Parameter for Calculations of kinematic and dynamics

Document Version: V1.2

DOOSAN

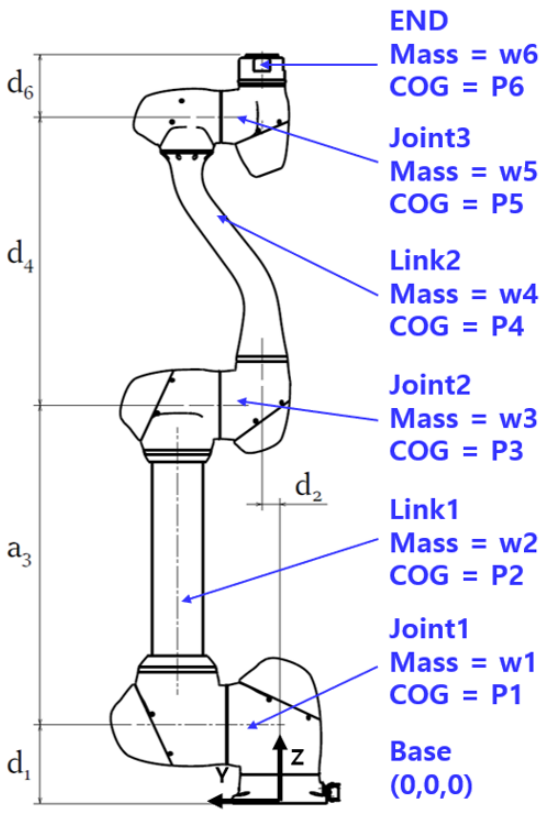
Doosan robot series(M/H/A/E/P)

Parameter and COG is defined as below figure

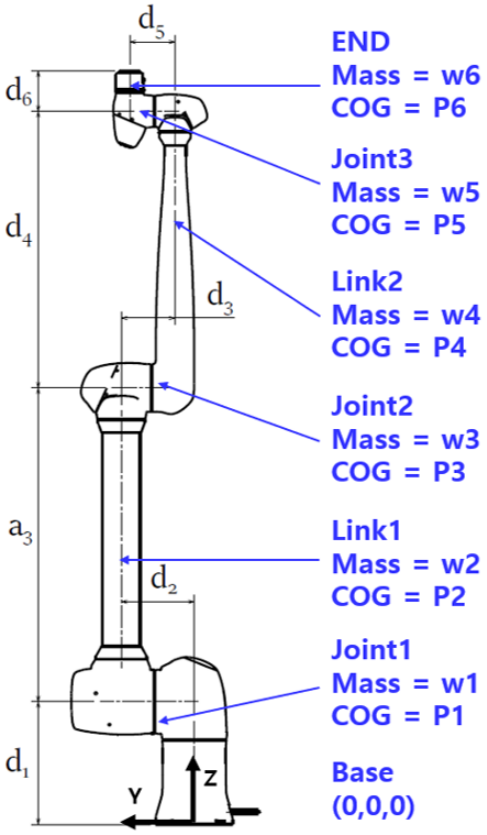
> **Caution**
>
> These values is only supported for your Calculation.

Doosan robot series(M/H/A/E/P)

M/H/A/E-Series



P-Series



Defined The Denavit-Hartenberg Parameters for M/ H/ A/ E/ P-Series

Kinematic	theta [degree]	a [mm]	d [mm]	alpha [degree]
Joint1	θ_1	0	d_1	0
Link1	θ_2 -90	0	d_2	-90
Joint2	θ_3 +90	a_3	d_3	0
Link2	θ_4	0	d_4	90
Joint3	θ_5	0	d_5	-90
End	θ_6	0	d_6	90

- ***In P-Series, θ_4 is zero.***

DH Value of M/ H-Series : Unit [mm]

Value	M0609	M0617	M1013	M1509	H2017	H2515
d_1	135	152.5	152.5	152.5	344.3	344.3
d_2	6.25	34.5	34.5	34.5	9.9	9.9
a_3	411	845	620	411	845	759.5
d_3	--	--	--	--	--	--
d_4	368	734	559	368	734	619.5
d_5	--	--	--	--	--	--
d_6	121	121	121	121	121	121

DH Value of A/ E/ P-Series : Unit [mm]

Value	A0509	A0509S	A0912	A0912S	E0509	P3020
d_1	155.5	155.5	195	195	204.5	394.3
d_2	0	0	39	39	0	235.1
a_3	409	409	560	560	373	1010
d_3	--	--	--	--	--	-173.15
d_4	367	367	516	516	373	890
d_5	--	--	--	--	--	145.95
d_6	124	127	124	127	172.5	130

CoG Value Data of M/ H-Series : Point Value is defined by Base Coordination.

COG Value			M0609	M0617	M1013	M1509	H2017	H2515
Joint1	w1 [kg]		5.02	7.8	7.8	7.8	20.25	20.25
	p1	X	0.07	0.12	0.12	0.12	-0.05	-0.05
	[mm]	Y	36.23	42.8	42.8	42.8	118.54	118.54
		Z	131.58	146.12	146.12	146.12	284.32	284.32
Link1	w2 [kg]		8.04	11.55	10.83	10.06	28.54	28.11
	p2	X	0.03	-0.05	-0.05	-0.06	-0.02	-0.02
	[mm]	Y	166.3	192.7	192.32	191.84	235.17	235.17

		Z	339.47	510.02	412.23	323.09	724.85	701.59
Joint2	w3 [kg]		3.6	3.68	3.68	3.68	6.42	6.42
	p3	X	-0.02	-0.015	-0.02	-0.02	-0.06	-0.07
	[mm]	Y	49.7	79.11	79.11	79.13	59.43	59.43
		Z	552.87	1004.2	779.2	570.21	1197.63	1111.21
Link2	w4 [kg]		3.57	4.28	3.82	3.59	7.59	7.3
	p4	X	0.04	0.057	0.07	0.04	0.08	0.08
	[mm]	Y	103.33	125.79	126.38	131.81	138.86	140.58
		Z	804.19	1478.31	1148.98	821.9	1702.74	1543.83
Joint3	w5 [kg]		2.83	2.8	2.82	2.83	4.1	4.1
	p5	X	-0.07	-0.27	-0.27	-0.07	-0.06	-0.06
	[mm]	Y	38.22	665.87	66.59	66.51	58.71	58.69
		Z	910.17	1727.85	1327.85	927.67	1923.89	1723.89
END	w6 [kg]		1.16	1.16	1.16	1.16	0.9	0.9
	p6	X	-0.03	-0.29	-0.29	-0.03	-0.03	-0.03
	[mm]	Y	6.21	34.51	34.51	34.51	9.94	9.91
		Z	981.1	1798.6	1398.6	998.6	1994.86	1794.9

CoG Value Data of A/ E/ P-Series : Point Value is defined by Base Coordination.

COG Value		**A0509**	**A0509S**	**A0912**	**A0912S**	**E0509**	**P3020**
Joint1	w1 [kg]	3.72	3.72	7.86	7.86	5.75	28.434

	p1	X	-0.069	-0.069	0.044	0.044	0.001	-0.006
	[mm]	Y	24.423	24.423	29.982	29.982	49.633	112.8
		Z	148.125	148.125	183.88	183.88	154.87	328.63
Link1	w2 [kg]		6.84	6.84	10.99	10.99	3.46	29.856
	p2	X	0	0	1.426	1.426	0	0
	[mm]	Y	132.71	132.71	170.908	170.908	173.11	241.29
		Z	359.986	359.986	392.484	392.484	390.97	796.37
Joint2	w3 [kg]		2.77	2.77	2.88	2.88	4.58	2.836
	p3	X	0.071	0.071	0.085	0.085	0.012	0.018
	[mm]	Y	33.009	33.009	71.058	71.058	62.355	108.54
		Z	569.623	569.623	757.513	757.513	606.69	1414.9
Link2	w4 [kg]		2.68	2.68	3.27	3.27	2.21	5.767
	p4	X	-0.086	-0.086	-0.096	-0.096	0.004	-0.023
	[mm]	Y	86.348	86.348	124.314	124.314	95.573	65.353
		Z	845.469	845.469	1131.255	1131.255	822.37	1990.7
Joint3	w5 [kg]		2.05	2.05	2.14	2.14	3.55	2.912
	p5	X	0.091	0.091	0.109	0.109	-0.003	0.029
	[mm]	Y	15.434	15.434	53.77	53.77	43.841	184.6
		Z	937.957	937.957	1274.286	1274.286	988.51	2296.3
END	w6 [kg]		0.77	0.87	0.78	0.88	0.72	1.087
	p6	X	-0.022	-0.022	-0.019	-0.019	0.054	-0.232

	[mm]	Y	-0.007	-0.007	38.994	38.994	-0.114	208
		Z	1003.754	1007.754	1342.73	1346.73	1090.9	2296.3