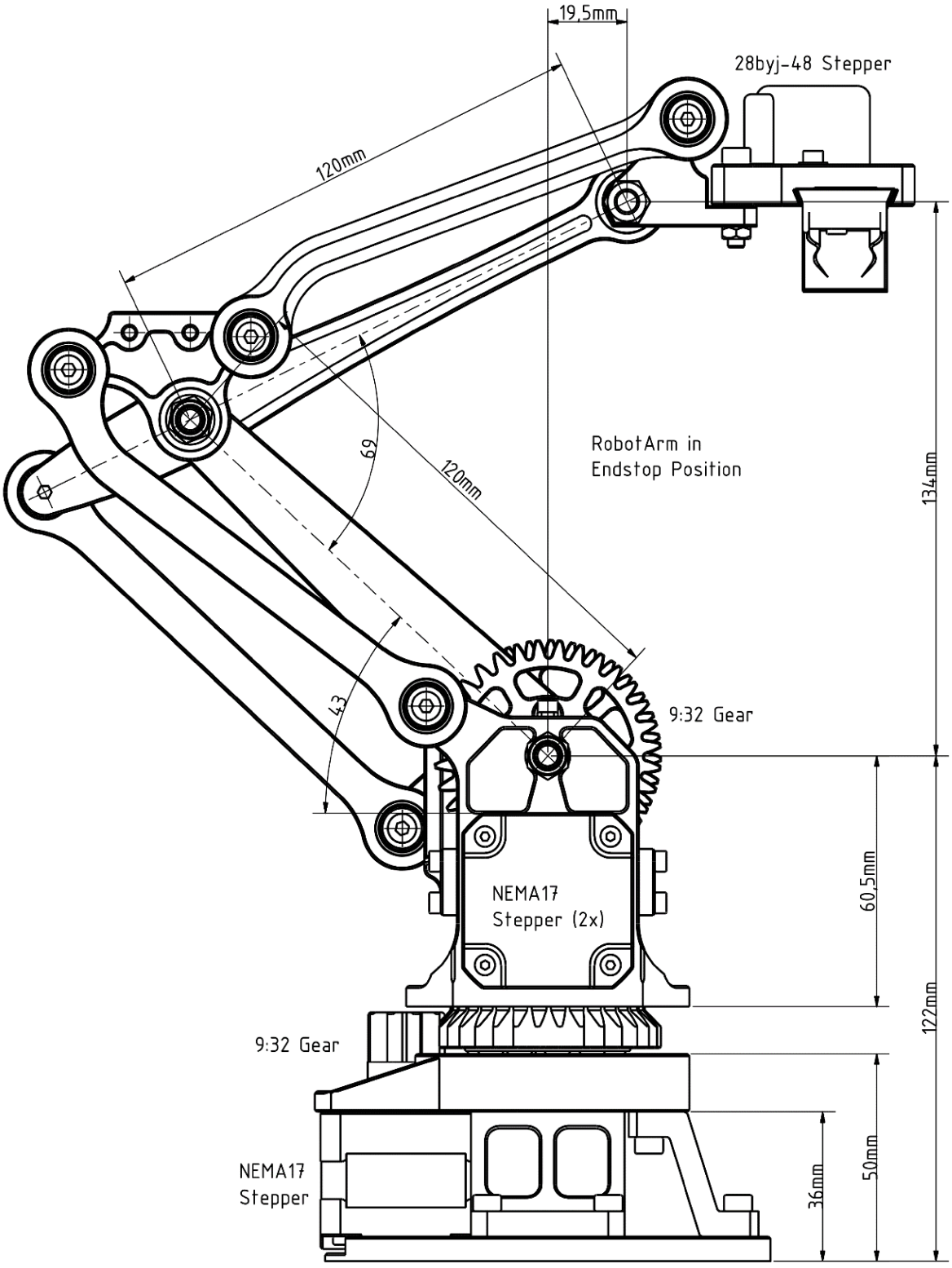
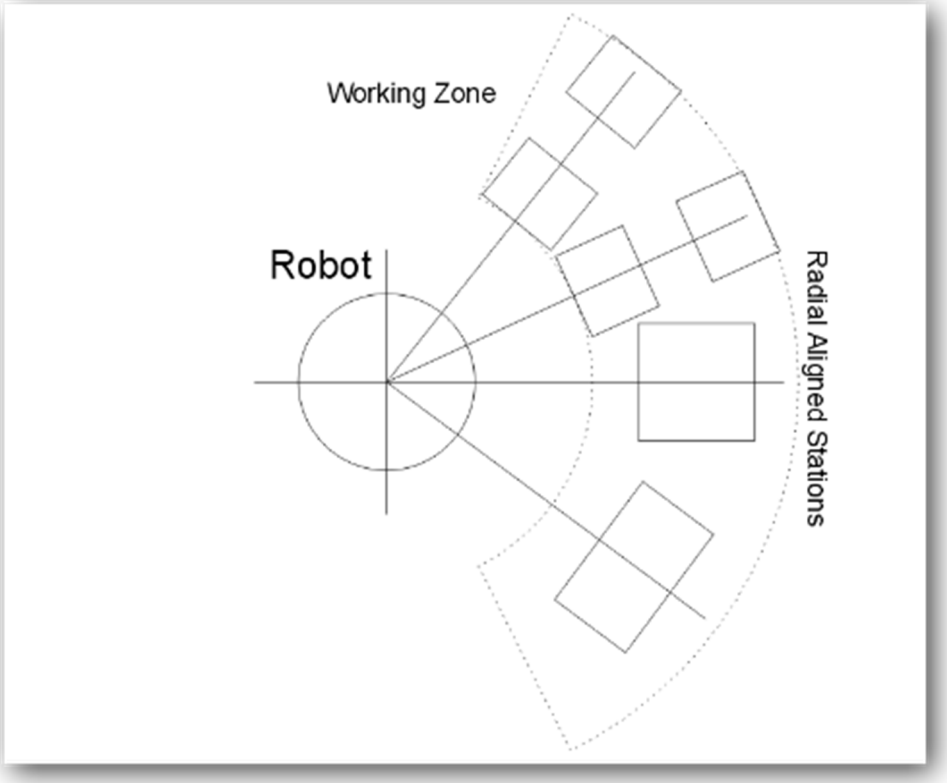
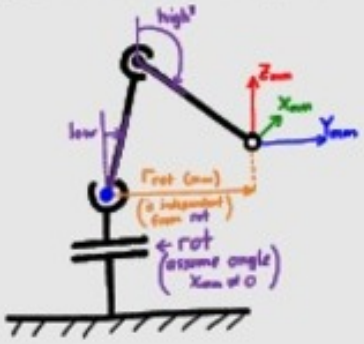

19,5mm
28byj-48 Stepper
120mm
69
120mm
RobotArm in
Endstop Position
134mm
43
9:32 Gear
NEMA17
Stepper (2x)
60,5mm
122mm
9:32 Gear
NEMA17
Stepper
36mm
50mm



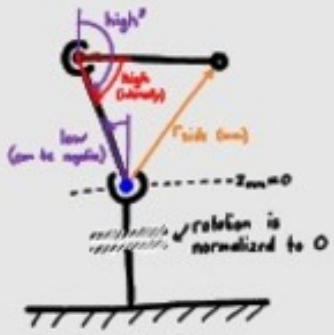
Robot Geometry

Florin Tobler 2016
see file "robotGeometry.cpp"

3-Dimensional Cartesian System



2-Dimensional Side View



Geometry for high

Geometry for low

$$r_{rot} = \sqrt{X_{mm}^2 + Y_{mm}^2}$$

$$r_{side} = \sqrt{r_{rot}^2 + Z_{mm}^2}$$

$$rot = \sin^{-1}\left(\frac{X_{mm}}{r_{rot}}\right)$$

$$high = 2 \cdot \cos^{-1}\left(\frac{r_{side}}{2 \cdot 120mm}\right)$$

$$low = \begin{cases} \omega + \varphi & (Z_{mm} > 0) \\ \pi - \omega + \varphi & (Z_{mm} < 0) \end{cases}$$

$$high^* = high + low$$

$$\omega = \sin^{-1}\left(\frac{r_{rot}}{r_{side}}\right)$$

$$\varphi = \alpha - \frac{\pi}{2}$$

$$\alpha = \frac{\pi - high}{2}$$