

# LP Positions

Users can provide liquidity to Ambient by committing tokens to a specific pool. Liquidity providers (LPs) earn a yield on their capital generated by the swap fees paid into the pool. For receiving these fees, LPs must deal with the fact that the collateral they deposit is not fixed. LP positions continuously rebalance between the two tokens in the pair as swaps arrive in the pool.

This rebalance imposes a statistical cost on LPs in the form of impermanent loss (IL), which is the difference between the value of the rebalanced position vs. an equivalent static portfolio of the two assets. The larger the price ratio of the assets in the pool moves from the starting price, the larger IL cost the LP experiences.

There are two types of LP positions supported in Ambient: ambient liquidity and concentrated liquidity. Ambient liquidity is always active at every price point in the pool. This is recommended for users who want easy to manage positions that don't need to be manually managed. It's also recommended for users with smaller amounts of capital, since ambient liquidity has lower gas costs.

Concentrated liquidity is created in a user-determined price range. Concentrated liquidity requires substantially more sophistication and manual management. Concentrated LPs are more capital efficient, generating higher fees for a fixed amount of capital. But this is only true when the current pool price is inside the LP's price range. Out-of-range LPs do not contribute to the active liquidity in the pool, and therefore do not earn any fees for the time they're out-of-range. However even out-of-range LPs suffer from a form of statistical IL. For this reason it is imperative for yield-seeking concentrated LPs to minimize the time their positions spend out of range.

## Minting

Minting is the process of creating a new LP position or committing additional capital to a pre-existing LP position. Ordinary users can use the frontend web app to mint both concentrated and ambient liquidity

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Users who want to mint an LP position have the following parameters to choose from:

- The token pair to provide liquidity on.
- Concentrated or ambient liquidity type
- Lower and upper price range that the LP is active across (concentrated liquidity only)
- Deposit quantity. Can be fixed in terms of either side of the pair.
- Maximum slippage.
- Settlement type. Deposits can be made directly from ERC20 token or from the user's surplus collateral held at the DEX.
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Ambient LP position can be minted in the form of ERC20 LP tokens or as native lightweight entries inside the DEX contract. We recommend only using LP tokens when there's a specific need, as native LP positions incur a lower gas cost.

## Managing LP Positions

Users can view their existing LP positions through the web frontend

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Users can remove or burn liquidity in a specific position. This removes the liquidity from the pool and pays back the underlying collateral (based on the current pool's price) to the user. The token collateral can either be paid back to the user's wallet or deposited into the user's surplus collateral balance at the DEX.

Out of range positions can be re-positioned back into range with a single transaction. Under the hood this combines a burn, swap, and mint operation into a single transaction.

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