MCP SERVER | NO CODE | CLOUD HOSTED

Heart Rate Zone Calculator MCP for AI Agents

Personalizing Training Zones for Running, Cycling, and Swimming

The Heart Rate Zone Calculator gives you precision training zones using established formulas like Karvonen. It calculates specific heart rate ranges for running, cycling, or swimming, adjusting intensity based on your personal fitness level and goals. You can determine your physiological ceiling, define metabolic targets, and plan workouts optimized for endurance or VO2 Max development.

A+ Quality Score 100/100

heart-rate | training-zones | karvoden-method | fitness-optimization | athletic-performance

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vinkius.com/mcp/heart-rate-zone-calculator

SCAN TO VIEW

The connectivity layer between AI and the world's software.

Vinkius sits between AI and every application. All communication passes through Vinkius Cloud via the Model Context Protocol (MCP) — with governance, observability, and security at every layer.

Your AI Connections Run Through Vinkius Cloud

The world's largest managed MCP catalog

Vinkius is the connectivity layer where AI connects to the software your business already runs. We handle the hosting, the security, the credentials, the uptime — you get agents that actually do things.

We operate the world's largest managed MCP catalog. Major SaaS platforms, CRMs, databases, and cloud providers — running, monitored, production-ready. This MCP server is hosted and maintained by the Vinkius Cloud for AI Agents.

> *The agent doesn't manage credentials, doesn't manage uptime, doesn't manage security. Vinkius does.*
>
> — Architecture principle

Four Pillars of the Vinkius Runtime

01 — Security by design

Credentials stay encrypted at rest via AES-256. The AI agent never touches raw keys — they're injected into a sandboxed V8 isolate at runtime. Actions are logged, and connections have an emergency kill switch.

02 — Built on MCP Fusion

This MCP server was built with **MCP Fusion**, the open-source framework (Apache 2.0) that powers the entire Vinkius catalog. Schema-as-firewall strips undeclared fields, compiled PII redaction runs at zero overhead, and cryptographic lockfiles produce git-diffable audit trails.

03 — Deterministic observability

Eight immutable metrics per endpoint: request volume, p95 latency, error rate, active connections, cost attribution. A live payload feed logs every tool call with mutation detection.

04 — Autonomous operations

Servers are deployed, monitored, and patched autonomously. New capabilities and security patches ship weekly. Zero-downtime deployments ensure continuous availability across all managed MCP servers.

AES-256	Ed25519	24h TTL	V8 Isolate
Encryption at rest	PKI vault signatures	Ephemeral session keys	Sandboxed execution

One Token. Instant Access.

Every MCP server on Vinkius is accessed through a **Connection Token**. Tokens are generated in the cloud dashboard and produce a unique MCP endpoint URL. Paste this URL into any MCP-compatible client — no SDK required.

A single token can serve **multiple AI clients simultaneously**, or you can issue separate tokens per client for granular access control. Each token tracks its own request count, last activity timestamp, and can be individually enabled or revoked.

MCP ENDPOINT

```
https://edge.vinkius.com/{token}/mcp
```

Claude · Cursor · VS Code · Windsurf · Grok · Gemini

Security Is the Architecture

Security in Vinkius is not a feature — it's the foundation of the runtime. The gateway enforces multiple independent protection layers between AI agents and third-party APIs.

01 — Ed25519 PKI Vault

Every workspace has an Ed25519 Master Key. Session keys are generated ephemerally (24h TTL) and signed by the Master Key. Credentials never leave the vault boundary.

02 — V8 Isolate Sandboxing

Tool code runs inside isolated-vm V8 isolates with 64 MB memory caps and per-request timeouts. No filesystem access, no network access except through the SSRF-guarded fetch bridge.

03 — SSRF Guard

All outbound HTTP requests are DNS-resolved and validated before execution. Private IP ranges (10.x, 172.16-31.x, 192.168.x, AWS metadata 169.254.x) are blocked at the network layer.

04 — DLP & PII Redaction

A ResponseGuard pipeline intercepts every tool response. Configurable redaction patterns strip sensitive fields (emails, SSNs, card numbers) before data reaches the AI agent.

05 — Cryptographic Audit Trail

Every request is signed into a SHA-256 hash chain with Ed25519 signatures. Events form a tamper-proof, SIEM-exportable forensic record.

06 — Honeytoken Trap System

Phantom credentials are injected into isolated environments. If a honeytoken is used outside Vinkius infrastructure, the server is quarantined instantly.

Emergency Kill Switch

EU AI Act Art. 14(1) Compliant

The kill switch is an **emergency halt** mechanism — not a simple toggle. When triggered, it executes three actions atomically:

01 — Server deactivated

The MCP server is immediately taken offline across the entire cluster.

02 — All tokens revoked

Every connection token is invalidated. Total lockout — reconnection blocked until new tokens are issued.

03 — WebSocket connections killed

Active connections terminated via Redis pubsub broadcast. Propagates to every runtime node in the cluster.

Full Visibility. Zero Guesswork.

The Vinkius cloud dashboard includes a full MCP Governance suite — real-time analytics and security controls for production AI operations.

Control Plane

KPI dashboard with request volume, latency, success rate, token consumption, and AI-generated operational briefings.

Agent Activity

Which AI clients are connecting, how often, and what they're doing — real-time session tracking.

FinOps

Cost tracking per tool, payload compression savings, budget optimization signals, and consumption trends.

Tool Health

Slowest and most error-prone tools, with actionable root-cause insights and performance baselines.

Firewall & DLP

PII redaction activity, sensitive data protection counters, and security event timeline.

Incident Log

Error trends, failure rates, status-code breakdowns, and forensic audit trail access.

> Get started at **cloud.vinkius.com** — connect your AI agent in under 60 seconds.

Heart Rate Zone Calculator MCP

3 tools available
Cloud-hosted on Vinkius

This MCP takes the guesswork out of interval training. Instead of simply guessing what heart rate range you should be in, it calculates personalized zones using the Karvonen method based on your Heart Rate Reserve. You can run through specific disciplines—like cycling versus swimming—and the tool adjusts the intensity boundaries accordingly. Whether you're aiming for pure endurance or hitting a VO2 Max goal, the calculations ensure your training is precise and safe. It's designed to tell you exactly what metabolic effort you need. When you connect this MCP via Vinkius, your AI client can handle all the math, giving you structured plans and zone definitions without you having to consult multiple fitness guides or spreadsheets.

Core Capabilities

01 — Determine Maximum Heart Rate

Establishes a reliable maximum heart rate number for accurate training calculations.

02 — Calculate Training Zones

Generates specific, scientifically backed heart rate ranges across all five standard training zones for your chosen sport.

03 — Plan Workout Distribution

Provides a recommended time breakdown across the different training zones to meet specific athletic goals (e.g., Endurance or Threshold).

One Click on Vinkius — From Prompt to Execution

Available at **vinkius.com/mcp/heart-rate-zone-calculator** — connect your AI agent in three steps.

01 First, your AI client uses the tool to establish your accurate maximum heart rate based on initial measurements.

02 Next, it runs the core calculations, applying the Karvonen formula and adjusting for specific sports like running or swimming.

03 The result is a detailed breakdown of your training zones and a recommended time allocation plan aligned with your desired fitness outcome.

The bottom line is that you get highly personalized, scientifically calculated workout plans based on your body's unique physiological data.

Built For

This MCP is built for serious athletes and coaches who track performance metrics. If you're tired of guessing which heart rate zone you need to hit during a tough training session, this is for you. It's ideal for physical therapists designing rehabilitation plans or endurance runners optimizing race prep.

Endurance Coach

Uses the calculator to define precise heart rate zones and plan complex multi-day training cycles for clients.

Physical Therapist

Defines safe, measurable cardio rehabilitation zones tailored to a patient's current cardiovascular fitness level.

Competitive Athlete

Quickly generates optimized workout distributions for specific goals, like maximizing VO2 Max before a major race.

What Changes When You Connect

01 You stop guessing your training intensity. By using `get_max_heart_rate`, you establish a reliable physiological ceiling before any calculations begin.

02 Workout planning gets precise. Instead of vague advice, the tool's ability to calculate specific heart rate ranges ensures every zone is defined for running or cycling.

03 Training time is optimized. Using `get_workout_distribution`, your agent can recommend exactly how many minutes you need in Zone 4 versus Zone 2 to meet a VO2 Max goal.

04 It handles multiple sports types. You don't have to switch formulas; the MCP applies necessary sport-specific modifiers for cycling, running, and swimming.

05 You get immediate action items. The calculator moves beyond just providing numbers, giving you actionable session duration plans based on your objectives.

Real-World Applications

Designing a Race Prep Cycle

A coach inputs their client's baseline data and asks the agent to map out a 4-week plan. The agent uses `get_max_heart_rate` first, then `calculate_training_zones`, finally recommending optimal session lengths via `get_workout_distribution` for peak performance.

Adjusting Training After Injury

A physical therapist needs to set safe parameters for a patient returning to cycling. The agent defines the initial zones and suggests low-intensity work using specific heart rate ranges, keeping training measurable but conservative.

Comparing Sport Intensity

An athlete wants to know if swimming requires different targets than running. They query the calculator for both sports using their HRR data, getting two distinct sets of tailored metabolic zones and intensity boundaries.

Patterns to Avoid

Using simple age formulas

✗ AVOID

Calculating max heart rate just by subtracting 220 from the user's age. This is inaccurate because it ignores real-world field test data.

✓ INSTEAD

Always let your agent use the `get_max_heart_rate` tool first. It accepts recorded metrics, giving you a much more accurate physiological ceiling than simple formulas.

Treating all zones equally

✗ AVOID

Running a full 60 minutes at Zone 3 every day without adjusting the mix of effort. This leads to burnout and poor adaptation.

✓ INSTEAD

Use `get_workout_distribution` to plan your sessions. It breaks down time allocation, ensuring you hit the right blend of low-intensity (Zone 2) and high-intensity work (Zone 5).

Ignoring sport type

✗ AVOID

Applying running zone boundaries to a cycling workout, leading to inefficient or inaccurate training targets.

✓ INSTEAD

Specify the activity. The calculator applies necessary sport modifiers when defining zones, ensuring the range is correct whether you're on a bike or the pavement.

The Right Fit

Use this MCP if your goal is scientific precision in cardio training. If you need to define exact heart rate ranges for multiple sports (running, swimming, etc.) and link those zones directly to specific performance goals (like VO2 Max), this tool works perfectly. Don't use it if you just want general fitness advice or a simple activity tracker; that's not its job. Also, don't rely on it for medical diagnosis—it calculates metrics based on provided data only. If your training plan requires complex periodization over months, you might need an advanced scheduling tool alongside this MCP to manage the overall load, but for defining the *metrics* of a single workout, this is top tier.

Heart Rate Zone Calculator: Defining Precise Training Zones in Fitness

Right now, setting up a training session usually involves looking at complicated charts and guessing which zones you need to spend time in. You might copy-paste generic heart rate ranges from the internet or rely on simple age formulas that just don't account for your actual cardiovascular fitness.

With this MCP, your agent handles all the complexity. It takes your recorded metrics—your max HR and resting HR—and uses established methods to pinpoint your exact metabolic targets. You get a structured, science-backed plan telling you exactly what heart rate range corresponds to Zone 3 for swimming versus running.

Heart Rate Zone Calculator: Optimizing Workout Distribution for Athletes

The biggest time sink is manually calculating how much time you need in each zone. Should your race prep focus more on Zone 3 or Zone 4? You end up doing spreadsheets full of complex formulas, constantly recalculating session lengths.

Now, you simply ask the agent to plan a workout for a specific goal. It runs `get_workout_distribution` and gives you a precise minute-by-minute breakdown—say, '25 minutes in Zone 4, followed by 10 minutes in Zone 3.' It just works.

Heart Rate Zone Calculator: 3 Tools for Athletic Performance Metrics

Use these tools to generate accurate maximum heart rates, define specific metabolic training zones, or plan optimal workout durations tailored to your sport.

#	TOOL	DESCRIPTION
01	`calculate_training_zones`	Defines the exact heart rate range boundaries for all five training zones based on your fitness data.
02	`get_workout_distribution`	Recommends how many minutes you should spend in each zone to hit a specific performance goal.
03	`get_max_heart_rate`	Determines the most accurate maximum heart rate for a user using recorded test data.

See It in Action

Real prompts you can use once this MCP is connected to your AI agent through Vinkius Cloud.

U What are my cycling zones if my max HR is 190 bpm and resting is 60 bpm?

Cycling Training Zones

ZONE	INTENSITY (%)	HEART RATE RANGE (BPM)
1	50-60%	123 - 135
2	60-70%	135 - 147
3	70-80%	147 - 159
4	80-90%	159 - 171
5	90-100%	171 - 190

U I have a 60 minute session for VO2 Max. How should I distribute the time?

Optimal Workout Distribution: Power/VO2 Max Focus

For peak performance, structure your 60 minutes like this:

- Zone 1 (Warm-up): 5 mins
- Zone 2: 5 mins
- Zone 3: 10 mins
- **Zone 4 (Key Effort): 25 mins**
- Zone 5 (Peak): 15 mins

U Help me calculate my max heart rate if I'm 30 and hit 185 bpm in a test.

Based on your field test result, your maximum estimated heart rate is **185 BPM**. This metric gives us the accurate ceiling needed to define all subsequent training zones for optimal safety and performance tracking. You can now use this number to plan specific workouts across cycling or running disciplines.

Frequently Asked Questions

01 **How do I calculate my personalized heart rate zones using the Heart Rate Zone Calculator MCP?**

You provide your resting and maximum heart rates, specifying your sport. The system uses the Karvonen formula to generate precise ranges for all five training zones, making sure your effort is tailored to running, cycling, or swimming.

02 **Does the Heart Rate Zone Calculator MCP help me plan my workout time?**

Yes. After defining your zones, you can ask the system how to distribute a specific duration of exercise—say, 60 minutes—to hit a target like Endurance or VO2 Max.

03 **What kind of data does the Heart Rate Zone Calculator MCP need from me?**

It needs your physiological baselines, primarily your maximum heart rate and resting heart rate. The more accurate these numbers are, the better the calculated training zones will be.

04 **Is this tool good for different sports? Can it handle cycling and running?**

Absolutely. It supports multiple disciplines—running, cycling, swimming, etc.—and applies sport-specific modifiers to ensure the zone boundaries make sense for your chosen activity.

05 **Can I use Heart Rate Zone Calculator MCP if my fitness level is changing?**

Yes. Because it uses personalized metrics instead of general formulas, you can continuously refine and adjust your zones as your cardiovascular fitness improves or declines.

Go Live in 60 Seconds

Get your connection token from **cloud.vinkius.com**, then paste the endpoint URL into any MCP-compatible client.

YOUR MCP ENDPOINT

```
https://edge.vinkius.com/[TOKEN]/mcp
```

CLIENT	WHERE TO CONFIGURE
Claude AI	Profile → Customize → Connectors → "+" → Add custom connector → Paste endpoint
Cursor	Settings → Features → MCP Servers → "+ Add New MCP Server" → Type: SSE → Paste endpoint
VS Code	Ctrl/Cmd+Shift+P → "MCP: Add Server" → add `"heart-rate-zone-calculator": { "url": "…" }`
Windsurf	MCP Settings → `mcp_settings.json` → Add endpoint URL
ChatGPT	Settings → Tools & plugins → Add MCP server → Paste endpoint
Gemini	Extensions → Add MCP Server → Paste endpoint URL

ASK AN AI ABOUT THIS

Let your preferred AI explain this MCP server

- Ask ChatGPT
- Ask Claude
- Ask Perplexity
- Ask Gemini
- Ask Grok

READY TO CONNECT

Heart Rate Zone Calculator is live on Vinkius Cloud.

Get your connection token, paste it into your AI agent, and start building. No SDK. No deployment. Just results.

Start at cloud.vinkius.com →

vinkius.com · support@vinkius.com

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