Webtec Hydraulic Flow & Pressure Calibration Service

Reliable, repeatable measurements every time from your instruments.
Total confidence in quantity measurements.

Hydraulic measurement and control

WEBTEC

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Features

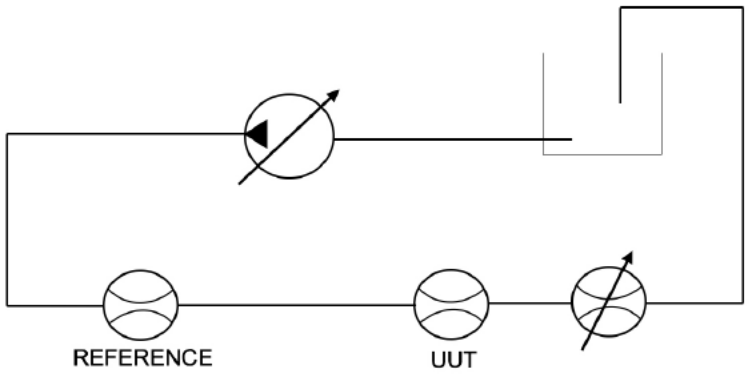
- Calibrations traceable to national and international standards.
- Robust monitoring system ensures consistent compliance.
- All instrumentation employed has full traceability.
- Calibration certificate demonstrating traceability; suitable for ISO9001 compliance.
- Calibration lead time is typically less than 2 weeks.

nqa. ISO 9001 Registered
UKAS QUALITY MANAGEMENT 015
Certificate No.8242

FLOWCAL-BU-ENG-3568.pdf 06/17
(Issue 2)

Flow Calibration Method

Below is the simplified hydraulic circuit employed in the calibration of all flow meters. It is a ratio-metric system whereby the oil is pumped in series through a reference meter and a Unit Under Test (UUT). Comparison of the reference and UUT flow shows the deviation and the UUT calibration factor can be adjusted accordingly.



Typical Calibration

Flow meters are checked at various points throughout their range to ensure they meet the exacting criteria. If any of the flow points fail to meet the accuracy specification repairs or adjustments are made.

Reference Meter Traceability

Reference meters are calibrated in a laboratory that maintains traceability to national and international standards, PTB (Germany), LNE (France), UKAS (UK) and NIST (USA).

The laboratory maintains an overall measurement uncertainty of 0.03% and has ISO9001 accreditation. It also complies with the ANSI/NCSL Z540-1-1994 laboratory standards. The laboratory operates within a Quality Management System according to ISO 9001:2008 and ISO/IEC 17025:2005.

Webtec reference meters are calibrated annually and are maintained using a rolling system whereby meters are calibrated just before and just after their installation anniversary. This ensures that all calibrations are conducted against a ‘known good reference’.

Calibration uncertainty around our reference meters is <0.2% and all meters produce stable results within this limit. During reference meter calibration viscosity variance is kept <1cSt so as to have negligible effect.

Flow Calibration Test Equipment

Webtec use a C2000 data acquisition system with a customised interface unit that conditions signals appropriately. The interface unit is monitored under the internal calibration system and all signal conversions are checked annually to maintain errors at better than <0.01%. Instruments used for the checks are calibrated annually by a UKAS accredited laboratory.

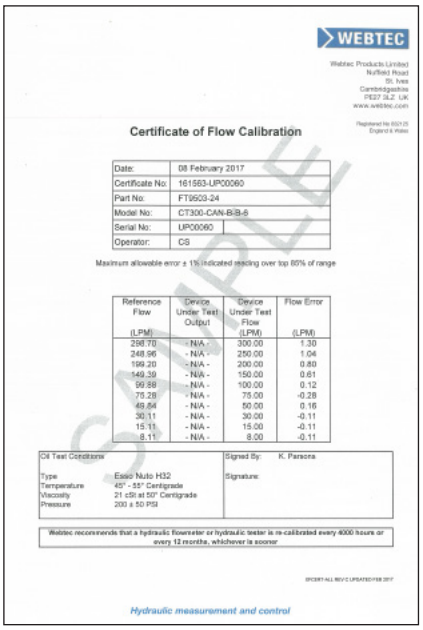
Oil condition is continually monitored through a particle counter to ensure it meets good cleanliness standards (NAS 8 or better). The oil is also sent for analysis annually to provide external verification.

Temperature sensors engaged to measure the test fluid temperature are monitored under the internal calibration system and are checked annually to maintain accuracy at better than ±1°C. Instruments used for these checks are calibrated annually by a UKAS accredited laboratory.

Fluid Viscosity

Flow meters are typically calibrated at a mean viscosity of 21cSt which is equivalent to ISO32 oil at 50°C. This temperature is accurately maintained to ensure a viscosity variance of <5cSt during any calibration. Calibration at other viscosities is possible, please contact sales.

Flow Calibration Certificate



WEBTEC

Webtec Products Limited
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www.webtec.com

Registered No 852125
England & Wales

Certificate of Flow Calibration

Date:	08 February 2017
Certificate No:	161563-UP00060
Part No:	FT9503-24
Model No:	CT300-CAN-B/B-6
Serial No:	UP00060
Operator:	CS

Maximum allowable error ± 1% indicated reading over top 80% of range

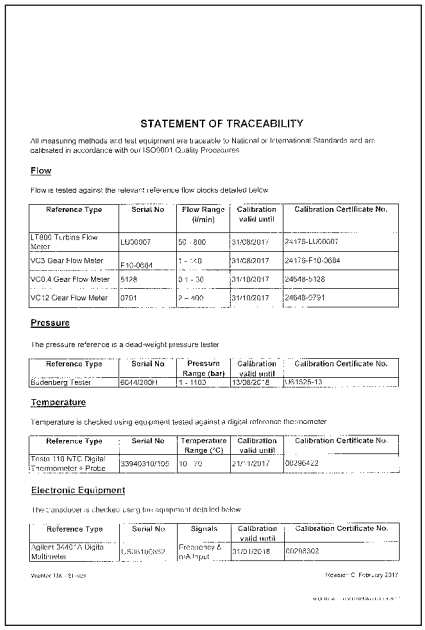
Reference Flow (LPM)	Device Under Test Output	Device Under Test Flow (LPM)	Flow Error (LPM)
298.70	- N/A -	300.00	1.30
248.96	- N/A -	250.00	1.04
199.20	- N/A -	200.00	0.80
149.39	- N/A -	150.00	0.61
99.59	- N/A -	100.00	0.12
75.28	- N/A -	75.00	-0.28
49.84	- N/A -	50.00	0.16
30.11	- N/A -	30.00	-0.11
15.11	- N/A -	15.00	-0.11
8.11	- N/A -	8.00	-0.11

Oil Test Conditions	Signed By: K. Parsons
Type: Esso Nuto H32	Signature:
Temperature: 45° - 55° Centigrade	
Viscosity: 21 cSt at 50° Centigrade	
Pressure: 200 ± 50 PSI	

Webtec recommends that a hydraulic flowmeter or hydraulic tester is re-calibrated every 4000 hours or every 12 months, whichever is sooner

EXCEPT ALL REV C UPDATED FEB 2017

Hydraulic measurement and control



STATEMENT OF TRACEABILITY

All measuring methods and test equipment are traceable to National or International Standards and are calibrated in accordance with our ISO9001 Quality Procedures

Flow

Flow is tested against the relevant reference flow blocks detailed below

Reference Type	Serial No	Flow Range (l/min)	Calibration valid until	Calibration Certificate No.
LT800 Turbine Flow Meter	LU00007	50 - 800	31/08/2017	24176-LU00007
VC3 Gear Flow Meter	F10-0684	1 - 140	31/08/2017	24176-F10-0684
VC0.4 Gear Flow Meter	5128	0.1 - 30	31/10/2017	24648-5128
VC12 Gear Flow Meter	0791	2 – 400	31/10/2017	24648-0791

Pressure

The pressure reference is a dead-weight pressure tester

Reference Type	Serial No	Pressure Range (bar)	Calibration valid until	Calibration Certificate No.
Budenberg Tester	G044/280H	1 - 1100	13/08/2017	051825-13

Temperature

Temperature is checked using equipment tested against a digital reference thermometer

Reference Type	Serial No	Temperature Range (°C)	Calibration valid until	Calibration Certificate No.
Testo 110 NTC Digital Thermometer + Probe	33940310/105	10 - 70	21/11/2017	00296422

Electronic Equipment

The transducer is checked using the equipment detailed below

Reference Type	Serial No	Signals	Calibration valid until	Calibration Certificate No.
Agilent 34401A Digital Multimeter	US36106352	Frequency & mA Input	31/01/2018	00298302

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Revised: C February 2017

The flow calibration certificate shows the details of the meter, a table of results and the conditions during the test. The second page displays the reference instrumentation employed during the calibration.

Pressure Calibration Method

Verification of pressure calibration is conducted on a Dead-Weight-Tester where the pressure is generated using sets of calibrated weights. These systems are extremely robust and reliable, providing total confidence in the results.

Pressure Calibrator Traceability

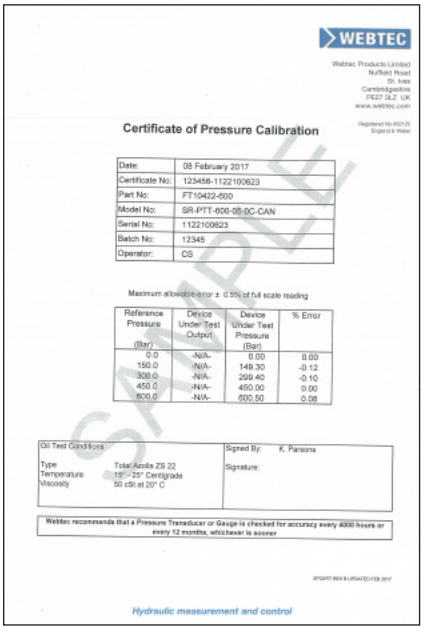
The Dead-Weight-Testers are calibrated at laboratories that maintain traceability to national and international standards, PTP (Germany), LNE (France), UKAS (UK) and NIST (USA).

The laboratories are accredited under their national schemes and maintain a measurement uncertainty for pressure at <0.02%.

Other Calibration Test Equipment

Some sensors require pressure calibration output signals to be recorded as an electrical value. Measurement instruments used for this purpose are calibrated to the same level of traceability as the Dead-Weight-Testers and have an accuracy of <0.06% and a level of calibration uncertainty <0.1%.

Pressure Calibration Certificate



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Certificate of Pressure Calibration

Date:	08 February 2017
Certificate No:	123456-1122100623
Part No:	FT10422-600
Model No:	SR-PTT-600-08-DC-CAN
Serial No:	1122100623
Batch No:	12345
Operator:	CS

Maximum allowable error ± 0.5% of full scale reading

Reference Pressure (Bar)	Device Under Test Output	Device Under Test Pressure (Bar)	% Error
0.0	-N/A-	0.00	0.00
150.0	-N/A-	149.30	-0.12
300.0	-N/A-	299.40	-0.10
450.0	-N/A-	450.00	0.00
600.0	-N/A-	600.50	0.08

Oil Test Conditions	Signed By: K. Parsons
Type: Total Azolla ZS 22	Signature:
Temperature: 15° - 25° Centigrade	
Viscosity: 50 cSt at 20° C	

Webtec recommends that a Pressure Transducer or Gauge is checked for accuracy every 4000 hours or every 12 months, whichever is sooner

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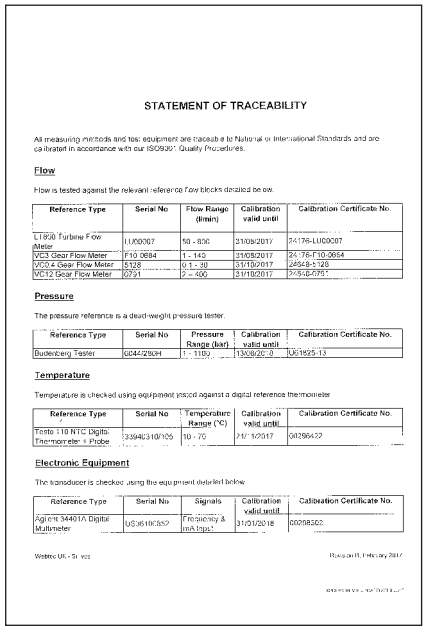
Hydraulic measurement and control



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Webtec UK - St Ives

Revised: C February 2017

The pressure calibration certificate records the details of the device, a table of measured results and the conditions during the test. The second page displays the reference instrumentation employed during the calibration.