GPUpartner

VALIDATION REPORT · TEXT GENERATION

Nemotron 3 Super 120B A12B

on RTX PRO 5000 Blackwell 48 GB · 2-bit (Q2_K) · Ollama / LM Studio · Chat

STATUS · NOV 22, 2026

Validated

5 of 5 checks pass

Nemotron 3 Super 120B A12B at 2-bit runs on the RTX PRO 5000 Blackwell 48 GB with 184K of context at about 98 tokens a second.

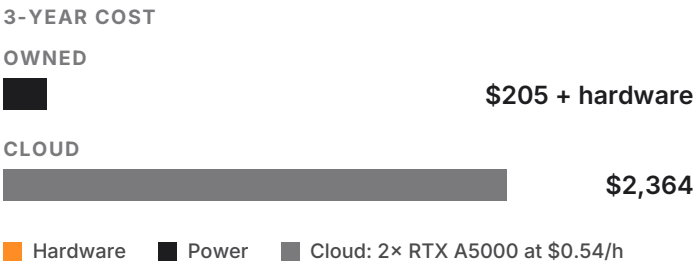
VALIDATION

CHECK	TARGET	RESULT	STATUS
Fits in GPU memory	48.0 GB usable	45.6 GB needed	PASS
Headroom	5% free	2.4 GB free (5%)	PASS
Context for chat	16K or more	184K	PASS
Writing speed	15 tok/s or more	98 tok/s	PASS
First reply	under 3 s, 2K prompt	1.2 s	PASS

Targets: a reply you can read along with, a first reply the use case tolerates, and 5% of memory left free. Calculated from published specs, not benchmarked.

BUDGET

HARDWARE, ONE-TIME	MSRP not entered
POWER, PER YEAR	$68 · 260 W at the wall
CLOUD INSTEAD, PER YEAR	$788
3-YEAR TOTAL, OWNED	Hardware + $205 power
3-YEAR TOTAL, CLOUD	$2,364
BREAK-EVEN	Needs the hardware MSRP



Budget basis: 4 h a day, power at $0.18 per kWh, cloud at RunPod on-demand prices as of Nov 22, 2026. Hardware at the MSRP entered in the calculator, not a GPU Partner quote. A 3-year view; resale value, staff time and taxes aren't counted.

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TECHNICAL DETAIL · TEXT GENERATION

Nemotron 3 Super 120B A12B

on RTX PRO 5000 Blackwell 48 GB · 2-bit (Q2_K) · Ollama / LM Studio · Chat

SETUP

PARAMETERS	124B, 12B active
PRECISION	2-bit (Q2_K)
CONTEXT	184K, auto
CHATS AT ONCE	1
USE	Chat
RUNS IN	Ollama / LM Studio
HARDWARE	RTX PRO 5000 Blackwell 48 GB
GPU CAN USE	48.0 GB of 48.0 GB

SAME MODEL, OTHER MACHINES

RTX 4090	Too big
RTX 5090	Too big
RTX PRO 6000 BLACKWELL	5-bit · 82 tok/s
M5 MAX 128 GB	5-bit · 32 tok/s
M3 ULTRA 256 GB	8-bit · 27 tok/s
DGX SPARK 128 GB	6-bit · 17 tok/s
RYZEN AI MAX+ 395 128 GB	5-bit · 15 tok/s

MEMORY

WEIGHTS	43.2 GB
CONTEXT	1.6 GB
RUNTIME	845 MB
SYSTEM	0.0 GB
FREE	2.4 GB

HOW TO RUN IT

OLLAMA	`ollama run nemotron-3-super:120b-a12b`
LLAMA.CPP	`llama-server -hf unsloth/NVIDIA-Nemotron-3-Super-120B-A12B-GGUF`
VLLM	`vllm serve nvidia/NVIDIA-Nemotron-3-Super-120B-A12B-BF16`
MLX (MAC)	`mlx_lm.chat --model mlx-community/NVIDIA-Nemotron-3-Super-120B-A12B-4bit`
MODEL CARD	huggingface.co/nvidia/NVIDIA-Nemotron-3-Super-120B-A12B-BF16

METHOD AND ASSUMPTIONS

Memory is the weights (parameters times bits per weight, read from each model's config.json), the context cache for every chat, and the runtime, against the memory this GPU can use after the OS and display take theirs. Writing speed is memory bandwidth over the bytes read per token, plus a per-layer latency, calibrated against llama.cpp benchmarks. First reply is the prompt's FLOPs over the chip's dense 16-bit TFLOPS at the runtime's measured efficiency. Running cost is power at the wall at your rate and hours; the cloud figure is the cheapest RunPod on-demand GPU that runs the same job. Accuracy: memory lands within about a gigabyte; speeds and times are rough, about ±25%. Model data and hardware specs checked Nov 2026; cloud prices are RunPod's on-demand list as of Nov 22, 2026. Report VR-1PZFKSL, generated November 22, 2026.