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# Bollinger Squeeze Release Momentum

Expert Advisor Documentation

| PLATFORM | TYPE | TIMEFRAME | WEBSITE |
| --- | --- | --- | --- |
| MetaTrader 5 (MT5) | Volatility Breakout (Squeeze Release) | M15 – H1 | www.algobot.live |

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## Overview

**Bollinger Squeeze Release Momentum** is a volatility-compression breakout Expert Advisor. It waits for the market to coil — a period where price energy builds while range contracts — and then trades the ignition of the move the moment that compression releases.

Compression is detected by comparing two classic envelopes around price. The **Bollinger Bands** (a simple moving average of close, plus and minus a multiple of the standard deviation) measure how far price is straying from its mean. The **Keltner Channels** (an exponential moving average, plus and minus a multiple of the Average True Range) measure the same width using volatility instead of dispersion. When the narrower Bollinger Bands sit *entirely inside* the wider Keltner Channels, the market is in a **squeeze**: quiet, range-bound, storing energy.

The trade is taken on the **squeeze release** — the completed bar where the Bollinger Bands push back outside the Keltner Channels, signalling that volatility has re-expanded. Direction is decided by a non-repainting least-squares momentum slope, then filtered by a long-period trend baseline and a volume check so the EA only acts on genuine, well-supported breakouts.

Every ingredient is computed from **completed OHLCV bars only**, so no signal repaints. The strategy is single-timeframe: it reads only the chart it is attached to, and was designed with FX majors and index CFDs on the M15–H1 range in mind, though it is not locked to any instrument.

> **Why the squeeze works:** Volatility is mean-reverting — extended quiet periods are typically followed by expansion. By entering only as the bands re-expand (rather than during the calm), the EA aims to be positioned at the start of the directional move rather than guessing while price is still coiling.

## How It Works

### 1. Detecting the Squeeze

On each completed bar the EA rebuilds both envelopes over the same `BandPeriod` window:

- **Bollinger Bands** — basis = SMA(close); upper/lower = basis ± `BbStdMult` × population standard deviation of close.
- **Keltner Channels** — mid = EMA(close); upper/lower = mid ± `KcAtrMult` × ATR( `AtrPeriod` ).

The squeeze is **ON** when the Bollinger upper band is below the Keltner upper band *and* the Bollinger lower band is above the Keltner lower band — the narrow band nested wholly inside the wide one.

### 2. The Release Trigger

The EA compares the squeeze state on the two most recently completed bars. A **release** occurs when the squeeze was ON one bar ago and is OFF now. That single-bar transition is the ignition event — no other entry is taken while the squeeze persists.

### 3. Direction — Momentum Slope

Direction comes from a **least-squares linear-regression slope** over the last `MomentumPeriod` closes. A rising slope points long; a falling slope points short. Because it is fitted only to completed bars, it does not repaint.

### 4. Confirmation Filters

A release only becomes a trade if it agrees with both structural filters:

- **Trend baseline** — a long `TrendEmaPeriod` EMA. Longs are allowed only when price is above it; shorts only when price is below it. This keeps breakouts aligned with the prevailing market structure.
- **Volume participation** — the release bar's tick volume must be at least `VolumeFactor` × the average volume across the band window, so the EA skips hollow, low-participation spikes.

**Long entry, all conditions met**

Squeeze ON last bar → OFF this bar (release), momentum slope > 0, close above the trend EMA, and release volume ≥ 1.10 × the window average → the EA opens a `Buy` at the Ask.

### 5. Stops, Targets & Trailing

Risk is entirely ATR-based, so it adapts to current volatility:

- **Initial stop** — `SlAtrMult` × ATR away from entry.
- **Take-profit** — `RewardRiskRatio` × the stop distance (a fixed reward:risk target).
- **Chandelier trailing stop** — once a trade is 1R in profit (price has moved `SlAtrMult` × ATR in favour), the stop begins ratcheting to `TrailAtrMult` × ATR behind price. It only ever moves in the profitable direction, and a small epsilon filter (5% of ATR) suppresses trivial adjustments to cut broker churn.

### 6. Volatility-Normalised Position Sizing

Lot size is scaled by comparing short-term ATR against a slower baseline ATR(`AtrPeriod` × 3). When current volatility is stretched relative to its own baseline, the multiplier shrinks (clamped between 0.5× and 2.0×), so risk-per-trade stays roughly constant:

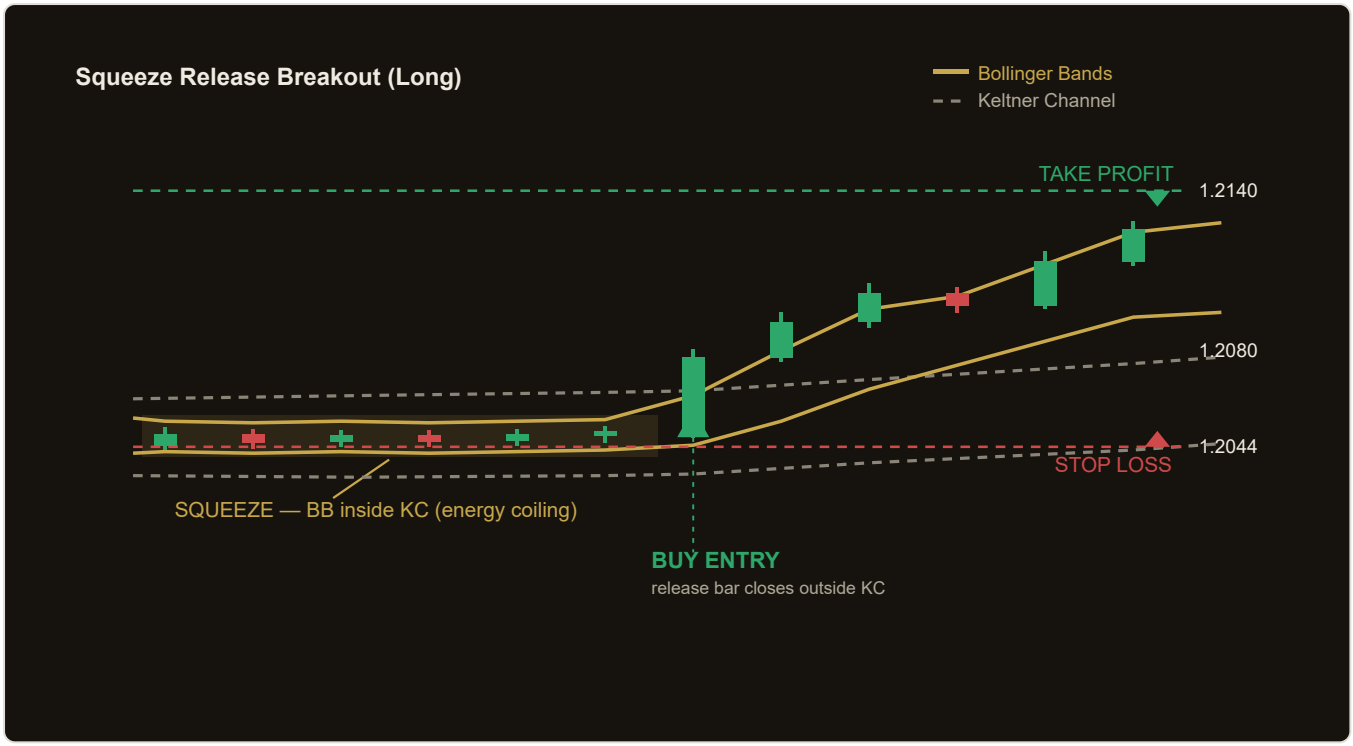
```
sizeMult = clamp(baseAtr / atr, 0.5, 2.0)
volume   = round(Lots × sizeMult, 2)   // floored at 0.01
```

### 7. Position Management

The EA holds **one position per magic number** at a time. New-bar detection ensures the logic runs exactly once per completed bar; trailing management runs every bar whether or not a new trade is opened, while entries are evaluated only when no position is currently open.

## 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

| Parameter | Default | Description |
|---|---|---|
| **BandPeriod** | `20` | Shared basis length for the Bollinger SMA and the Keltner EMA, in bars. Range 10–40, step 2. |
| **BbStdMult** | `2.0` | Bollinger band width in standard deviations of close. Range 1.5–3.0, step 0.1. |
| **KcAtrMult** | `1.5` | Keltner channel width in ATRs. Wider values make the squeeze trigger more often. Range 1.0–3.0, step 0.1. |
| **MomentumPeriod** | `12` | Lookback for the least-squares momentum slope that sets trade direction. Range 6–30, step 2. |
| **AtrPeriod** | `14` | ATR length used for the Keltner channel, stops, targets and position sizing. Range 7–28, step 1. |
| **TrendEmaPeriod** | `50` | Trend-baseline EMA — longs only above it, shorts only below it. Range 20–150, step 10. |
| **VolumeFactor** | `1.10` | Release-bar tick volume must be ≥ this × the average volume of the band window. Range 0.5–2.5, step 0.1. |
| **SlAtrMult** | `1.8` | Initial stop distance in ATRs; also the 1R threshold that arms the trailing stop. Range 1.0–4.0, step 0.1. |
| **RewardRiskRatio** | `2.0` | Take-profit distance as a reward:risk multiple of the stop distance. Range 1.0–4.0, step 0.25. |
| **TrailAtrMult** | `2.5` | Chandelier trailing-stop distance in ATRs behind price. Range 1.0–5.0, step 0.25. |
| **Lots** | `0.10` | Base lot size before volatility scaling is applied. Range 0.01–1.0, step 0.05. |
| **Magic** | `730220` | Unique identifier tagging this EA's orders and positions so it manages only its own trades. |

## Recommended Settings

The defaults are a balanced starting point for FX majors and index CFDs on the M15–H1 range. Adjust to instrument character and always validate on a demo account first.

### SYMBOLS & TIMEFRAME

- **Instruments:** FX majors (EURUSD, GBPUSD, USDJPY) and liquid index CFDs.
- **Timeframe:** M15 to H1. Lower timeframes fire more releases but include more noise; higher timeframes give fewer, cleaner signals.

### TUNING GUIDANCE

- **Fewer, higher-quality signals:** raise `VolumeFactor` (e.g. 1.3–1.5) and/or `KcAtrMult` toward the lower end so the squeeze is stricter.
- **More frequent signals:** lower `VolumeFactor` toward 0.8 and widen `KcAtrMult`, accepting looser confirmation.
- **Choppier instruments:** lengthen `TrendEmaPeriod` to filter more counter-trend breakouts; shorten it for faster-turning markets.
- **Risk profile:** `RewardRiskRatio` 2.0 balances hit-rate and payoff; higher values need a stronger trend to reach target, lower values bank profit sooner.

> **Tip:** Because sizing is volatility-normalised, keep `Lots` modest and let the EA's ATR scaling manage exposure. Optimise `BandPeriod`, `KcAtrMult` and `VolumeFactor` together — they jointly control how often a valid squeeze release appears.

## How to Install on MetaTrader 5

1. Copy `BollingerSqueezeReleaseMomentum.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

> **Before going live:** run the Strategy Tester over recent history for your chosen symbol and timeframe, then forward-test on a demo account. Confirm the EA opens, trails and closes trades as described before committing real capital.

## 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.