



Aalborg KBM

Pressure-atomizing burner for distillate and residual marine fuels

Application

Achieving optimal combustion efficiency is important to ensure fuel efficiency and economy onboard. Burner design is a critical factor that contributes directly to maintaining an accurate air-fuel ratio and, when working in combination with the right boiler, to achieving greater fuel efficiency and lower emissions.

Aalborg KBM burner from Alfa Laval

The Aalborg KBM burner is a pressure-atomizing burner designed for the continuous modulating operation of Aalborg OS-TCi and OC-TCi boilers. This burner helps maintain uniform combustion, which in turn contributes to improved heat transfer efficiency and reduced fouling of convection surfaces.

It features a user-friendly arrangement of compact, lightweight components that make the Aalborg KBM burner quicker and easier to install, operate and maintain than traditional mono-block burners. Another feature is the forced draft fan assembly that is specifically designed to supply the required amount of air at the required pressure. The unique air damper provides highly accurate control of airflow and minimizes draft loss during boiler shutdown. This translates into increased boiler uptime, reduced maintenance costs and optimal combustion efficiency.

Highly reliably, the Aalborg KBM burner with its robust construction is designed to operate with these marine fuels, which meet the ISO 8217:2010 fuel standard:

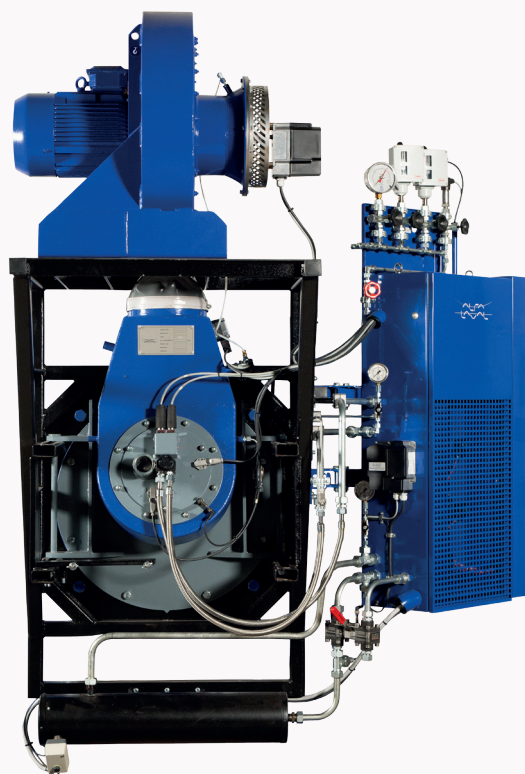
- Residual fuels: RMA, RMB, RMD, RME, RMG 180, RMG/K 380, RMG/K 500 and RMG/K 700
- Distillate fuels: DMA and DMB

The combination of easy-to-access, lightweight design and true ease of use makes the Aalborg KBM the burner of choice for ship owners and shipyards using Aalborg OS-TCi and OC-TCi boilers.

Features and benefits

Straightforward, modular, user-friendly design

Lightweight, easy-to-access design with pre-assembled modules and fewer components simplifies installation, operation and maintenance.



Lightweight and user-friendly, the Alfa Laval Aalborg KBM burner is faster and easier to install, operate and maintain than traditional.

Ease of maintenance

All combustion components that require service are assembled in a single easy-to-access retractable unit. Servomotors for oil and air regulation are also easily accessible. No removal of cables or pipes is required.

Ease of access

Access to the boiler furnace chamber for maintenance and inspection is simplified, thanks to the smart burner front plate design that enables hinged opening of the plate without demounting the wind box.

Improved airflow control

A specially designed rotary air damper valve accurately regulates the amount of air required for optimal combustion, reduces draft-induced temperature loss in the boiler and enables tight shut-off at burner stop.

Safe and reliable operation

Integrated boiler control equipment with a thin film transistor (TFT) touchscreen and advanced touch menus helps secure optimal operation of the boiler plant.

System components

The scope of supply for the Aalborg KBM consists of four pre-assembled modules for the mixing of marine fuel oils with supply air for efficient combustion. All modules are easy to install, easy to operate and easy to replace.

- Forced draft fan module

Mounted to the frame with a fail-safe vibration damper, the forced draft (FD) fan module supplies air to the boiler and controls airflow. For easy maintenance, it is quickly and securely mounted to the wind box by means of a hose clamp. Designed as a rotary slide plate valve, the air damper is securely bolted to the fan inlet flange.

This design enables a linear correlation between the angle of rotation and the open area in the valve, which significantly improves accuracy of the air-fuel ratio compared to that achieved with the use of butterfly valves. Moreover, during burner stops, there is virtually no airflow through the burner; this dramatically reduces draft-induced losses in the boiler.

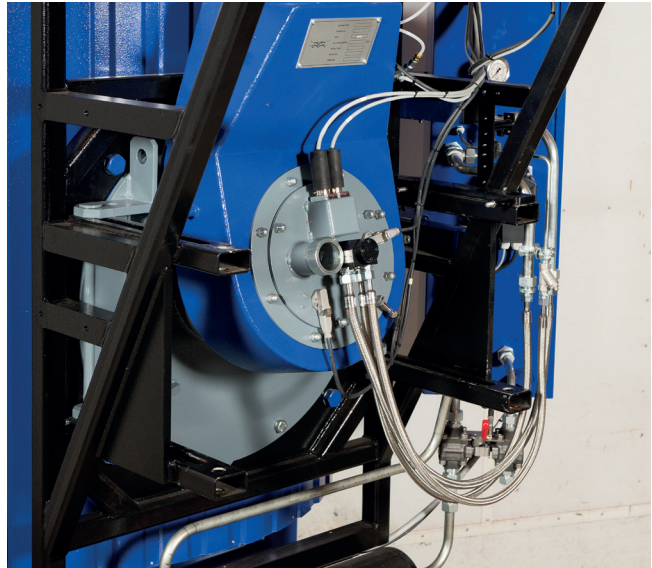
The air damper actuator with its servomotor with potentiometer feedback mounts directly onto the damper housing. It connects to the damper plate directly through a shaft. Removing the actuator is easy; simply loosen four hexagon head screws and one Allen set screw.

- Burner module

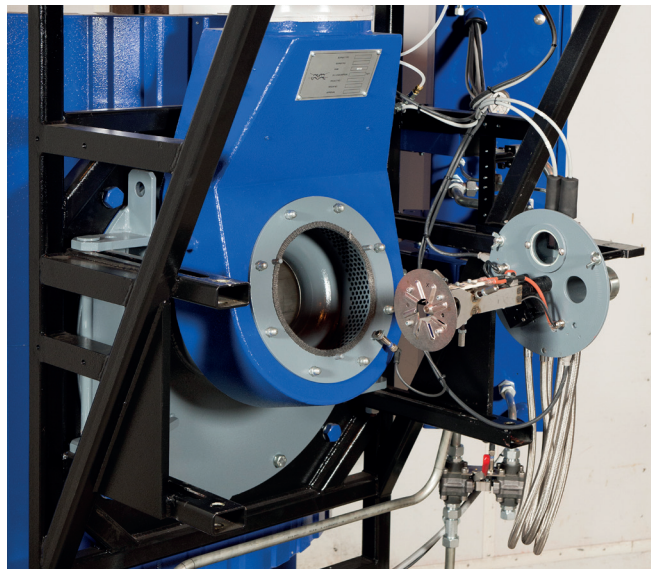
This module consists of several components mounted to the wind box. It creates the proper conditions for atomizing and mixing fuel and air and for subsequent ignition and flame propagation.

All parts that may require adjustment or maintenance are conveniently located in a single easy-to-access retractable unit called the end cap assembly. There is no need to remove any cables or pipes; simply loosen and remove three nuts for fast access to these parts:

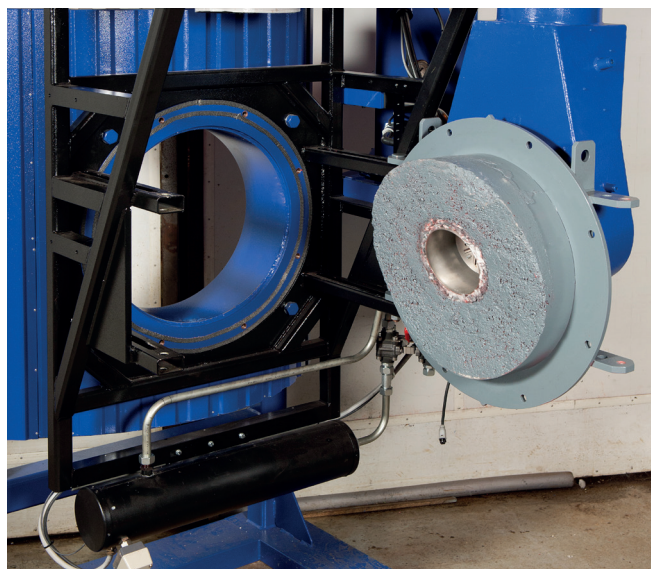
- Oil-atomizing nozzle
- Airflow swirler
- Swirler bracket with centering legs
- Lance heater
- Ignition electrodes
- Ignition unit
- Flame scanner protection glass



Burner assembled for operation.



End cap assembly retracted and mounted on the service bracket for maintenance.





FD Fan module with picture of the air damper in partial open position seen from the rear

A spliced clamp connects the burner lance to the instrument flange. This enables easy adjustment of the lance position relative to the burner tube from the exterior without retracting the end cap assembly. Simply loosen the clamp screws, adjust the lance position and remount the clamp.

- Oil cabinet module

This module contains all components for the oil system, steam system and control junction box.

Like all Aalborg KBM modules, the oil cabinet provides convenient access to components that require maintenance. To access junction box and oil cabinet components, including oil valves, simply unscrew the screw at the top left of the cabinet and remove the hatch. The oil valve actuator, which is identical to the air damper actuator, is positioned on the cabinet exterior for easy access as are the oil pressure manometers. A small valve cover ensures easy access to the oil flow control valve.

A splash shield protects the piping, valve housing manifolds and other threaded components from excess spray. Shield removal is only required when conducting a major overhaul of the oil piping system.

Convenient storage of large cables is provided on the left side of the cabinet, which acts as a cable tray. Simply loosen and remove the screw inside the oil compartment to lift the side hatch of the cabinet for access to the cables. Yard cables are mounted to the right of the tray.

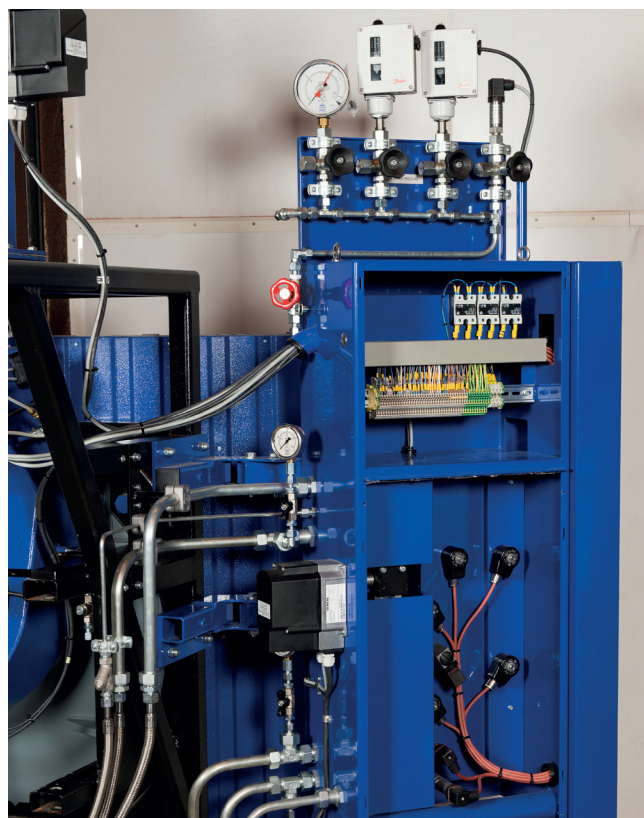
Located on top of the oil cabinet, the steam gauge monitors operation and meets the classification society requirements. Quick-closing valves are mounted outside the cabinet between the oil cabinet module and the frame module.

- Frame module.

The forced draft fan module and the oil cabinet module are mounted onto this base frame, which facilitates the hinged opening of the front plate for easy access to boiler furnace chamber. To access the chamber, simply pull out the front plate. Then, using one hinge, turn the front plate and, once turned, secure it with the excess hinge shaft. A service bracket is included and serves as a work table to the right of the burner.

Capacity range

The Aalborg KBM burner series ranges in capacity from 0.34 – 6.85 MW. Based on the use of HFO RMG 380, the mass flow rate ranges from 30-620 kg/h. The actual mass flow rate will vary depending on the type of marine fuel oil used.



Oil cabinet with front hatch removed.

Design data

Steam	Pressure: 7 bar g (saturation point) Feed water temperature: Min. 60°C
Fuel	HFO 380 cSt Calorific value: 40.2 MJ/kg Supply pressure: 29 bar g
Ambient conditions	1 – 45 °C 100 % RH. 1013 mbar A
Excess air	Max. λ = 1.24 or equal to max. 4.2% O ₂ in flue gas
Main power supply	3 x 440 VAC
Control power supply	1 x 230 VAC
Frequency	60 Hz

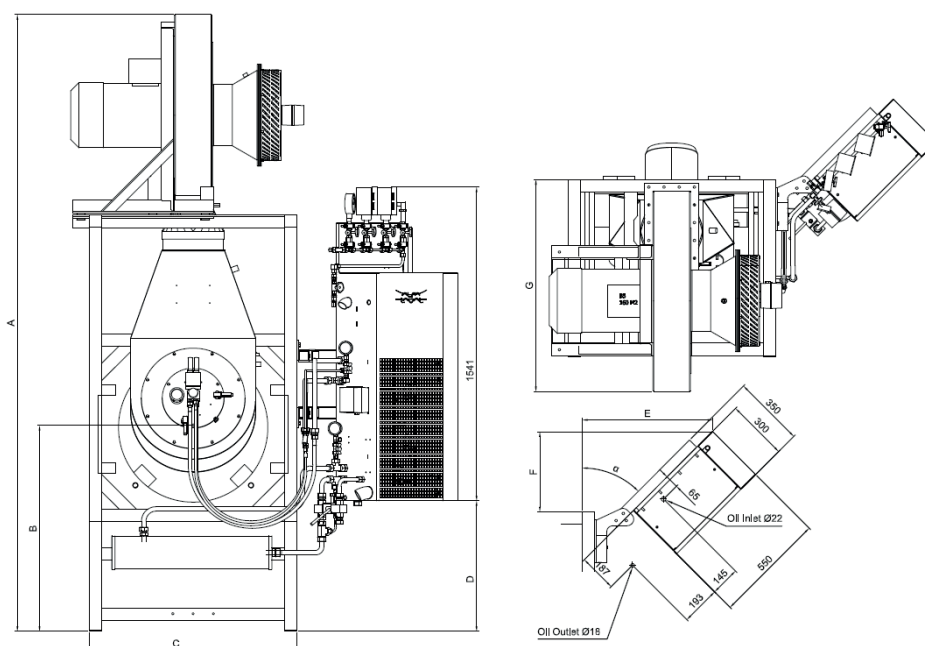
Capacities

Burner size	Steam	Oil			Air
	Boiler capacity t/h	Atomizer Size	Oil mass flow kg/h	Numbers of electrical heaters	Mass air flow kg/h
KBM 100	1.2	80	91	1	1607
KBM 125	1.6	100	122	1	2147
KBM 150	2	125	153	1	2689
KBM 200	2.5	160	191	1	3365
KBM 275	3.5	225	269	1	4730
KBM 350	4.5	275	347	2	6089
KBM 425	5.5	360	424	2	7458
KBM 500	6.5	400	502	2	8823
KBM 625	8	500	620	3	10896

Burner dimensions (in mm)

Windbox	Burner	A	B	C	D	E	F	G
1	KBM 100	2189	650	900	488	712	220	829
1	KBM 125	2189	650	900	337	712	220	829
1	KBM 150	2189	650	900	337	712	220	829
2	KBM 200	3025	997	1020	635	712	220	1042
2	KBM 275	3025	997	1020	635	712	220	1042
2	KBM 350	3025	997	1020	635	712	220	1042
3	KBM 425	3563	997	1130	635	712	220	1242
3	KBM 500	3563	997	1130	635	712	220	1242
3	KBM 625	3947	1380	1414	1018.5	712	220	1247

Dimensional Sketch



MDD00254EN 1508

How to contact Alfa Laval

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