

# Understanding Engine-Room Ventilation

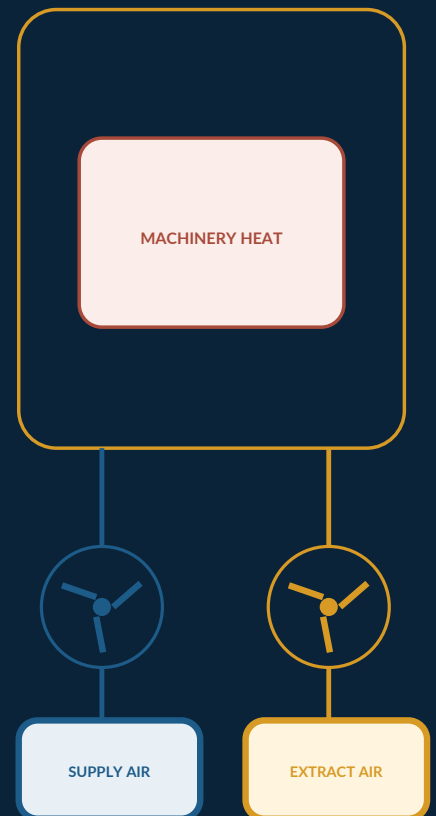
An owner's guide to combustion air,  
heat removal, dampers and fire integration

Ventilation is part of the propulsion,  
electrical and fire-safety systems.

Restricted or uncontrolled airflow can  
reduce power, raise heat and remove options.

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GUIDE OVERVIEW

# What engine-room ventilation is designed to do

The ventilation system supplies combustion air, limits machinery-space temperature, removes fumes and supports fire control. Its performance affects engines, generators, electrical equipment and crew access.

|       |                                                                                                                                                                                                                                                                          |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SCOPE | This guide covers natural and forced ventilation commonly fitted to diesel-powered yachts. It explains owner-level principles rather than airflow-design calculations. The installed engine, generator, fan and fire-system documentation remains the primary reference. |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

By the end of this guide, you should be able to:

- Distinguish combustion-air demand from the additional airflow needed to remove machinery heat.
- Trace external inlets, weather protection, trunks, filters, fans, dampers, outlets and controls.
- Recognise restriction, fan failure, poor airflow distribution, excessive pressure difference and water ingestion.
- Understand how ventilation interfaces with fire dampers, shutdowns and fixed extinguishing systems.
- Ask better questions during purchase, survey, refit, loaded trials and offshore preparation.

|                |                                                                                                                                                                                                                                   |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CORE PRINCIPLE | Ventilation capacity must be assessed as an installed system under realistic machinery load. Large openings or powerful fans do not guarantee correct airflow if the route is restricted, poorly balanced or vulnerable to water. |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Safety

Fans, belts and dampers may move automatically or remotely. Ventilation trunks can also carry smoke, heat and extinguishing agent. Isolate equipment before work and follow the vessel's fire plan before changing fan or damper positions during an incident.

SYSTEM ARCHITECTURE

# How air moves through the machinery space

A useful ventilation plan shows where air enters, what removes water and debris, how air reaches each engine or hot zone, where it leaves and what happens during fire shutdown.



Fire dampers, fan controls, temperature sensors and shutdown interfaces act across the complete airflow path.

## The main functions

- Combustion supply: Engines and generators consume air, so the compartment must replace it without excessive restriction.
- Heat removal: Radiated heat from engines, exhausts, alternators, electrical equipment and auxiliaries must be carried away.
- Fume control: Normal ventilation limits heat and odour, but it is not a substitute for repairing fuel, oil or exhaust leakage.
- Water protection: Weather louvres, demisters, baffles and drains reduce spray and salt entering the machinery space.
- Fire control: Fans and openings must be capable of shutdown or closure in accordance with the installed fire strategy.
- Monitoring: Temperature, pressure difference, fan status, damper position and visual airflow clues reveal changing condition.

|                    |                                                                                                                                                                                   |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AIRFLOW IS A ROUTE | The smallest effective opening, blocked filter, closed damper or collapsed duct can control the whole system. Trace the route rather than judging one fan or grille in isolation. |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

AIRFLOW DEMAND

# Combustion air, heat removal and installed resistance

Engine manufacturers define air demand and permitted intake restriction for their equipment. Ventilation design must also remove compartment heat under the expected simultaneous load and external conditions.



Fan nameplate capacity is not the delivered airflow once the actual installation resistance is included.

| Consideration            | What changes the requirement                                                            | Owner focus                                                                                               |
|--------------------------|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| Main-engine combustion   | Engine power, turbocharger demand, altitude and inlet-air temperature.                  | Manufacturer airflow data, restriction limit and whether air is drawn from the room or dedicated ducting. |
| Generator combustion     | Number of generators operating and electrical load.                                     | Simultaneous operation with propulsion machinery, especially during high hotel load.                      |
| Radiated heat            | Engines, exhausts, alternators, converters, hydraulics, refrigeration and hot pipework. | Insulation condition, equipment added during refit and full-load temperature.                             |
| External conditions      | High ambient temperature, sun-heated structure, low vessel speed and following wind.    | Test in the most demanding realistic condition rather than a cool dockside day.                           |
| System resistance        | Louvres, screens, filters, demisters, bends, silencers, long ducts and fire dampers.    | Clean and dirty pressure loss, delivered fan duty and evidence of inlet depression.                       |
| Safety margin and ageing | Filter loading, corrosion, fan wear and later equipment additions.                      | Preserve margin without defeating water or fire protection by removing components.                        |

DO NOT ADD FAN RATINGS TOGETHER BLINDLY

Two fans operating in the same duct or against the same restriction do not necessarily deliver the sum of their free-air ratings. Installed airflow needs measurement or engineering evidence.

AIR INLETS AND TRUNKS

# Weather protection, drainage, filters and access

External openings must admit enough air while limiting seawater, rain, spray, salt and debris. The route should remain effective across heel, trim, sea state and different wind directions.



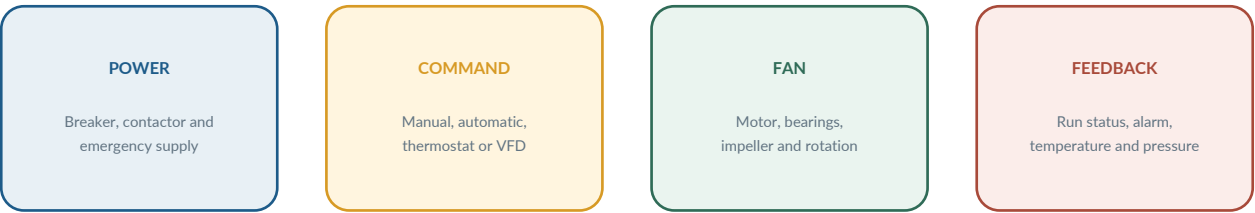
| Area                          | Common weakness                                                                                   | Owner focus                                                                                      |
|-------------------------------|---------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| External louvre or cowl       | Fouling, damage, wrong orientation, small free area or wind-driven recirculation.                 | Clear opening, actual free area, position relative to exhaust outlets and condition underway.    |
| Mist eliminator / demister    | Salt deposits, damaged media, blocked drainage or excessive pressure loss.                        | Cleaning method, replacement interval, access and pressure difference when wet.                  |
| Drain pan and overboard drain | Blocked limber, poor fall, siphon or drainage into the machinery space.                           | Prove the water route, inspect traps and confirm no backflow under heel or sea pressure.         |
| Screens and filters           | Debris, insects, paint, oil or salt reduces effective area.                                       | Clean baseline, spare elements, correct mesh and no improvised fine filter that starves engines. |
| Ventilation trunk             | Collapsed liner, loose insulation, corrosion, disconnected joint or stores obstructing the route. | Full-length inspection where possible, structural support and no hidden fire-boundary breach.    |
| Fire damper at opening        | Partly closed blade, corrosion, failed actuator or poor position indication.                      | Normal open position, remote closure, local access, seal and return-to-service test.             |

|                                                   |                                                                                                                                                                           |
|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A CLEAN-LOOKING GRILLE CAN STILL RESTRICT AIRFLOW | Decorative covers, acoustic linings and demisters may hide the true free area. Engine-room pressure and loaded temperature provide better evidence than appearance alone. |
|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

FANS, BLOWERS AND CONTROLS

# Power, direction, redundancy and feedback

Forced ventilation may use supply fans, extract fans or a balanced arrangement. Fan type, rotation, duct resistance and control logic determine whether useful air reaches the machinery.



| Area                      | What can fail                                                                        | Owner focus                                                                        |
|---------------------------|--------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Fan motor and bearings    | Overheat, corrosion, seized bearings, electrical fault or reduced speed.             | Sound, vibration, current, temperature, insulation condition and service history.  |
| Impeller and casing       | Fouling, imbalance, cracked blades, rubbing, wrong rotation or loose hub.            | Air direction, secure guards, cleanliness and inspection after abnormal vibration. |
| Belts or drive            | Slip, dust, misalignment, ageing or failed tensioner.                                | Correct tension, spare belts, matched sets and no oil contamination.               |
| Starter, contactor or VFD | Loss of command, trip, poor cooling, failed speed reference or bypass fault.         | Local/manual mode, alarms, reset logic, spare fuses and fire-shutdown interface.   |
| Automatic control         | Sensor or software error starts too late, cycles rapidly or fails to increase speed. | Set points, staged fans, override and behaviour after power restoration.           |
| Redundancy                | Both fans share one breaker, control circuit, trunk, damper or blocked inlet.        | Test one-fan operation and identify genuine common dependencies.                   |

RUN INDICATION IS NOT AIRFLOW INDICATION

A contactor or display may show a fan running while the impeller turns backwards, a belt slips, a damper remains closed or the duct is blocked.

AIRFLOW DISTRIBUTION

# Avoiding hot spots, dead zones and pressure problems

Total airflow can appear adequate while engines inhale hot air or electrical equipment sits in a stagnant pocket. Supply and extraction positions determine the path through the compartment.

LOW / COOL SUPPLY

Direct air towards engine intakes

SWEEP MACHINERY

Pass air across hot and occupied zones

HIGH EXTRACTION

Remove rising hot air and fumes

AVOID SHORT CIRCUIT

Supply must not flow directly to outlet

| Condition                   | What it can cause                                                                            | Evidence to consider                                                                                 |
|-----------------------------|----------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| Short-circuit airflow       | Fresh air travels directly from inlet to outlet without cooling machinery.                   | Smoke/airflow test, local temperature mapping and duct discharge direction.                          |
| Hot-air recirculation       | Extracted air is drawn back into an inlet or engine air filter.                              | External outlet/inlet positions, wind direction and loaded inlet-air temperature.                    |
| Excessive negative pressure | Reduced engine airflow, hard-opening doors, fume draw from adjacent spaces and fan overload. | Pressure difference under load, engine restriction and behaviour with access doors closed.           |
| Excessive positive pressure | Heat, oil mist or fumes escape through doors and penetrations into accommodation.            | Airflow direction at boundaries, door seals and contaminated-air pathways.                           |
| Local dead zone             | Electrical panels, batteries or auxiliaries experience higher temperature than room average. | Multiple sensors, thermal inspection and equipment-specific temperature alarms.                      |
| Door or hatch left open     | Designed airflow bypasses trunks and fire boundaries.                                        | Compare normal closed-space performance and do not treat open doors as a permanent cooling solution. |

PRESSURE DIRECTION MATTERS

The correct balance is installation-specific. The practical requirement is enough combustion air, controlled heat and no routine movement of machinery-space fumes into occupied areas.

TEMPERATURE AND HEAT SOAK

# Measuring what the machinery actually experiences

One sensor near an extract duct may not represent the air reaching an engine intake, alternator or control panel. Useful monitoring compares several locations under repeatable load.

**AMBIENT**  
Outside air sets the starting condition

**AIR INLET**  
Measure after louvres and filters

**HOT ZONE**  
Turbo, exhaust and electrical equipment

**EXTRACT AIR**  
Shows total heat carried away

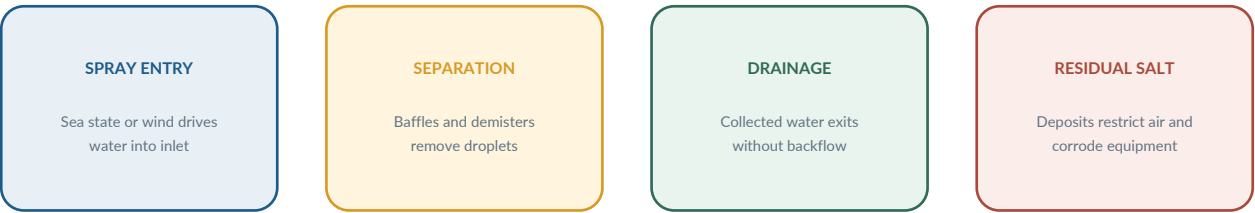
| Observation                                 | Possible interpretation                                                                     | Owner focus                                                                                     |
|---------------------------------------------|---------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| Temperature rises gradually with load       | Normal heat accumulation or marginal airflow/cooler capacity.                               | Compare outside, inlet, engine-intake, hot-zone and extract temperatures.                       |
| Temperature continues rising at steady load | Fan stage failed, filter loading, recirculation, closed damper or excessive machinery heat. | Do not wait for engine overheat; inspect airflow and reduce load if margin disappears.          |
| High temperature after shutdown             | Heat soak from exhausts and engines while forced airflow stops.                             | Post-run fan logic, electrical-panel limits and whether safe ventilation continues as designed. |
| One side of room much hotter                | Poor distribution, fan failure, blocked branch or unequal machinery load.                   | Map temperatures and compare fan airflow rather than relying on room average.                   |
| Engine intake air unusually hot             | Recirculation, hot supply location, fan reversal or insufficient fresh air.                 | Engine derating, smoke, boost and manufacturer inlet-temperature limit.                         |
| Alarm operates only in certain weather      | Wind pressure, following sea, spray loading or outlet recirculation changes airflow.        | Record vessel heading, speed, wind and sea condition with the alarm.                            |

|                                            |                                                                                                                                                  |
|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ALARM LIMITS ARE NOT NORMAL TARGETS</b> | A rising trend that remains below an alarm can still reduce engine power, alternator life and electrical reliability. Preserve operating margin. |
|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|

WATER AND SALT INGESTION

# Protecting machinery without starving it of air

Ventilation openings are exposed to rain, spray and sea wash. Water separation must work without adding so much resistance that engines and fans cannot obtain the required airflow.



| Area                       | Common problem                                                                         | Owner focus                                                                         |
|----------------------------|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Weather louvre or cowl     | Wind-driven spray enters because of position, orientation or damaged baffles.          | Observe in real sea conditions, not only with a hose test alongside.                |
| Demister media             | Salt loading increases pressure loss and may shed water downstream.                    | Cleaning, replacement, drainage and pressure difference when wet.                   |
| Drain system               | Blocked drain, failed trap or poor fall floods trunk and carries water into machinery. | Prove free drainage, inspect after heavy weather and confirm no seawater backflow.  |
| Duct lining and insulation | Absorbs water, corrodes hidden structure or collapses into the airflow.                | Dryness, attachment, fire rating and access behind panels.                          |
| Salt deposition            | Corrodes fan motors, alternators, terminals, sensors and air filters.                  | White deposits, tracking, fan current, electrical insulation and cleaning practice. |
| Emergency closure          | Crew closes inlets in heavy weather and forgets to reopen them before load.            | Clear labels, bridge/engine-room communication and pre-start damper checks.         |

|                                                      |                                                                                                                                                                                   |
|------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| WATER PROTECTION AND AIRFLOW MUST BE TESTED TOGETHER | Removing demisters may improve airflow but expose machinery to salt. Adding finer media may stop spray but exceed the permitted restriction. Changes need engineering assessment. |
|------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## FIRE-SAFETY INTEGRATION

# Fans, fire dampers, shutdowns and fixed extinguishing

Ventilation can feed a machinery-space fire and provide a path for smoke. The fire plan normally depends on stopping fans, closing openings and isolating fuel or machinery before fixed extinguishing is used.



| Equipment or function         | Purpose                                                                                   | Owner focus                                                                                          |
|-------------------------------|-------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| Fire dampers / closures       | Restore the fire boundary and limit air or extinguishing-agent loss.                      | Remote and local operation, blade travel, seals, indication, labels and access.                      |
| Fan emergency stops           | Remove forced air and prevent smoke spread or continued combustion support.               | Location outside the space, clear identity, test procedure and whether supply and extract both stop. |
| Fuel and machinery shutdowns  | Reduce fuel, hydraulic and electrical energy feeding the incident.                        | Which engines, generators, pumps and quick-closing valves are affected.                              |
| Fixed extinguishing interlock | May require or automatically initiate fan shutdown and damper closure.                    | Actual sequence, time delay, override, status indication and post-discharge restrictions.            |
| Natural openings              | Open grilles or trunks can defeat containment even if fans stop.                          | Every opening included on the closure plan, including later refit penetrations.                      |
| Re-entry and restart          | Premature ventilation may reintroduce oxygen, spread smoke or remove extinguishing agent. | Follow the fire-system procedure and competent authority before reopening or restarting.             |

## A DAMPER MUST WORK IN BOTH STATES

A damper stuck open compromises fire containment; a damper stuck closed can starve machinery of air. Testing must confirm full travel, indication and return to the normal operating position.

## FUMES AND CONTAMINATION

# Oil mist, exhaust leakage and air moving into occupied spaces

Ventilation removes normal heat and minor odour, but strong smell, visible haze or recurring contamination indicates a defect. Fans may spread leaked gas through the yacht rather than make it safe.

**OIL / FUEL MIST**

Leaks and hot surfaces  
create vapour or smoke

**EXHAUST LEAK**

Soot and CO enter the  
machinery space

**BILGE / CHEMICALS**

Odours and vapours  
enter the airflow

**AIR PATH**

Fans can spread contamination  
to accommodation

| Evidence                           | Possible source                                                                        | Why it matters                                                                                    |
|------------------------------------|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| Fuel smell                         | Leaking hose, fitting, filter, tank vent or spill.                                     | Fire exposure, slip hazard and vapour movement; ventilation does not replace stopping the leak.   |
| Oil mist or haze                   | Crankcase breather, leaking oil on hot surface, turbo issue or atomised hydraulic oil. | Fire risk, contaminated air filters and reduced visibility.                                       |
| Soot or exhaust smell              | Dry exhaust joint, manifold, turbo, bellows, wet-exhaust leak or nearby vessel.        | Carbon monoxide, fire, heat damage and crew exposure.                                             |
| Electrical or hot-insulation smell | Overheated motor, cable, alternator, VFD, transformer or insulation.                   | May indicate impending electrical fire or ventilation fan failure.                                |
| Bilge or chemical odour            | Contaminated bilge, cleaning solvent, battery issue or waste-system leak.              | Airflow can carry vapour into accommodation and obscure more serious smells.                      |
| Symptoms in crew                   | Carbon monoxide, heat stress, fumes or oxygen-deficient/fire atmosphere.               | Leave the space, account for personnel and seek emergency/medical help; do not investigate alone. |

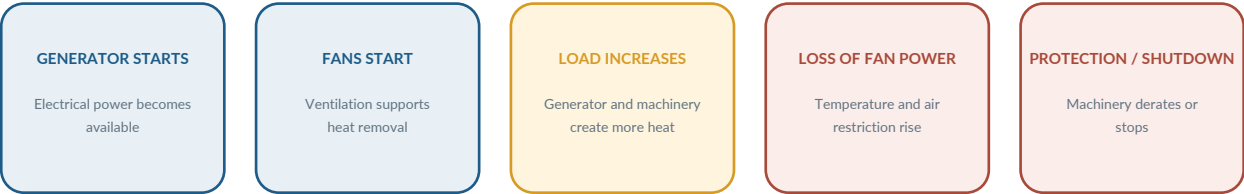
**DO NOT USE SMELL AS  
THE ONLY DETECTOR**

Carbon monoxide may not be recognised by smell. Maintain suitable alarms in occupied spaces and treat alarms or compatible symptoms as urgent.

MACHINERY AND POWER DEPENDENCIES

# What ventilation failure can disable

Ventilation may depend on the same electrical system and generators that need the airflow. Blackout recovery and reduced-power operation should consider heat removal from the first engine start onwards.



| System                                | How ventilation affects it                                                                    | Questions to resolve                                                                   |
|---------------------------------------|-----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| Main engines                          | Combustion-air restriction and high inlet temperature reduce power and increase thermal load. | Can safe reduced load be maintained after one fan or inlet is lost?                    |
| Generators                            | Generator combustion and alternator cooling add heat while supplying fan power.               | What airflow exists during start-up, blackout recovery and single-generator operation? |
| Electrical panels / drives            | High ambient temperature shortens component life and may trip converters or VFDs.             | Which local fans or air-conditioners depend on the main ventilation route?             |
| Hydraulic and refrigeration equipment | Motors, pumps and compressors add heat and may derate or trip.                                | Does machinery load increase at the same time as propulsion demand?                    |
| Fire system                           | Normal fan power must be removed or controlled during fire response.                          | Are shutdown controls independent, accessible and compatible with emergency power?     |
| Accommodation boundary                | Pressure imbalance can move heat and fumes through doors, cable penetrations or ducts.        | What happens when doors are closed and all machinery is at full load?                  |

|                        |                                                                                                                                                                      |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TEST THE DEGRADED CASE | Normal operation with every fan running does not show whether the yacht can preserve propulsion or electrical power after one fan, breaker, damper or inlet is lost. |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## FAILURE AWARENESS

# Common weaknesses and immediate response

Ventilation failures often begin with a temperature trend, fan sound, pressure change, water in a trunk or machinery that no longer reaches normal output.

**RECOGNISE**

Heat, alarm, smell,  
smoke or lost airflow

**REDUCE LOAD**

Lower heat and  
combustion demand

**STABILISE**

Protect propulsion,  
power and crew

**CHECK / ISOLATE**

Fans, dampers, filters,  
power and water entry

**REASSESS**

Restore, ventilate,  
divert or seek help

| Evidence or failure                 | Possible cause                                                                                               | Immediate thinking                                                                                             |
|-------------------------------------|--------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| High temperature or hot-zone alarm  | Fan failure, blocked filter, closed damper, recirculation, extra machinery load or high ambient temperature. | Reduce heat load, confirm airflow and protect engines/electrical equipment before limits are exceeded.         |
| Engine smoke, derating or low boost | Combustion-air restriction, hot intake air or ventilation pressure loss.                                     | Reduce engine demand and inspect inlet route, dampers and fans; do not assume an internal engine fault.        |
| Fan running but little air          | Wrong rotation, slipping belt, damaged impeller, closed damper or collapsed duct.                            | Verify delivered airflow and fan direction rather than relying on status indication.                           |
| Water or salt inside trunk          | Sea-state entry, blocked drains, failed demister or outlet backflow.                                         | Protect electrical equipment, reduce exposure and correct the drainage or weather-protection fault.            |
| Smoke, fuel or exhaust smell        | Fire, leak or contaminated-air pathway.                                                                      | Treat the source as the hazard; follow fire or evacuation procedure rather than simply increasing ventilation. |
| Fire damper or fan fails test       | Corrosion, actuator, cable, solenoid, power or interlock fault.                                              | Restore fire readiness before offshore use and confirm the normal open operating state afterwards.             |

**DO NOT NORMALISE IT**

An engine-room door that must remain open, a fan that often trips, salt on alternators or a high-temperature alarm that appears only in calm weather are unresolved system defects.

## Restart and re-entry decisions

After a ventilation shutdown, fire event or contamination incident, restarting fans may spread smoke, reintroduce oxygen or expose people. Follow the installed procedure and confirm the hazard has been controlled.

## MAINTENANCE STRATEGY

# Owner checks, loaded tests, records and spares

Ventilation maintenance should preserve free area, fan output, drainage, fire closure and reliable monitoring. Cleaning one filter is not a complete system test.

| Area                        | Good maintenance evidence                                                                                             | Why it matters                                                            |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| Inlets and water separation | Louvres, demisters, screens, drains and trunks inspected and cleaned.                                                 | Preserves airflow while preventing salt and water entry.                  |
| Fans and drives             | Motor, bearings, belts, impeller, rotation, current and vibration recorded.                                           | Confirms delivered fan condition rather than only electrical run status.  |
| Dampers and closures        | Full travel, seals, remote/local operation, position indication and reset tested.                                     | Supports normal airflow and fire containment.                             |
| Controls and alarms         | Automatic stages, VFDs, temperature/pressure sensors and power-restoration logic tested.                              | Prevents hidden control faults and late fan response.                     |
| Loaded ventilation test     | Temperatures, pressure difference, fan status and machinery performance recorded at representative simultaneous load. | Proves the installed system in realistic operation.                       |
| Fire-system interface       | Fan stops, damper closure, fuel/machinery shutdown and status feedback tested under approved procedure.               | Confirms the complete fire sequence without accidental loss of readiness. |

## Useful spares and tools

- Correct filters or demister elements, fan belts, fuses, contactors or approved relays where owner replacement is realistic.
- Damper cable/actuator service parts and position switches only where specified by the manufacturer.
- Portable temperature and pressure-difference instruments for repeatable checks.
- Drain-cleaning tools, corrosion-control materials and lighting for safe trunk inspection.
- Current airflow data, diagrams, fan curves, control logic, fire plan and specialist contacts.

|               |                                                                                                                                                                                                     |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| WORK TO REFER | Airflow measurement and balancing, fan selection, duct or inlet modification, fire-damper repair, electrical-control configuration and fixed-fire-system integration require competent specialists. |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## OFFSHORE READINESS

# Buyer questions and readiness checklist

An offshore-ready ventilation system has demonstrated adequate air and temperature control at realistic load, protects machinery from salt, integrates correctly with fire response and has a credible degraded mode.

| Area                    | Questions for purchase or survey                                                                                                 |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| Airflow basis           | Are engine and generator air demands, heat loads, fan duties and permitted restrictions documented for the current installation? |
| Inlets and distribution | Are louvres, demisters, drains, trunks and branch outlets clear, dry and able to reach every hot zone?                           |
| Fans and controls       | Do supply/extract fans, stages, VFDs, alarms and local/manual controls work without trips or abnormal vibration?                 |
| Loaded performance      | Are machinery-space, engine-intake and electrical-panel temperatures acceptable at representative simultaneous load?             |
| Water and corrosion     | Is there evidence of salt, spray, blocked drainage, corroded fan motors or contaminated filters?                                 |
| Fire integration        | Do fan stops, fire dampers, closures, fuel shutdowns and fixed-extinguishing interfaces follow a clear tested sequence?          |
| Degraded operation      | What propulsion and electrical load can be maintained after loss of one fan, damper, inlet, breaker or control circuit?          |

## Quick readiness check

|                          | Readiness statement                                                                                       |
|--------------------------|-----------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> | I can trace supply and extraction routes, including filters, drains, fans, dampers and outlets.           |
| <input type="checkbox"/> | Combustion-air demand and heat-removal duty are documented for the current machinery.                     |
| <input type="checkbox"/> | Normal loaded temperatures, pressure difference, fan stages and engine-intake conditions are known.       |
| <input type="checkbox"/> | There are no unresolved hot spots, fan trips, blocked drains, salt deposits or airflow restrictions.      |
| <input type="checkbox"/> | Fan rotation, belts, bearings, filters, demisters, alarms and controls are current and accessible.        |
| <input type="checkbox"/> | Fire dampers, remote fan stops and fire-system interfaces have been tested under an approved procedure.   |
| <input type="checkbox"/> | A reduced-load plan exists after loss of one fan, inlet, damper or power supply.                          |
| <input type="checkbox"/> | More than one person knows the response to high temperature, smoke, water entry and ventilation shutdown. |

### KEY TAKEAWAY

A dependable engine-room ventilation system combines adequate combustion air, effective heat removal, controlled pressure and distribution, protection from water and salt, reliable fans and dampers, and a tested fire-shutdown sequence.

## Guidance to consult

Use the installed engine, generator, fan, control and fire-extinguishing manufacturers' current instructions, together with applicable flag-state, coding, class, insurance and yard requirements.

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