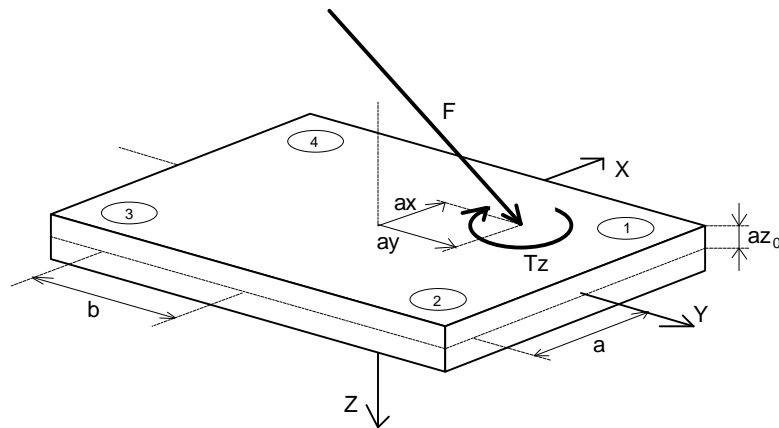


Kistler Force Plate Formulae



Force plate output signals

Output signal	Channel	Description
fx12	1	Force in X-direction measured by sensor 1 + sensor 2
fx34	2	Force in X-direction measured by sensor 3 + sensor 4
fy14	3	Force in Y-direction measured by sensor 1 + sensor 4
fy23	4	Force in Y-direction measured by sensor 2 + sensor 3
fz1 ... fz4	5 ... 8	Force in Z direction measured by sensor 1 ... 4

Calculated parameters

Parameter	Calculation	Description
Fx	$= fx12 + fx34$	Medio-lateral force 1)
Fy	$= fy14 + fy23$	Anterior-posterior force 1)
Fz	$= fz1 + fz2 + fz3 + fz4$	Vertical force
Mx	$= b * (fz1 + fz2 - fz3 - fz4)$	Plate moment about X-axis 3)
My	$= a * (-fz1 + fz2 + fz3 - fz4)$	Plate moment about Y-axis 3)
Mz	$= b * (-fx12 + fx34) + a * (fy14 - fy23)$	Plate moment about Z-axis 3)
Mx'	$= Mx + Fy * az0$	Plate moment about top plate surface 2)
My'	$= My - Fx * az0$	Plate moment about top plate surface 2)
ax	$= -My' / Fz$	X-Coordinate of force application point (COP) 2)
ay	$= Mx' / Fz$	Y-Coordinate of force application point (COP) 2)
Tz	$= Mz - Fy * ax + Fx * ay$	Free moment, Vertical torque, „Frictional“ torque
COFx	$= Fx / Fz$	Coefficient of Friction x-component
COFy	$= Fy / Fz$	Coefficient of Friction y-component
COFxy	$= \text{sqrt} (COFx^2 + COFy^2)$	Coefficient of Friction absolute

All formulae are in Kistler coordinate system

1) Walking direction is positive Y-axis

2) az0 = top plane offset (negative value)

3) a, b = sensor offset (positive values)