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## TEN COMMON MISTAKES WHEN SPECIFYING A FLOW METER

A discussion on LinkedIn about whether the future of flowmeter sales was through online marketing, triggered a great outpouring from industry professionals. The key message was why this approach could miss the benefit of interactive communication with an ‘informed user’ to ensure an optimum flowmeter solution is provided for the specific process. It made me think of some common errors made when users set about specifying a flow meter.

### **1. Specifying a Flow Meter: Flow rate**

In some circumstances users have no idea what the flow rate is in their process pipe. “That is why we want to measure it”. Plant construction is often such that for mechanical reasons much larger pipes are used than merely the size required to carry the flow. It is then that we have to start looking at the motive force behind the flow and the plumbing considerations. Often a user will overlook an important factor: that their process is subject to significant pulsations and peak flow is perhaps forty percent higher or even twice the average.

### **2. Specifying a Flow Meter: Temperature**

Some users overlook the maximum operating temperature specification of the flow meter and assume that all flowmeters will operate to 150°C. When the device fails it is assumed a fault with the product

rather than the operating parameters of the process! In a similar way to mobile phone manufacturers who put water evident markers in their phones, we now include non-reversible high temperature markers in our flowmeters to record if the maximum operating temperature has been exceeded for any length of time.

### **3. Specifying a Flow Meter: Viscosity**

Many users are unaware that several types of flowmeters are viscosity sensitive and will significantly change their calibration with changes in the fluid properties. These Reynolds number sensitive devices are usually only linear in the “turbulent” flow range and their performance drops off as the liquid runs “smoother”. For instance, using a 40 cSt oil would immediately take a turbine meter, rated and calibrated for 1cst, out of the turbulent zone and into the non-linear laminar flow region. Changes in temperature would then change the viscosity and the calibration factor. Many flowmeter types rely on higher Reynolds numbers for their linear performance including vortex shedding, Pelton wheel, variable area and most pressure differential devices. Other technologies such as positive displacement, Coriolis and ultrasonic meters are less sensitive to these changes but not completely immune.

### **4. Specifying a Flow Meter: Output type**

“Will the flowmeter interface with my instrument?” To answer this, we need to know what the input requirements of your instrument are? Logic level, NPN or PNP pulse, analog current or voltage or a higher level language? Please check this requirement before specifying the meter! All Titan flowmeter data sheets specify the output requirements for that meter.

### **5. Specifying a Flow Meter: Pipe connections**

Your chosen pipe connection should be dictated by your process flow rate. A flow meter to work at 100ml per minute is not likely to have a 1” NPT pipe thread. Typically, a small flow meter will have small pipe connections. Specifying the line size as well as the correct thread of flange detail is essential.

### **6. Specifying a Flow Meter: Pressure drop**

This is a very important consideration. Will the available pressure head be enough to operate the flowmeter you have chosen efficiently and still leave enough available for later processes? This is often overlooked resulting in commissioning delays as either an alternative product or more pumping capacity is required. Titan can provide [pressure drop data](#) for all of our manufactured flow meters.

### **7. Specifying a Flow Meter: Pulsating flow**

As already mentioned, pulsating flow can cause problems for most flowmeter types. Positive displacement devices are undoubtedly the most immune with all other flowmeter types sharing the honours on intolerance. It is always best practice to eliminate pulsation with a damper and a pressure regulator. [Mitigating the effects of pulsating flow](#) can be achieved using a simple air pocket and a length of

flexible tube, or a commercial bladder damper with appropriate gas charge and a high-quality pressure regulator. Either method will reduce the pulsations but only within a limited set of operational parameters. Change the stroke, frequency or flow rate of the pump and the efficiency of the damper will be reduced.

### **8. Specifying a Flow Meter: Environment**

Is your flowmeter outside in an Alaskan winter or subject to the Saharan summer? Is it in a [hazardous area](#) on an offshore oil rig? We have had users forget to mention all of the preceding scenarios! Environment specification is especially important for hazardous areas where an appropriate flowmeter and detector will be required.

### **9. Specifying a Flow Meter: Power supply requirements**

All flowmeter manufacturers try to protect their products from poor power supplies. Most experienced users will specify a quality power supply for the sensors around their plant. However, when solenoids, dc motors and other noisy electrical apparatus are added, users may question why their flowmeter electronics are having problems. If you have an analog output, a suitable voltage supply will be required; it will not work off 9V. See our [Troubleshooting guidance](#) for more information.

### **10. Specifying a Flow Meter: Installation constraints**

“I did not realise I needed straight pipes before and after the flowmeter!” Before specifying, check out your flowmeter’s installation instructions as well as the device specifications. If you have a tight operating space, consider a [positive displacement flowmeter](#) which will be largely immune from the surrounding plumbing. Will you require a filter? It is good practice to install a filter close to the flowmeter but very few users do as they rely on other parts of the system. Will your fittings affect the flow profile onto the flowmeter?

**Before choosing a flow meter always read the whole specification sheet and installation instructions for the flowmeter you are considering. If in doubt talk to your supplier who will be able to help you [specify the optimal flowmeter for your process](#).**

For advice or technical support, please contact Titan Enterprises at [sales@flowmeters.co.uk](mailto:sales@flowmeters.co.uk) or speak to one of our technical team on +44 (0)1935 812790.