



Flow Calibration Rig

On-site Mobile Calibration of in-line Flow Meters

PHARMA



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Introduction

In every production facility from water utility to pharmaceutical, flow is an essential measurement parameter used to control the production. Whether it is to control how the production is running or dosing the right amount of product to a batch, it is crucial that the measured values are reliable and within specifications. Discrepancies in the measurement can cost you money in excessive use of ingredients, but it can also influence the final product quality and consistency of production. Product quality is especially important in pharmaceutical production and this is also why legislation demands frequent calibration of measuring points.

Flow calibration can be time-consuming

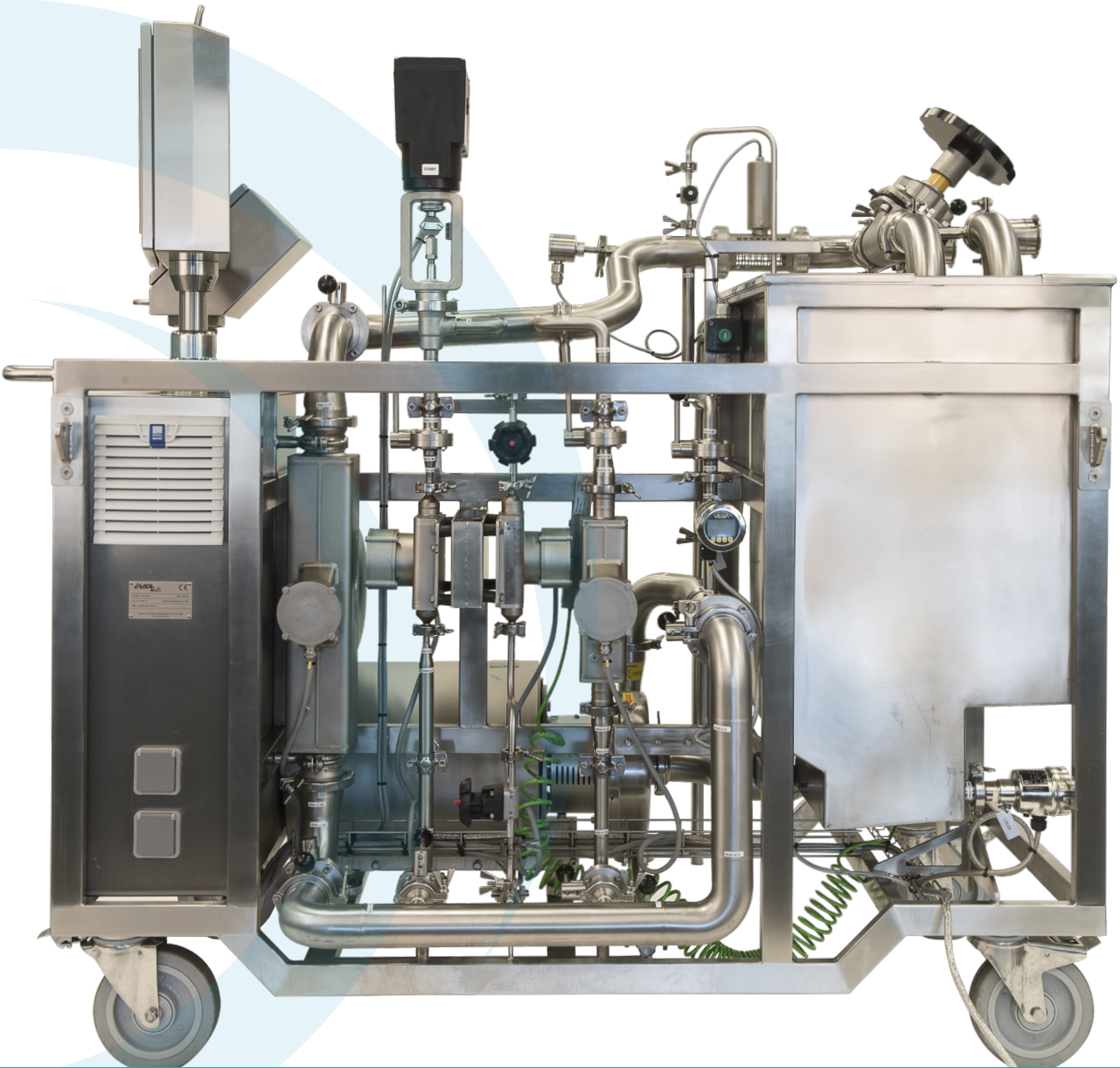
To ensure the accuracy of your flow meters they need to be calibrated 1-2 times annually. This can, however, be a time-consuming process and in most cases, you have to close down parts of the production. In order to calibrate your flow meter, you first need to physically remove it from the process line, this is in itself a time-consuming task and if you do not have a replacement flow meter the production will grind to a halt. After the flow meter has been dismounted you need to send it to a calibration laboratory either in-house or externally. In both cases the flow meter can be damaged when moved and if you send it to a third party you risk losing the flow meter during transit. Furthermore, the calibration process is subject to a lot of planning and waiting time when sent to a third party and any delays or incidents in the process could result in loss of valuable production time and profit. Lastly, when sending it to a third party you also run the risk of contaminating not only the flow meter, but a whole batch or system if it is not cleaned properly and it can be very expensive to rectify.

On-site and in-line flow calibration will save you time and money

The main feature of the Insatech Flow Calibration Rig is that it can calibrate flow meters in-line in your production. This is done by connecting the rig directly to the pipework and comparing the measured values but it also means that you do not have to remove the flow meter before calibration or re-install it afterwards. With a flow rig on-site, you increase the flexibility of your calibration and makes it much easier to plan ahead and keep within schedule, furthermore you avoid the waiting time during removal, transportation and third-party calibration. The fully automatic flow calibration makes it easy for all your technicians to use the rig and the broad flow range from 5 – 40.000 kg/h makes it possible to calibrate most flow meters with the same rig. Additionally, when performing the calibration yourself, you will have full control of any contamination risks making them much less likely to happen.

In short:

the Flow Calibration Rig can change the time spent on calibration from days to hours and the fast response time makes it easy to plan your calibrations with the least amount of downtime which will ultimately save you time and money.



Side view of flow calibration rig



How it works

The Flow Calibration Rig is easily connected to the Unit Under Test. Water is circulated through both and the readings are compared. Calibration can be performed using as many points as you need and the Rig supports creating or following your Standard Operating Procedures making your quality control much more reliable. As a bonus the in-line calibration will verify you instrument directly in process condition eliminating uncertainties that can arise when removing and reinstalling an instrument.

Plug and Play Connection

The Flow Calibration Rig works by connecting the rig to preinstalled flanged pipework on either side of the flow meter (Unit Under Test). This can be done using either flanges or Tri-clamps. The measurement data from the UUT can be gathered directly via mA and Pulse.

Highly Accurate and Stable Calibration

After being connected to the UUT the calibration can begin. During the calibration, water from the rig's tank is circulated through the flow meter as well as the Master Meter and the readings are compared. The Flow Calibration Rig uses very accurate state of the art Coriolis mass flow meters for exact measurement of the flow.

Use Standard Operating Procedures for More Reliable Quality Control

The Rig can use as many calibration points as needed which gives you the ability to calibrate every measuring point according to your own internal Standard Operating Procedure (SOP). Using SOPs will result in an optimized calibration that is comparable to process conditions, making your quality control much more reliable. This also ensures that every dosage is within the batch specifications resulting in consistent product quality and gives you full control over valuable high-cost ingredients and thereby optimizing cost of production.

Bonus Value: Check of the Total Test Loop

Because the rig is connected directly to the pipework you will be able to check the total test loop, something that is only made possible under true production conditions. If you remove the flow meter and verify it in a laboratory, the flow meter will be verified according to the laboratory setup, but when you reinstall it in your production the conditions might be different therefore introducing new uncertainties. When verifying in-line the conditions will not change after the calibration, making it more accurate. Furthermore, the risk of cross contamination is eliminated as the flow meter remains in the production string. Another benefit of connecting the Rig in-line is that it can easily be used to troubleshoot a flow meter if you suspect it is not measuring correctly.

Close-up of the hygienic test loop connections



Operation



The Flow Calibration Rig is developed with special focus on operating costs, user friendliness, accuracy and documentation. Furthermore, it is delivered tested and calibrated with accreditation certificates, ready for use.

User Friendliness

Connections, instruments, and handles are placed ergonomically correct allowing operation from one side. The software is designed with usability in mind making your operator's user experience simple and effective every time. During the calibration all results are presented on the screen after each point of the calibration. Cleaning can be done to standard industrial standards and all wet parts are designed for CIP (Clean In Place) and SIP (Steam In Place).

Mobility

The Calibration Rig is designed for mobility and the wheels allow it to be moved to wherever needed. The compact design of the rig means it fits through standard industrial doors and elevators. The rig can be lifted by crane using lifting lugs or straps by each corner.

Documentation from Basic to Full Validation

We work according to approved standards, e.g. Good Automation Manufacturing Practice (GAMP) and the rig is designed according to both the machinery directive and the low voltage directive.

The documentation package that comes with the Rig is made according to user specification and ranges from basic operations manual to full validation in accordance with common practice in the pharmaceutical industry.

Is the Standard Rig Insufficient?

We can design the unit to suit your local requirements, and we prefer to work on a mutually agreed user requirement specification.

Front view of the operator control panel





Product specifications

The below specifications are for our standard model, but it can be delivered to almost any specification you might have.

CIP (Clean in place)	Yes
Steam Sterilisable (Steam in place)	Yes
ATEX	Yes (Optional)
Flow Range	5...40.000 kg/h
Accuracy	Less than 0,3% of measured value (accredited)
Pressure	Up to 5 Bar
Temperature	Up to 40 °C
Ambient Temperature	+10...40 °C
Build Material	Piping: Stainless Steel AISI 304 or optionally AISI 316L Flow meters: EN 1.4404/AISI 316L or C22
Surface Roughness	Better than Ra 0,8
Pipework Connection	Flanges or Tri-Clamps
Data Connection to UUT	mA and Pulse
Power Supply	400 VAC, 16 A
Dimensions (L x W x H)	1705 x 779 x 1770 mm, Can be delivered to ASME standard
Weight	Drained weight approx. 450 kg



Service and support

Please call us if service or further training is required.

Minimal Maintenance

The Flow Calibration Rig is developed for pharmaceutical use and therefore easy maintenance and cleaning are of the essence and can be done according to industry standards. Maintenance is limited to a yearly inspection of critical parts, e. g. motor, pump, and we recommend calibrating the Rig once a year.

Maintenance and recommended spare parts may differ depending on the specifications, but will always be described in the delivered documentation.

Service and Support is Readily Available

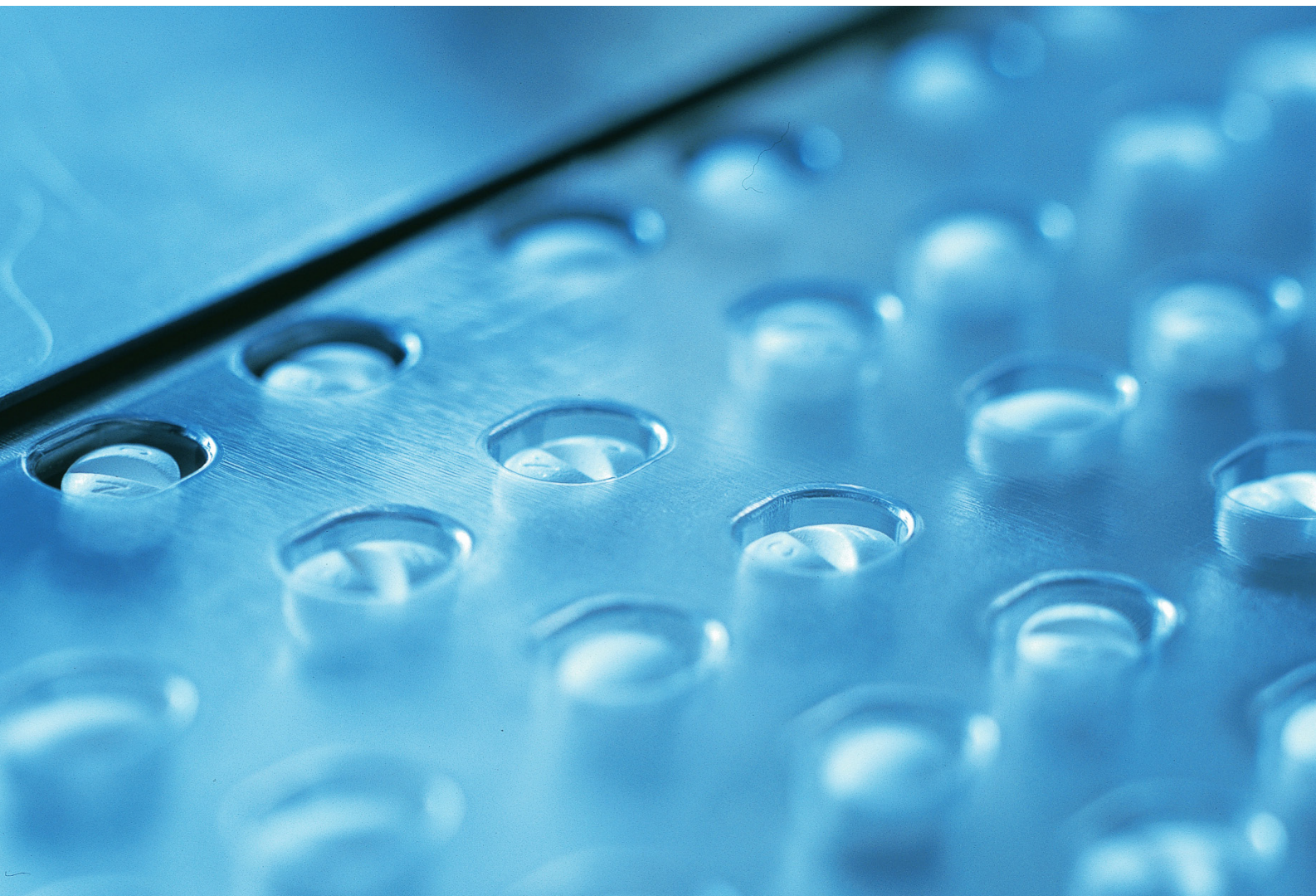
We know that the after sales experience is important to you and your total product experience. Therefore, we have a well-staffed service department ready to help you if challenges should arise. We perform repairs on location or at our workshop depending on what is most beneficial in the given situation.

The rig is built with standard components which makes spare parts easily obtainable. If you choose to sign a service agreement with us, we will perform maintenance on the rig and ensure it functions correctly. Furthermore, we will take responsibility for timely calibration of it.

Training

The ever-increasing complexity of measuring equipment makes proper training very useful. Insatech can offer equipment and application training either at your or our facilities. Furthermore, the training will be targeted towards your various working situations ensuring that you get the highest benefit possible.





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