PACE Tallis

Transfer Standard Calibrator

TERPS® Performance

A digital standard delivering unrivalled accuracy

Features

- Total accuracy of 3 Pa / 0.03 mbar with Druck TERPS resonating silicon technology
- Configurable to fit a wide range of applications, with 1, 2 or 3 reference sensors from 200 kPa to 21.1 MPa
- Full-featured yet simple to use platform, from laboratory barometer to working calibration standard
- Compact, robust transfer standard, ideal for in-situ testing and interlaboratory comparison
- Versatile, maintains performance with a wide range of environmental conditions and test media
- Precision of 10 ppm FS
- Long term stability of up to 15 ppm FS per year
- Barometric reference option

Performance Benefits

- lower risk of errors during use (automated software vs user error)
- No effects of physical quantities to impact error budget (e.g. local gravity / density of the media)
- Easy setup and operation
- Calibrated across a wide temperature range
- Guaranteed uncertainty budget (e.g. no induced errors due to poor piston cleanliness)
- Lower overall cost of ownership
- Lower product cost than a typical DWT
- Minimal servicing required (no cleaning of pistons etc)
- Automated software vs experienced and well-trained manual operators
- Reduced shipping costs for calibration
- Less "real estate" required for physical product.
- No need for expensive vacuum pumps, custom test benches

Miscellaneous

- Portable - for calibrations in remote and sub-optimal conditions
- Lower risk of damage during use/transportation (robust sensor vs pistons, mass sets etc)

Druck
a Baker Hughes business

PACE Tallis Transfer Standard

The new PACE precision pressure indicator brings together the latest measurement technology from Druck to offer an elegant, flexible and economical solution to pressure measurement for test, calibration and monitoring.

Druck has been at the forefront of pressure measurement technology for almost 50 years and still continues to push the boundaries of what is possible in terms of precision, stability and expanded uncertainty for a pressure transducer.

The new PACE Tallis is a compact, robust transfer standard, ideal for in-situ testing and interlaboratory comparison.

By utilizing Drucks' TERPS resonant silicon sensor technology, which exhibits market leading metrological characteristics, with specific regard to precision and long term stability, PACE Tallis provides versatility whilst maintaining performance in a wide range of environmental conditions and test media.

This versatility along with the configurability of 1, 2 or 3 reference sensors from 200kPa to 21.1 MPa enables PACE Tallis to fit a wide range of applications.

Leak test

Leak Test measures leak rate over the measure dwell time. At the start of the test, the instrument measures the applied test pressure of the user system. The instrument records the pressure change during measure dwell time. On completion the display shows the leak rate results, with leak rate per second or per minute in the current pressure units selected.

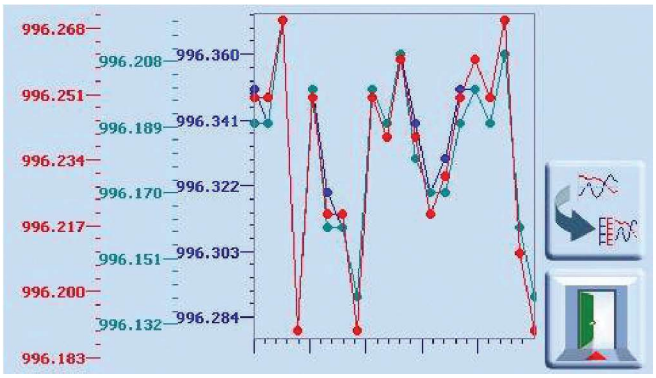
Switch test – standard with the analogue output or voltage free contacts option

Switch Test automates the testing of pressure switch devices. Following the test, displayed is the pressure at which contacts open and close and the switch hysteresis. Switch Test task can also be set to capture switch toggle max, min and average values.

Analogue output

The Analogue Output can be programmed via the setup menu screen to output a signal proportional to the instrument range selected. This allows the instrument to interface with PC or PLC I/O cards, remote displays, chart recorders or other data logging equipment.

Users can select outputs of 0 to 10 V, 0 to 5 V, -5 to 5 V and 0/4 to 20 mA. Precision with respect to host instrument measured pressure 0.05% FS over the host instrument operating temperature range, variable update rate to 80 readings per second. The option is programmable between minimum and FS pressure for proportional output against pressure.



Volt free contacts

Volt Free Contacts enable control of peripheral devices such as vacuum pumps, ovens, etc. Each VFC option has three independent volt-free NO/NC relay contacts. A number of conditions can be set within a PACE Tallis instrument to trigger a relay toggling its contacts.

Aeronautical aviation

Available ranges: 55,000ft/650 knots or 75,000ft/1000 knots Indication available in pure aeronautical units:

Altitude – feet or meters

Air speed – knots or km/hour, mph

Mach – mach number

Derived pressure at mean sea level and barograph for barometric applications.

Specifications

Pressure measurement	
Tallis pressure ranges:	See page 6 for full list of pressure ranges available
IRS-B barometric reference ranges:	750-1150 mbar absolute, 10.9-16.7 psi absolute, 75-115 kPa absolute
Over range indication:	10% above mbar/bar full scale pressure range.
Pressure media:	Not suitable for use with Oxygen or combustible gas Pressure ranges 8 bar and above compatible with Stainless Steel 316 and Hastelloy C 276 Absolute ranges 3500 mbar abs and below: Dry, oil free, non-corrosive gas or air.
Display	
Panel	¼ VGA wide format 4.3 inch colour graphics LCD c/w integral touch screen
Comms update rate	8 times per second
Display update rate readout	2 times per second ± 9999999
Pressure units	mbar, bar, Pa(N/m2), hPa, kPa, MPa, mmHg @ 0°C, cmHg @ 0°C, mHg @ 0°C,, inHg @ 0°C, mmH2O @ 4°C, cmH2O @ 4°C, mH2O @ 4°C, mmH2O @ 20°C, cmH2O @20°C, mH2O @ 20°C, kg/m2, kg/cm2, torr, atm, psi, lb/ft2, inH2O @ 4°C, inH2O @ 20°C, inH2O @ 60°F, ftH2O @ 4°C, ftH2O @ 20°C, ftH2O @ 60°F, User Defined 1, User Defined 2, User Defined 3, User Defined 4 (Feet and Meters in Airfield task)
Performance over the calibrated temperature range	
Tallis Precision	2 and 3.5 bar absolute 0.0010% FS includes linearity, hysteresis, repeatability and temperature effects 8-211 bar absolute 0.0010% FS includes linearity, hysteresis, repeatability and temperature effects*
Tallis barometer precision	Precision for the optional barometric reference 0.020 mbar or 0.0002901 psi. Includes non-linearity, hysteresis, repeatability and temperature effects between 15°C (59°F) and 45°C (113°F)
Tallis long term stability	Tallis 2 and 3.5 Bar absolute 0.0015% FS per annum, barometer 0.03 mbara per annum Tallis 8-211 bar absolute 0.0010% FS per 28 days*, barometer 0.03 mbara per annum
Tallis accuracy	Absolute ranges 2000, 3500 mbar accuracy (2 Sigma) over calibrated temperature range 6 ppm RDG + 15 ppm FS. Pseudo Gauge range 2000, 3500 mbar accuracy (2 Sigma) over calibrated temperature range add Tallis barometer accuracy using RSS (root sum squared)method. Assuming Tallis barometer is used. Absolute and Pseudo Gauge ranges 8-211 bar 7 ppm RDG + 19 ppm FS (in Pseudo Gauge mode Tallis barometer specification already included)* Includes measurement precision, measurement long term stability and calibration equipment expanded uncertainty.
Tallis multi-year accuracy specification	**2 and 3.5 Bara** / **8-211 Bara*** 2 year: 5 ppm RDG + 21 ppm FS / 13 ppm RDG + 20 ppm FS 3 year: 3 ppm RDG + 29 ppm FS / 22 ppm RDG + 20 ppm FS 4 year: 3 ppm RDG + 37 ppm FS / 32 ppm RDG + 21 ppm FS 5 year: 2 ppm RDG + 45 ppm FS / 42 ppm RDG + 21 ppm FS
Pseudo gauge mode precision	RSS absolute mode reference precision and barometric precision
Tallis Barometric reference accuracy	Barometer accuracy (2 Sigma) = 0.05 mbar over the calibrated temperature range. Includes measurement precision, measurement long term stability per annum and calibration equipment expanded uncertainty

*To meet annual Tallis accuracy specification, zeroing against a barometric reference is recommended every 28 days. The long term stability spec will be subject to the specification of the barometric reference used, quoted figures are for a Tallis spec barometer.

Pseudo-gauge option available .Note that atmospheric tare against the barometer and calibration via SCPI commands is not available in this mode. In this mode, Baro will be available for manual taring only.

Electrical	
Power Supply	90 VAC to 130 VAC @ 47 to 63 Hz and 180 VAC to 260 VAC @ 47 to 63 Hz. 15 VA
Communications	
Communication	RS232, USB and IEEE-488, SCPI, DPI141, DPI142 and DPI150 emulation. LabVIEW drivers Ethernet (VXI-II and Sockets using SCPI).
Data log	Display screen shot stored in CSV format, onto memory card or external USB storage device. User defined update rate from 1 second.

Environmental		
Temperature	Operating	10°C to 50°C (50°F to 122°F)
	Calibrated	15°C to 45°C (59°F to 113°F)
	Storage	-20°C to 70°C (-4°F to 158°F)
Sealing **Humidity** **Vibration** **Shock** **Conformity**	IP20 (EN60529), indoor use only 5% RH to 95% RH non-condensing. Compliant with Def. Stan. 66-31 8.4 Cat 3 and MIL-T-28800E Cat 2 Mechanical shock conforms to EN61010 Electrical safety - Global (IEC61010-1, UL61010-1, CSA 22.2, No. 61010-1 and CB test certificate), LVD (EN 61010-1). EMC EN61326, PED, ROHS and WEEE. CE marked	
Physical		
Weight	3.2kg (excluding external PSU and packaging) to 6.5 lbs (including external PSU and packaging)	
Dimensions	218 mm wide x 88mm (2U) high x 250 mm deep (8.6in x 3.5 (2U) x 9.8 in)	
Pressure connection	G 1/8 Female (1/8 NPT Female by adaptor, standard for North America) 25 mbar to 210 bar. 9/16 18 UNF Autoclave male 350 bar to 1000 bar.	

Ordering information

Please state the following (where applicable)

1. Model PACE Tallis

Tallis chassis	Tallis absolute	Tallis-B absolute	1 X Switch Test/ Voltage Free Contact option or Switch Test/Analogue Output option	2 X Switch Test/ Voltage Free Contact option or Switch Test/Analogue Output option	Leak Test and Aeronautical option	Tallis Pseudo Gauge only
Tallis1001 1 X internal sensor 2 X IDOS connection	•	•	•	○	•	○
Tallis1002 2 X internal sensors 2 X IDOS connection	•	•	•	○	•	•
Tallis1003 3 X internal sensors 2 X IDOS connection	•	•	○	○	•	•

• Available
○ Not Available

2. Options

The range of optional features includes:

- Leak Test – Automatically measures leak rates in the desired units/minute or units/seconds
- Switch Test/Analogue Output – Accurate calibration of pressure switches/integration into older ATE applications
- Switch Test/Voltage Free Contacts – Accurate calibration of pressure switches/automatically triggering ancillary devices
- Aeronautical - Allows for the test and calibration of aeronautical instruments
  Please state the required range:
  55,000ft/650 knots or 75,000ft/1000 knots
- Pseudo gauge only option available for ranges 8 bara and above. For pseudo gauge measurement below 8 bara, barometric reference sensor needs to be installed.

3. PACE chassis – Area of use/mains lead

Please state area of use for instrument set up:
Europe
North America
Japan
Asia
Rest of the world

Please state area of use for mains lead:
UK
Japan
EU
USA
South Africa/India
China
Australia/New Zealand

4. Country marking

Tallis will be supplied with appropriate standard compliance labelling (STD). Additional regional specific labelling may also be made available as required

PACE Tallis from the rear

PACE Tallis Sensor ranges

mbar	psi	kPa
2 bara	30 psia	200.0 kPaa
3.5 bara	50 psia	350.0 kPaa
8 bara	116 psia	0.8 MPaa
11 bara	160 psia	1.1 MPaa
21 bara	304 psia	2.1 MPaa
36 bara	522 psia	3.6 MPaa
71 bara	1,029 psia	7.1 MPaa
101 bara	1,465 psia	10.1 MPaa
136 bara	1,973 psia	13.6 MPaa
173 bara	2,509 psia	17.3 MPaa
211 bara	3,060 psia	21.1 MPaa
1 bar pg	15 psi pg	100.0 kPa pg
2.5 bar pg	36 psi pg	250.0 kPa pg
7 bar pg	100 psi pg	700.0 kPa pg
10 bar pg	150 psi pg	1.0 MPa pg
20 bar pg	300 psi pg	2.0 MPa pg
35 bar pg	500 psi pg	3.5 MPa pg
70 bar pg	1000 psi pg	7.0 MPa pg
100 bar pg	1500 psi pg	10.0 MPa pg
135 bar pg	2000 psi pg	13.5 MPa pg
172 bar pg	2500 psi pg	17.2 MPa pg
210 bar pg	3000 psi pg	21.0 MPa pg

PACE barometric option*

PACE Internal Resonant Sensor Barometer ranges – Tallis-B

mbar	psi	kPa
750–1150 mbar a	10.9 – 16.7 psi a	75–115 kPa a

*Provides gauge pressure option in conjunction with Tallis absolute sensors. Provides internal reference for the 28 day zero required to maintain 8-211 Bara accuracy specification.

Physical accessories

Please order the following as separate line items:

Part number	Description
IO-ADAPT-G1/4	Adaptor G1/8 Male to G 1/4 Female
IO-ADAPT-G18	Adaptor G1/8 Male to G1/8 Female
IO-ADAPT-1/8NPT	Adaptor G1/8 Male to 1/8 NPT Female
IO-ADAPT-1/4NPT	Adaptor G1/8 Male to 1/4 NPT Female
IO-ADAPT-7/16UNF	Adaptor G1/8 Male to 7/16 – 20 UNF Female
IO-ADAPT-AN4	Adaptor G 1/8 Male to AN4 37 Deg Male
IO-ADAPT-AN6	Adaptor G 1/8 Male to AN6 37 Deg Male
IO-ADAPT-BARB	Adaptor G 1/8 Male to 1/4 Hose
IO-ADAPTOR-KIT	Contains one of each of the above adaptors
IO-ADAPT-9/16AC	Adaptor 9/16 18 UNF Autoclave Female to 1/8 NPT Female
IO-SNUBBER-1	Snubber reference port
IO-DIFF-KIT-LP	Differential connection kit low pressure: Helps reduce the impact of thermal and/or pressure changes in ambient conditions occurring during the measurement cycle
IO-RMK-P1000	19" rack mount kit
IO-PAN-P1000	19" panel mount kit

Supporting services

Services ordering information:

Please order the following as separate line items:

External IDOS universal pressure module

PACE Family

PACE – pressure calibration and test solutions

PACE1000 – Precision Pressure Indicator

PACE1001 Barometer – Precision Barometric Indicator and Recorder

PACE5000 – Single Channel Pressure Controller Chassis

PACE6000 – Dual Channel Pressure Controller Chassis

CM0 – Standard precision high speed pressure controller module

CM1 – High precision high speed pressure controller module

CM2 – Premium precision high speed pressure controller Module

CM3 – Reference precision high speed pressure controller module

All CM modules and PACE 1000 pressure ranges 2 to 211 bara can be calibrated using PACE Tallis.

PACE Tallis can also be used to calibrate Air Data Test sets.

For further information please refer to Druck.com/PACE-Tallis

Related products

Druck manufacture a wide range of pressure transducers, transmitters, indicators, calibrators, controllers and Air Data test systems. Our range of portable calibrators also cover temperature and electrical parameters.

Please refer to www.bakerhughesds.com/druck/pressurecontrollers for further information.

Delivering world class pressure measurement and calibration technology

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920-716B
BHCS39442 (10/2024)

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