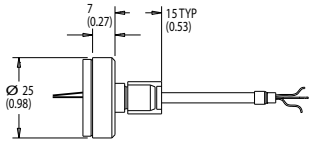




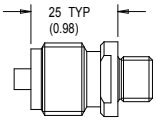
DEPTH CABLE



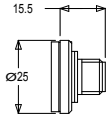
DEPTH CONE PRESSURE ADAPTOR



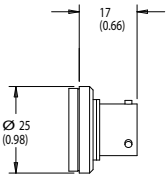
24 AWG 7/0.2 PTFE CABLE



OPTIONAL WELDED PRESSURE ADAPTOR



M12x1 5-PIN



BAYONET MIL-C-26482

Notes:

1. *All dimensions are nominal lengths and are subject to change.*
2. *All dimensions are in millimeters (inches).*
3. *Other pressure and electrical connectors may be available, please contact GE.*
4. *Low Pressure ≤ 7 bar (100 psi)*
5. *Medium Pressure >7 bar (100 psi) and ≤ 70 bar (1,000 psi)*

(1) Select model number

Main Product Variant

RPS Resonant Pressure Sensor - Frequency & Diode Output **(Note 1)**

DPS Digital Pressure Sensor - Digital Output **(Note 1)**

Product Series

8 RPS/DPS 8000 Series

Diameter, Material and Isolation

0 25mm Stainless Steel Oil isolated

Electrical Connector

0 No Electrical Connector (Flying leads)
1 Polyurethane Cable IP65
2 Raychem Cable
3 Polyurethane Cable (Depth) IP68
4 Hytrel Cable (Depth) IP68
6 MIL-C-26482 (6-pin Shell Size 10)
C 1/2" NPT Conduit with Polyurethane Cable (Non-Exd Only)
G M12x1 5-Pin
H Orange PTFE Cable

Output Option

0 Frequency & Diode (Low Power <3.5 mA)
1 Frequency & Diode (Low Jitter aprox 75 ns)
A RS485
B RS232

Compensated Temperature Range

TA -10 to +50 °C
TB -40 to +85 °C **(Note 2)**

Accuracy

A1 - Standard 0.02%
A2 - Improved 0.01%

Calibration

CC Full Thermal Calibration

Hazardous Area Approval

H0 None

Pressure Connector

PA G1/4 Female
PB G1/4 Male Flat
PC G1/4 Male 60 degree internal Cone
PD G1/8 Male 60 degree internal Cone
PE 1/4 NPT Female
PF 1/4 NPT Male
PG 1/8 NPT Male
PH M20x1.5
PJ M14x1.5 60° Internal Cone
PK M12x1 Internal Cone
PL 7/16-20 UNJF Male 74 degree external cone
PN G1/2 Male
PQ G1/4 Quick Connect
PR 1/2 NPT Male
PT G1/4 Male Flat Long
PV 7/16-20 UNF Female)
PW Depth Cone (G1/4 Female)
PX 7/16-20 UNF Male Flat

R	**8**	**0**	**4**	**1**	**-**	**TA**	**-**	**A2**	**-**	**CC**	**-**	**H0**	**-**	**PA**	**Typical Model Number**

Note 1: RPS variants require Output Option Code '0' or '1'. DPS variants require Output Option Code 'A' or 'B'.

Note 2: Pressure ranges 2 and 7 bar (30 and 100 psi) are not available at this temperature range.

2) State pressure range (2, 7, 14, 20, 35 or 70 bar or equivalents) and units: e.g. 0 to 20 bar, 0 to 100 psi
Unit options are:

Symbol	Description
bar	bar
mbar	millibar
psi	pounds/sq. inch
Pa	Pascal
hPa	hectoPascal
kPa	kiloPascal
MPa	megaPascal
mmH_2O	mm water
cmH_2O	cm water
mH_2O	metres water
inH_2O	inches water
ftH_2O	feet water
mmHg	mm mercury
inHg	inches mercury
kgf/cm^2	kg force/sq. cm
atm	atmosphere
Torr	torr

3) State cable lengths and units: e.g. 1 m cable, 3 ft cable (only required on certain electrical connectors)

Typical order examples:
RPS 8010-TA-A1-CC-H0-PA, 0-7 bara, 5 m cable
DPS 806A-TB-A2-CC-H0-PL, 0-1,000 psia

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920-519F