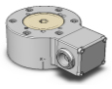
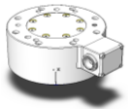
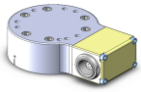
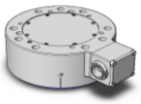
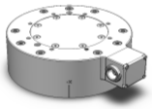
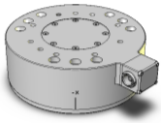
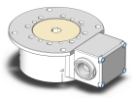
FT IP68 Fz Loss as a Function of Submersion Depth

IP68 F/T Sensors: Submersible to 10 Meters						
When submerged, IP68 sensors exhibit a decrease in Fz sensor output values related to the submersion depth. Although this offset can be biased out, a loss of effective Fz range results. This loss must be considered when selecting a calibration, and makes some smaller calibrations unusable.						
All loss values and equations are approximate.						
FT Model	**DELTA IP68**	**THETA IP68**	**OMEGA85 IP68**	**OMEGA160 IP68**	**OMEGA190 IP68**	**OMEGA250 IP68**
-Fz Loss at full 10m depth:						
English (US)	161 lbs	429 lbs	128 lbs	429 lbs	661 lbs	1138 lbs
Metric (SI)	716 N	1907 N	570 N	1907 N	2941 N	5061 N
Equation [Fz=fn(depth)]:						
English (US)	Fz [lb] = -4.9 * depth [ft]	Fz [lb] = -13 * depth [ft]	Fz [lb] = -3.9 * depth [ft]	Fz [lb] = -13 * depth [ft]	Fz [lb] = -20 * depth [ft]	Fz [lb] = -35 * depth [ft]
Metric (SI)	Fz [N] = -72 * depth [m]	Fz [N] = -191 * depth [m]	Fz [N] = -57 * depth [m]	Fz [N] = -191 * depth [m]	Fz [N] = -294 * depth [m]	Fz [N] = -506 * depth [m]
						

IP68 F/T Sensors: Submersible to 4 Meters						
When submerged, IP68 sensors exhibit a decrease in Fz sensor output values related to the submersion depth. Although this offset can be biased out, a loss of effective Fz range results. This loss must be considered when selecting a calibration, and makes some smaller calibrations unusable.						
All loss values and equations are approximate.						
FT Model	**NANO17 IP68**	**NANO25 IP68**	**MINI40 IP68**	**MINI45 IP68**	**MINI58 IP68**	**GAMMA IP68**
-Fz Loss at full depth:						
English (US)	2.01 lbs	4.33 lbs	17.0 lbs	17.0 lbs	24.3 lbs	42.9 lbs
Metric (SI)	8.93 N	19.3 N	75.5 N	75.5 N	108 N	191 N
Equation [Fz=fn(depth)]:						
English (US)	Fz [lb] = -0.15 * depth [ft]	Fz [lb] = -0.33 * depth [ft]	Fz [lb] = -1.29 * depth [ft]	Fz [lb] = -1.29 * depth [ft]	Fz [lb] = -1.86 * depth [ft]	Fz [lb] = -3.27 * depth [ft]
Metric (SI)	Fz [N] = -2.23 * depth [m]	Fz [N] = -4.81 * depth [m]	Fz [N] = -18.9 * depth [m]	Fz [N] = -18.9 * depth [m]	Fz [N] = -27.1 * depth [m]	Fz [N] = -47.7 * depth [m]
						

Example 1:	An Omega190 sensor with a US-800-6000 calibration is used at a depth of 10 m.
	Normal maximum sensing range in Fz is +/- 2000 lb. When submerged to 10 m depth, a force of -661 lbs registers in Fz due to the hydrostatic
	pressure acting on the tooling plate. The effective range in -Fz has been reduced by 661 lbs to 1339 lbs.
	Even though you can bias the sensor when full depth has been reached, applying forces exceeding 1339 lbs in -Fz will cause gage saturation.
	(On the other hand, you gain an additional 661 lbs in +Fz range in this situation, allowing application of 661+2000 = 2661 lbs
	in +Fz before gage saturation occurs.)

Example 2:	A Theta sensor with a SI-2500-400 calibration is used at a depth of 5 m.
	Normal maximum sensing range in Fz is +/- 6250 N. Use the equation to determine the Fz loss at 5 m:
	Fz [N] = -191 * depth [m] ---> Fz =-191 * 5 ---> Fz = -955 N
	At a depth of 5 m, the maximum sensing range in -Fz will be reduced by 955 N to 5295 N.

Example 3:	A customer requests a Delta sensor with a US-50-150 calibration to be used at a depth of 10 m.
	Normal maximum sensing range in Fz is +/- 150 lb. When submerged to 10 m, a force in -Fz of 161 lbs will be applied due to the hydrostatic
	pressure acting on the tooling plate. This force exceeds the maximum sensing range, causing the gages to saturate. No sensor output can be
	obtained.
	This calibration is inappropriate for use at the full 10 m depth.