

Garman Klass Volatility Breakout

Expert Advisor Documentation

PLATFORM	TYPE	TIMEFRAME	WEBSITE
MetaTrader 5 (MT5)	Volatility Breakout	Any (Single TF)	www.algobot.live

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Overview

Garman Klass Volatility Breakout is a volatility-ignition breakout Expert Advisor. Instead of measuring volatility the crude way — close-to-close, which discards the intrabar path, or raw High–Low range, which ignores where the bar opened and closed — it uses the **Garman-Klass estimator**, which reads the full OHLC of every candle and is roughly five times more statistically efficient than close-to-close variance.

The per-bar Garman-Klass variance is defined as:

$$GK = 0.5 \cdot \ln(H / L)^2 - (2 \cdot \ln 2 - 1) \cdot \ln(C / O)^2$$

Because a bar's High is always at least its Open and Close, and its Low always at most, the term $\ln(H/L)$ dominates the smaller $\ln(C/O)$ term, and the coefficient $(2 \cdot \ln 2 - 1) \approx 0.386$ is below 0.5 . As a result GK is always non-negative and its square root is a clean per-bar volatility reading.

The strategy watches for the market to sit quietly and then *ignite*: a single candle whose Garman-Klass volatility explodes well above the recent baseline, while simultaneously breaking price out of the baseline range in a decisive, directional way. It is fully symmetric — the same logic triggers longs above the box and shorts below it.

Why Garman-Klass? By using Open, High, Low *and* Close of each bar, the estimator captures far more information from the same data than a simple close-based measure. That efficiency lets the EA distinguish a genuine regime expansion from one more noisy candle with fewer bars of history.

How It Works

On every completed bar the EA performs a three-stage evaluation. It acts only once per bar, using the newest fully-completed candle (shift 1) as the ignition candidate, and only when no position for its Magic number is currently open.

1. Baseline — the quiet regime

Over the last `BaselinePeriod` completed bars *behind* the trigger candle, the EA computes the RMS (root-mean-square) Garman-Klass volatility, `baselineVol = sqrt(mean(GK))`. This is the market's "normal" energy level. The very same window also carves out a price box, recording its highest high (`baselineHigh`) and lowest low (`baselineLow`).

2. Ignition — the expansion candle

The newest completed bar is the trigger. Its own volatility, `ignitionVol = sqrt(GK_trigger)`, must reach at least `ExpansionFactor × baselineVol`. This filters out ordinary candles and demands a real jump in energy — a break out of the recent regime rather than more of the same noise.

3. Confirmation — directional breakout

An energetic candle alone is not enough; it must also point somewhere. The close is measured against the candle's own range via `closePos = (Close - Low) / (High - Low)`:

- **Long:** an up-body candle ($\text{Close} > \text{Open}$) that closes in the **top** `ClosePositionPct` of its range **and** whose close clears `baselineHigh`.
- **Short:** a down-body candle ($\text{Close} < \text{Open}$) that closes in the **bottom** `ClosePositionPct` of its range **and** whose close breaks below `baselineLow`.

Exit — ATR-based stop and reward:risk target

Risk is defined entirely from the Average True Range measured at the completed bar. When a signal fires, the EA sends a market order with:

- **Stop loss:** `AtrStopMult × ATR` from the entry price.
- **Take profit:** `RewardRiskRatio × stopDistance` — a fixed multiple of the stop distance.

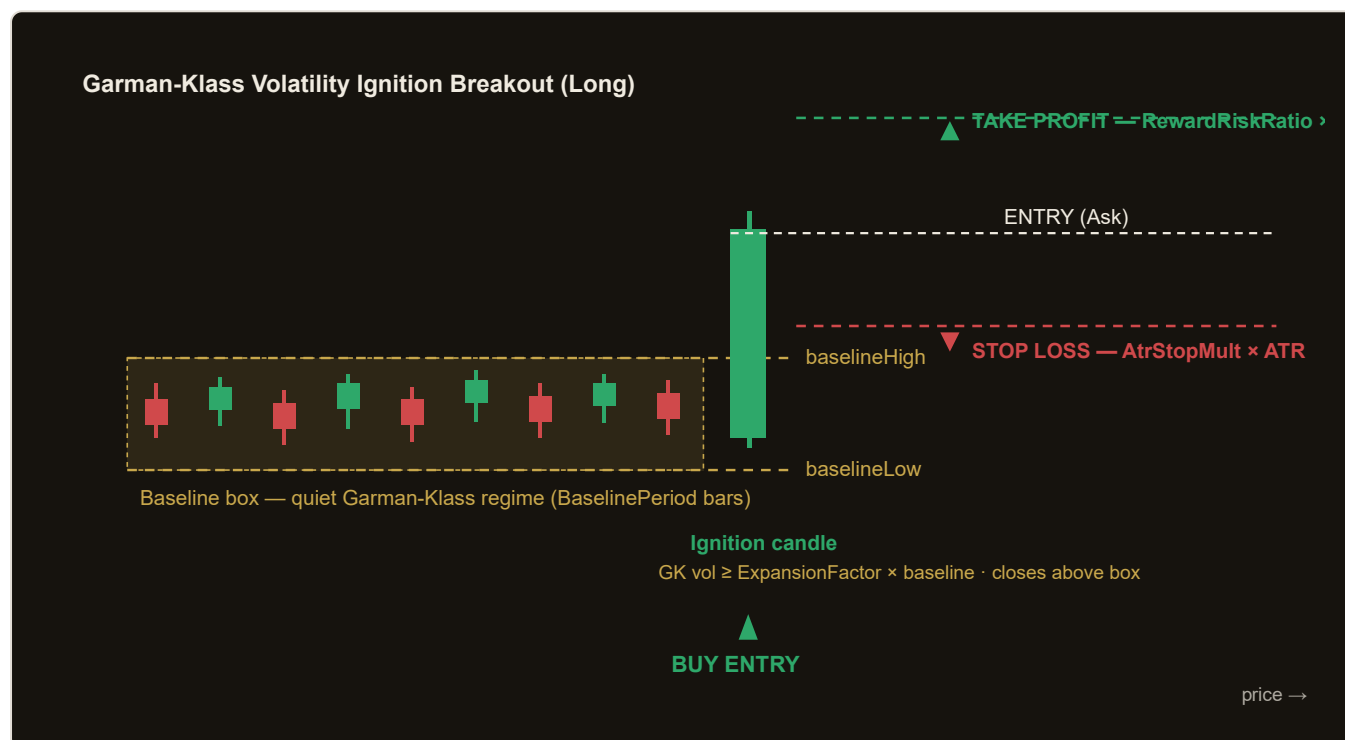
Longs enter at the Ask with the stop below and target above; shorts enter at the Bid with the stop above and target below. There are no trailing adjustments — each trade runs to its stop or target, and only **one**

position per Magic is allowed at a time.

Single timeframe. Every candle read uses the chart's own timeframe, so the strategy runs on whatever timeframe you attach it to. Choose the timeframe deliberately — it defines what "a bar" and therefore "an ignition" means.

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
BaselinePeriod	20	Number of completed bars behind the trigger candle used to form the volatility baseline and the price box. Integer, range 10–60, step 5.
ExpansionFactor	1.8	Ignition filter: the trigger bar's Garman-Klass volatility must be at least this multiple of the baseline volatility. Higher = rarer, more explosive setups. Numeric, range 1.2–3.5, step 0.1.
ClosePositionPct	0.66	Directional confirmation: the close must sit within the top (long) or bottom (short) fraction of the trigger candle's range. Numeric, range 0.50–0.90, step 0.05.
AtrPeriod	14	Averaging period for the ATR used to size the protective stop. Integer, range 7–30, step 1.
AtrStopMult	2.0	Stop-loss distance as a multiple of ATR from the entry price. Numeric, range 1.0–4.0, step 0.25.
RewardRiskRatio	1.8	Take-profit distance as a reward:risk multiple of the ATR stop distance. Numeric, range 1.0–4.0, step 0.25.
Lots	0.10	Fixed trade volume in lots. Numeric, range 0.01–1.0, step 0.05.
Magic	7314	Magic number identifying this EA's positions. Ensures the one-position-at-a-time rule applies only to trades opened by this strategy.

Recommended Settings

The defaults are a balanced starting point. Because the strategy is timeframe-agnostic, the key decision is which timeframe defines a "bar" and therefore an ignition candle.

SUGGESTED BASELINE CONFIGURATION

- **Symbol:** liquid major FX pairs (e.g. EUR/USD, GBP/USD) or index CFDs with clean OHLC data.
- **Timeframe:** H1 is a sensible default — long enough that an ignition candle reflects a real move, short enough to produce a workable number of setups.
- **BaselinePeriod:** 20 bars gives a stable read of the recent regime without being so long it smooths away the contrast.
- **ExpansionFactor:** 1.8 balances selectivity and frequency; raise toward 2.5–3.5 for fewer, cleaner breakouts.

- **AtrStopMult / RewardRiskRatio:** 2.0 stop with a 1.8 target keeps trades on the right side of the ATR while allowing room for the move to develop.

Tuning example

On a noisy, range-bound instrument you may see too many marginal signals. Increasing **ExpansionFactor** from 1.8 to 2.4 and **ClosePositionPct** from 0.66 to 0.75 demands a stronger, more decisive ignition candle — cutting trade count but improving the quality of each breakout that survives the filters.

Always backtest and forward-test first. Optimal parameters differ by symbol, timeframe, and broker spread. Validate any configuration on out-of-sample data and a demo account before committing real capital.

How to Install on MetaTrader 5

- 1 Copy **GarmanKlassVolatilityBreakout.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

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