

Renko Trend Exhaustion Reversal

Expert Advisor Documentation

PLATFORM

MetaTrader 5 (MT5)

TYPE

Volatility Mean Reversion

TIMEFRAME

H1 (US500)

WEBSITE

www.algobot.live

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Overview

Renko Trend Exhaustion Reversal is a counter-trend Expert Advisor for MetaTrader 5, designed for the US500 index on the H1 timeframe. It converts raw price action into a stream of volatility-scaled **Renko bricks**, then fades directional runs that have become over-extended — but only when the broader tape is unusually quiet.

The core idea combines two distinct volatility measurements. First, brick size is derived from the **Average True Range (ATR)**, so the Renko grid automatically recalibrates to current market conditions. Second, **historical volatility (HV)** — the annualised standard deviation of recent log-returns — is monitored against its own rolling median to detect **volatility compression**. When a long run of same-direction bricks coincides with a compressed, quiet tape, Renko Trend Exhaustion Reversal treats the move as exhausted and enters against it, targeting a mean-reverting snap-back.

Design intent. This is a **mean-reversion / fade** strategy, not a trend-follower. It deliberately trades *against* the recent brick direction. Because it fades momentum, it performs best in range-bound or exhaustion-prone conditions and is most vulnerable during sustained, genuine breakouts.

How It Works

1. Volatility-Scaled Renko Bricks

On every closed bar the EA recomputes an adaptive brick size:

```
brickSize = BrickAtrMult × ATR(AtrPeriod)
```

A new brick is emitted each time the closed price moves at least `brickSize` away from the last brick boundary. The move is processed **greedily**, so a single large bar can emit multiple bricks at once. Each brick is recorded as `+1` (up) or `-1` (down) in a rolling direction history, and the length of the consecutive same-direction tail run is measured.

2. Historical Volatility & Compression

Historical volatility is the annualised standard deviation of the last `HvPeriod` log-returns, $\ln(C_t / C_{t-1})$, scaled by a simple square-root-of-time rule (~1,638 bars/year for H1). Each closed bar's HV reading is appended to a rolling history. The tape is considered **compressed** when:

```
HV < rolling median of the last HvPeriod HV readings
```

In other words, the market is quieter than its own recent norm — a condition under which an exhausted directional push is more likely to stall and revert.

3. Entry — Exhaustion Reversal

Once a run of `MinBricks` or more consecutive same-direction bricks forms *during compression*, the EA fades it:

- **Up-run exhaustion → SHORT:** after $\geq$ `MinBricks` consecutive up-bricks while HV is compressed, sell to fade the exhausted rally.
- **Down-run exhaustion → LONG:** after $\geq$ `MinBricks` consecutive down-bricks while HV is compressed, buy to fade the exhausted decline.

Only **one position at a time** (per symbol and magic number) is permitted; new signals are ignored while a trade is open.

4. Exit — Stop-Loss & Take-Profit

Every trade is submitted with a fixed stop-loss and take-profit calculated at entry:

- **Stop-loss:** placed one full brick beyond the last brick extreme, plus a quarter-ATR buffer.
 - Short: `SL = lastUpBrickTop + brickSize + 0.25 × ATR`

◦ Long: $SL = \text{lastDownBrickBottom} - \text{brickSize} - 0.25 \times ATR$

- **Take-profit:** a multiple of the measured risk distance — $TP = \text{entry} \pm \text{RewardRatio} \times \text{risk}$, where $\text{risk} = |\text{SL} - \text{entry}|$.

Worked example (SHORT)

Suppose $ATR = 5.0$ index points, $\text{BrickAtrMult} = 1.0$ ($\text{brickSize} = 5.0$), and after a 6-brick up-run during compression the last up-brick top sits at 5,120 with the current Bid at 5,118. The stop is $5,120 + 5.0 + (0.25 \times 5.0) = 5,126.25$, giving a risk of $5,126.25 - 5,118 = 8.25$. With $\text{RewardRatio} = 2.0$, the take-profit is $5,118 - (2.0 \times 8.25) = 5,101.50$.

Strategy in Action

The illustration below shows an example of how the strategy identifies a setup and triggers its entry and exit. This is a simplified, illustrative example for educational purposes — not real market data.



Fade the exhausted rally → SHORT, target the mean-reverting snap-back

Illustrative example only. Actual market behaviour varies.

Parameters

Parameter	Default	Description
BrickAtrMult	1.0	Renko brick size as a multiple of <code>ATR(AtrPeriod)</code> . Range 0.5–2.0, step 0.25. Larger values produce bigger bricks and fewer, slower signals.
AtrPeriod	14	ATR look-back (bars) used to size bricks and the stop-loss buffer. Range 7–28, step 7.
MinBricks	5	Minimum number of consecutive same-direction bricks required to declare trend exhaustion. Range 3–10, step 1.
HvPeriod	30	Look-back for the log-return historical volatility and its rolling median (compression test). Range 10–60, step 5.
RewardRatio	2.0	Take-profit distance as a multiple of the stop (risk) distance. Range 1.0–5.0, step 0.5.
Lots	0.10	Fixed order volume in lots. Range 0.01–1.0, step 0.05.
Magic	14001	EA magic number used to identify and isolate its own positions. Range 1–99999. Keep constant across optimization runs.

Recommended Settings

Renko Trend Exhaustion Reversal was designed and calibrated for the **US500 index on the H1 timeframe**. The defaults above are a sensible starting point; the parameters below respond well to optimization on your broker's data.

SUGGESTED OPTIMIZATION RANGES

- **BrickAtrMult:** 0.5 – 2.0 — controls brick granularity and signal frequency.
- **MinBricks:** 3 – 8 — how extended a run must be before it is faded.
- **HvPeriod:** 20 – 60 — sensitivity of the volatility-compression filter.
- **RewardRatio:** 1.5 – 4.0 — trade-off between win rate and per-trade payoff.

Tip. Hold `Magic` constant across every optimization pass so the tester and live accounts consistently recognise the EA's own positions. Because the strategy warms up its buffers, allow at least `max(AtrPeriod, HvPeriod) + a few bars` of history before the first trade can appear.

Curve-fitting caution. Over-optimising on a single historical window produces settings that look excellent in backtest but fail live. Validate any chosen parameters on out-of-sample data and forward-test on a demo account before risking real capital.

How to Install on MetaTrader 5

- 1 Copy `RenkoTrendExhaustionReversal.ex5` to your MT5 `MQL5\Experts\` folder
- 2 Restart MetaTrader 5 and refresh the Navigator panel
- 3 Drag the EA onto a chart matching the recommended symbol and timeframe (US500, H1)
- 4 Configure the input parameters and click **OK**
- 5 Enable **Algo Trading** in the MT5 toolbar

Note. To modify or recompile the EA, open `RenkoTrendExhaustionReversal.mq5` in MetaEditor and compile it to regenerate `RenkoTrendExhaustionReversal.ex5`. The EA acts only on completed bars, so signals are evaluated once per closed H1 candle.

Risk Warning

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