

Volatility Contraction Breakout

Expert Advisor Documentation

PLATFORM

MetaTrader 5 (MT5)

TYPE

Price-Action Breakout

TIMEFRAME

Any · H1–H4 recommended

WEBSITE

www.algotbot.live

⚠ Important Disclaimer This document is for educational and informational purposes only. It does not constitute financial or investment advice. Trading forex, CFDs, and other leveraged instruments involves substantial risk of loss and is not suitable for all investors. Past backtest performance does not guarantee future results. Never trade with capital you cannot afford to lose.

Overview

Volatility Contraction Breakout is a pure price-action Expert Advisor that uses *no indicators* — no ATR, no moving averages, no oscillators. Every decision is derived directly from raw bar OHLC values.

The strategy is built on a well-known market behaviour: before a strong directional move, ranges tend to **tighten** (a “coil”). Bars get smaller and swings overlap more. The EA measures this contraction purely from price, defines the consolidation box that the coil carves out, and then waits for a **strong-bodied candle to close decisively beyond a box fence** — the box expansion. A close above the box triggers a long; a close below triggers a short. Stops are placed at the breakout candle’s opposite extreme (structural), and targets are a configurable reward-to-risk multiple of that stop distance.

Because every `Bar()` / `Bars()` call uses the primary timeframe, the EA is single-timeframe and runs on whatever chart period it is attached to at test or trade time.

How It Works

On each completed bar, the EA evaluates three independent conditions in sequence. A trade is taken only when all of them line up on the just-closed candle.

1. Volatility Contraction (Squeeze) Test

The EA compares two adjacent windows of `ContractionBars` (K) bars sitting behind the breakout candle. It computes the **average bar range** (High – Low) of the most-recent K bars and of the prior K bars. The market is considered “coiled” only when:

$$\text{recentAvgRange} \leq \text{ContractionFactor} \times \text{priorAvgRange}$$

With the default `ContractionFactor = 0.80`, the recent ranges must average at most 80% of the prior ranges — a measurable squeeze, calculated without any indicator.

2. Consolidation Box

The bars directly behind the breakout candle form a box. Its fences are the **highest high** (`boxHigh`) and **lowest low** (`boxLow`) over the last `BoxLookback` bars. The box height (`boxHigh - boxLow`) is the energy stored against those fences and is also used to scale the breakout buffer.

3. Breakout Confirmation & Entry

The just-completed candle is the breakout candidate. It must satisfy two filters and then clear a fence:

- **Strong body:** the candle body must be at least `MinBodyPct` of its full High–Low range (default 50%) — rejecting weak, indecisive bars.
- **Buffer clearance:** the close must exceed the fence by `BreakoutBufferPct × boxHeight` — filtering out marginal pokes through the edge.

Direction logic

- **Long**
 - `Close > boxHigh + buffer` and the candle is bullish (`Close > Open`).
- **Short**
 - `Close < boxLow - buffer` and the candle is bearish (`Close < Open`).

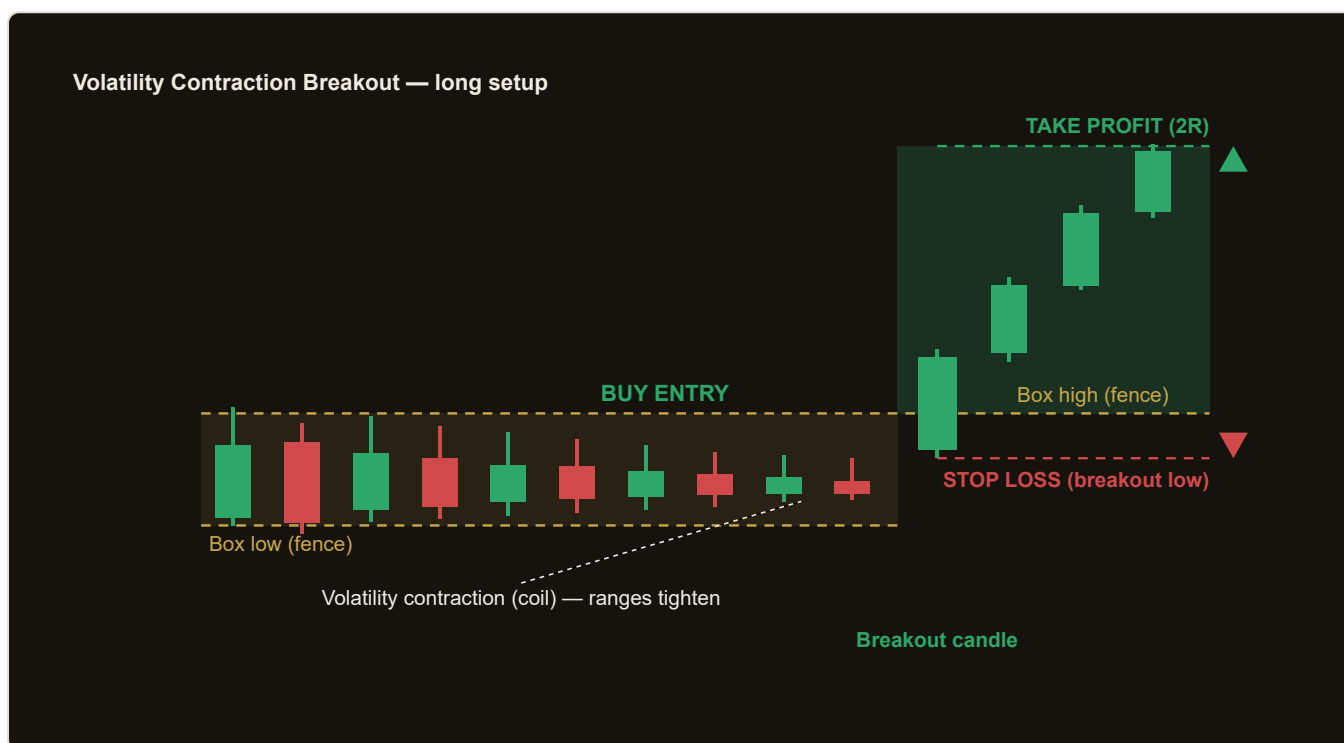
4. Stop Loss & Take Profit

- **Stop loss (structural):** placed at the opposite extreme of the breakout candle — the candle *low* for longs, the candle *high* for shorts.
- **Take profit:** `RewardRiskRatio × risk`, where *risk* is the distance from entry to the structural stop. With the default `RewardRiskRatio = 2.0`, the target is twice the stop distance.

Trade management. The EA acts **once per completed bar** (new-bar detection) and holds **at most one position per magic number** at a time. There is no pyramiding and no averaging in. A position closes when price reaches its fixed stop loss or take profit.

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.

Parameters

All parameters below map directly to the EA inputs. Defaults match the strategy's `DescribeParameters()` definition; ranges show the recommended optimization bounds and step.

Parameter	Default	Description
BoxLookback	20	Number of bars behind the breakout candle that form the consolidation box (highest high / lowest low). Range 10–40, step 2.
ContractionBars	5	Size (K) of each contraction window — the recent K bars vs. the prior K bars compared in the squeeze test. Range 3–12, step 1.
ContractionFactor	0.80	Squeeze threshold: the recent average range must be at most this fraction of the prior average range. Lower = stricter coil. Range 0.50–1.0, step 0.05.
BreakoutBufferPct	0.05	Breakout filter: the close must clear the fence by this fraction of box height. Higher = fewer, cleaner breakouts. Range 0.0–0.30, step 0.01.
MinBodyPct	0.50	Strength filter: the breakout candle body must be at least this fraction of its High–Low range. Higher = more decisive candles only. Range 0.0–0.90, step 0.05.
RewardRiskRatio	2.0	Take-profit distance as a reward:risk multiple of the structural stop distance. Range 1.0–5.0, step 0.5.
Lots	0.10	Fixed order volume in lots for each trade. Range 0.01–1.0, step 0.05.
Magic	4209	Magic number used to tag and identify this EA's positions, ensuring it manages only its own trades (one position per magic at a time).

Recommended Settings

The defaults are a balanced starting point suitable for liquid instruments. Adjust toward your instrument's character and always validate on out-of-sample data before live use.

- **Timeframe:** Any single timeframe; H1–H4 tend to produce cleaner consolidation boxes and fewer false breakouts than very low timeframes.
- **Instruments:** Trending, liquid markets — major FX pairs, index CFDs, or metals — where contraction-then-expansion patterns are common.
- **Tighter coil:** lower `ContractionFactor` (e.g. 0.65–0.75) and raise `MinBodyPct` for fewer but higher-conviction signals.
- **Cleaner breakouts:** increase `BreakoutBufferPct` (e.g. 0.08–0.12) to avoid marginal pokes through a fence.
- **Risk control:** keep `Lots` conservative; because the stop is structural, position size should reflect the variable distance to the breakout candle's extreme.

Optimization tip. Start by tuning `BoxLookback` and `ContractionBars` together (they define what “a coil” means for your instrument), then refine `ContractionFactor` and the two breakout filters. Optimize `RewardRiskRatio` last so it does not mask weak entry quality.

How to Install on MetaTrader 5

- 1 Copy `VolatilityContractionBreakout.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

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.