

Patented aperture calibration rig for FLEXIM ultrasonic clamp-on transducers

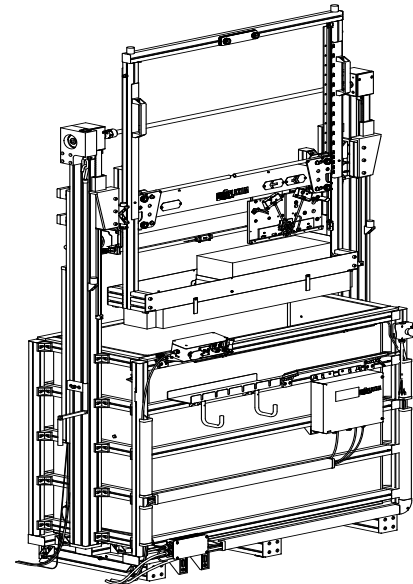
For use at customer sites

Features

- Calibration of FLEXIM ultrasonic clamp-on transducers
- Designed for use at customer sites and calibration laboratories
- Same standards and precision as with FLEXIM factory calibration
- PTB and NIST traceable calibration
- Highly automated and software-controlled calibration process
- Easy to operate
- Faster and more accurate than classic calibration on pipe
- Saves shipping of transducers, time and money
- Installation and start-up by FLEXIM

Field of application

- Independent calibration laboratories
- Calibration service providers
- FLEXIM end customers with high calibration demand



AperCal

Kalibrierschein Calibration Certificate

Testgerät / Device under test (DUT)

Kalibrierschein Nr.: 20190429-019
Certificate No.

Schallwandler: CDM2NS2 Ser. Nr.: 26774
Transducer Ser. No.

Reflektorabstand [mm] 205,50
reflector distance [mm]

Flüssigkeit / Fluid
Temperatur / Temperature

Wasser / Water
24,0 °C

Messergebnisse / Test results

Sensorkonstante	Mittelwert / Mean value	4099,86	m/s	±	0,15%
Transducer Constant	Standard Abweichung / standard deviation	0,030%			Passed
	bei T=20°C / at T=20°C	4093,15 <td>m/s</td> <td></td> <td></td>	m/s		

Die angegebene Messunsicherheit ist die erweiterte Messunsicherheit basierend auf dem Erweiterungsfaktor $k = 2$ (95% Vertrauensbereich).
The uncertainty listed is the expanded uncertainty based on a coverage factor of $k=2$ (95% confidence).

Das angegebene Messgerät erfüllt die in der Spezifikation angegebenen Genauigkeitsdaten (Passed / Failed).
The indicated instrument meets the accuracy data published in the specification (passed / failed).

Passed

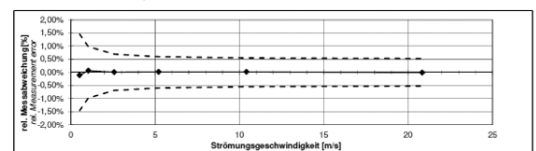
Calibration result as left

Messpunkt Meas. Point	Strömungsgeschwindigkeit [m/s] Flow velocity		Durchfluß [m³/h] Flow		rel. Messwertabweichung % rel. measurement error	
	Normal	Standard	Normal	Standard	Fehler / Error	Grenze / Limit
1	0,52		132,37	132,23	-0,11%	1,45%
2	1,04		264,69	264,47	-0,08%	0,92%
3	2,57		664,12	664,17	0,01%	0,69%
4	5,20		1323,92	1324,16	0,02%	0,60%
5	10,41		2648,47	2648,96	0,02%	0,55%
6	20,82		5296,94	5297,75	-0,01%	0,52%

Pipe ID used in flow velocity calculation: 300,00 mm

Justagegrenze / Adjustment limit: 0,50% ± 0,005 m/s

Überschreitet der Fehler bei As Found Kalibrierung diese Grenze wird die Justage der Sensorkonstante empfohlen.
If the error exceeds the limit, adjustment of the transducer constant is recommended.



Die Kalibrierung des oben angegebenen Messgerätes wurde gegen Normale ausgeführt, die sich auf nationale Normale rückführen lassen. Die Kalibrierung erfolgte nach Vorgaben, die im Rahmen unseres zertifizierten QM-Systems nach DIN EN ISO 9001 überwacht werden.
The instrument specified above was calibrated against measurement standards which are traceable to national measurement standards. The calibration was carried out according to the guidelines monitored by our certified QM-system in compliance with DIN EN ISO 9001.

Normal / Standard: Flexim Ser. Nr. / Ser. No.: 10342
Kalibriert bis / Calibration due: 31.08.2019 Zertifikat Nr. / Certificate No.: VXX1NH010343 20190829

Datum: 10.04.2019 Prüfer: Galatis Unterschrift:
Date: 10.04.2019 Test eng: Galatis Signature

Dieses Protokoll enthält 1 Seite und darf nur vollständig vervielfältigt werden. This certificate contains 1 page and should be copied only in its entirety.
F: 04.296_ACR Calibration_seri_FLX FLEXIM GmbH Bobergstr. 4 D-13681 Berlin Stand 01
07.04.2019 ACR

Calibration certificate (example)

AperCal calibration rig

Technical data

	AperCal	
measurement uncertainty of the acoustical calibration factor k_a		0.15 %
power supply		230 V/50...60 Hz
power consumption	W	< 300 (without PC)
dimensions		see dimensional drawing
weight	kg	550 (without water) 1250
ambient temperature	°C	15...30, without strong daily fluctuations
place of installation		not exposed to direct sunlight
emission sound pressure level	dB (A)	<<70
software		
AperCal software package		for controlling the aperture calibration rig, to be installed on the PC
menu language		English
transducer connection box		
connection		transducers (see table below) <ul style="list-style-type: none"> • with stripped cable ends • with connector: LEMO 3B, SMB • others on request
mating cycles		LEMO: 5000 SMB: 500
water basin		
dimensions	mm	1506 x 624 x 1146
volume	l	approx. 700
water		demineralised, electrical conductivity < 10 µS/cm
accessories		
label printer		with label tape (length: 8 m, width: 9 mm, self-adhesive, for permanent labelling)
SENSPROM		50 blanks
accessories (by customer)		
PC		
• operating system		Windows 10
• RAM		8 GB
• network connection I		RJ45 (connection to the aperture calibration rig)
• network connection II		connection to the customer network (optional)
monitor		
• resolution		min. 1920 x 1080 pixels

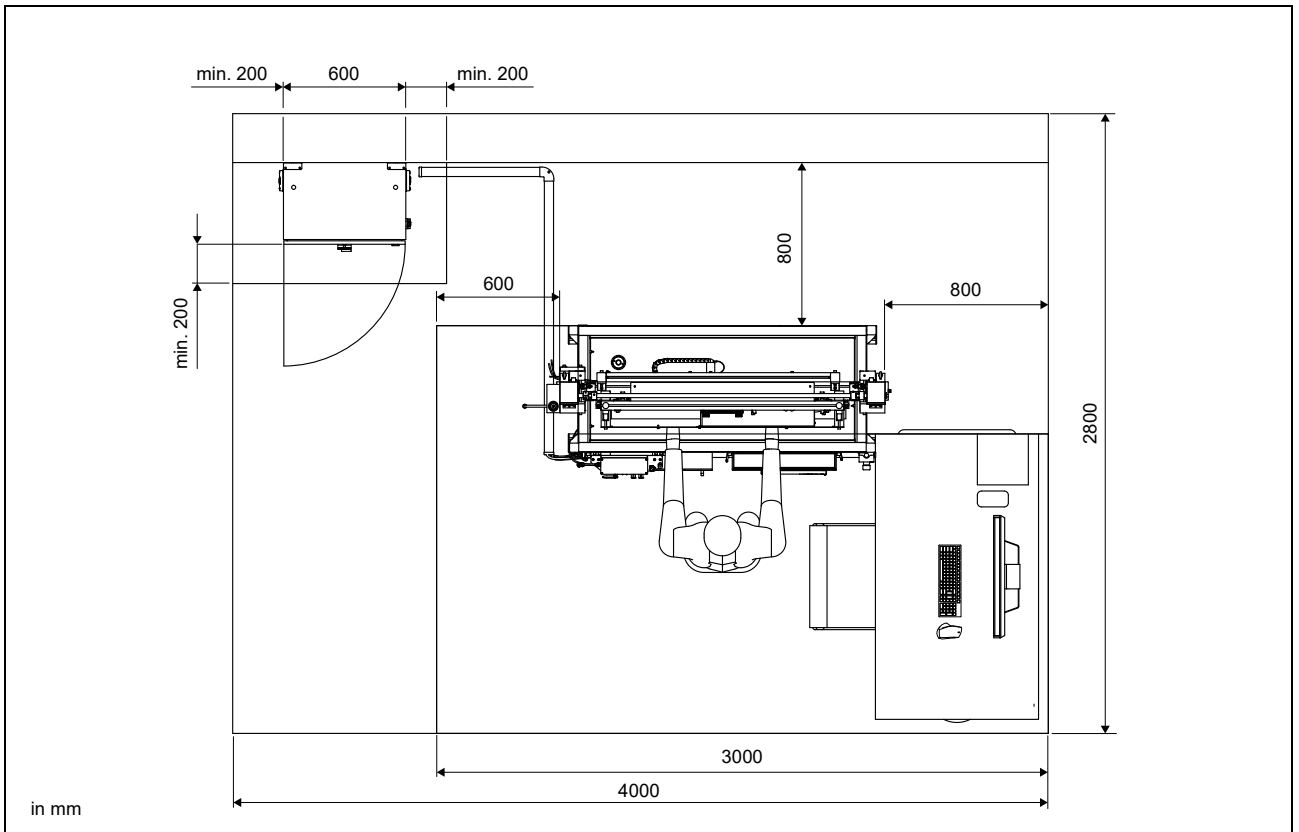
Transducers

The following transducers can be calibrated on the aperture calibration rig:

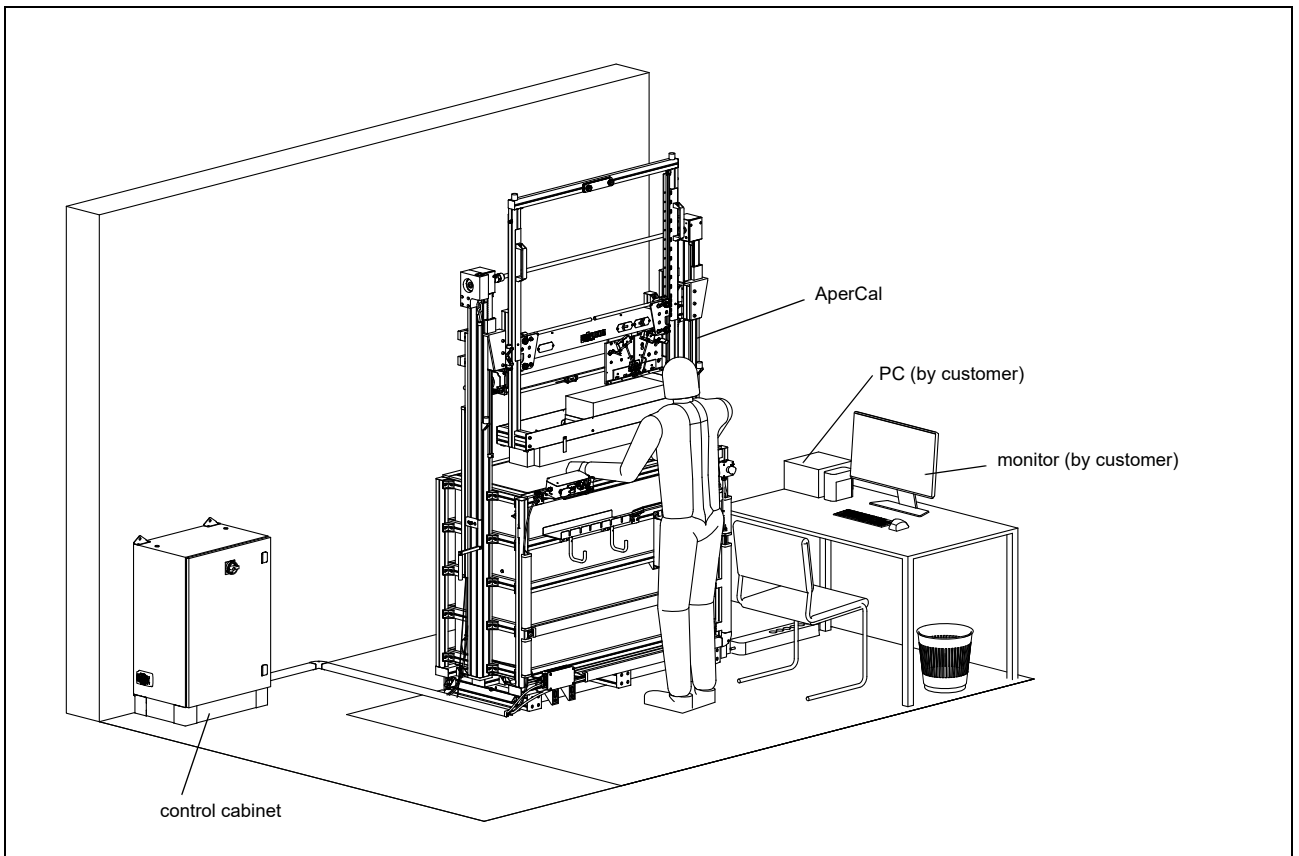
technical type		
* * x * N 3 1	* * x * N 3 3	
* * x * N 4 1	* * x * N 4 3	* * x * E 4 5
* * x * E 5 1	* * x * E 5 2	* * x * E 5 3
* * x * N 5 1	* * x * N 5 2	* * x * N 5 3
* * x * S 5 2	* * x * S 5 3	
* * x * N 7 1	* * x * N 7 3	
* * x * N 8 1	* * x * N 8 3	* * x * E 8 5
* * x * N B 1		
* * x * N C 3	* * x * S C 3	
* * x * N H 1	* * x * N H 3	* * x * E H 5
* * x * S H 3		
* * x * L I 1	* * x * L I 3	* * x * L I 8
* * M 2 N S 2		
* * x * N W 1	* * x * N W 3	* * x * E W 5
* * x * S W 3		
* * x * L Z 1	* * x * E Z 7	* * x * N Z 7

x (transducer frequency) - G, H, K, M, P, Q (Not all transducer frequencies are always available.)

Dimensions



Setup



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Errors excepted.

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