

YOUBUSABOY / LEARN. PLAN. CROSS-CHECK.

Dive Planner

User & instructor guide



YouBusaBoy

Dive Planner

OPEN CIRCUIT

AIR • NITROX • TRIMIX

youbusaboy.com/planner.html

ANTONIO CIGLIOLA

Open circuit | Air, Nitrox & Trimix | Perdix 2

From your first profile to gas reserves, decompression graphs and a readable A5 slate. Worked calculations, practical checks and classroom exercises.

GUIDE v1.0 / WEBSITE RELEASE 12 SEPTEMBER 2026

youbusaboy.com/planner.html

How to use this guide

This guide explains the YouBusaBoy planner as supplied in the **12 September 2026 website release**. It is written for divers learning the interface and for instructors preparing supervised planning exercises. The author name is **Antonio Cigliola**.

A planning aid with defined limits

The planner is educational software. It is not a validated life-support system, a training qualification or a substitute for an independently checked dive plan. Neither this guide nor the website is endorsed by Shearwater or a training agency.

Three kinds of examples

Worked teaching profiles are calculations reproduced from this release. They are simulated, not claims about completed dives. **Documented cases** describe a reported website fault and published gas-identification incidents. **The 150 m audit** demonstrates why a result can be unsuitable even when software returns a schedule.

Use the right learning path

You want to...	Read first
Build a first plan	Quick start, profile entry and gas setup: pages 4-8
Understand the answer	Model, MOD, graphs and gas management: pages 9-16
Reproduce worked cases	Examples and runtime tables: pages 17-23
Cross-check a Perdix 2	Setup and comparison worksheet: pages 24-25
Save, print or teach	Practical workflow and reference: pages 26-37

All pressures in the website are **bar**; cylinder sizes are internal water volumes in **litres**; RMV is **surface litres per minute**. Use analysed gas fractions and actual available pressures. Default settings are software examples, not personal recommendations.

Guide edition 1.0 | 12 September 2026. Covered engine: **20260912-interface + common-cylinder update**. The guide download is added by the **20260912-guide-v1** website package. A precise file fingerprint and sources appear on page 33.

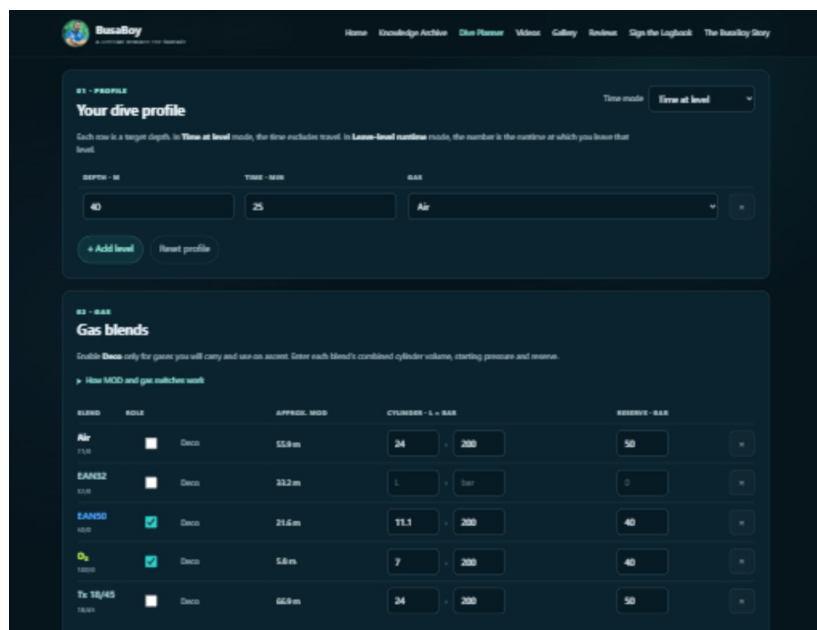
Find your next step

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Your first planning cycle

Start with a fresh session or select **Clear history**. This prevents a previous simulated dive from quietly changing the next result. Keep the same settings while reproducing a guide example.

Step	What to do
1. Profile	Choose Time at level. Enter depth, hold time and the gas for each row.
2. Gases	Enable Deco for carried ascent gases. Enter volume, start pressure and reserve for every gas that will be used.
3. Settings	Expand Advanced settings. Check GF, rates, oxygen limits, environment and emergency-gas assumptions.
4. Calculate	Read the acknowledgement, tick it and select Calculate dive plan.
5. Review	Read warnings, schedule, reserves, exposure and contingency; then inspect the graph.
6. Keep	Name and save the job. Independently cross-check before printing the slate.



Actual local desktop interface, 40 m / 25 min example. EAN50 and O2 have Deco enabled; unused presets remain disabled. The values are explained on pages 18-20.

Depth, time and travel

A profile row means: travel to this depth, then spend the specified time there on the selected gas. + **Add level** adds a row; the remove button deletes that row. **Reset profile** resets the level list, so review it before calculating. Gases and advanced settings are separate controls.

Time mode	Meaning	40 m example
Time at level	Time spent at the target depth; travel is added.	25 min hold + 3 min descent = leave at runtime 28.
Leave-level runtime	Elapsed time from leaving the surface when you depart that row.	Enter 28 to represent the same final runtime; 25 would leave only 22 min at depth.

Travel is deliberately rounded

The engine rounds each travel leg up to whole minutes. At 18 m/min, a 40 m descent is 3 minutes. A very short move can still consume a full minute: the 6.0 m to 5.8 m leg in Case 3 lasts 1 minute. This affects runtime, gas, tissue loading and comparisons with other planners.

Building a multilevel profile

For the teaching profile on page 22, enter 30 m / 10 min / Air, then 18 m / 10 min / Air in Time at level mode. The engine adds travel between rows and generates the final ascent after the last row. Increasing leave-level runtimes must leave enough time for travel and any switch.

Do not draw your own decompression ascent with profile rows

Automatic decompression is generated after the final input level. Manually entered ascent levels are not a fully validated decompression route. Use an established planner to validate all intermediate ascents; do not use a shallow row to bypass a required ceiling.

Input depth range: 0-150 m; level time range: 0-600 min. These are software bounds, not diving permissions. A zero-minute row can define travel to a switch depth. Hypoxic travel planning requires explicit, independently checked gas transitions. The code rejects travel below pO₂ 0.16 bar; this validation threshold is not an operational target.

Tell the planner what you carry

Control	Meaning / entry
O2 % and He %	Enter percentages, such as 18 and 45 for Tx18/45. Remaining fraction is nitrogen. O2 + He must not exceed 100.
Add blend	Creates the entered mixture. Select it in the profile if needed; check its carried capacity.
Deco checkbox	Makes this mixture eligible for automatic ascent switches when decompression is required.
Cylinder L x bar	Combined internal water volume for this blend, then measured starting pressure. For twin 12 L cylinders use 24 L.
Reserve bar	An entered pressure to retain in the normal plan. This is separate from the minimum-gas calculation.
Remove blend	Deletes the gas. Review every profile gas afterward; a deleted selection can fall back to another gas.

Three-gas example entries

Blend	O2 / He	Deco	Water volume	Start / reserve
Air	21 / 0	Off	24 L	200 / 50 bar
EAN50	50 / 0	On	11.1 L	200 / 40 bar
O2	100 / 0	On	7 L	200 / 40 bar

Air labels are white, EAN50 blue and oxygen lime green on the dark website. These are **interface colours**, not an equipment identification standard. Read the mixture and MOD; colour can be lost in printing or underwater.

One blend is a pooled gas account

22.2 L can represent two 11.1 L sidemount cylinders mathematically. The planner does not track left/right pressures, valve isolation, inaccessible gas or a failed cylinder. Those require a separate configuration-specific gas plan.

A displayed MOD depends on the gas role: a working gas uses the working limit; an enabled deco gas can show its deco MOD. Every manually entered working level is still checked against the working oxygen limit.

Set the decompression model

Setting	Release default	What it changes
GF Low / GF High	40 / 85	The allowable inert-gas gradient during ascent. Low influences the first-stop region; High controls the final ascent target.
Last stop	6 m	Requested final mandatory stop. Choices 3-7 m; oxygen eligibility can move it shallower, with a warning.
Descent	18 m/min	Travel toward a deeper input level.
Ascent to first stop	9 m/min	Initial automatic ascent and ordinary profile ascent travel.
Between stops	3 m/min	Travel within the generated decompression ascent.
Last stop to surface	3 m/min	Final ascent segment.
Safety stop enabled	On: 5 m / 3 min	Adds a precautionary stop to eligible no-stop ascents; required decompression uses its calculated stops.
Switch time	1 min	Time allowed at each scheduled gas change. Range 0-5 min, in 0.5 min steps.

Use settings with a reason

GF values are not probabilities of decompression sickness. A setting of 85 does not mean 85% risk, 85% safety or a diver being 85% saturated. The model contains theoretical compartments and pressure limits; it cannot observe your individual physiology.

Changing GF, rate, final stop or switch duration can change the entire schedule. Save a separate job when comparing alternatives, then compare total runtime, per-gas use and oxygen exposure together.

The example settings are reproducibility settings

The 40/85 and breathing-rate defaults in this guide reproduce the website. Choose real settings with your instructor and established planning method. A longer stop schedule is not automatically evidence of a safer overall dive.

Breathing rates and environment

Input	Default	Interpretation
Work / bottom RMV	18 L/min	Surface-volume breathing rate for working portions.
Ascent / travel RMV	15 L/min	Ascent gas rate; descent belongs to the working part.
Deco-stop RMV	15 L/min	Rate for stationary automatic deco and switch segments.
Working pO2	1.40 bar	Maximum oxygen partial pressure for manually planned work and travel.
Deco pO2	1.60 bar	Limit used to choose eligible automatic ascent gases.
Water / density	Salt / 1.030 kg/L	Converts depth to ambient pressure. Fresh preset is 1.000.
Altitude	0 m	Adjusts surface pressure using the entered elevation.
Sea-level pressure	1013 mbar	Sea-level reference pressure before altitude adjustment.

RMV is not bar/min. If a 12 L cylinder drops by 40 bar over 10 minutes at a roughly constant 20 m, an illustrative estimate using this release is $12 \times 40 / (10 \times 3.033) = \mathbf{15.8 \text{ L/min}}$. Use reliable logged measurements and suitable allowances for effort, cold and stress.

Do not enter local station pressure as the sea-level value and then apply altitude again: that double-adjusts the pressure. Confirm the pressure convention when reproducing a site. Changing water type updates its preset density; recheck any custom value.

Emergency RMV is a separate input

Normal RMV does not define emergency consumption. The minimum-gas helper has its own team size, emergency RMV per diver, problem time, ascent speed and handover time. A default of 15 L/min per diver must not be assumed adequate under stress.

What happens when you calculate

Stage	What the current implementation does
1. Validate	Checks numeric entries, mixtures and whether gases can be breathed along the entered route within configured oxygen limits.
2. Initialise	Starts 16 nitrogen and helium compartments from surface equilibrium, or the selected previous simulated tissues and surface interval.
3. Simulate the profile	Applies travel and hold segments, updating tissue loading, gas use, CNS and OTU.
4. Generate the ascent	Evaluates the final state. Creates a no-stop ascent or a gradient-factor decompression ascent, with eligible gas changes.
5. Add the reports	Produces runtime events, gas accounts, minimum-gas estimate, pressure checks and the deeper/longer contingency.
6. Draw the graph	Samples the calculated plan and tissue states. Draws depth, GF99, NDL/TTS, gas switches and stops.

Why the graph is useful

It shows the **planned** trajectory and the model response at each sampled time. A flat depth segment can be a working hold, a gas change, a safety stop or mandatory deco. Read the phase and gas, not the shape alone.

Why a generated schedule is not approval

Gas capacity, gas-density and oxygen-exposure warnings can accompany a calculated plan. Some unsafe inputs stop calculation, while other concerns remain warnings. A successful calculation means the code returned an answer; it does not establish that equipment, training, reserves or physiology support the dive.

This is an open-circuit implementation of ZHL-16C with configurable gradient factors. It does not model rebreather setpoints, scrubbers, bailout conversion or your body in real time.

Why O2 can switch at 5.8 m

The familiar rule uses 1 bar at the surface and another bar per 10 m. With 100% oxygen and a 1.60 bar limit, it gives 6 m. This website uses the configured surface pressure and water density instead.

The exact calculation in this release

$P_{\text{ambient}} = P_{\text{surface}} + \text{density} \times 1000 \times 9.80665 \times \text{depth} / 100000$

$pO_2 = \text{oxygen fraction} \times P_{\text{ambient}}$

$\text{MOD} = (pO_2 \text{ limit} / \text{oxygen fraction} - P_{\text{surface}}) / \text{pressure rise per metre}$

At sea level, 1013 mbar and density 1.030 kg/L, pressure rises by **0.101008495 bar/m**. At 6 m the ambient pressure is **1.61905 bar**. On 100% oxygen this exceeds 1.60 bar. The exact MOD is about 5.811 m; the switch is rounded down to **5.8 m**.

Mixture	Working MOD at 1.40 bar	Deco MOD at 1.60 bar
Air 21/0	55.9 m	65.4 m
EAN50 50/0	17.6 m	21.6 m
O2 100/0	3.8 m	5.8 m

Table values show downward-rounded display/switch depths. Some validation messages round the exact value normally, so EAN50 can be described as 17.7 m in an error while its displayed working MOD is 17.6 m. Neither permits a 40 m working level.

Do not adjust physics to obtain a preferred number

Enter the actual environment and analysed mixture. Do not raise a limit or change density simply to force a 6 m label. The planner also accounts for gas-switch time and the small travel leg to the eligible depth.

A 40 m plan containing only EAN50 or only O2 is rejected under the default working limit. The software asks for a suitable gas or a reduced depth; it does not silently cap the profile at MOD.

Read the whole result

Result	How to interpret it
Profile runtime	Elapsed time when the final manually entered level ends. Includes profile travel and switches.
TTS from last level	Time from that point to the surface, including travel, scheduled switches and stops. It is not just deco hold time.
Compact runtime plan	Action, target depth, segment duration, leave-event runtime and active gas. Underlined rows identify gas switches.
Detailed event schedule	Expanded events behind the compact table. Useful when checking individual travel legs or stop increments.
CNS / OTU	Modelled oxygen-exposure indices for this calculation. Neither is a probability of an injury.
Bottom gas checks	pO ₂ , pN ₂ , pHe for trimix, equivalent air depth, equivalent narcotic depth and estimated gas density.
Warnings	Inputs or results needing attention. A red gas margin, high density or CNS warning is not cancelled by a plausible graph.

For END, this release treats oxygen as narcotic together with nitrogen. EAD is based on nitrogen relative to air. These are gas comparisons, not personalised narcosis predictions. Gas density is estimated at **0 degrees C**; its displayed references are 5.2 and 6.2 g/L.

CNS and OTU have specific limits here

The code accumulates CNS from its exposure table and OTU above pO₂ 0.5 bar. It reports 0 CNS below the table's 0.6 bar starting point. It does not schedule oxygen breaks or carry cumulative CNS/OTU through the repetitive-dive feature. A displayed 0 is not a zero-risk statement.

DAN describes the relationship between high gas density, breathing effort and carbon-dioxide retention. The density warnings deserve review even when the oxygen MOD passes. [Source: Performance Under Pressure \[4\]](#).

Read the visual dive plan

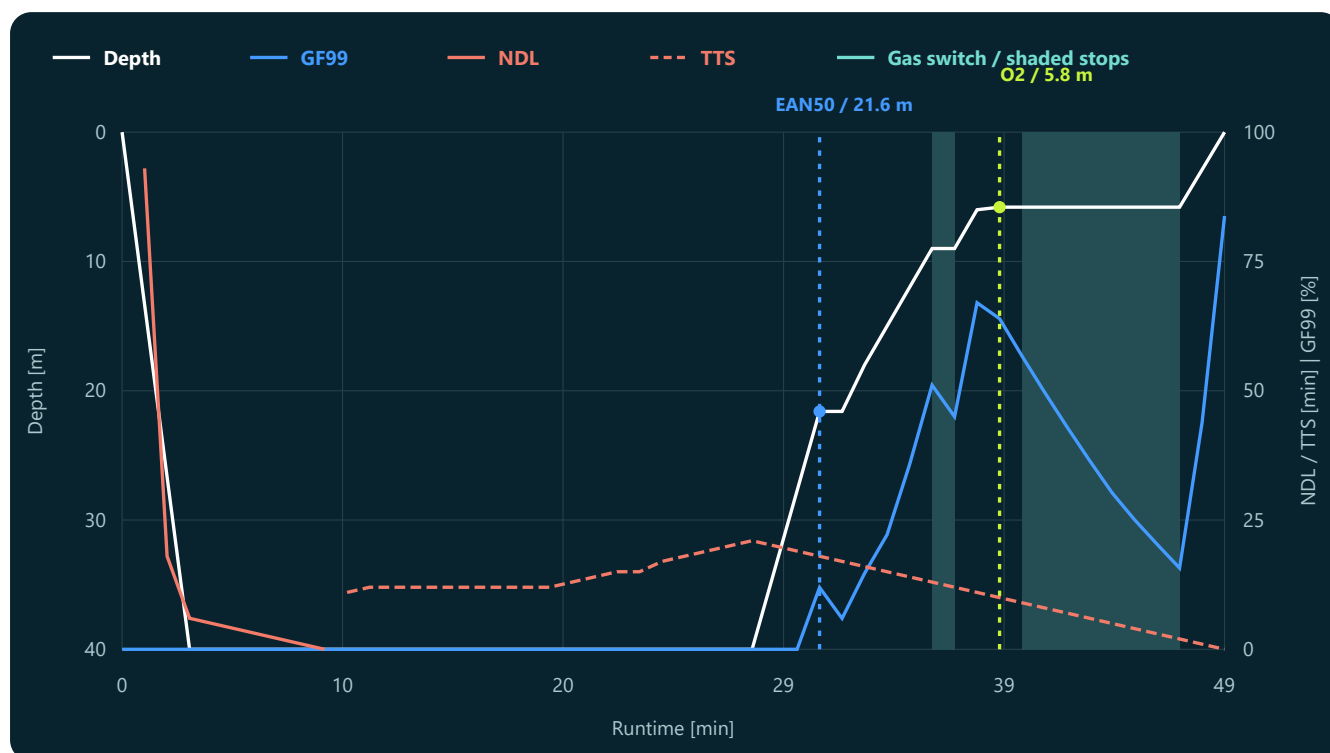


Figure 1. Vector rendering of the planner's actual 40 m, three-gas timeline. Its 16:9 layout uses the website's colour and axis conventions. This is a calculated profile, not a downloaded dive log.

Visual cue	Meaning
White depth trace	Read against the left axis: surface at the top, deeper water below.
Blue GF99 trace	The highest current compartment gradient relative to its unmodified M-value. Read as percent on the right.
Solid / dashed red	NDL in minutes while no-stop; dashed TTS after decompression starts. The graph keeps TTS for the rest of that plan.
Vertical markers / bands	Actual scheduled gas changes; shaded intervals identify deco or safety stops.

Move the pointer on desktop or tap on mobile. Focus the graph and use Left/Right/Home/End to inspect samples. The readout gives runtime, depth, gas, GF99, ND/L/TTS and phase. The right axis shares a numeric scale between **minutes** and **percent**; these units are not interchangeable. ND/L is visually capped at 99+.

From litres to pressure

The planner uses an ideal-gas account. At a constant depth:

gas used [surface L] = RMV [L/min] x ambient pressure [bar] x time [min].

Travel uses the average start/end ambient pressure. Pressure used is surface litres divided by cylinder water volume.

Case 3: the actual per-gas account

Gas	Used	Pressure used	Predicted end	Reserve
Air	2623 L	109.3 bar	90.7 bar	50 bar
EAN50	280 L	25.2 bar	174.8 bar	40 bar
O2	231 L	33.0 bar	167.0 bar	40 bar

The normal capacity margin is **water volume x (start - reserve) - gas used**. Each used blend needs a non-negative margin. A cylinder-equivalent value such as 13.1 L at 200 bar means 2623 L / 200; it is not a recommendation to choose a cylinder of that size.

Common cylinder comparison

The comparison lists 10 L, 11.1 L, 12 L, 15 L, 20 L (10 x 2 twinset), 22.2 L (11.1 x 2 sidemount) and 24 L (12 x 2 twinset). It converts the same bottom-gas demand into pressure for each volume.

Three different columns, three different questions

Normal-plan use is total use of the bottom gas. Minimum gas is the separate emergency estimate. Required at start is profile/bottom gas used before automatic ascent plus minimum gas. Also check total normal consumption plus the entered reserve; the comparison alone does not settle gas adequacy.

Reference fill defaults to 200 bar and controls the comparison, not the actual cylinder fill. Temperature, real-gas compressibility, usable regulator pressure and gas made inaccessible by a failure are not modelled.

Understand the minimum-gas helper

This helper estimates shared bottom gas from the deepest point to the surface on a no-stop plan, or to the first scheduled independent deco-gas handover. It uses the emergency inputs, not the normal breathing rates.

Emergency assumption	Release default
Divers sharing the gas	2
RMV per diver	15 L/min (an example, not a stress recommendation)
Problem time at maximum depth	1 min
Emergency ascent speed	10 m/min
Handover time on bottom gas	1 min
Combined emergency RMV	$2 \times 15 = 30$ L/min

Case 3: 40 m to the EAN50 handover

Component	Calculated surface litres
Problem at 40 m	151.6 L
Travel to 21.6 m	227.6 L
Required bottom-gas holds on this route	0.0 L
One-minute handover	95.8 L
Total	475.1 L = 19.8 bar in 24 L

This estimate stops at the handover

It does not independently prove that both divers have enough EAN50 and O₂ afterward. It does not recalculate a complete emergency decompression schedule, lost-gas ascent or overhead exit. Those must be planned separately.

On an Air-only decompression plan, no independent deco destination exists. The helper reports unavailable; that does not mean zero reserve. Increase emergency assumptions to match training and conditions, and verify the whole team escape route.

Turn pressure means start ascent

The website's **Turn / start ascent** panel is anchored to the end of your final profile row. On a simple square profile it is a start-ascent pressure prediction. It is not a navigation turnback calculation or an automatic rule of thirds.

Case 3, at 40 m / runtime 28	Value
Air before the ascent	$200 - 2437.8 / 24 = 98.4$ bar
Air needed after leaving the level	$185.6 / 24 + 50$ reserve = 57.7 bar
Normal-plan margin at that point	$98.4 - 57.7 = 40.7$ bar

The same check for every carried gas

Gas	At turn / start	Needed from turn	Margin
Air	98 bar	58 bar	+41 bar
EAN50	200 bar	65 bar	+135 bar
O2	200 bar	73 bar	+127 bar

Stage gases have not yet been consumed at this point in the example, so their start values remain 200 bar. Values in the display are rounded to the nearest bar. For an operational trigger, apply the agreed conservative rounding and margin; do not treat a rounded display as an exact gauge target.

A shore or overhead route needs another calculation

If you must swim back before ascending, add the return route, current, team sharing, access to staged gas and any failure assumptions to a separate route plan. A direct ascent calculation cannot establish pressure for a cave exit, wreck penetration or long swim to shore.

A trigger is a team decision

Agree time, pressure and other termination criteria before diving; act on the first applicable limit. The 98 bar in this example is a prediction for the entered profile, not a universal turn pressure and not a replacement for minimum gas.

Find maximum stay to reserve

Enter the depth profile and complete capacity data for all used gases. In **Time at level** mode, select **Find max stay to reserve**. The search changes the hold at the deepest selected level and tests the entire normal ascent, switches and stops against the entered pressure reserves.

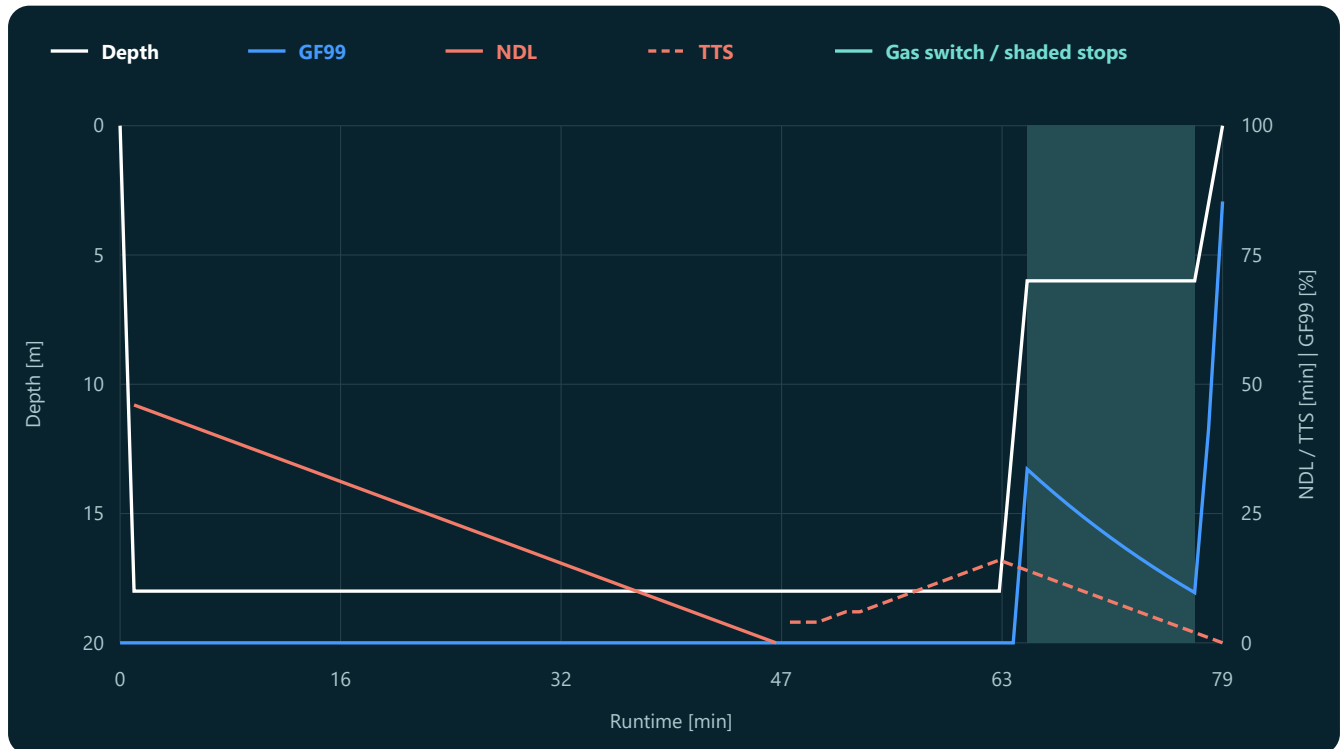


Figure 2. The 18 m Air example with 24 L at 200 bar and a 50 bar reserve finds **62 minutes at depth**. Total runtime is **79 min**; it includes **12 min of mandatory deco holds**. Estimated use is 3591.8 L, leaving about 50.3 bar.

Gas-limited is not no-stop-limited

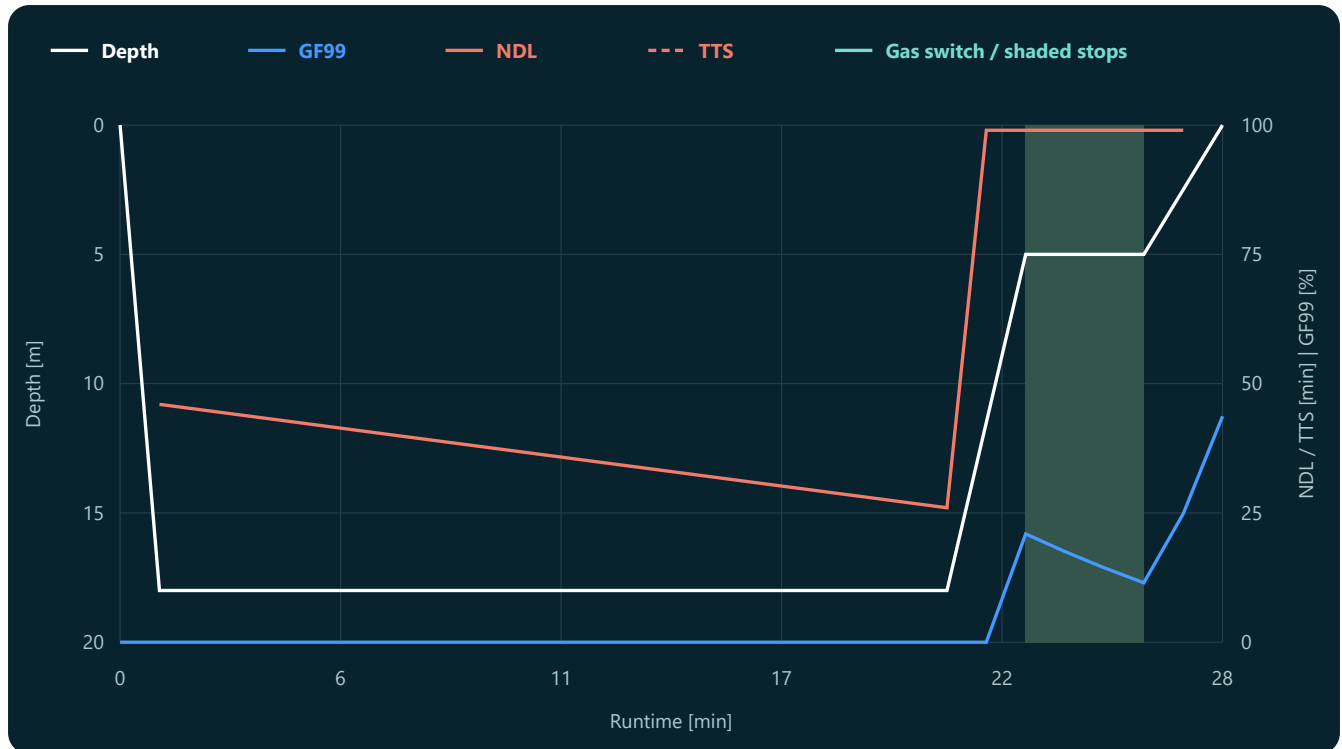
The function does not enforce a personal maximum CNS, an NDL-only condition, a complete team minimum-gas requirement, a thermal limit or an overhead exit. Here it produces an Air-only deco plan with no available independent-handover minimum-gas estimate.

After accepting the changed hold, press **Calculate dive plan** again and review the contingency. In this release that ensures the deeper/longer plan corresponds to the newly entered maximum time. Review all warnings, then shorten the plan or change the planning assumptions as appropriate.

The search works in whole-minute holds up to 600 minutes. It uses a bounded search, not a proof of the globally best plan. If leave-level runtime mode gives a feasibility error, use Time at level and re-enter the intended profile.

Case 1 / 18 m on Air

Question: how do hold time, ascent time and a safety stop combine? Use a fresh tissue state, 18 m / 20 min / Air, 24 L at 200 bar, 50 bar reserve. All settings are the release defaults on pages 7-8 and 14.



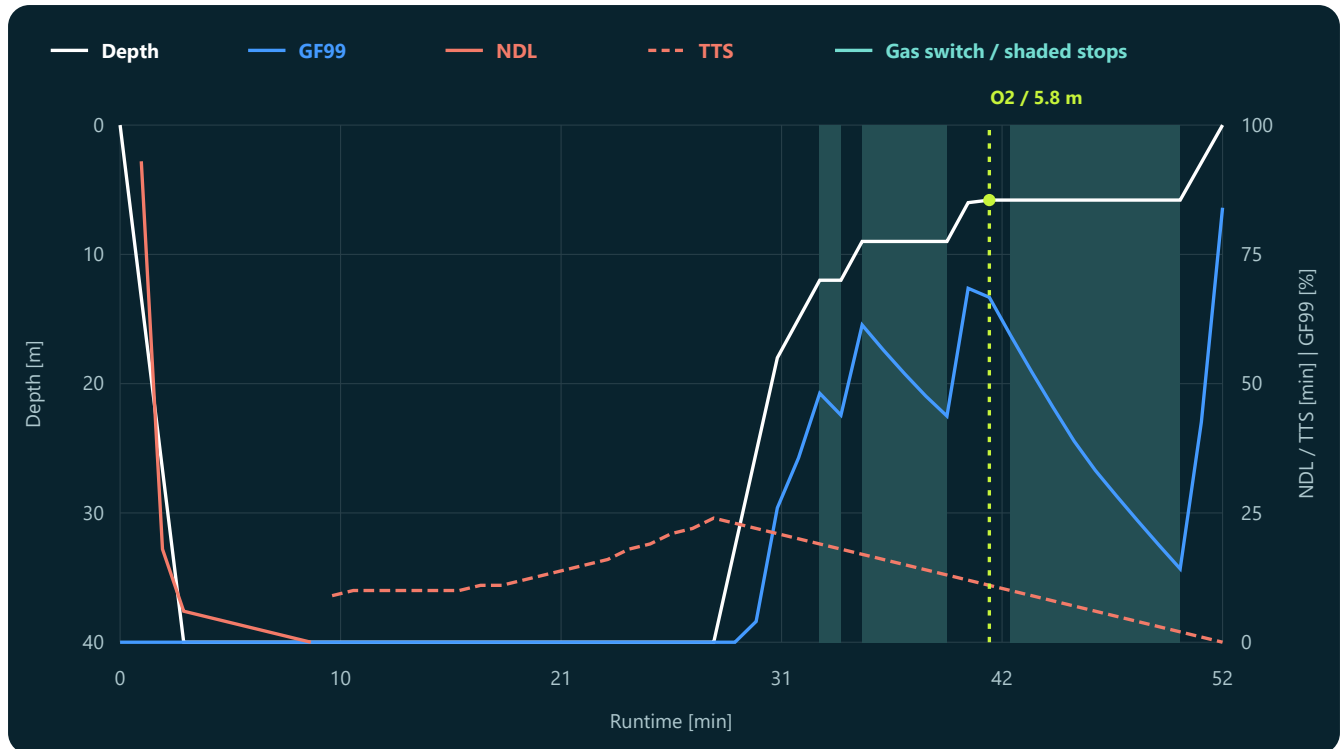
Action	Depth	Segment	Leave at	Gas
Descend	18 m	1 min	1 min	Air
Level	18 m	20 min	21 min	Air
Ascend	5 m	2 min	23 min	Air
Safety	5 m	3 min	26 min	Air
Ascend	0 m	2 min	28 min	Air

Total runtime is **28 min**: 1 minute descending, 20 minutes at depth and 7 minutes for the ascent including the 3-minute safety stop. Gas use is **1225 L**; predicted end pressure is about **148.9 bar**. No mandatory deco holds are generated.

CNS displays 0% because maximum pO₂ is about 0.595 bar, below the code's 0.6 bar table threshold; OTU is about 5. This is a model convention, not absence of physiological exposure.

Case 2 / Air + oxygen at 40 m

Enter **40 m / 25 min / Air**. Carry Air 24 L at 200 bar, reserve 50; O2 7 L at 200 bar, reserve 40. Enable O2 for deco; leave other deco gases disabled. Use fresh tissues and the same defaults.



Runtime	TTS at last level	Deco holds	CNS / OTU
52 min	24 min	13 min	32% / 51

The profile ends at runtime **28**. The generated oxygen switch starts at runtime **41**, at **5.8 m**, and takes 1 minute. Total use is about **2922 L Air + 255 L O2**. The Air minimum-gas helper is about **838 L** to the oxygen handover.

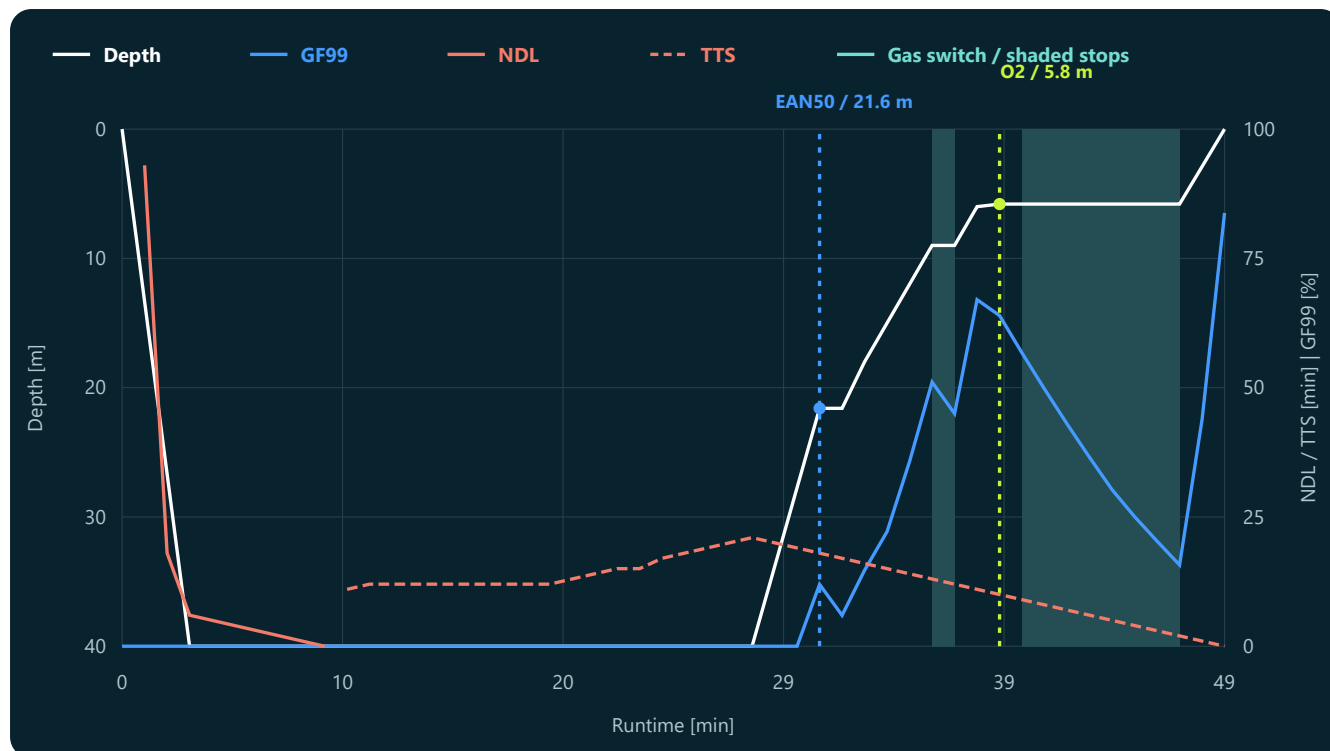
This is a comparison test, not a recommended 40 m Air dive

The website reports Air density around 6.4 g/L at 40 m, above its 6.2 g/L reference. A passed oxygen MOD and enough cylinder capacity do not resolve that concern. Review breathing-gas suitability, training and conditions independently.

Teaching task: disable O2 and calculate again. Identify the change in ascent, the gas account and the unavailable minimum-gas handover. Re-enable O2 before moving to the next case.

Case 3 / add EAN50

Keep Case 2's profile and add **EAN50 11.1 L at 200 bar, reserve 40**. Enable both EAN50 and O2 for decompression. The planned working gas is still Air. The Air density limitation from page 18 still applies.



Output	Air + O2	Air + EAN50 + O2
Total runtime	52 min	49 min
TTS from runtime 28	24 min	21 min
Deco hold time	13 min	8 min
Air consumption	2922 L	2623 L
CNS / OTU	32% / 51	35% / 59

EAN50 switches at **21.6 m / runtime 31**; oxygen at **5.8 m / runtime 39**. The richer intermediate gas reduces Air use and total runtime in this example, but increases calculated oxygen exposure. Faster is not the only comparison that matters.

The graph marker identifies the **start** of each switch. The runtime table gives the **end** of that one-minute event: 32 and 40 minutes. This explains an apparent one-minute difference.

Case 3 / compact runtime

Teaching schedule for the exact inputs on pages 18-19. Underlined switch rows retain the NOTOX notation requested for the website. Runtime starts when leaving the surface; it does not restart at the bottom.

Action	Depth	Segment	Leave at	Gas
Descend	40 m	3 min	3 min	Air
Level	40 m	25 min	28 min	Air
Ascend	21.6 m	3 min	31 min	Air
<u>SWITCH</u>	<u>21.6 m</u>	<u>1 min</u>	<u>32 min</u>	<u>EAN50</u>
Ascend	18 m	1 min	33 min	EAN50
Ascend	15 m	1 min	34 min	EAN50
Ascend	12 m	1 min	35 min	EAN50
Ascend	9 m	1 min	36 min	EAN50
Deco	9 m	1 min	37 min	EAN50
Ascend	6 m	1 min	38 min	EAN50
Ascend	5.8 m	1 min	39 min	EAN50
<u>SWITCH</u>	<u>5.8 m</u>	<u>1 min</u>	<u>40 min</u>	<u>O2</u>
Deco	5.8 m	7 min	47 min	O2
Ascend	0 m	2 min	49 min	O2

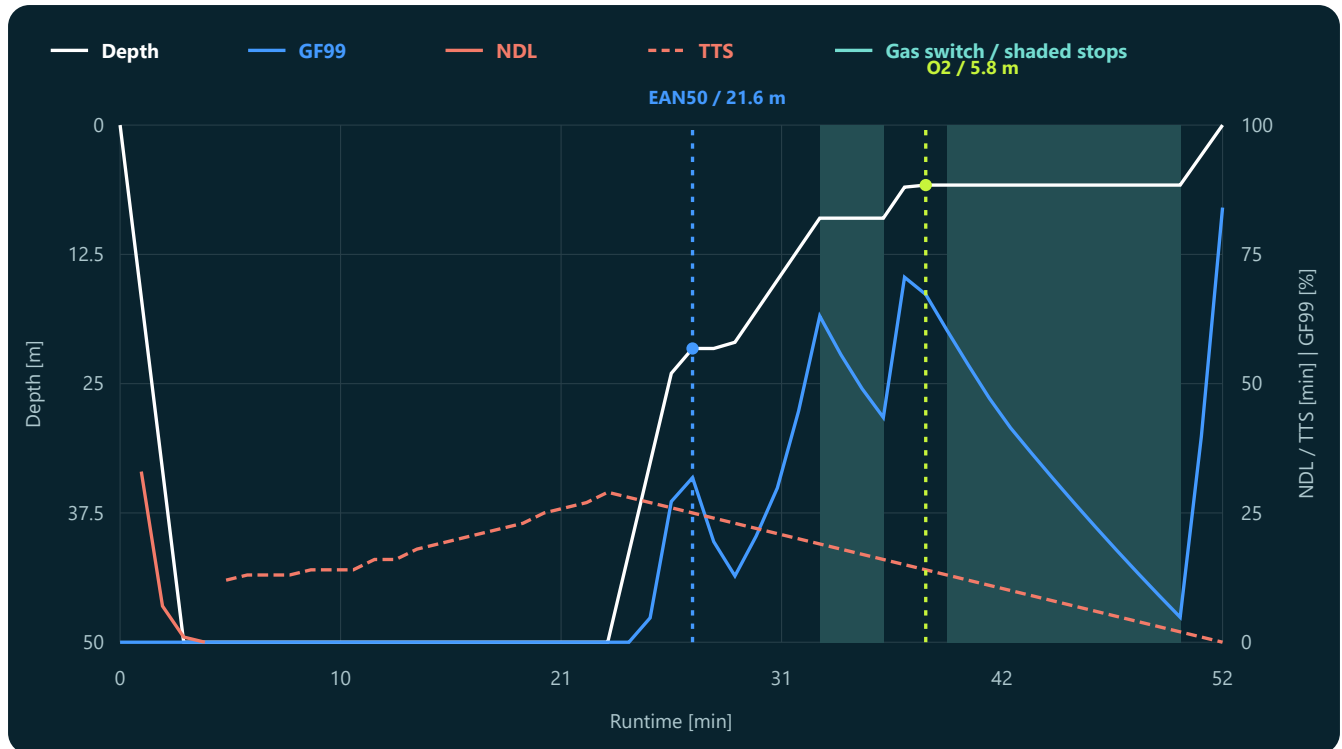
Read across, then cross-check

At 21.6 m, the switch starts at 31 and finishes at 32. At 5.8 m, it starts at 39 and finishes at 40. The seven-minute oxygen hold then finishes at 47; the final ascent reaches the surface at 49.

The result may name 18 m as the first stop region even though no stationary hold is needed there after the richer-gas switch. The detailed event schedule explains such travel-only depth points. Do not invent a hold by reading only a summary label.

Case 4 / a trimix comparison

Use **50 m / 20 min / Tx18/45**, with the same 24 L / 200 / 50 bottom-gas capacity, EAN50 11.1 L / 200 / 40 and O2 7 L / 200 / 40. Enable EAN50 and O2 only for automatic deco. Begin with fresh tissues.



Runtime	TTS at last level	Deco holds	CNS / OTU
52 min	29 min	14 min	44% / 67

The profile ends at runtime **23**. EAN50 switches at **21.6 m / runtime 27**; oxygen at **5.8 m / runtime 38**. Modelled gas use is **2637 L trimix, 384 L EAN50 and 327 L O2**. The minimum-gas estimate is about **672 L trimix** to the first independent handover.

Helium changes both gas properties and the compartment calculation. Inspect bottom pHe, EAD, END and density in the report. The END display counts oxygen as narcotic; do not compare it with another planner until that convention is matched.

Instructor-led comparison

This profile requires appropriate technical training and an independently validated plan. Use it to compare assumptions and model outputs on the surface. It is not a proposed open-water training dive or a substitute for a gas-selection protocol.

Beyond a single square profile

The deeper / longer contingency

The **Too deep** and **Too long** controls add to the deepest level. Case 3 with +3 m / +3 min becomes 43 m / 28 min at depth. Its profile runtime is 31; total runtime **58 min**, TTS **27 min**, CNS **46%** and OTU **75**. Air use rises to about **3064 L**.

This is a depth/time contingency. It does not model losing EAN50, missing oxygen, a failed regulator or a delayed rescue. Build those branches with a validated planning workflow. If the contingency fails validation, read its error separately from the main plan.

A simple multilevel comparison

Fresh tissues; Air 24 L / 200 / 50; 30 m for 10 min, then 18 m for 10 min. The engine leaves the first row at 12 min, travels for 2 min and leaves the second at 24. Total runtime is **31 min**, including the 3-minute safety stop. Air use is about **1603 L**. See the manual-ascent limitation on page 5.

Residual loading: an exact teaching chain

Step	Action
1	Calculate Case 1 (18 m / 20 min). Select Store current result as previous dive.
2	Enter 24 m / 30 min / Air, with O2 enabled and the Case 2 capacities. Tick Start this plan from the previous calculated dive.
3	Enter a 60-minute surface interval and calculate. Expected total 39 min; TTS 7 min; Air 2067 L, O2 63 L.
4	Review the ascent: the model can require a deco ascent branch with a switch even when stationary deco holds total zero.
5	Use Clear history to return to a fresh teaching state.

Residual loading is simulated, held in this browser session, and not imported from your computer. The interface describes chains up to six calculations. CNS and OTU from earlier dives are not accumulated by this feature. A retrieved job can restore its saved initial tissues; clear history explicitly for a fresh comparison.

Documented cases, practical lessons

Case A: the missing oxygen switch

Source: the YouBusaBoy development request. The site owner reported that an Air + O2 plan did not schedule the expected shallow oxygen switch. A reproduction against the supplied original engine confirmed the missing switch. The updated release inserts MOD-aware gas-change points and respects the configured limit.

Application: the regression case on page 18 now includes the 5.8 m oxygen switch. The lesson is to inspect actual gas events, not assume a gas entered in a list will be used. This is a documented software case; it is not presented as an underwater incident.

Case B: the cylinder that was not what it seemed

In a published DAN account, a 50% oxygen cylinder was mistaken for a 32% cylinder during a charter. The author identified the mix-up and exchanged the cylinder underwater. The same article discusses a fatal event involving a cylinder labelled oxygen that a diver believed contained air. [DAN, Breathing Gases \[3\]](#).

Application: software labels and colour coding cannot verify what is physically in a cylinder. Analyse and label gases, reconcile them with the plan, and apply the complete gas-switch procedure taught by your instructor. The underline is a reminder to perform that procedure; it is not the procedure itself.

Case C: predicted stop time versus breathing gas

Shearwater describes support questions in which a stop takes longer than predicted because a richer gas was enabled but not actually used. Predictions assume future gas choices, while tissue tracking follows the gas selected as active. [Shearwater, Only Enable Gases... \[2\]](#).

Application: before comparing a slate and computer, reconcile carried gases, enabled gases and actual breathing gas. A shorter predicted TTS is meaningless if its assumed gas cannot be used.

Perdix 2 / surface setup

Prepare the computer alongside your reviewed plan. This reference follows **Perdix 2 Technical Manual, RevB [1]**. Check your installed firmware's manual and follow the on-screen button labels.

Menu / control	Action
System Setup > Mode Setup	Select OC Tec; check salinity. Check metric units in Display Setup.
System Setup > Deco Setup	Select Buhlmann ZHL16C GF; enter the agreed GF pair and last stop.
System Setup > OC Gases / Dive Setup > Define Gas	Edit O2/He. Follow Next, Edit, Change and Save prompts.
Adv. Config 2	Review OC MOD and OC Deco PPO2. Units are ATA.
Dive Setup > Deco Planner	Enter depth, time and RMV; confirm settings and starting CNS, then Plan.

The manual specifies 18 m/min descent, 10 m/min ascent, one RMV, simple profiles and 3 or 6 m last stops. It depicts oxygen as **99/00**; confirm your unit's convention. [Manual: pages 56-59, 63-69, 72 \[1\]](#).

Prepare an entry sheet from your plan

Your reviewed mixture	O2 %	He %	Physical cylinder ID
Air	21	0	Write its label / ID
EAN50	50	0	Write its label / ID
Oxygen	See 99/00 convention	0	Record analysis too
Tx18/45 (alternative bottom gas)	18	45	Write its label / ID

These percentages are entry examples, not instructions to alter a cylinder analysis. Where the device represents oxygen as 99/00 and the website uses 100/0, record that difference. Use actual oxygen content when checking the physical gas's MOD.

Enable only what you will use

Set unused computer gases Off. Before descent, verify the active gas matches what you are breathing. The computer does not automatically select a new active gas underwater: complete the physical switch procedure and make the corresponding computer selection. See Shearwater [2].

Perdix 2 / reconcile the result

This website does not transfer settings or upload a schedule to a Perdix. It has no Bluetooth, USB or Shearwater account integration. You enter reviewed gas/model settings manually and compare independently generated results. The live computer will calculate from the actual dive.

Five checks before comparing runtimes

Check	What to record on both sides
Gas fractions and enabled gases	Actual analysis; whether oxygen is represented as 100/0 or 99/0; all unused gases disabled.
Pressure convention	Website limits are bar. 1 ATA is approximately 1.013 bar: 1.60 bar is about 1.579 ATA. Equal numbers are not equal pressures.
Time convention	In this guide, 40 m / 25 min means a 25-minute hold and runtime 28 at ascent start. Inspect the other planner's bottom/runtime row; do not blindly enter 25.
Model and travel	GF pair, actual final stop, ascent legs, switch duration and RMV. The website uses separate rates and whole-minute travel legs.
Initial conditions	Surface pressure, water-density convention, prior tissues and oxygen exposure. A stored web job does not represent the Perdix's actual tissue history.

The pressure conversion above is arithmetic, not a recommendation to change the computer's oxygen limits. A rounded menu increment may not represent the exact same limit. Reconcile the intended maximum exposure with an instructor; do not relax it merely to make switch depths or total times match.

What to do with a disagreement

Record the first differing event: bottom departure, gas switch, first stop, final stop or surface arrival. Compare its gas, pressure, duration and tissue starting state. If the difference is unexplained, do not average the schedules or select the shorter one. Resolve it with the manufacturer documentation and an established planning tool.

The Perdix instructions here were checked against documentation, not tested on a physical Perdix 2. Support lists firmware V102 on the review date; menu details can change. Firmware updates reset decompression tissues, so follow manufacturer instructions when scheduling updates. [Support and updates](#) [5].

Print a useful A5 slate

Print A5 slate

Calculate and review the current plan, then select **Print A5 slate**. In the browser's print dialog choose A5 (148 x 210 mm), portrait, and inspect the preview. The page stylesheet requests 7 mm margins. Start at actual size / 100%; disable browser headers and footers if they add a URL or date over the content.

Check before printing	Why it matters
Paper and scale	A4 paper does not automatically become an A5 card. Print on A5, or centre the A5 page on larger paper and trim after checking its size.
Switch rows	Every switch must remain readable and underlined in monochrome as well as colour.
All pages	Long schedules may span more than one A5 page. Inspect the last row, repeated headings and page breaks.
Current assumptions	Verify the plan after any edit, maximum-stay search or job retrieval. Include your agreed team notes separately.
Physical proof	Print a test, read it at arm's length, then check the laminated result for glare, small type and obscured edges.

The slate is a subset of the screen

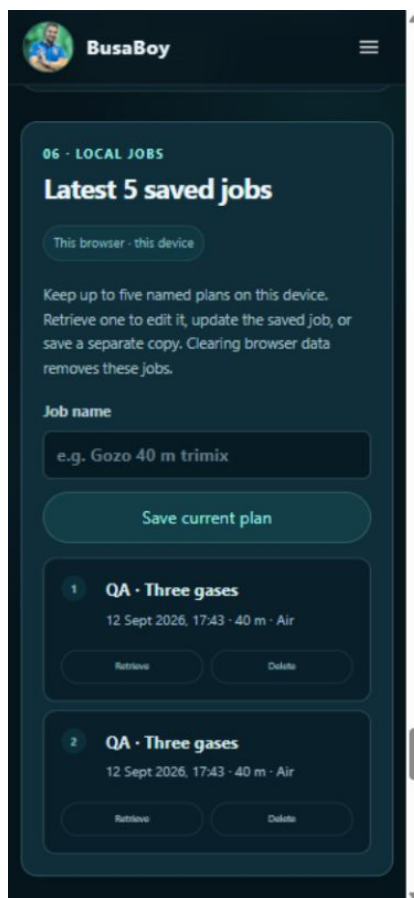
The A5 layout prioritises the summary, compact runtime and turn/start-ascent panel. It omits the full graph and several detailed physiology and cylinder reports. Review and retain those separately. This guide is for surface study; its example pages are not operational slates.

Copy plan

Copy plan places a text summary on the clipboard. Gas switches have double-underscore markers, such as **__SWITCH __**. These may appear as literal characters or different formatting in another app. When transferring to a handwritten slate, underline the entire switch line explicitly.

Use the gas-change notation as a cue for your taught NOTOX procedure and team confirmation. Colour and underlining support the procedure; neither establishes cylinder identity, gas analysis or a permissible switch depth.

Save, retrieve and use on mobile



Actual mobile view at a 390 px viewport. Local Jobs sits below the results and graph; the navigation link jumps directly to it. The illustrated QA jobs are test entries.

Action	Behaviour
Save current plan	Give it a clear name. Saving recalculates from current inputs and keeps up to five jobs in this browser.
Retrieve / update	Retrieve restores the saved inputs. Edit, calculate and save to update that job. Use Save as new job for a separate version.
Delete / Undo delete	Delete removes the selected local job. Undo delete restores the most recently deleted job while the session remains open.
Storage limits	A sixth saved job displaces the oldest. Clearing site/browser data, private browsing or using another browser/device can remove or hide jobs.

Use a name such as **Training C3 - 40m - 25hold - GF40-85**. Local jobs are not cloud backups or a dive log. The session-only residual-history feature is separate from named saved jobs. On mobile, swipe wide result tables if needed, tap the graph for values and use the section links to return to inputs.

When the result surprises you

Symptom	Check / next step
No result after Calculate	Read the inline error. Complete the acknowledgement, numeric inputs and valid mixtures. Correct the named field and calculate again.
40 m with only EAN50 or O2 fails	Expected under the working oxygen limit. Select a suitable working gas or reduce the depth; do not override the limit to force a plan.
O2 is present but no switch appears	Is Deco enabled? Is the ascent actually on the deco branch? Is the gas usable at the generated depths and configured limit?
O2 switch is 5.8 m, not 6 m	Check sea-level pressure, density, oxygen percentage and bar versus ATA. See page 10.
A 0.2 m leg takes 1 minute	The engine rounds each travel leg up to whole minutes.
Negative reserve margin	Reduce demand or revise the actual gas supply and independently review the plan. A schedule can be displayed while capacity fails.
Minimum gas unavailable	On a deco plan, an independent usable handover is missing. Unavailable is not a zero-gas requirement.
Maximum stay fails immediately	Check all used capacities. Use Time at level; the search can fail in leave-runtime mode when its zero-hold candidate is invalid.
Graph disappears after editing	Expected: old results are cleared to avoid showing a stale plan. Calculate the new inputs.
Saved job is missing	Use the same browser, profile and website address. Private sessions and cleared storage do not provide durable backups.
Copy or print seems incomplete	Clipboard formatting varies; inspect the A5 preview. Full reports and graph are deliberately excluded from the compact slate.

If calculation does not converge, stop and inspect the profile and gases. Do not try to make the warning disappear by repeatedly changing unrelated values. Save the reproducible inputs and report the release/version with the error.

Know the boundary of the tool

The software accepts input depths up to 150 m. That is a range used for testing, not evidence of suitability for a 150 m dive. The Perdix 2 manual specifies a **130 m calibrated maximum rated depth**; the 150 m software audit is outside that rating. [Technical manual, page 80 \[1\]](#).

Synthetic 150 m audit	Result
Full generated runtime	298 min
TTS after the final profile level	277 min
CNS / OTU	321% / 406
Bottom-gas use / entered total	6571 L / 4800 L
Normal reserve feasibility	Failed for multiple gases

This was a code stress test with a hypoxic bottom mixture and travel/deco gases. It is deliberately not provided as an executable dive schedule. The displayed answer fails capacity and oxygen-exposure review. A returned number does not make the scenario usable.

Limitations that affect ordinary planning too

Manual ascents: automatic deco starts after the last input level, not before each shallower row.

Emergency route: minimum gas stops at its defined handover and does not cover every failure. **Search:** maximum stay checks simple reserves, not overall dive feasibility.

Physiology: repetitive tissues do not include cumulative oxygen exposure; oxygen breaks, individual susceptibility, fatigue and thermal stress are not simulated. **Gas:** ideal-gas volumes do not represent all real fills or inaccessible cylinder contents.

Verification is bounded

The engine has automated numerical and regression checks, not independent physiological validation. It uses discrete steps and a small numerical ceiling tolerance; tiny GF differences can occur. No operational equivalence with a Perdix or another established planner is claimed.

An instructor-led session

Suggested 60-75 minute **surface classroom** session. Adapt to the students' existing qualifications. Technical examples are for learners already studying those topics; this document does not add any certification or depth entitlement.

Time	Activity	Evidence of understanding
10 min	Map the interface and units	Student explains hold time versus runtime and RMV versus bar/min.
15 min	Reproduce Case 1 and inspect graph	Student identifies safety stop, total runtime, gas use and the CNS-table convention.
15 min	Compare Cases 2 and 3	Student locates both switches and explains runtime, oxygen-exposure and density findings.
15 min	Review pressure and reserve calculations	Student separates normal reserve, minimum gas and route turnback.
10-20 min	Perdix comparison and error exercise	Student records assumptions and explains an unresolved mismatch before accepting a plan.

Questions and answer key

1. Why is a 40 m / 25 min hold left at runtime 28? *Three minutes of rounded descent precede the hold.*
2. Why do graph switches show 31/39 and table rows 32/40? *Start versus end of a one-minute switch.*
3. Does adding EAN50 reduce every burden? *No: runtime and Air use fall here, while CNS/OTU rise.*
4. Is 62 minutes at 18 m a no-stop recommendation? *No: the gas-limited search produces mandatory deco.*
5. Does a 98 bar start-ascent prediction cover a wreck exit? *No: the route and failure assumptions are missing.*
6. Can a copied 1.60 setting differ between tools? *Yes: bar and ATA differ; verify conventions.*

Before using this guide in a course

The instructor should reproduce the chosen examples, verify manufacturer menus on the actual computer and check the lesson against current agency procedures. Record any corrections with the guide and website version. No instructor or agency approval is implied by the layout.

A reusable planning worksheet

Use this as a discussion and reconciliation record. It is not an underwater schedule. Keep the completed validated plan and emergency branches with the team documentation.

Planning record	Entry
Date / site / team	_____
Website release / saved job	_____
Purpose / training limits	_____
Time mode / levels / gases	_____ _____
GF / final stop / travel rates	_____
Environment / pressure units	_____
RMV work / ascent / deco	_____
Emergency RMV / team / route	_____

Gas / analysed O2-He	Cylinder / fill	Reserve / accessibility
_____	_____	_____
_____	_____	_____
_____	_____	_____

Independent comparison	Entry
Computer / firmware / planner	_____
First difference / explanation	_____ _____
Agreed pressure / time triggers	_____
Lost-gas / overrun branches	_____
Reviewed by / date	_____

Before the plan leaves the classroom

A practical final review

Confirm the analysed gases and physical cylinder labels. Reconcile time mode, GF, pressure units, environment and initial tissues. Read every switch and the complete ascent. Check each normal gas margin, the emergency route, gas density and oxygen exposure. Resolve differences with the independent planner and actual computer.

Agree team termination criteria, lost-gas branches and contingency plans. Review environmental limits, exposure protection, surface support and the site emergency arrangements. Check that the final slate is current, complete and readable. A website calculation cannot supply these missing decisions.

Term	Meaning in this guide
CNS / OTU	Two modelled oxygen-exposure indices; not injury probabilities.
Deco / safety stop	A calculated decompression obligation / an optional precaution on a no-stop ascent.
EAD / END	Equivalent air depth from nitrogen / equivalent narcotic depth under the selected narcotic-gas assumption.
GF Low / GF High	Inputs controlling permitted modelled gradients across the ascent.
GF99	Current leading compartment gradient relative to the original M-value.
MOD / pO2	Maximum operating depth for a specified oxygen limit / oxygen partial pressure.
NDL / TTS	Remaining no-stop time / estimated time from the current or specified state to the surface.
RMV	Respiratory minute volume in surface litres per minute.
Runtime / segment	Elapsed time since leaving the surface / duration of one event.
Reserve / minimum gas	Entered normal retained pressure / a separately defined emergency-gas calculation.
Trimix 18/45	18% oxygen, 45% helium, balance nitrogen.

Sources and release record

Website: youbusaboy.com/planner.html

Guide: version 1.0, 12 September 2026. Author: Antonio Cigliola.

Covered planner: 20260912-interface with the common-cylinder update.

Download package: 20260913-photo-v1. Source archive: supplied complete website v3; calculations use the corrected local release.

Engine SHA-256:

e641605c1eda57417909969fbd35382c

8dc6c3dea6cde9b940f14509850ee7d7

Primary references

1. Shearwater Research - Perdix 2 Technical Manual

Doc. 13301-Tec-RevB, 25 May 2022. Setup: pp. 56-59, 63-69; oxygen units/limits: p. 72; rated depth: p. 80.

[Open official source](#)

2. Shearwater Research - Only Enable Gases You Will Actually Use

Tyler Coen, 2 August 2021. Active breathing gas, enabled gases and predictions.

[Open official source](#)

3. Divers Alert Network - Breathing Gases

Georgia Hausserman, 1 May 2017. Published gas-identification cases.

[Open official source](#)

4. Divers Alert Network - Performance Under Pressure

Reilly Fogarty, 1 May 2019. Gas density and breathing-effort context.

[Open official source](#)

5. Shearwater Research - Perdix 2 Support

Current manual links, firmware listing and update instructions.

[Open official source](#)

What was checked for this edition

Nine scenario datasets and two invalid-gas cases were regenerated from the covered engine. Figures use those generated timelines. Desktop three-gas results and mobile Local Jobs layout were inspected in a browser. PDF pages were rendered and visually reviewed; navigation and document links were checked. These checks do not constitute independent dive-model validation or a physical Perdix test.

Sources accessed 12 September 2026. Website screenshots are from the local release. Cover updated 13 September 2026 using a user-supplied photograph, colour edited and composed with AI assistance. Timeline figures were prepared from planner data. Manufacturer trademarks do not imply affiliation.

Acronyms and diving terms

This is the complete acronym list used in the planner, this guide, the Perdix 2 comparison and the release record. Chemical symbols such as O₂, N₂ and He are included because they appear in gas entries and partial-pressure calculations. NOTOX is retained as the website's notation cue; it is not presented as a universal industry expansion.

Term	Explanation
AI	Air Integration: the Perdix 2 wireless pressure-transmitter system.
ATA	Atmospheres absolute: pressure including the surface atmosphere.
A4 / A5	ISO paper sizes used for the full guide and the compact slate printout.
BO	Bailout: open-circuit gas used as an emergency return gas in a rebreather context.
CC	Closed circuit: a rebreather mode; outside the open-circuit calculation in this guide.
CNS	Central nervous system; the planner's modelled oxygen-exposure percentage.
CO ₂	Carbon dioxide; high gas density and exertion can increase breathing effort and CO ₂ -retention concern.
DAN	Divers Alert Network; an independent reference source cited for gas-identification and gas-density context.
DCS	Decompression sickness; a medical condition, not a value predicted by this website.
EAD	Equivalent air depth; nitrogen comparison expressed as an air depth.
EAN	Enriched air nitrox; EAN32 is 32% oxygen and EAN50 is 50% oxygen.
END	Equivalent narcotic depth; this release counts oxygen and nitrogen as narcotic for its display.
EN 13319	European dive-instrument standard referenced by the Perdix 2 salinity setting.
GF	Gradient factor; the low/high pair modifies the Buhlmann M-value limits.
GF99	Current leading-compartment gradient relative to the original M-value; not a risk percentage.
GTR	Gas time remaining; a computer display concept, not calculated by this website.
He	Helium; inert gas fraction used in Trimix entries.
ID	Identifier; a physical cylinder label or other record used to match the analysed gas to the plan.
M-value	Theoretical maximum tolerated inert-gas pressure in a compartment model.
MOD	Maximum operating depth for a selected gas and pO ₂ limit.
N ₂	Nitrogen; the remaining inert fraction after oxygen and helium.

Acronyms continued

The first page covers the planning, gas, model and exposure terms. This continuation completes the computer and website notation.

Term	Explanation
NDL	No-decompression limit: remaining time before a mandatory decompression obligation.
NOTOX	The website's underlined gas-switch notation cue; follow the taught gas-switch procedure.
O ₂	Oxygen; the gas fraction used to calculate pO ₂ and oxygen exposure.
OC	Open circuit: gas is breathed from a cylinder and exhaled to the water.
OTU	Oxygen tolerance unit; the planner's modelled oxygen-exposure index.
pHe / pN ₂ / pO ₂	Partial pressure of helium, nitrogen or oxygen.
PDF	Portable Document Format; the downloadable guide file.
PPO ₂ / ppO ₂	Oxygen partial pressure; the Perdix manual writes PPO ₂ and the website often writes pO ₂ .
RMV	Respiratory minute volume; surface-equivalent litres per minute used by the planner.
SAC	Surface air consumption; a pressure-rate display. In metric units, RMV = SAC x cylinder volume.
SI	Surface interval; time spent at the surface between repetitive dives.
TTS	Time to surface; predicted time including ascent, switches and decompression stops.
Tx	Trimix shorthand, such as Tx18/45 for 18% oxygen and 45% helium.
USB	Universal Serial Bus; a connection mentioned in the Perdix 2 integration limitations.
URL	Uniform Resource Locator; the web address printed in the guide and release record.
VPM-B	Variable Permeability Model B; an optional computer algorithm, not used by this website.
ZHL-16C	Buhlmann 16-compartment decompression model used by the planner.
QA	Quality assurance; the browser and regression checks described in the release report.
SHA-256	Secure Hash Algorithm with a 256-bit digest used to identify the covered engine and packages.
ZIP	ZIP archive format used for the FTP patch and complete website package.

The guide uses "deco" as a short form of decompression and "p" before a gas symbol to mean partial pressure. Neither is a separate algorithm.

Measures, units and conversions

Enter values using the labels shown by the website: metres, minutes, bar, litres, litres per minute, kilograms per litre and millibars. The conversions below help reconcile a Perdix 2 or another reference; they do not change the planner's input convention.

Quantity / symbol	Meaning	Useful conversion or relationship
Depth: m	Metres of water used by the planner.	1 m = 3.28084 ft; 1 ft = 0.3048 m.
Depth: msw / fsw	Metres / feet of seawater used in some manuals.	1 msw is approximately 3.28084 fsw as a display conversion; water density changes pressure.
Pressure: bar	Absolute or gauge pressure depending on context; planner gas and pO2 reports use bar.	1 bar = 1000 mbar = 100 kPa = 14.5038 psi.
Pressure: mbar	Millibar, used for entered sea-level pressure.	1013 mbar = 1.013 bar; 1 mbar = 0.001 bar.
Pressure: ATA / atm	Atmospheres absolute, including surface pressure.	1 ATA = 1.01325 bar = 1013.25 mbar = 14.6959 psi.
Pressure: psi	Pounds per square inch, common in imperial displays.	1 psi = 0.0689476 bar; 1 bar = 14.5038 psi.
Volume: L	Litres of cylinder water volume or surface gas volume.	A 12 L cylinder at 200 bar represents about 2400 surface L before reserves and real-gas effects.
Gas use: L/min	Surface-equivalent gas consumption.	At constant depth: surface L = RMV x ambient bar x minutes.
SAC: bar/min	Cylinder pressure drop adjusted to surface conditions.	RMV [L/min] = SAC [bar/min] x cylinder water volume [L].

Measures continued

The remaining entries cover time, temperature, gas fractions, partial pressure and cylinder pairing.

Quantity / symbol	Meaning	Useful conversion or relationship
Time: min / s	Minutes and seconds.	1 min = 60 s; website travel legs are rounded up to whole minutes.
Temperature: deg C / deg F	Temperature reference for gas-density and equipment notes.	deg F = (deg C x 9/5) + 32; deg C = (deg F - 32) x 5/9.
Density: kg/L / g/L	Water or breathing-gas density units.	1 kg/L = 1000 g/L; 1.030 kg/L = 1.030 g/mL.
Fraction: % / decimal	Gas composition and exposure fraction.	21% O ₂ = 0.21; 50% O ₂ = 0.50; 100% O ₂ = 1.00.
pO ₂	Oxygen partial pressure.	pO ₂ [bar] = oxygen fraction x ambient absolute pressure [bar].
Ambient pressure	Surface pressure plus water-column pressure.	P _{ambient} = P _{surface} + (density x gravity x depth); the website uses site inputs.
MOD	Depth at a selected pO ₂ limit.	MOD = (limit / oxygen fraction - surface pressure) / pressure rise per metre.
Cylinder pairing	Combined internal volume.	Twin 10 L = 20 L; twin 11.1 L = 22.2 L; twin 12 L = 24 L.

A conversion example

At 1013 mbar and 1.030 kg/L, 100% O₂ at a 1.60 bar limit gives an exact MOD near 5.811 m, displayed as 5.8 m. The same nominal 1.60 entered as ATA is a different pressure. Compare units before comparing schedules.

Use actual site pressure, water convention, analysed fractions and the instrument's documented units. Round operational values according to the agreed team procedure, not merely the nearest display value.