PSEDYS | TECHNICAL REFERENCE MANUAL V3.0

VWAP — Volume Weighted Average Price

Technical Reference Manual v1.0

PSEDYS | Complete Edition
TP×Vol Cumulative · Daily Reset · AVWAP · StdDev Bands · Institutional Reference · MTF · Bot vs TradingView

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1. What is VWAP? Concept

VWAP (Volume Weighted Average Price) represents the **volume-weighted average price** of the trading day. It is the standard institutional reference — investment funds, market makers, and execution algorithms use VWAP as a benchmark.

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Significance: If you fill a position at prices below VWAP = you bought below the daily average (good); above VWAP = you bought more expensively than the average (less favorable).

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2. Calculation Formula — Complete

2.1 Typical Price

```
TP[i] = (High[i] + Low[i] + Close[i]) / 3
```

2.2 Cumulative VWAP

```
CumTPV[i] = Σ (TP[j] × Volume[j])  for j = first_bar_of_day..i
CumVol[i] = Σ Volume[j]             for j = first_bar_of_day..i

VWAP[i] = CumTPV[i] / CumVol[i]
```

Daily reset: VWAP resets at the opening of each session (00:00 UTC for crypto, 09:30 ET for US stocks). CumTPV and CumVol restart from 0.

Consequence: At bar 1 of the day: VWAP = TP[1] (the only observation). Throughout the day, VWAP "converges" towards a stable price.

2.3 VWAP Bands (Standard Deviation)

```
Variance[i] = Σ (TP[j] - VWAP[i])² × Volume[j] / CumVol[i]
StdDev[i]   = √Variance[i]

Band1_Upper = VWAP + 1 × StdDev
Band1_Lower = VWAP - 1 × StdDev
Band2_Upper = VWAP + 2 × StdDev
Band2_Lower = VWAP - 2 × StdDev
```

VWAP bands are not identical to Bollinger Bands — they are volume-weighted and accumulated from the daily reset.

2.4 AVWAP (Anchored VWAP)

```
AVWAP[i] = Σ (TP[j] × Volume[j]) / Σ Volume[j]
           for j = anchor_bar..i
```

Common anchor points:
- Previous major High or Low (significant swing high/low)

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- Start day of a trend
- Date of a major event (earnings, listing, crash)
- Previous Week/Month High or Low

AVWAP does not reset daily — it is calculated from a manually specified anchor point.

2.5 Complete Numerical Example — 50 bars

Verification bar 1:

```
TP[1] = (High[1]+Low[1]+Close[1])/3 = 100.18
VWAP[1] = TP[1]×Vol[1] / Vol[1] = 100.18  ✓
```

Verification bar 2:

```
TP[2] = 100.42
CumTPV[2] = 100.18×1914 + 100.42×3233 = 516402.38
CumVol[2] = 1914 + 3233 = 5147
VWAP[2] = 516402.38 / 5147 = 100.3308  ✓
```

VWAP Table (selection):

Bar	TP	Volume	VWAP	Close vs VWAP
1	100.18	1914	100.1800	≈VWAP
5	101.05	3413	100.5992	> VWAP
10	103.09	1322	101.4090	> VWAP
20	105.62	1271	102.6802	> VWAP
30	108.48	4148	104.2316	> VWAP
40	111.61	3702	105.9543	> VWAP
50	114.78	1779	107.4056	> VWAP

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3. VWAP Interpretation

```
Close > VWAP: price throughout the day was mostly bought → bullish bias
Close < VWAP: price throughout the day was mostly sold → bearish bias
Close = VWAP: intraday equilibrium

VWAP as support: in a bullish trend, retracement to VWAP = entry point
VWAP as resistance: in a bearish trend, bounce at VWAP = Short entry
```

4. VWAP vs SMA vs EMA — Critical Differences

Aspect	VWAP	SMA	EMA
Weighting	Volume	Equal	Exponential (recency)
Reset	Daily (or anchor)	No	No
TP	(H+L+C)/3	Close	Close
Usage	Intraday/institutional reference	Trend ma	Trend ma
Lag	Low (converges quickly)	(N-1)/2 bars	Similar to EMA
Significance	Real average price of the day with volume	Average of prices	Recency-weighted average

VWAP cannot be used on daily or weekly charts (it makes no sense: one day = one bar = VWAP = TP). Use on intraday (1M, 5M, 15M, 1H).

5. Trading Signals

5.1 VWAP as Dynamic Support/Resistance

```
Intraday bullish trend:
  Retracement to VWAP + low volume = dynamic support
  → Long Entry with SL below VWAP − 0.5×ATR

Intraday bearish trend:
  Bounce at VWAP + low volume = dynamic resistance
  → Short Entry with SL above VWAP + 0.5×ATR
```

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5.2 VWAP Bounce

```
Price tests VWAP (touch) and returns in the direction of the main trend:
  Long: Close falls to VWAP, forms bullish reversal bar, low volume on retracement
  Short: Close rises to VWAP, forms bearish reversal bar
```

5.3 VWAP Break

```
Price crosses VWAP with high volume (RVOL > 1.5):
  Bullish break (Close > VWAP): possible bias change → Long
  Bearish break (Close < VWAP): possible bias change → Short
```

5.4 AVWAP Setup

```
AVWAP anchored at major swing low:
  Close > AVWAP: buyers from that swing are in profit → limited supply
  Close < AVWAP: buyers from swing low are in loss → selling pressure

AVWAP anchored at major swing high:
  Close < AVWAP: price below the average of those who sold at high → possible demand
```

5.5 Combined Filters

```
# VWAP position filter
above_vwap = close > vwap
below_vwap = close < vwap

# Entry in trend
entry_long = (
    above_vwap and                  # bullish relative to daily VWAP
    close > avwap_swing_low and     # bullish relative to AVWAP anchor
    pullback_to_vwap and            # retracement to VWAP
    ema_stack_bullish_4h            # macro bullish
)
```

6. VWAP in Different Regimes

Intraday bullish trend: Consistent Close above VWAP. Retracements to VWAP = opportunities. Price "rejects" VWAP as support.

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Sideways intraday: Price frequently crosses VWAP in both directions. VWAP as a magnet to which the price returns. Mean reversion to VWAP.

Intraday bearish trend: Consistent Close below VWAP. VWAP as resistance. Bounces at VWAP = Short opportunities.

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7. MTF

Level	Timeframe	VWAP Usage
Intraday	5M/15M	Daily VWAP as main reference
Intraday	1H	Daily VWAP + macro AVWAP
Macro	4H	AVWAP anchored at macro levels (not daily VWAP)

VWAP is not interpreted on 4H/1D (one bar = entire day → VWAP = daily TP). On 4H, anchored AVWAPs are used.

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8. PSEDYS — VWAP in the avwap_scalp Strategy

The `avwap_scalp` strategy in PSEDYS uses AVWAP as the primary reference:

```
# From strategy_profiles TI:
# avwap_scalp: tp_alloc=0/0/100, tp3_behavior=trailing, trail_pct=1%

# AVWAP as filter:
entry_long = (
    close > avwap and           # above AVWAP (bullish)
    rsi_pullback < 50 and       # RSI retracement
    volume_ok                   # confirmed volume
)

# Exit: trailing SL from TP3 with trail_pct=1%
# Entire allocation on TP3 with trailing → riding trend relative to AVWAP
```

AVWAP timeframes in PSEDYS: `avwap_5m` and `avwap_1h` — AVWAP channels on different timeframes.

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9. Bot vs TradingView Validation

```
□ TP = (High + Low + Close) / 3
□ CumTPV reset at the first bar of the day (00:00 UTC crypto)
□ VWAP = CumTPV / CumVol
□ AVWAP: reset at the specified anchor (NOT daily)
□ VWAP bands: volume-weighted StdDev (not simple population std)
□ Tolerance: < 0.001 USD
```

Python Script:

```python
def vwap(highs, lows, closes, volumes, session_starts=None):
    n = len(closes)
    tp = [(highs[i]+lows[i]+closes[i])/3 for i in range(n)]
    vwap_v = [None]*n
    cum_tpv = cum_vol = 0
    for i in range(n):
        if session_starts and i in session_starts:
            cum_tpv = cum_vol = 0  # daily reset
        cum_tpv += tp[i]*volumes[i]
        cum_vol += volumes[i]
        vwap_v[i] = cum_tpv/cum_vol if cum_vol > 0 else tp[i]
    return vwap_v

def avwap(highs, lows, closes, volumes, anchor_idx):
    n = len(closes)
    tp = [(highs[i]+lows[i]+closes[i])/3 for i in range(n)]
    avwap_v = [None]*n
    cum_tpv = cum_vol = 0
    for i in range(anchor_idx, n):
        cum_tpv += tp[i]*volumes[i]
        cum_vol += volumes[i]
        avwap_v[i] = cum_tpv/cum_vol
    return avwap_v
```

10. Practical Exercises

Exercise 1: Retracement to VWAP in Intraday Bullish Trend

Situation: BTC 5M. Bullish trend from the opening. Price rose 1.2% above VWAP. Now retracing towards VWAP on 3 small bars (low volume).

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Answer: Long Entry at VWAP touch. Healthy retracement on low volume to VWAP = classic entry opportunity in trend. SL below VWAP − 0.3×ATR(5M). TP1 at previous day's High; TP2 at VWAP_Band1_Upper.

Exercise 2: Break below VWAP with High Volume Midday

Situation: ETH 15M. Price was above VWAP all morning. At 13:00 UTC, large bearish bar breaks VWAP downwards with RVOL = 3.2. Followed by 2 bars retesting VWAP from below.

Answer: Intraday bias change — Short on retest. Break below VWAP with RVOL = 3.2 = intraday regime change. Retest of VWAP from below = confirmation that VWAP has become resistance. Short Entry on VWAP retest (Close below VWAP after retest). SL above VWAP + 0.5×ATR. TP at VWAP_Band1_Lower.

Indicator manual: VWAP — Volume Weighted Average Price Part 2 of 2.

11. Cheat Sheet — Quick Summary

Concept	Value / Rule
TP	`(High + Low + Close) / 3`
VWAP	`Σ(TP×Vol) / ΣVol` — cumulative from open
Reset	Daily (00:00 UTC crypto, 09:30 ET stocks)
AVWAP	VWAP anchored to specific point (NO daily reset)
VWAP Band 1	`VWAP ± 1×StdDev_vol_weighted`
VWAP Band 2	`VWAP ± 2×StdDev_vol_weighted`
Close > VWAP	Bullish intraday bias
Close < VWAP	Bearish intraday bias
VWAP support	Pullback to VWAP in bullish trend → Long
VWAP resistance	Bounce at VWAP in bearish trend → Short
VWAP break	With RVOL > 1.5 → bias change
Useful timeframe	1M–1H intraday; AVWAP on any TF
NOT on	4H/1D (one bar = entire day → daily TP)
vs SMA	VWAP: volume-weighted; SMA: equally weighted
Cause #1 error	Missing or incorrect daily reset
Cause #2 error	Close instead of TP=(H+L+C)/3

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