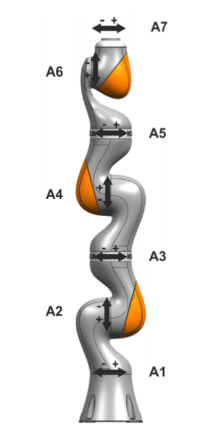
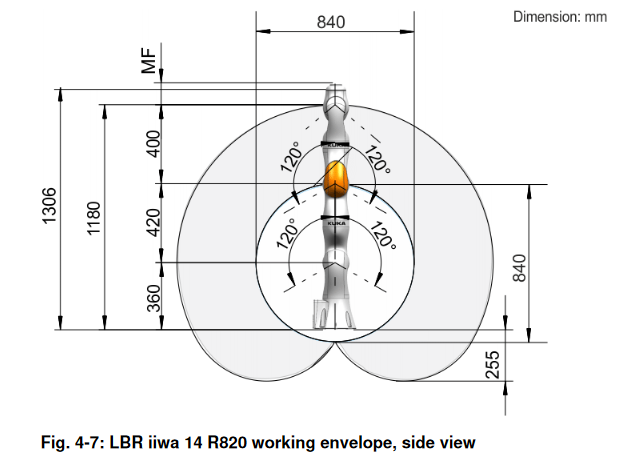
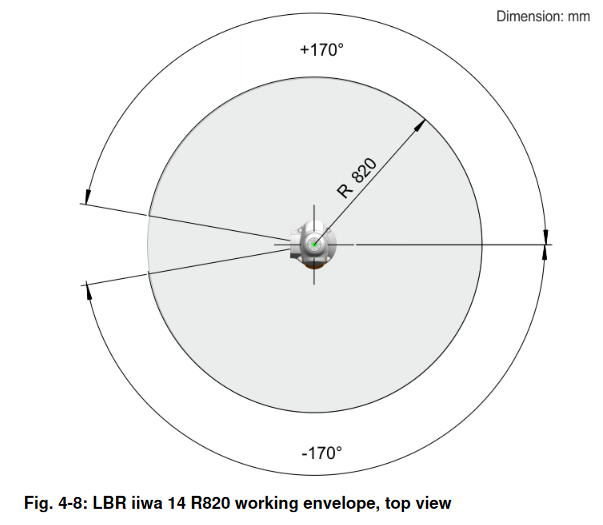
Report

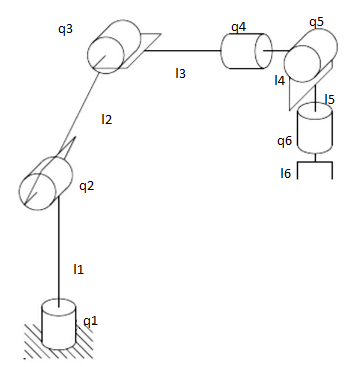
Description of robot







Kinematic scheme



Description

|  |  |  |
| --- | --- | --- |
| Q | Min angle | Max angle |
| Q1 | -170 | 170 |
| Q2 | -120 | 120 |
| Q3 | -120 | 120 |
| Q4 | -170 | 170 |
| Q5 | -120 | 120 |
| Q6 | -170 | 170 |

|  |  |
| --- | --- |
| L | length |
| L1 | 360 |
| L2 | 400 |
| L3 | 200 |
| L4 | 200 |
| L5 | 126 |
| L6 | 20 |

Formulas of forward kinematic solution

Rx = Ry = Rz = T =

Step by step explaining of inverse kinematics

xg, yg and zg is the coordinates of goal

Q1 = atan2(xg/yg)

Rc =

Cos(Q3) =

Q3 = atan2(cos(q3),sin(q3))

Q2 = atan2(zc, rc)-atan2(l2\*sin(q3),l1+l2\*cos(q3))

P = transposed rotation part of (Rz(q0) \* T(l1) \* Ry(q1) \* T(l2) \* Ry(q2) \* T(l3))

Q4 = atan2(p[1,2], p[0,2])

Q5 = atan2(sqrt((p[0, 2])\*\*2+(p[1, 2])\*\*2),p[2,2])

Q6 = atan2(p[2,1],p[2,0])

Link to github

https://github.com/EriKarasik/HW22