

DYNAMICS OF THE LINEAR PNEUMATIC ACTUATOR

SYMBOL	NAME	UNIT	VALUE
f	frequency	[Hz]	1000
D	piston diameter	[mm]	50
S	piston stroke	[mm]	100
m	mass of moving parts	[g]	1530
p ₁	pressure in the chamber 1	[bar]	result of conversion function 1
p ₂	pressure in the chamber 2	[bar]	result of conversion function 2
s	piston position	[mm]	result of conversion function 3
u _{p1}	voltage depends on p ₁ value	[V]	in column 1 of the data
u _{p2}	voltage depends on p ₂ value	[V]	in column 2 of the data
u _s	voltage depends on s value	[V]	in column 3 of the data

$$(1) \quad p_1 = 1.2319 \cdot u_{p1} - 0.0076$$

$$(2) \quad p_2 = 2.0480 \cdot u_{p2} + 0.0011$$

$$(3) \quad s = \frac{u_s - u_{s \min}}{u_{s \max} - u_{s \min}} \cdot S$$