TrigasFI GmbH
Erdinger Str. 2b
85375 Neufahrn
Germany
www.trigasfi.com
Tel.: +49-8165-64 72 0
Fax: +49-8165-64 72 29
tfinfo@trigasfi.com

Flow Profile Evaluation by Trigas and KURZ
A special service to ensure highly accurate flow measurement

Elbows and bends in piping as well as other disturbances in the flow path can cause heavily distorted velocity profiles in flow channels. This in turn can lead to significant errors in flow measurement values. When the potential for such distortions exists, the typical recommendation by of many suppliers is to select an optimum place and insertion depth. This however is not always sufficient to ensure accurate flow measurement.
This is particularly true when measuring inside larger diameters or measuring wells where the flow profiles change unpredictably with velocity.

Methods to normalize a distorted flow profile include installing long upstream pipe sections, but this may not be always possible because of space constrains. Different types of flow straighteners can accomplish the same task but usually cause pressure loss which may be deemed unacceptable for the application.

TrigasDM in cooperation with KURZ Instruments is offering a special product as well as a special service through our service company TrigasFI in order to meet the requirements of these applications, where neither of the solutions described above is practical or desirable.

The right equipment

KURZ K-BAR meters are available with up to 4 sensors on one measuring probe. A sophisticated flow computer is using these multiple signals to calculate the average flow velocity and provide a compensated and accurate flow signal.
In most cases this is enough to obtain the required measurement accuracy.

If the flow profile is more complicated, more of these probes can be installed in different locations and orientations, for example 90° to each other. All of the sensor outputs will be used by the flow computer to estimate the average velocity and measure flow accurately.

But how do we know how many sensor points and probes we need and how they should be positioned?

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General guidelines provided by manufacturers can only meet the requirements of non-demanding applications. And of course, accuracy statements provided by the same manufacturers are based on such applications as well.

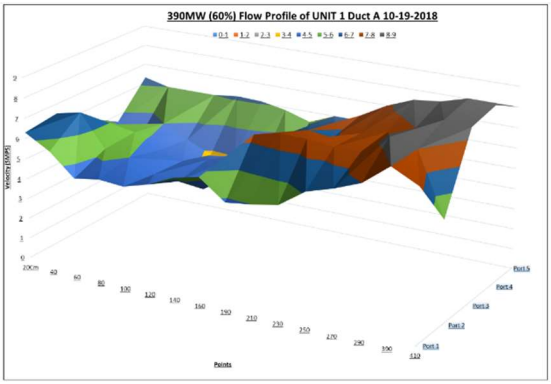
But what if a customer has a difficult application with unknown and unpredictable flow profile?
Even a top-quality sensor can easily deliver a signal with 30%, 40% or higher deviation if installed at a location where flow velocity is not representative of the average velocity in the pipe or duct.

The right service

Our Service company TrigasFI, in cooperation with KURZ Instruments is providing a special flow profile evaluation service to support customers with difficult applications.

For this purpose, a hand-held velocity measuring device or an insertion probe is used to take several measuring points and create a three-dimensional flow profile.
If the customer does not already have an instrument suitable for this task, we recommend our hand-held measuring instruments 2444 or 2445, depending on the required maximum temperature.
These handhelds can be equipped with telescope probes and have a built-in data logger to log the recorded values for later evaluation.

After that, we will process the data and create a representation of the flow profile.
Depending on the desired accuracy and based on this flow profile study, the customer receives a recommendation specifying the number of probes and the number of measurement points required as well as where these sensors should be installed.



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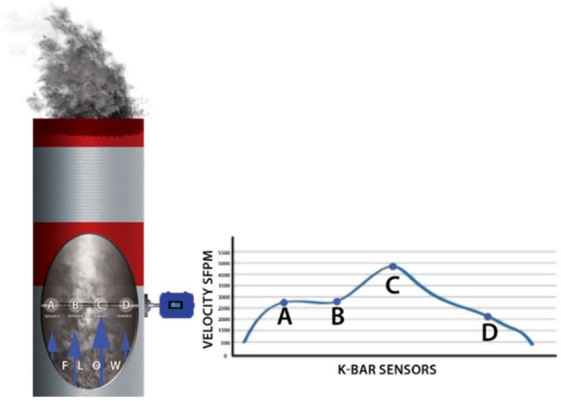

A typical example for such an application could be the measurement of combustion gases in big stacks, but also air or gas measurements in ducts and big pipes.

In the example here, the flow profile showed 4 significant points where the sensors should be positioned at the K-Bar probe.

With this method, flow measurement in difficult applications is no longer a “wild guess”, but a measurement on a clear technical basis. Customers who want to take advantage of the 30 years of experience with gas flow measurement in this kind of applications, are welcomed to contact us for advice.

By Anita Renc, Director Sales & Marketing, TrigasFI GmbH