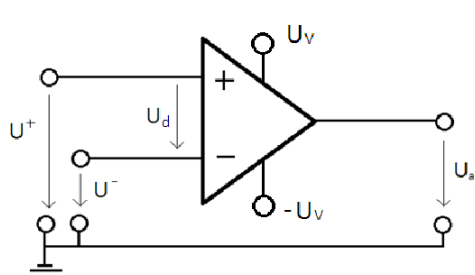


# OPV Grundschaltungen - Übersicht

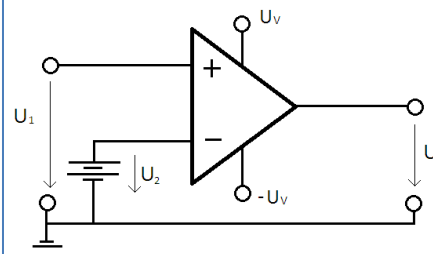
## Der OPV



$$U_a = \begin{cases} -U_V & \text{für } U_d < 0 \\ U_V & \text{für } U_d > 0 \end{cases}$$

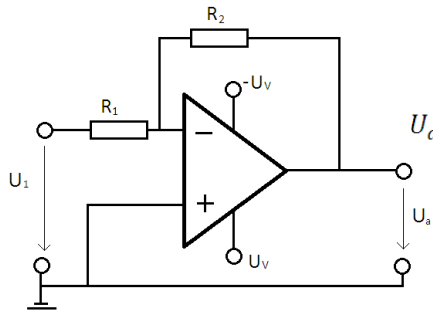
$$U_a = V * U_d$$

## Der Komperator



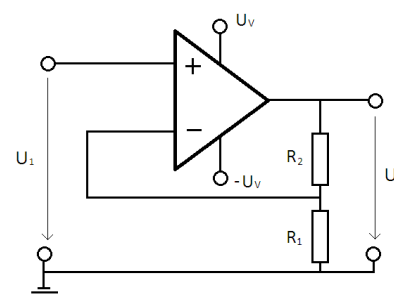
$$U_a = \begin{cases} -U_V & \text{für } U_1 < U_2 \\ U_V & \text{für } U_1 > U_2 \end{cases}$$

## Invertierender Verstärker



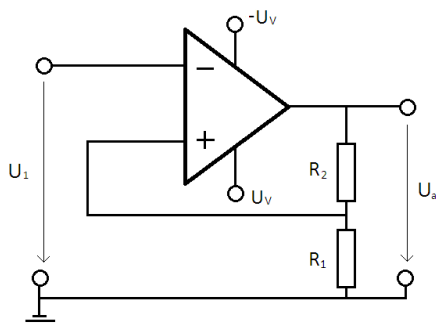
$$U_a = \begin{cases} U_V & \text{für } U_1 < -\frac{R_1}{R_2} U_V \\ -\frac{R_2}{R_1} U_1 & \text{sonst} \\ -U_V & \text{für } U_1 > \frac{R_1}{R_2} U_V \end{cases}$$

## Nicht-invertierender Verstärker



$$U_a = \begin{cases} -U_V & \text{für } U_1 < -\frac{R_1}{R_1 + R_2} U_V \\ \left(1 + \frac{R_2}{R_1}\right) U_1 & \text{sonst} \\ U_V & \text{für } U_1 > \frac{R_1}{R_1 + R_2} U_V \end{cases}$$

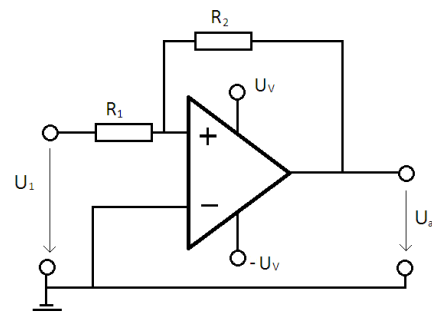
## Invertierender Schmitt-Trigger



$$U_{1\text{ein}} = -\frac{R_1}{R_1 + R_2} U_V$$

$$U_{1\text{aus}} = \frac{R_1}{R_1 + R_2} U_V$$

## Nicht-invertierender Schmitt-Trigger

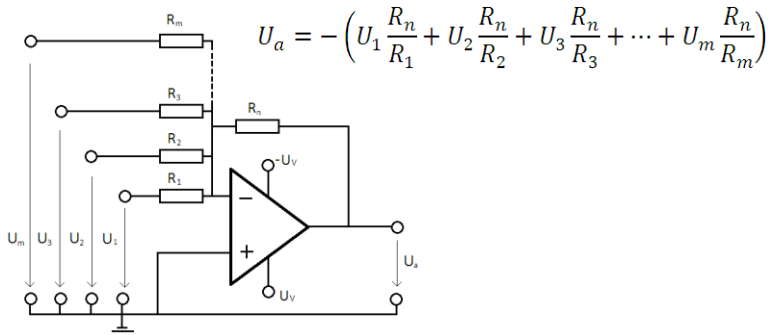


$$U_{1\text{ein}} = \frac{R_1}{R_2} U_V$$

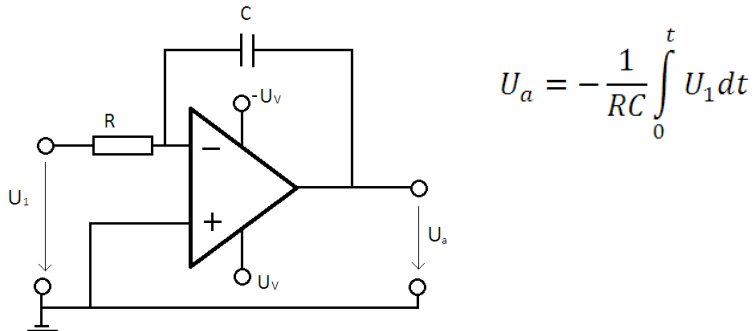
$$U_{1\text{aus}} = -\frac{R_1}{R_2} U_V$$

# OPV Grundschaltungen - Übersicht

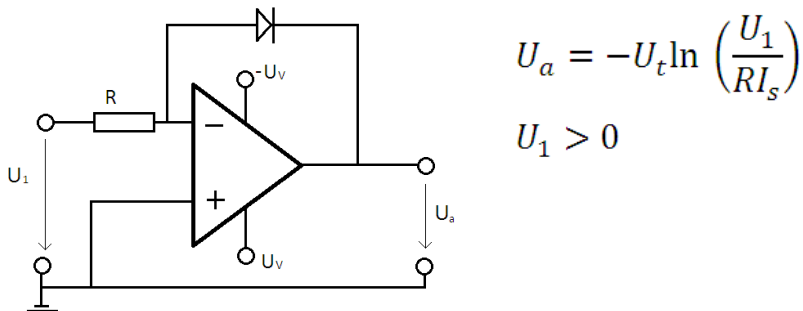
## Der Umkehraddierer \*



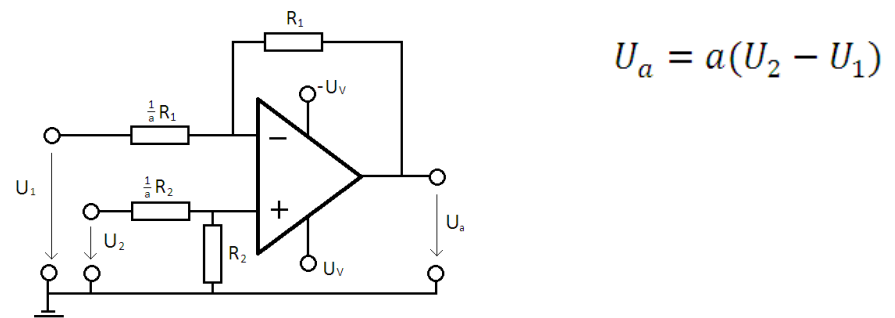
## Der Integrierer \*



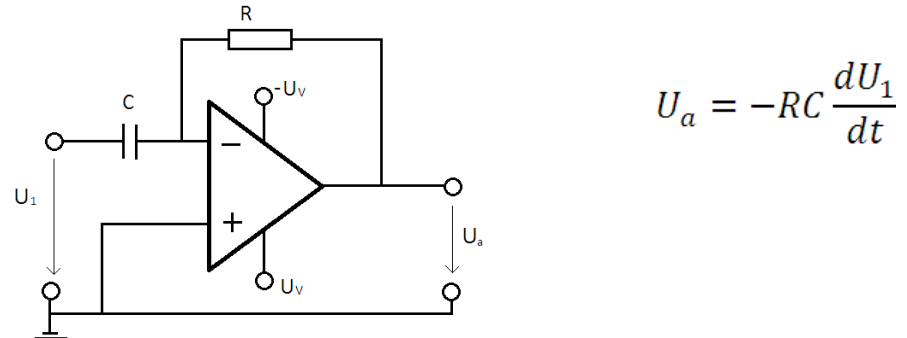
## Der Logarithmierer \*



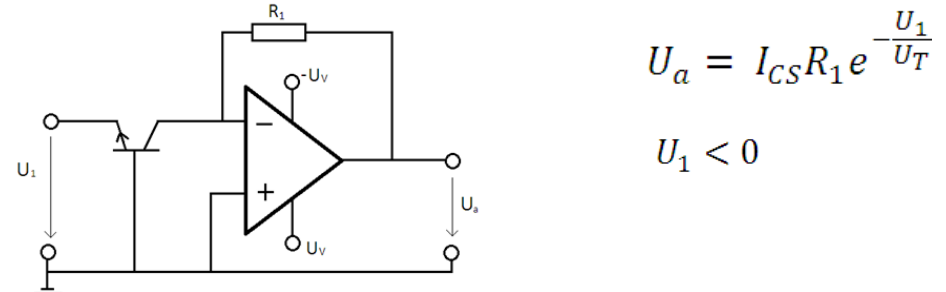
## Der Subtrahierer \*



## Der Differenzierer \*



## Der Exponentialverstärker \*



\* Die maximale Ausgangsspannung  $U_a$  beträgt  $U_V$ . Die minimale Ausgangsspannung  $U_a$  beträgt  $-U_V$ .