

E+H Calibration Data Sheet Definitions

(for use with QF-025 Calibration Data Sheet)

Parameter	Description						
Customer Data	User must complete the customer data section so that E+H can add or update customer information in the customer database. Also could identify the location of an onsite calibration, which is necessary in order to quote travel & expenses properly.						
Type of Calibration	<p>User must select the type of calibration that they are requesting. This will determine what documentation is provided as part of the calibration. The options are:</p> <p>Standard 2 Protocol - Standard means that the calibration is traceable to NIST, but no special or additional documentation provided, other than the standard calibration certificate. “2 Protocol” means that the “As Found” and the “As Left” calibration data is provided. “As Found” means the calibration is performed with the instrument before any adjustments are made. NOTE: On Coriolis meters and pressure instruments, our standard is to rezero the meter before the start of the “As Found” calibration. This is the standard operating procedure for those technologies. In order to carryout an “As Found” calibration, the instrument must be functioning properly and pass all bench tests beforehand. If an instrument is determined to be faulty (fails bench tests), then an “As Found” calibration will not be performed. In that case, only an “As Left” calibration will be performed. “As Left” means that the instrument has been adjusted and the calibration is being performed with those adjustments.</p> <p>Standard 1 Protocol - Same as above, except only an “As Found” calibration is performed. No adjustments are made to the instrument. This is termed calibration verification in some industries.</p> <p>Accredited 2 Protocol – Calibration is performed according to ISO 17025 and includes additional documentation showing the standards that were used to perform the calibration, the uncertainty of the calibration, and the accreditation certificate number. The calibration is performed with “As Found” and “As Left” data.</p> <p>Accredited 1 Protocol – Same as above, except only an “As Found” calibration is performed according to ISO 17025.</p>						
Re-zero instrument before start of calibration?	The customer must also specify whether the instrument is re-zeroed before the start of the calibration. Our default for Coriolis flow meters and pressure transmitters are to re-zero them to remove any bias that is associated with installation, since that is the standard operating procedure for the application of those products. This is no longer defined within the definition of regulated industry.						
Number of Points	<p>User indicates how many points are included as part of the calibration. Depending on the location of the calibration (laboratory or onsite), will determine what points are considered standard or optional. The number of runs at each point is already defined by E+H and are:</p> <p>Flow Lab – 3 pt. Standard – This is our standard laboratory flow calibration. Depending on the technology of the flow meter determines the percentages of the points. All customer specified flowrate values will be evaluated by E+H to determine whether they will be accepted based on the size and type of flow meter.</p> <table border="1"> <tr> <td>Coriolis</td><td>(2 x 25%, 1 x 50%, 2 x 100%). This means there are 2 runs performed at 25%, 1 run at 50%, and 2 runs at 100%. The 100% value is set at a value requested by the user. If the user doesn't specify the 100% value, then E+H sets it at a default based on the size of the meter, usually equating to ~1/5 of the maximum allowable range of the meter (most ideal range for calibration adjustments).</td></tr> <tr> <td>Magnetic, Ultrasonic, or Mechanical</td><td>(1 x 4%, 2 x 40%, 1 x 100%). The default 100% value is ~ ½ of the maximum allowable range of the meter. Can vary on Mechanical meters depending on specific type.</td></tr> <tr> <td>Vortex</td><td>(1 x 20%, 1 x 40%, 2 x 65%). Varies slightly based on meter size. The default percentages are based on the maximum allowable range of the meter.</td></tr> </table>	Coriolis	(2 x 25%, 1 x 50%, 2 x 100%). This means there are 2 runs performed at 25%, 1 run at 50%, and 2 runs at 100%. The 100% value is set at a value requested by the user. If the user doesn't specify the 100% value, then E+H sets it at a default based on the size of the meter, usually equating to ~1/5 of the maximum allowable range of the meter (most ideal range for calibration adjustments).	Magnetic, Ultrasonic, or Mechanical	(1 x 4%, 2 x 40%, 1 x 100%). The default 100% value is ~ ½ of the maximum allowable range of the meter. Can vary on Mechanical meters depending on specific type.	Vortex	(1 x 20%, 1 x 40%, 2 x 65%). Varies slightly based on meter size. The default percentages are based on the maximum allowable range of the meter.
Coriolis	(2 x 25%, 1 x 50%, 2 x 100%). This means there are 2 runs performed at 25%, 1 run at 50%, and 2 runs at 100%. The 100% value is set at a value requested by the user. If the user doesn't specify the 100% value, then E+H sets it at a default based on the size of the meter, usually equating to ~1/5 of the maximum allowable range of the meter (most ideal range for calibration adjustments).						
Magnetic, Ultrasonic, or Mechanical	(1 x 4%, 2 x 40%, 1 x 100%). The default 100% value is ~ ½ of the maximum allowable range of the meter. Can vary on Mechanical meters depending on specific type.						
Vortex	(1 x 20%, 1 x 40%, 2 x 65%). Varies slightly based on meter size. The default percentages are based on the maximum allowable range of the meter.						

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Flow Lab – 5 pt. Opt. – This is our optional 5 point laboratory flow calibration.

Coriolis	(1 x 20%, 1 x 35%, 1 x 50%, 1 x 75%, 1 x 100%). The 100% value is set at a value requested by the user. If the user doesn't specify the 100% value, then E+H sets it at a default based on the size of the meter, usually equating to ~1/5 of the maximum allowable range of the meter (most ideal range for calibration adjustments).
Magnetic, Ultrasonic, or Mechanical	(1 x 10%, 1 x 25%, 1 x 50%, 1 x 75%, 1 x 100%). The default 100% value is ~ 1/2 of the maximum allowable range of the meter. Can vary on Mechanical meters depending on specific type.
Vortex	(1 x 30%, 1 x 38%, 1 x 45%, 1 x 53%, 1 x 65%). Varies slightly based on meter size. The default percentages are based on the maximum allowable range of the meter.

Flow Onsite – 2 pt. Standard – This is our standard onsite flow calibration.

Coriolis	(2 x 25%, 2 x 100%). This means there are 2 runs performed at 25%, and 2 runs at 100%. The 100% value is set at a value requested by the user, if achievable. If the user doesn't specify the 100% value, then E+H sets it at a default based on the size of the meter, usually equating to ~1/5 of the maximum allowable range of the meter (most ideal range for calibration adjustments).
Magnetic, Ultrasonic, or Mechanical	(2 x 50%, 2 x 100%). The 100% value is set at a value requested by the user, if achievable. If the user doesn't specify the 100% value, then E+H sets it at a default based on the size of the meter. Can vary on Mechanical meters depending on specific type. Default 100% value usually in the range of 20% to 50% of actual full scale, depending on meter size.
Vortex	(2 x 50%, 2 x 100%). Varies slightly based on meter size. The 100% value is set at a value requested by the user, if achievable. If the user doesn't specify the 100% value, then E+H sets it at a default based on the size of the meter.

Flow Onsite – 3 pt. Opt. - This is our optional 3 pt. onsite flow calibration.

Coriolis	(2 x 25%, 1 x 50%, 2 x 100%). This means there are 2 runs performed at 25%, 1 run at 50%, and 2 runs at 100%. The 100% value is set at a value requested by the user, if achievable. If the user doesn't specify the 100% value, then E+H sets it at a default based on the size of the meter, usually equating to ~1/5 of the maximum allowable range of the meter (most ideal range for calibration adjustments).
Magnetic, Ultrasonic, or Mechanical	(1 x 10%, 2 x 50%, 2 x 100%). The 100% value is set at a value requested by the user, if achievable. If the user doesn't specify the 100% value, then E+H sets it at a default based on the size of the meter. Can vary on Mechanical meters depending on specific type.
Vortex	(1 x 25%, 2 x 50%, 2 x 100%). Varies slightly based on meter size. The 100% value is set at a value requested by the user, if achievable. If the user doesn't specify the 100% value, then E+H sets it at a default based on the size of the meter.

Pressure – 3 pt. Standard – (2 x 0%, 2 x 50%, 1 x 100%) This is our standard 3 pt. pressure calibration for laboratory or onsite. It is performed in an up/down manner starting at the minimum pressure, going up to the maximum pressure, then back down to minimum pressure. This will always have 2 measurements taken at each point, except the maximum point which will only have 1 measurement.

Pressure – 5 pt. Standard – (2 x 0%, 2 x 25%, 2 x 50%, 2 x 75%, 1 x 100%) This is our optional 5 pt. pressure calibration for laboratory or onsite. It is performed in an up/down manner starting at the minimum pressure, going up to the maximum pressure, then back down to minimum pressure. This will always have 2 measurements taken at each point, except the maximum point which will only have 1 measurement.

Temperature – 3 pt. Standard – (1 x 0°C, 1 x 50°C, 1 x 100°C). This is our standard laboratory

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	<p>calibration. It can also be used for field calibration if 3 points are required, but often field calibrations will only consist of 1 or 2 points. If requiring less than 3 points for a field temperature calibration, then use “Special” and indicate the custom points in the table. If requesting laboratory calibration and want a 3 pt. calibration performed at different points than stated in the standard, then use the “Special” selection and indicate the requested points in the custom table.</p> <p>Special – Use for anything that doesn’t fit within standard or optional. When selecting the option, the requested calibration points must be indicated in the custom calibration points table.</p>
Calibration Location	User specifies where they would like the calibration to be performed. In some cases, E+H might not be capable of performing the calibration in the location requested. This will prompt E+H to make alternative suggestions to the customer.
Regulated Industry	This refers to customers that are regulated by 3 rd party or industry standards, such as FDA, EPA, etc. No calibration adjustments (excluding zero point), software changes, etc. are allowed without the authorization from the customer.
Area Classification	This pertains to information about the area or environment that the instrument is located in that has to be determined before performing onsite calibrations. The environmental conditions of the area where calibration takes place is required when Accredited onsite calibration is requested. Accredited calibrations can not be performed if these conditions are outside of our scope of accreditation.
Type of Instrument	<p>Information about the type of instrument for which the customer is requesting calibration. Information in this section needs to be completed with the maximum amount of detail as possible to help us determine our capabilities to perform calibration on it. This is also why it is important that one datasheet is completed for each instrument, unless the instruments are identical model numbers and are used in identical applications.</p> <p>NOTE: If the customer is selecting a Coriolis meter as the type of instrument, they also have the option to include a density calibration. The options are Water Density Cal or Special Density Cal. For the Water Density Cal, the instrument is calibrated on water at ambient temperature (single point). For the Special Density Cal, which can only be performed at the factory (Greenwood, IN or Switzerland), the instrument is calibrated with 4 different fluids at temperatures ranging from 40 to 180 °F. In either case, the density calibration will be accompanied by a certificate.</p>
Reviewed by	This section completed by individual at E+H after technical review of the application is complete. This will then serve as the record for the calibration request and must be attached to the RA database, FS order, and/or the tech support system.