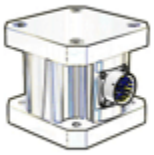
Custom transducer questionnaire

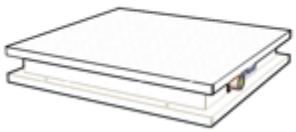
AMTI has extensive experience creating custom transducers to meet the needs of non-standard applications. From tweaking standard sensors to engineering custom designs, AMTI can provide a transducer that will meet your specific requirements.

The following list of questions will help AMTI determine what multi-component transducer will best suit the requirements of your application. Please answer all of the questions as completely as possible. We realize that you may not yet know all of the conditions and loads, so please just supply your best estimate as all load and positions need to be indicated, even if they are not to be measured. After we receive your form, we will review your answers and contact you to discuss sensor solutions specific to your application.

1.) Please provide a brief description of your application. If possible, please also provide a simple drawing on the attached grid paper.

2.) Select a representative physical form from the figures below, or enter a description of the transducer's package in the space provided.





○ Rectangular ○ Cylindrical ○ Platform ○ Flanged

3.) Enter the desired x, y, and z dimensions of the transducer below. Refer to the figure associated with question 4 for the coordinate axes. If your transducer is cylindrical then enter the length (z) and the diameter (d).

x: _____ inches OR _____ centimeters

y: _____ inches OR _____ centimeters

z: _____ inches OR _____ centimeters

d: _____ inches OR _____ centimeters

4.) AMTI generally designs its transducers to measure all six forces and moments, and it is only under that condition that the crosstalk correction matrix can function. With that in mind, indicate any of the measurement components below that you are not interested in. Please also note that the cost of the sensor is not proportional to the number of channels and that six-axis transducers are standard.

Fx (horizontal)

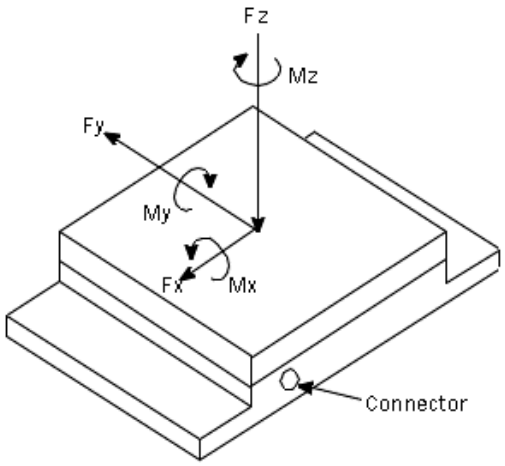
Fy (horizontal)

Fz (vertical)

Mx (moment about the x-axis)

My (moment about the y-axis)

Mz (moment about the z-axis)



<u>Important note for the following section</u>

The rated capacity of a single-axis load cell is usually based upon the application of a single force or torque. For example, a tension/compression load cell of a rated capacity assumes all other loads, as well as all applied moments or torques, are also zero. This assumption is not valid for most multi-axis applications because there are multiple forces and moments applied to the transducers.

Even in the case where fewer than six components are of interest to the user, it is still necessary to specify all the potential forces and moments which will be applied. As a general rule, most transducers are limited by their moment capacities. Specifying a multi-axis cell by only its Fx, Fy and Fz loads is often attempted but

provides insufficient information to size the load cell properly. Any individual moment can be provided by two orthogonal forces and by a pure torque. These three cases will not result in the same stress levels on the sensing element.

In order to resolve these issues and allow correct computation of the sizing of the transducer, we require the information in sections 5, 6 and 7 to be filled out. Alternative formats are not preferred and make computation difficult. In cases where the item is unknown, it is necessary to provide your best estimate of the number. We are looking for the worst case scenario, and multiple cases can be provided if needed.

In order to avoid confusion, please put "0" instead of leaving a blank in cases where you believe the item to be zero. ***Please be sure to leave no blank fields on any of the nine items in the following three sections.***

5.) Enter the maximum load for each of the axes below. If the load is negative (tension), please indicate so with a negative sign (-).

Fx: _____ pounds OR _____ Newtons

Fy: _____ pounds OR _____ Newtons

Fz: _____ pounds OR _____ Newtons

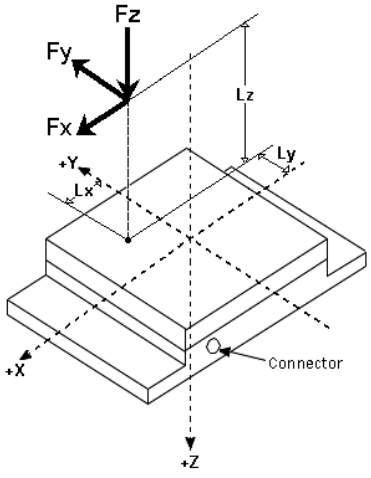
6.) Enter the location of the applied force(s) with respect to the transducer's top surface. Every sensor must be built to withstand the moment forces you will apply to it, even if you do not intend to measure them. The moment forces increase substantially as the location of the applied force is moved away from the center of the transducer. This is especially relevant in applications where there is anything mounted on the transducer that extends off its top surface.

Identify where the force will be applied to the transducer's surface or to the object connected to the transducer. Then describe the location in terms of its distance away from the center of the transducer's top surface.

Lx: _____ inches OR _____ centimeters

Ly: _____ inches OR _____ centimeters

Lz: _____ inches OR _____ centimeters



7.) Enter the pure torque applied around each of the axes below. Please note that pure torques are often zero because they have no Fx, Fy, or Fz components.

Tx: _____ inch-pounds OR _____ Newton-meters

Ty: _____ inch-pounds OR _____ Newton-meters

Tz: _____ inch-pounds OR _____ Newton-meters

8.) Describe your top and bottom mounting configuration details. What types of attachment points are required? Indicate if there is a specific bolt pattern that must be followed for mounting. Female threaded holes are the most common and economical; however, other types can be accommodated. Please also provide a simple drawing on the attached grid paper, if possible.

9.) Describe your environmental requirements. Will the transducer be used in a dirty environment, under salt or fresh water, in a vacuum, outdoors, etc.?

10.) Describe your connection needs if you require a special connector (i.e., waterproof, pigtail).

11.) If a specific connector location is required, describe it here. Please note that our coordinate convention requires that the connector or cable is located at the minus (-) y-axis position. (Refer to the figure associated with question 4 for an illustration of our convention orientation.)

12.) Please provide your operating environment's temperatures if they fall outside of the typical ambient range.

Minimum temperature: Fahrenheit OR Celsius

Maximum temperature: Fahrenheit OR Celsius

13.) Please describe any other requirements that may affect the transducer design, such as weight, stiffness, natural frequency, impact loads, hydrostatic pressure, or sensitivity.

14.) Have you identified a standard AMTI model that comes close to meeting your requirements? If so, please indicate the model's name in the space below. To some extent, it is more cost effective to modify standard sensors than design new ones. This is especially true if only a load capacity, connector, or mounting method needs to be modified.

Model number:

15.) Please enter your contact information below.

First name (required):

Last name (required):

Company name:

Address 1:

Address 2:

Address 3:

City:

State/province:

Postal code:

Country:

E-mail (required):