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Yang Zhang Expansion Momentum

Expert Advisor Documentation

PLATFORM	TYPE	TIMEFRAME	WEBSITE
MetaTrader 5 (MT5)	Volatility Regime Momentum	Any (H1 / H4 recommended)	www.algobot.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

Yang Zhang Expansion Momentum is a trend-initiation Expert Advisor built around the **Yang-Zhang realized-volatility estimator** — a drift-independent, gap-inclusive measure of how much a market is actually moving. Rather than reacting to a price breaking a level, the EA reacts to a change of *volatility regime*: the moment a quiet market ignites into an active one.

The core idea is that volatility clusters and that new trends are frequently born when an expansion of volatility begins on top of a directional lean that is *already present*. The strategy therefore waits for a fresh volatility expansion (the "ignition"), then trades in the direction the market was already drifting when the expansion fired. Expansions that ignite with no directional lean are treated as noise and ignored.

The EA runs on a **single timeframe** — whichever chart it is attached to — and manages at most one position per magic number at a time.

> **What makes Yang-Zhang volatility special?** It blends three variance sources — overnight (gap) returns, open-to-close returns, and the drift-free Rogers-Satchell intrabar range — into a single minimum-variance, unbiased estimate. Because it is drift-independent, the volatility reading stays honest even when price is trending hard, so a genuine expansion can be told apart from ordinary directional movement.

How It Works

1. Tracking the volatility regime

On each newly completed bar the EA computes the Yang-Zhang volatility (`YZ`) over the trailing `VolPeriod` window. It maintains a rolling history of these readings and derives a slow **baseline** — the simple moving average of the previous `BaselinePeriod` values (the current reading is excluded). The baseline represents the market's recent "normal" level of activity.

2. The ignition trigger

An entry is armed only on a **fresh cross** of `YZ` from below to above `baseline × ExpansionFactor`. Only the exact crossing bar can arm a trade — the EA never chases a regime that is already hot. This is a volatility-regime event, not a price-range breakout.

```
threshold = baseline × ExpansionFactor
crossUp   = (YZ_prev <= threshold) AND (YZ_now > threshold)
```

3. Direction from pre-existing drift

Direction is decided by the drift that was already in place when volatility ignited. The EA measures the cumulative log-return over the window and normalises it by the random-walk expectation, `YZ × √VolPeriod`:

```
drift   = ln( Close_now / Close_(now − VolPeriod) )
driftZ  = drift / ( YZ × √VolPeriod )
```

- **Go long** when `driftZ > +MinDriftZ` — the market was leaning up as it ignited.
- **Go short** when `driftZ < −MinDriftZ` — the market was leaning down as it ignited.
- **Stand aside** when `|driftZ| ≤ MinDriftZ` — a directionless ignition is rejected as noise.

4. Entry orders and protective levels

When a trade is triggered, the EA reads the ATR over `AtrPeriod` and places a market order with an asymmetric stop and target:

```
LONG :  SL = entry − AtrStopMult   × ATR
        TP = entry + AtrTargetMult × ATR
SHORT:  SL = entry + AtrStopMult   × ATR
        TP = entry − AtrTargetMult × ATR
```

With the defaults (`AtrStopMult 2.0`, `AtrTargetMult 3.0`) the target sits farther than the stop, giving a positive reward-to-risk profile on the initial placement.

5. Exits

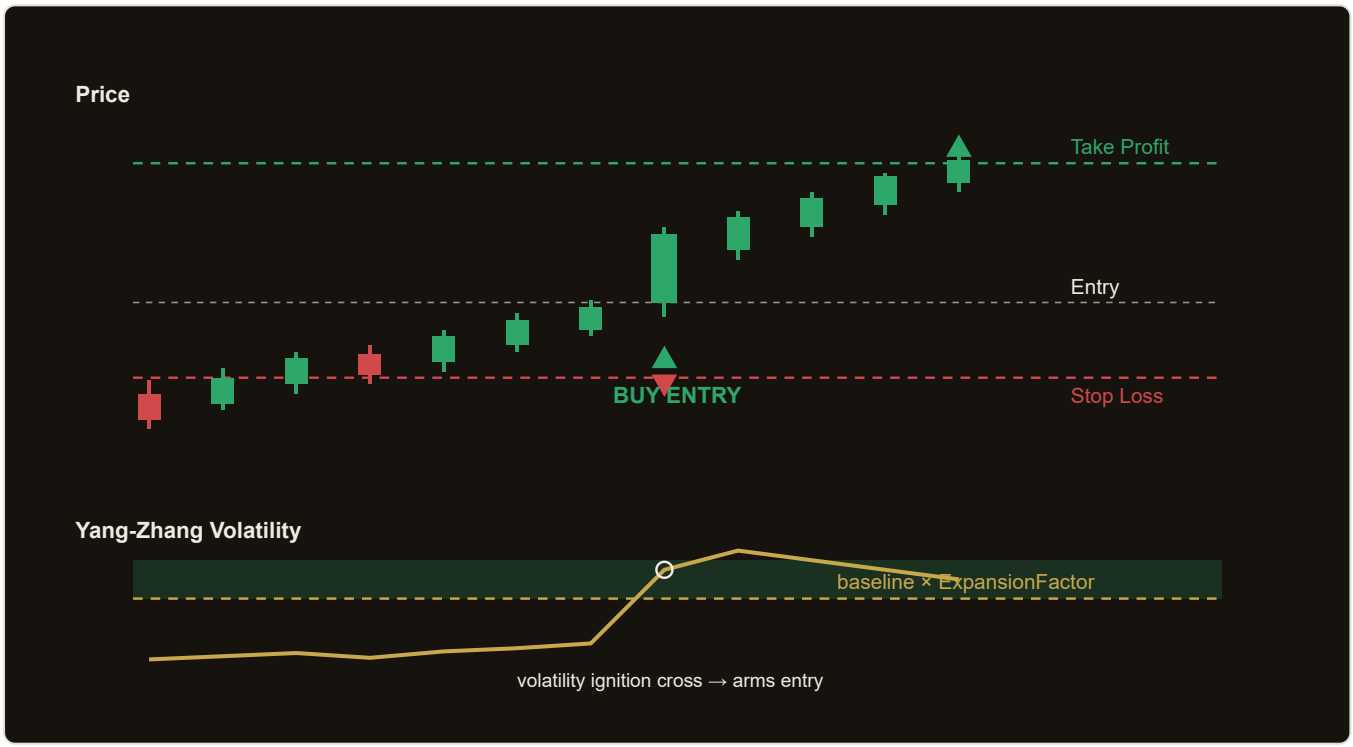
A position is closed by whichever of these comes first:

- **ATR stop-loss** — the protective SL is hit.
- **ATR take-profit** — the TP is reached.
- **Regime exit (vol collapse)** — when the current `YZ` falls back below its baseline, the expansion's fuel is considered spent and the EA flattens the position immediately, regardless of price.

> **One position at a time.** While a position with the EA's magic number is open, the strategy only manages the exit — it will not stack or reverse. A new ignition is considered only after the current position is closed.

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.

In the illustration, price has been gently drifting higher (a positive `driftZ`). When Yang-Zhang volatility crosses up through the `baseline × ExpansionFactor` threshold, the ignition bar arms a **long** entry in the direction of that existing lean. The ATR stop sits below and the ATR target above; here price expands into the take-profit. Had volatility instead collapsed back below its baseline, the position would have been flattened by the regime exit.

Parameters

Parameter	Default	Description
VolPeriod	`20`	Window (bars) for the Yang-Zhang volatility and the cumulative drift measurement. Range 10–50, step 2.
BaselinePeriod	`50`	Number of prior YZ readings averaged into the slow baseline the current volatility must expand above. Range 20–150, step 10.
ExpansionFactor	`1.15`	Regime trigger multiplier: YZ must cross above `baseline × ExpansionFactor` to arm an entry. Range 1.0–1.6, step 0.05.
MinDriftZ	`0.50`	Direction gate: the random-walk-normalised drift `|driftZ|` must exceed this for a trade. Larger values demand a stronger pre-existing lean. Range 0.0–2.0, step 0.10.
AtrPeriod	`14`	ATR lookback used to size the protective stop and target. Range 7–30, step 1.
AtrStopMult	`2.0`	ATR multiple for the stop-loss distance from entry. Range 1.0–4.0, step 0.5.
AtrTargetMult	`3.0`	ATR multiple for the take-profit distance from entry. Range 1.0–6.0, step 0.5.
Lots	`0.10`	Trade volume in lots. Range 0.01–1.0, step 0.05.
Magic	`7412`	Magic number identifying this EA's positions so it manages only its own trades.

Recommended Settings

The strategy is timeframe-agnostic and runs on whatever chart it is attached to. As a starting point:

- **Timeframe:** H1 or H4 tend to produce cleaner volatility-regime shifts with fewer false ignitions than very low timeframes.
- **Symbols:** liquid instruments with well-behaved sessions — major FX pairs (e.g. EUR/USD, GBP/USD) or major indices.
- **Volatility window:** the default `VolPeriod 20` / `BaselinePeriod 50` pairing keeps the trigger responsive while the baseline stays stable. Widen the baseline to demand a calmer "normal" before an expansion counts.
- **Selectivity:** raise `ExpansionFactor` and/or `MinDriftZ` to take fewer, higher-conviction ignitions; lower them for more frequent entries.

Example — tuning for conviction

Setting `ExpansionFactor = 1.30` and `MinDriftZ = 0.80` requires both a stronger volatility jump and a clearer directional lean before entering. This typically reduces trade count and filters out marginal ignitions, at the cost of missing softer moves. Always validate any change with a backtest and forward test before live use.

Note on warm-up. The EA needs enough completed bars to populate the baseline (roughly `BaselinePeriod + VolPeriod + 2` bars) before it can trade. Expect no signals immediately after attaching to a fresh chart or at the very start of a backtest.

How to Install on MetaTrader 5

1. Copy `YangZhangExpansionMomentum.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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