Plan of the intercomparison of distributed calibration objects in pressure		
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Content

Intercomparison of 2 pressure gauges

The pressure gauges will be transported between participating laboratories.

ILC pressure 2026:1

Proficiency testing provider (PT)

Swedish Metrology and Quality AB (SMQ) is organizing this intercomparison on calibration of the following objects.

Transfer standard: Keller LEX 1, see figure 1 and 2.

Figure 1: Transfer standard 1 0 - 300 bar

Figure 2: Transfer standard 2 0 – 2000 bar

Gauge pressure (oil)

Range 1: 0 - 300 bar

Calibration points for comparison: 0; 60; 120; 240 and 300 bar for both increasing and decreasing pressures/values. You do not need to calibrate all pressure levels.

Calibrated in vertical installation position with pressure connection facing downwards

Range 2: 0 – 2000 bar

Calibration points for comparison: 0; 300; 600; 1200; 1600 and 2000 bar for both increasing and decreasing pressures/values. You do not need to calibrate all pressure levels.

Calibrated in vertical installation position with pressure connection facing downwards

Both transfer standards above are sent in one parcel. Participants can choose to calibrate one or both gauges at the pressure steps that the laboratory is capable of.

The above concept for the intercomparison was decided by an advisory group related to the calibration area of pressure. No subcontractors are involved in the intercomparison.

Participants welcome to this intercomparison.

Participation is open for three categories of laboratories:

- Accredited laboratories
- Laboratories that will apply for accreditation.
- Laboratories that want to evaluate their Calibration and Measurement Capability (CMC).

Due to practical reasons the number of participants is limited to minimum 8 and maximum 20

Description of the values included in the intercomparison.

The intercomparison will start and end with all objects calibrated at the reference laboratory which also will define the reference values. It's CMC levels for uncertainty (U) together with the resolution of the transfer standards that are given in the table 1 below.

	Calibration Point/Pressure	Resolution	CMC/U	Possible reference uncertainty, U *
	[bar]	[bar]	[bar]	
Range 1	0	0,01	-	
	60	0,01	0,003	0,006
	120	0,01	0,005	0,010
	180	0,01	0,008	0,016
	240	0,01	0,010	0,020
	300	0,01	0,013	0,022
Range 2	0	0,01	-	
	600	0,01	0,04	0,16
	1200	0,01	0,10	0,20
	1600	0,01	0,14	0,28
	2000	0,01	0,19	0,38

Table 1: CMC levels for reference laboratory

*Including estimated drift during the circulation

The uncertainty values are expressed as U at 95 % confidence level.

The reference values and respective uncertainties concerning these intercomparison objects will be based on the calibration in the pilot laboratory before and after the distribution.

Traceability will be to RISE Sweden.

Detailed documented instructions

Detailed technical instructions will be sent to the participants who have registered to the ILC together with the reporting form as an excel document.

Time schedule and quality check

After registration of interested laboratories a plan for circulating of the calibration objects and a time schedule will be worked out and sent to all of them.

The calibration objects will eventually be transported by different means in participating countries.

Immediately at receiving and sending the objects each participant shall inform the organizer (SMQ) by e-mail about the status of the objects. If there are any signs of impact (for example marks or scratches) a photograph shall be send to the organizer to decide how to proceed and to inform the next participant.

Each participant will have access to the object for maximum 5 working days and should use its own method for calibration.

If one wishes to use further calibration points these should be presented in the calibration certificate in order not to disturb a quick evaluation prepared for the the reporting form as excel document.

Laboratories freely decide which uncertainty they want to state in the protocol. Accredited laboratories can declare their CMC-values, or a value estimated for the actual measurement condition. They should, however, indicate the choice.

After finishing calibration, the objects shall be sent to the following participant on the transportation list using the same parcel they arrived in. The organizer shall be informed when and by which means the transport to next participant will be organised.

Original data from the calibration shall be sent to the organizer immediately after finishing the measurements. This is preferably done by e-mailing the filled excel-reporting file. But a scanned paper copy will also do. By a fast delivery, the organizer gets control that everything is as expected. It also helps to detect eventual arising problems in time.

Statistical analyses that will be used

The organiser will calculate reference values that will be used in the calculations as described in ISO/IEC 17043:2023 annex B3 presenting En-values (formula B5)

Reporting

Participants shall send their final calibration certificate to the organiser within 1 week after the calibrations are finished in form of a pdf-file in a mail message.

The excel-reporting document that will be sent to the laboratories that have applied for participation shall indicate the height difference between the reference points of the working standard and the object. Further the temperature and air pressure during the calibration together with the gravity at calibration place should be given.

At the end of the intercomparison a draft report will be returned to the participants within 4 weeks from the time when the last participant has reported it results in a calibration certificate.

The participants are encouraged to comment on the draft report within 2 weeks after receiving.

The final report will be published within 2 weeks after receiving comments on the draft report.

If a participant does not follow the described reporting rules without giving reasonable explanations the organizer tries to extract the relevant content for the comparison. If this is not possible the results will be excluded from the report.

A participant may decide to withdraw from the exercise. This might be caused by problems detected during or after having performed the measurements. However, the withdrawal in this case must be announced to the organizer before the draft report is distributed to all participants.

The participant may appeal to the full report if there should be major faults in the report.

The intercomparison report will list up all participating laboratories. However, each will be treated anonymously, and its result will only be identified by a code that is send to each participant in a separate e-mail.

Damaged PT/ILC item

The participant shall immediately inform the organizer in case of any anomalies or other detected problem to allow him to take appropriate actions.

Price for participation

Prise for laboratories:

- Laboratories having maximum 3 calibration technicians –basic price 750 EUR.
- Laboratories having more than 3 calibration technicians –basic price 980 EUR.
- In addition, 490 EUR on each calibration object as defined in list of objects above.

Each laboratory will cover the transport cost to next laboratory

If the laboratory decides not to fulfil its part of the agreement after they have applied, they shall still pay the basic price.