

Coil Tension Breakout

Expert Advisor Documentation

PLATFORM

MetaTrader 5 (MT5)

TYPE

Volatility Compression Breakout

TIMEFRAME

M15 – H4

WEBSITE

www.algobot.live

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Overview

Coil Tension Breakout is a volatility-compression breakout Expert Advisor. Its distinctive signal object is a short run of bars whose **per-bar ranges contract monotonically** — each bar is at least a set fraction narrower than the one before it — while the whole cluster stays packed inside a tight ATR envelope. That converging shape is a coil winding up: volatility is being wrung out of the market bar by bar, storing "tension" that tends to release with a directional thrust.

This is deliberately *not* a single narrow-range bar, and *not* an average-volatility "squeeze". It is a strictly narrowing **sequence** of individual bar ranges — a miniature pennant. When the just-closed bar breaks decisively out of that coil, and it does so **with** the prevailing slow-EMA trend, the EA takes the release as a continuation trade.

The edge comes as much from risk control as from selection. Because the coil is tight by construction, the structural stop placed just past the opposite coil edge is very close, so each trade risks little of the account. That tight stop is paired with a roomier ATR target for an asymmetric reward-to-risk profile, a failed-breakout fast exit that cuts trades that fall back into the coil, and a breakeven ratchet that protects winners.

Core idea: a coil is *compression that resolves into expansion*. The strategy waits for volatility to visibly collapse into a monotonically narrowing sequence, then trades only the trend-aligned release out of it — turning a coin-flip breakout into a filtered continuation.

How It Works

1. Detecting the coil

On every freshly-closed bar the EA looks at the `CoilBars` bars that end **just before** the most recent bar (the release bar). Those bars must satisfy two conditions simultaneously:

- **Monotonic contraction** — for every step through the cluster, $\text{range}[k] \leq \text{range}[k-1] \times \text{ContractionFactor}$. Each bar is genuinely tighter than its predecessor, so the shape is a winding coil rather than random chop. With the default `ContractionFactor = 0.90`, each bar's high-low range must be at most 90% of the previous bar's.
- **Tight envelope** — the coil's full span (`max high - min low`) must be $\leq \text{CoilAtrMax} \times \text{ATR}$. This rejects coils that are still wide enough to be hiding a swing, keeping only genuinely compressed clusters.

The high and low of that cluster become `coilHigh` and `coilLow` — the release boundaries used for both entry and risk placement.

2. The trend gate

A slow `EMA(TrendPeriod)` defines the tradable regime. The EA measures the EMA's **slope** across `SlopeLookback` bars: if the EMA is higher now than it was `SlopeLookback` bars ago the trend is up; if lower, the trend is down. Breakouts are only taken **with** that trend. Gating the release to the prevailing direction is what turns a random breakout into a continuation edge and keeps the majority of false breaks — the main source of drawdown — off the book.

3. Entry — the decisive release

The just-closed bar is the release bar. A single position is held at a time, symmetric long and short:

- **Long** — the release bar closes above $\text{coilHigh} + \text{BreakAtrMult} \times \text{ATR}$, prints a bullish body (`close > open`), and the slow EMA is sloping up.
- **Short** — the release bar closes below $\text{coilLow} - \text{BreakAtrMult} \times \text{ATR}$, prints a bearish body (`close < open`), and the slow EMA is sloping down.

The `BreakAtrMult` margin demands a decisive clearance of the boundary rather than a marginal touch, and the confirming body ensures the bar actually closed in the direction of the break.

4. Exits and risk management

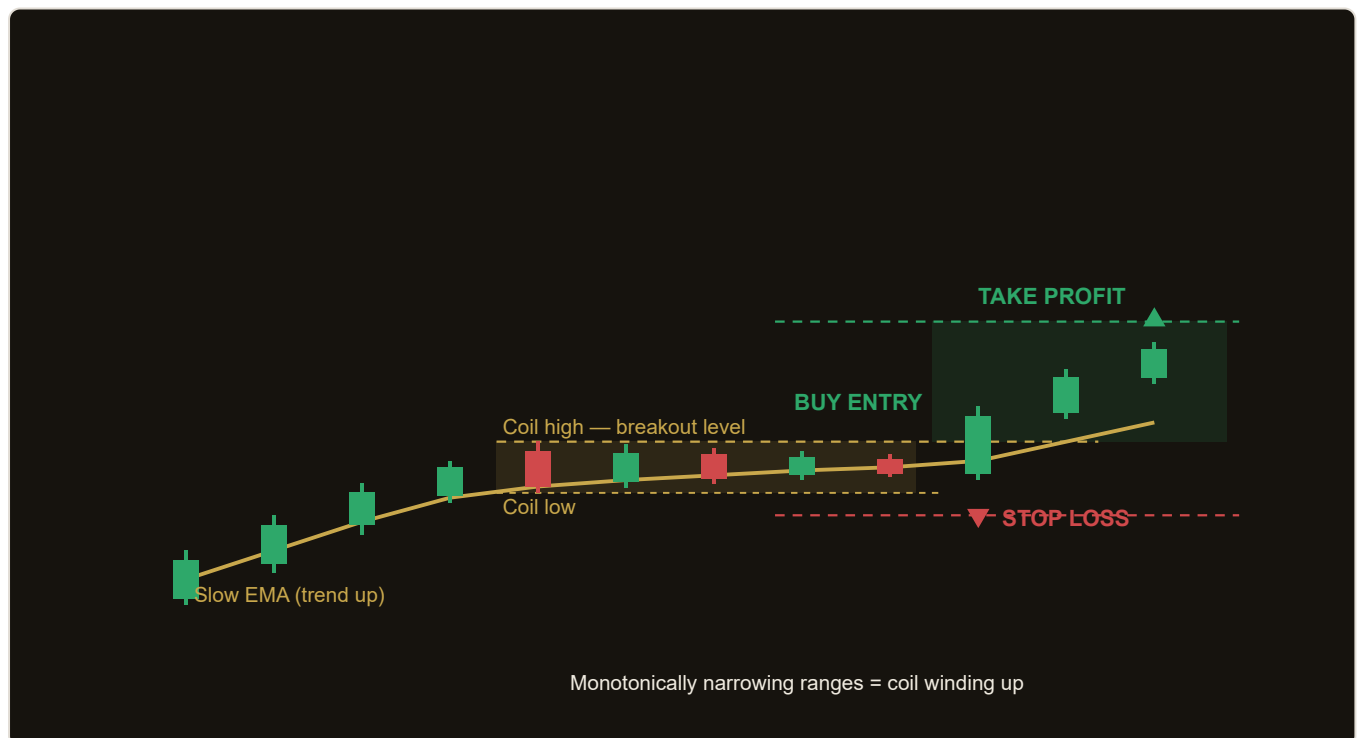
This is where the small, bounded drawdown comes from:

- **Structural stop** — the stop-loss sits just past the *opposite* coil edge (for a long, $\text{coilLow} - \text{StopBufferAtr} \times \text{ATR}$). Because the coil is tight by construction, this stop is close to entry, so each trade risks very little.
- **ATR target** — the take-profit is $\text{TpAtrMult} \times \text{ATR}$ away, a measured release move. A tight stop paired with a roomy target gives an asymmetric reward-to-risk ratio.
- **Failed-breakout fast exit** — if a later bar closes back through the release boundary (price falls back into the coil), the breakout has failed and the position is cut immediately, usually well before the structural stop is reached.
- **Breakeven ratchet** — once price has run $\text{BreakevenAtr} \times \text{ATR}$ in favour, the stop is pulled to the entry price, so a winner can never turn into a loser. This runs on every tick.

No repaint: signals are evaluated only once per freshly-closed bar and act on the bar that just closed. The breakeven ratchet is the only piece that runs intra-bar (on every tick), using the ATR read from the most recent closed bar.

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.



Illustrative example only. Actual market behaviour varies.

Reading the illustration

A trend advances into a cluster of bars whose ranges shrink step by step (the shaded coil). While the slow EMA still slopes up, the release bar closes decisively above the coil high with a bullish body — the **BUY ENTRY**. The structural stop sits just below the opposite coil edge (close, because the coil is tight), and the take-profit is a multiple of ATR above. If instead a later bar had closed back inside the coil, the failed-breakout exit would have cut the trade early.

Parameters

Parameter	Default	Description
CoilBars	4	Number of successively-narrowing bars that form the coil (range 3–8).
ContractionFactor	0.90	Each coil bar's range must be $\leq$ the previous bar's range $\times$ this value. Lower = stricter contraction (range 0.60–1.00).
CoilAtrMax	1.50	Maximum coil span (max high – min low) expressed in ATRs — how tight the whole coil must be (range 0.50–3.00).
TrendPeriod	100	Period of the slow EMA that defines the tradable trend regime (range 20–250).
SlopeLookback	5	Number of bars back used to measure the slow EMA's slope (range 2–20).
BreakAtrMult	0.15	Decisive-break margin: the release close must clear the coil boundary by this $\times$ ATR (range 0.00–1.00).
AtrPeriod	14	ATR averaging period used for the envelope, break margin, stop, and target (range 7–28).
StopBufferAtr	0.25	Extra ATR buffer placed beyond the opposite coil edge for the structural stop (range 0.00–1.50).
TpAtrMult	3.00	Take-profit distance in ATRs from entry (range 0.50–8.00).
BreakevenAtr	1.00	Move the stop to entry once price has run this many ATRs in favour; 0 disables the ratchet (range 0.00–3.00).
Lots	0.10	Fixed position volume in lots (range 0.01–1.00).
Magic	5127	Magic number identifying this EA's positions (range 0–9,999,999).

Tuning tips: tighten selectivity by lowering `ContractionFactor` (e.g. 0.80) and `CoilAtrMax`, or by raising `BreakAtrMult` so only strong releases qualify. Loosen it (fewer, higher-quality signals become more frequent) by moving those the other way. `TpAtrMult` versus `StopBufferAtr` sets your reward-to-risk shape; the tight structural stop is the reason the default target can be generous.

Recommended Settings

The strategy is timeframe-agnostic but was designed around liquid instruments where coils resolve cleanly rather than getting chopped apart by spread and noise.

- **Instruments:** liquid FX majors (e.g. EUR/USD, GBP/USD) or a major index.
- **Timeframes:** M15 to H4. Lower timeframes produce more coils but are more sensitive to spread; higher timeframes give fewer, cleaner releases.
- **Defaults:** the shipped defaults (4-bar coil, 0.90 contraction, 1.50-ATR envelope, EMA-100 trend gate, 3.0-ATR target) are a balanced starting point.
- **Account:** use a broker with tight spreads and low slippage — the structural stop is close, so execution quality matters.

Always validate before live use. Backtest and forward-test on your specific broker feed and instrument before committing real capital. Coil frequency, spread, and slippage vary between brokers and materially affect results.

How to Install on MetaTrader 5

- 1 Copy `CoilTensionBreakout.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
- 4 Configure the input parameters and click **OK**
- 5 Enable **Algo Trading** in the MT5 toolbar

Note: the EA manages a single position at a time and only evaluates entries on a freshly-closed bar, so leave the chart and terminal running. Ensure the chart symbol has enough loaded history to satisfy the warm-up (the larger of the coil length, `TrendPeriod`, and `AtrPeriod`, plus the slope lookback).

Risk Warning

Trading foreign exchange, CFDs, and other leveraged financial instruments involves substantial risk of loss and is not suitable for all investors. The strategies and tools described in this document are provided for **educational purposes only** and do not constitute financial advice, investment recommendations, or solicitation to trade. Always consult a qualified financial adviser before making trading decisions. Past backtest performance is not indicative of future results.