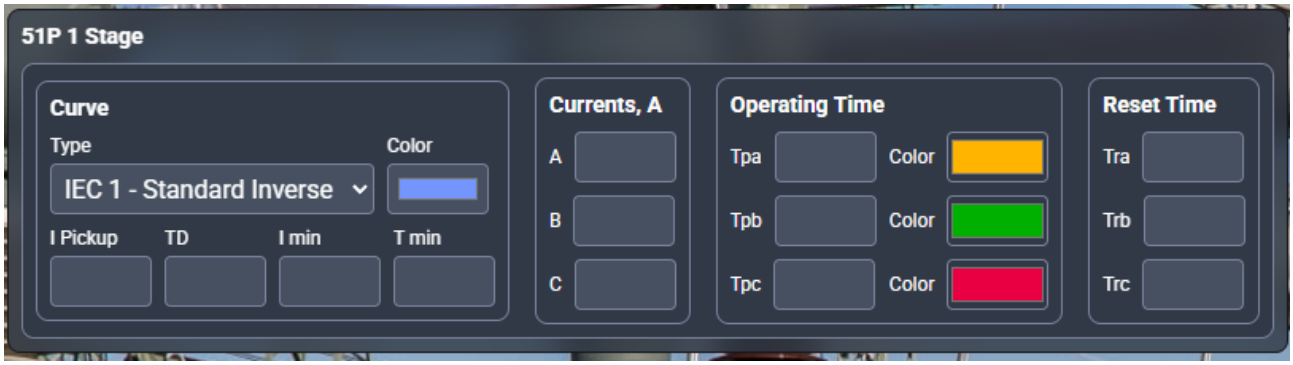
OVERCURRENT

Protection → **Overcurrent**

At this point overcurrent protection has four stages **51P, 51N** function and four stages with custom curves.

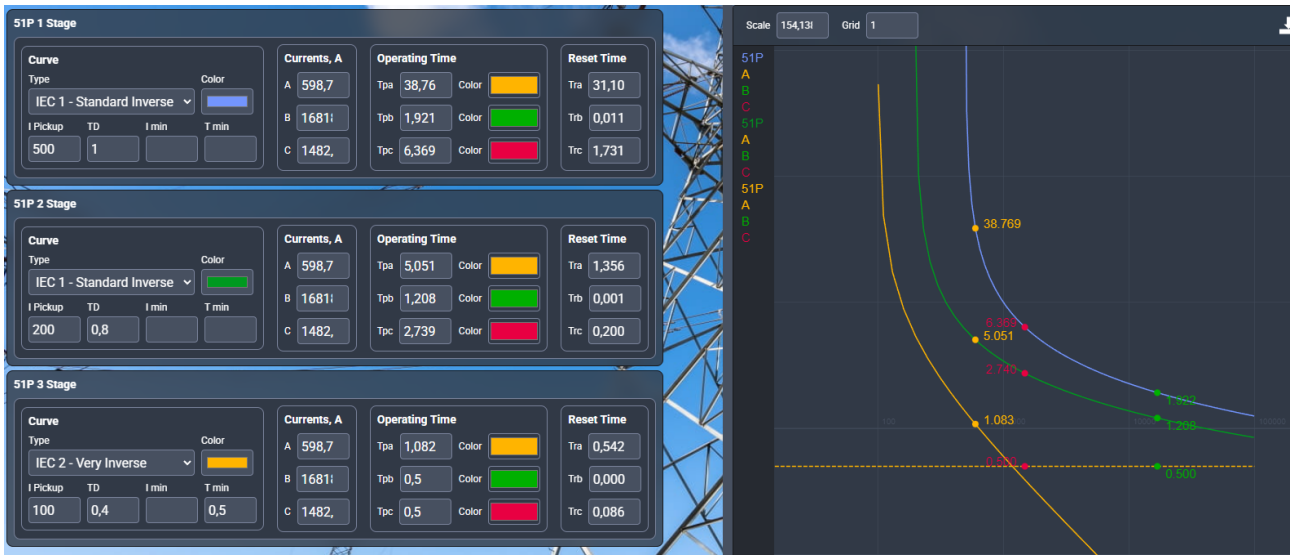


Curve section is used to specify settings of the stage. With usual pickup current and time dial you can adjust minimal operational time and current.

In **Currents** section you can insert or link from **COMTRADE** page currents for **Operating time** and **Reset time** calculation for each phase.

Each stage has 20 most usable characteristics (see next page).

Example of calculations.



RelayHelper
You can just see

Name	Operating time	Reset time
IEC 1 - Standard Inverse	$TD\frac{0.14}{\left(\left(\frac{I}{I_{Pickup}}\right)^{0.2}-1\right)}$	$TD\frac{13.5}{\left(1-\left(\frac{I}{I_{Pickup}}\right)^{2}\right)}$
IEC 2 - Very Inverse	$TD\frac{13.5}{\left(\left(\frac{I}{I_{Pickup}}\right)^{1}-1\right)}$	$TD\frac{47.3}{\left(1-\left(\frac{I}{I_{Pickup}}\right)^{2}\right)}$
IEC 3 - Extremely Inverse	$TD\frac{80}{\left(\left(\frac{I}{I_{Pickup}}\right)^{2}-1\right)}$	$TD\frac{80}{\left(1-\left(\frac{I}{I_{Pickup}}\right)^{2}\right)}$
IEC 4 - Long-Time Inverse	$TD\frac{120}{\left(\left(\frac{I}{I_{Pickup}}\right)^{1}-1\right)}$	$TD\frac{120}{\left(1-\left(\frac{I}{I_{Pickup}}\right)^{1}\right)}$
IEC 5 - Short-Time Inverse	$TD\frac{0.5}{\left(\left(\frac{I}{I_{Pickup}}\right)^{0.04}-1\right)}$	$TD\frac{4.85}{\left(1-\left(\frac{I}{I_{Pickup}}\right)^{2}\right)}$
U 1 - Moderately Inverse	$TD\left(0.0226+\frac{0.0104}{\left(\left(\frac{I}{I_{Pickup}}\right)^{0.02}-1\right)}\right)$	$TD\frac{1.08}{\left(1-\left(\frac{I}{I_{Pickup}}\right)^{2}\right)}$
U 2 - Inverse	$TD\left(0.18+\frac{5.95}{\left(\left(\frac{I}{I_{Pickup}}\right)^{2}-1\right)}\right)$	$TD\frac{5.95}{\left(1-\left(\frac{I}{I_{Pickup}}\right)^{2}\right)}$
U 3 - Very Inverse	$TD\left(0.0963+\frac{3.88}{\left(\left(\frac{I}{I_{Pickup}}\right)^{2}-1\right)}\right)$	$TD\frac{3.88}{\left(1-\left(\frac{I}{I_{Pickup}}\right)^{2}\right)}$
U 4 - Extremely Inverse	$TD\left(0.02434+\frac{5.64}{\left(\left(\frac{I}{I_{Pickup}}\right)^{2}-1\right)}\right)$	$TD\frac{5.64}{\left(1-\left(\frac{I}{I_{Pickup}}\right)^{2}\right)}$
U 5 - Short-Time Inverse	$TD\left(0.00262+\frac{0.00342}{\left(\left(\frac{I}{I_{Pickup}}\right)^{0.02}-1\right)}\right)$	$TD\frac{0.323}{\left(1-\left(\frac{I}{I_{Pickup}}\right)^{2}\right)}$
ANSI 1 - Long-Time Inverse	$TD\left(10.9296+\frac{28.0715}{\left(\left(\frac{I}{I_{Pickup}}\right)^{1}-1\right)}\right)$	$TD\frac{64.5}{\left(1-\left(\frac{I}{I_{Pickup}}\right)^{1}\right)}$
ANSI 2 - Short-Time Inverse	$TD\left(0.16965+\frac{1.3315}{\left(\left(\frac{I}{I_{Pickup}}\right)^{1.2969}-1\right)}\right)$	$TD\frac{4.155}{\left(1-\left(\frac{I}{I_{Pickup}}\right)^{1.2969}\right)}$
ANSI 3 - Extremely Inverse	$TD\left(0.1217+\frac{28.2}{\left(\left(\frac{I}{I_{Pickup}}\right)^{2}-1\right)}\right)$	$TD\frac{29.1}{\left(1-\left(\frac{I}{I_{Pickup}}\right)^{2}\right)}$
ANSI 4 - Very Inverse	$TD\left(0.491+\frac{19.61}{\left(\left(\frac{I}{I_{Pickup}}\right)^{2}-1\right)}\right)$	$TD\frac{21.6}{\left(1-\left(\frac{I}{I_{Pickup}}\right)^{2}\right)}$
ANSI 5 - Normal Inverse	$TD\left(0.8983+\frac{44.6705}{\left(\left(\frac{I}{I_{Pickup}}\right)^{2.0938}-1\right)}\right)$	$TD\frac{44}{\left(1-\left(\frac{I}{I_{Pickup}}\right)^{2.0938}\right)}$
ANSI 6 - Moderately Inverse	$TD\left(0.114+\frac{0.0515}{\left(\left(\frac{I}{I_{Pickup}}\right)^{0.02}-1\right)}\right)$	$TD\frac{2.85}{\left(1-\left(\frac{I}{I_{Pickup}}\right)^{2}\right)}$
ANSI 7 - Definite Inverse	$TD\left(1.06795+\frac{2.3985}{\left(\left(\frac{I}{I_{Pickup}}\right)^{1.5625}-1\right)}\right)$	$TD\frac{5.197}{\left(1-\left(\frac{I}{I_{Pickup}}\right)^{1.5625}\right)}$
RI	$\frac{TD}{\left(0.339-0.236\frac{I_{Pickup}}{I}\right)}$	0
RD	$5.8-1.35\ln ln\left(\frac{I}{TD\times I_{Pickup}}\right)$	0
Definite time	TD	0