Projet robotique

Titre du projet : **robot kuka KR 6 R700-2**

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Elaboré par : **salsabil khadraoui**

Niveau d'étude : **M1 TAGE**

2024_2025

FICHE TECHNIQUE DU ROBOT

KUKA

KR 6 R700-2

Technical data

Maximum reach	726 mm
Maximum payload	6.8 kg
Pose repeatability (ISO 9283)	± 0.02 mm
Number of axes	6
Mounting position	Floor; Ceiling; Wall; Desired angle
Footprint	208 mm x 208 mm
Weight	approx. 53 kg

Axis data

Motion range	
A1	±170 °
A2	-190 / 45 °
A3	-120 / 156 °
A4	±185 °
A5	±120 °
A6	±350 °

Operating conditions

Ambient temperature during operation	0 °C to 45 °C (273 K to 318 K)

Protection rating

Protection rating (IEC 60529)	IP65 / IP67
Protection rating, robot wrist (IEC 60529)	IP65 / IP67

Controller

Controller	KR C5 micro; KR C4 smallsize-2; KR C4 compact

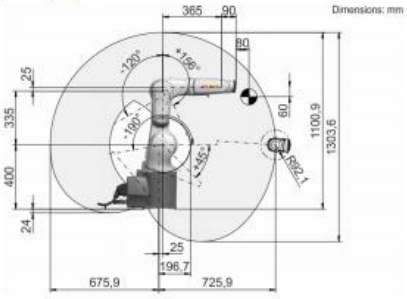
Certificates

ESD requirements	IEC61340-5-1; ANSI/ESD S20.20

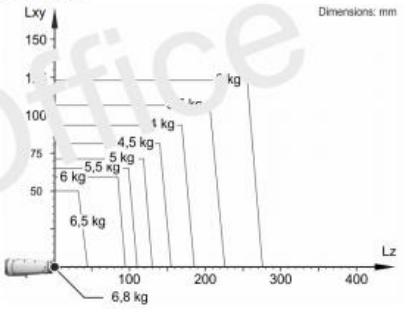
Cycle time

138 cycles per minute (25 mm / 305 mm / 25 mm, 1 kg)

Workspace graphic

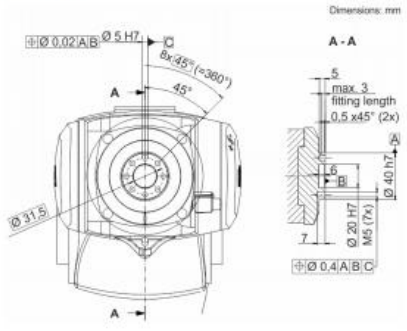


Payload diagram



The KR 6 R700-2 is designed for a rated payload of 6 kg in order to optimize the dynamic performance of the robot. With reduced load center distances and favorable supplementary loads, a maximum payload of up to 6.8 kg can be mounted. The specific KUKA Load case must be verified using KUKA. For further consultation, please contact KUKA Service.

Mounting flange



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1) Table_DH :

i	θi	di	ai	αi
1	$\theta 1$	400	0	$\pi/2$
2	$\theta 2$	0	360	0
3	$\theta 3$	365	25	$\pi/2$
4	$\theta 4$	0	0	$-\pi/2$
5	$\theta 5$	0	0	$\pi/2$
6	$\theta 6$	90	0	0

2) La matrice homogène associée au tableau :

T =[cos(thetai), -sin(thetai)*cos(alphai), sin(thetai)*sin(alphai), ai*cos(thetai);

sin(thetai), cos(thetai)*cos(alphai) , -cos(thetai)*sin(alphai), ai*sin(thetai);

0 , sin(alphai) , cos(alphai) , di ;

0 , 0 , 0 , 1];

3) Code Matlab du modèle geomtrique du robot avec animation :

```
syms thetai alphai ai di
T =[ cos(thetai), -sin(thetai)*cos(alphai), sin(thetai)*sin(alphai),
ai*cos(thetai);
sin(thetai), cos(thetai)*cos(alphai) , -cos(thetai)*sin(alphai), ai*sin(thetai);
0 , sin(alphai) , cos(alphai) , di ;
0 , 0 , 0 , 1 ];
O0=[0;0;0];
figure(1)
syms q1 a
thetai=q1;di=a;ai=0;alphai=pi/2;
T01=subs(T);

syms q2 b
thetai=q2;di=0;ai=b;alphai=0;
T12=subs(T);
T02=T01*T12;T02=simplify(T02);

syms q3 c d
thetai=q3;di=c;ai=d;alphai=pi/2;
T23=subs(T);
T03=T02*T23;T03=simplify(T03);

syms q4
thetai=q4;di=0;ai=0;alphai=-pi/2;
T34=subs(T);
T04=T03*T34;T04=simplify(T04);

syms q5
thetai=q5;di=0;ai=0;alphai=pi/2;
T45=subs(T);
T05=T04*T45;T05=simplify(T05);

syms q6 e
thetai=q6;di=e;ai=0;alphai=0;
T56=subs(T);
T06=T05*T56;T06=simplify(T06);
q1_range = deg2rad(0:2:45);
```

```
q2_range = deg2rad(0:2:90);
q3_range = deg2rad(-45:2:45);
q4_range = deg2rad(0:2:45);
q5_range = deg2rad(-60:2:60);
q6_range = deg2rad(0:2:90);
for i = 1:max([length(q1_range), length(q2_range), length(q3_range),
length(q4_range), length(q5_range), length(q6_range)])

    q1 = q1_range(min(i, length(q1_range)));
    q2 = q2_range(min(i, length(q2_range)));
    q3 = q3_range(min(i, length(q3_range)));
    q4 = q4_range(min(i, length(q4_range)));
    q5 = q5_range(min(i, length(q5_range)));
    q6 = q6_range(min(i, length(q6_range)));

    a=400;
    T01num=double(subs(T01));
    O1=T01num(1:3,4);

    b=360;
    T02num=double(subs(T02));
    O2=T02num(1:3,4);

    c=365;d=25;
    T03num=double(subs(T03));
    O3=T03num(1:3,4);

    T04num=double(subs(T04));
    O4=T04num(1:3,4);

    T05num=double(subs(T05));
    O5=T05num(1:3,4);

    e=90;
    T06num=double(subs(T06));
    O6=T06num(1:3,4);

plot3(O0(1),O0(2),O0(3),'o');
hold on
plot3(O1(1),O1(2),O1(3),'o');
plot3(O2(1),O2(2),O2(3),'o');
plot3(O3(1),O3(2),O3(3),'o');
plot3(O4(1),O4(2),O4(3),'o');
plot3(O5(1),O5(2),O5(3),'o');
plot3(O6(1),O6(2),O6(3),'o');
plot3([O0(1),O1(1),O2(1),O3(1),O4(1),O5(1),O6(1)],[O0(2),O1(2),O2(2),O3(2),O4(2),O
5(2),O6(2)],[O0(3),O1(3),O2(3),O3(3),O4(3),O5(3),O6(3)], LineWidth=2);
 xlim([-1000 1000]);
ylim([-1000 1000]);
zlim([0 1500]);
xlabel('X');
ylabel('Y');
zlabel('Z');
pause(0.1)
view(3);
hold off;
end
nop=1;
```