

$$1. U_g - U_{R_{LED}} - U_{CE} - U_{LED} = 0$$

$I_C = ?$ für LED $\approx I_B$

$$I_C = 20 \text{ mA}$$

$$\Rightarrow R_{LED} = \frac{U_g - U_{CE} - U_{LED}}{I_C}$$

$U_{CE} \rightarrow$ Datenblatt

Collector-Emitter
Saturation-Voltage = 200 mV

$$U_{CE} \approx 0,2 \text{ V}$$

brü.
 $\frac{0,3 \text{ V}}{V_{CE(sat)}} \rightarrow V_{max}$

$$R_{LED} = \frac{3,3 \text{ V} - 0,2 \text{ V} - 2,1 \text{ V}}{0,02 \text{ A}} \leftarrow \text{in dem Fall anpassen.}$$

2. a) Basis-Widerstand:

$$U_s - U_B - U_{BE} = 0$$

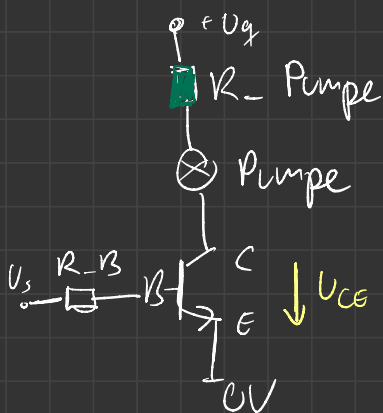
$$R_{Basis} = \frac{U_s - U_{BE}}{I_B} \rightarrow I_B = \frac{I_C}{h_{FE}}$$

b) h_{FE} :

$$I_C = h_{FE} \cdot I_B \rightarrow R_{Basis} = \frac{h_{FE} (U_s - U_{BE})}{I_C}$$

$$U_{BE} = V_{BE(sat)}: 0,6$$

$$h_{FE} = 40$$



$$1. U_g - U_{R_{Pumpe}} - U_{CE} - U_{CE} = 0$$

$$I_C = 100 \text{ mA}$$

$$\Rightarrow R_{Pumpe} = \frac{U_g - U_{CE} - U_{CE}}{I_C}$$

$U_{CE} \Rightarrow$ Datenblatt

Collector-Emitter Saturation-Voltage = $0,3 \text{ V}$!

$V_{CE(sat)}$
(V)_{max}

$$R_{Pumpe} = \frac{3,3 \text{ V} - 0,3 \text{ V} - 3 \text{ V}}{0,1 \text{ A}} = 0$$

\uparrow $0,1 \text{ A} = I_{C \text{ max}}$
anpassen.

2. a) Basis-Widerstand:

$$U_s - U_{RB} - U_{BE} = 0$$

$$R_{Basis} = \frac{U_s - U_{BE}}{I_B} \rightarrow I_B = \frac{I_C}{h_{FE}}$$

b) h_{FE} :

$$I_C = h_{FE} \cdot I_B \rightarrow R_{Basis} = \frac{h_{FE} (U_s - U_{BE})}{I_C}$$

$$U_{BE} = V_{BE(sat)} = 0,6$$

$$h_{FE} = 40 = 100$$

$$R_{B} = \frac{100 \cdot (3,3 \text{ V} - 0,6)}{0,1} = 2,7 \text{ k}\Omega$$

Pin 3, 3V

Motor

