



Your Complete Combustion System Supplier



STEAM **HEAT** **WATER**
Boilers • Burners • Control systems



SES Combustion has more than 40 years experience in designing, manufacturing and attending systems and equipment for boiler plants in ships, power/heating plants, paper mills and other heavy industry.

SES Combustion has delivered boiler equipment for following purposes:

- * Main steam boilers in ships with turbine propulsion
- * Auxiliary steam boilers in ships with diesel engine propulsion
- * Donkey steam boilers in ships
- * Exhaust gas boilers (economisers) in ships
- * Oil, gas and solid fuel (coal, timber, waste material) steam, hot water and heat oil boilers
- * Black liquor recovery boilers
- * Waste heat recovery boilers (economisers) in diesel engine power plants

SES Combustion has delivered boiler equipment to more than 500 ships and 100 land based plants



SES-Turboflame air assisted marine burner recently installed in Seabourn Pride cruise ship with two Sunrod auxiliary boilers.

SES Combustion (former S.E.S. Scandinavian Electronics AB) was the “in house” automation supplier to ABB Sunrod. Aalborg Industries and KangRim are some other major marine boilers manufacturers with automation from us.

SES Combustion has delivered steam boiler automation for most marine oil fired burners:

- | | |
|-------------------|------------------|
| * Hamworthy | * SES-Turboflame |
| * Vesta (Aalborg) | * Saacke |
| * Petrokraft | * Oilon |
| * Sunflame | * Weishaupt |

SESCON feed water level controller in a military frigate with steam turbine propulsion, a very qualified task.

The **SESCON** controller was developed by SES Combustion specially for marine boilers with consideration to control circuits such as feed water level, steam pressure, fuel oil pressure, fuel oil temperature, fuel oil flow, combustion air flow e.t.c.



Quoting a highly qualified commissioning engineer from Aalborg Industries in Korea: “**SESCON** is by far the best feed water level controller I ever experienced”. The water level just stays steady in the middle of the drum in the Mission D boiler.

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Exhaust gas boilers in diesel engine power plant with boiler start/stop depending on load request and damper control to keep steam pressure constant. Most systems delivered to China

Operator touch panel in boiler automation for industrial boiler. Complete system including burner management, boiler safety and combustion control system.



Mobile operator touch panel in combined district heating and power production plant. Burner management and boiler safety system. The operator can bring the touch panel to the burners to check the performance of all burner components

Factory test of BMS (burner management system) and ESP (emergency shutdown procedure) for a black liquor recovery boiler with 6 burners in a paper mill.

100 % of all PLC programs and wiring connections are tested before delivery. This system was designed to replace an old system burner by burner without stopping the black liquor boiler!!!



Swedish representative of world leading products:

Ignition burners

Pressur switches

Gas valves

Flame scanners

Actuators



Hegwein

CapLine Controls

UNI

Frige

ARIS

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Lennart Axelsson

Service and spare parts world-wide

With the two most experienced ex-Sunrod service engineers available **SES Combustion** is one the leading global companies within marine boiler, burner and boiler automation offering:

- * On-voyage and in-harbour repairs
- * Boiler system installation, commissioning and upgrading
- * Boiler system trouble-shooting and maintenance
- * Boiler system inspection, engineering and redesign
- * Spare parts for most boilers, burners and control systems
- * MFO to MGO/MDO conversion



Leif G. Andersson



Old boiler automation designed by our staff many years ago. The only persons who can set the combustion curve in this system are service engineers from **SES Combustion**. Spare parts are still available from stock.

Our still going strong boiler automation type M100. Probably still the best system for auxiliary boilers in ships. Our service engineers know every detail in the system. Most spare parts available from stock.



Old Hamworthy steam atomised burner. We lived with it for more than 40 years...

All ships with our boiler automation can be converted from HFO to MGO firing.

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SES-TURBOFLAME

Air assisted multi fuel
Marine Burner



Dual fuel - oil and gas
Integrated air fans



Fuel oil burner
Integrated air fans

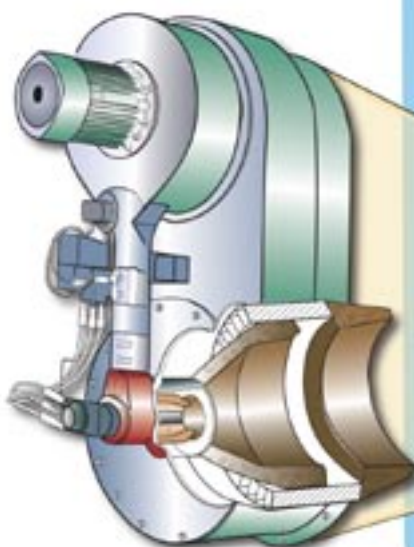


High capacity fuel oil burner
Separate primary air fan

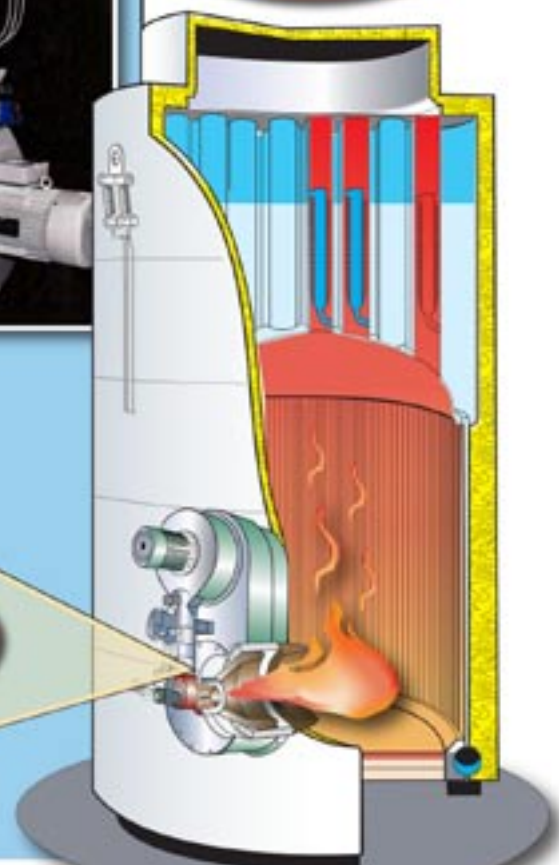
- High performance
- Low cost
- Reliable design
few moving parts
- Can be rotated
to fit ER layout



Low NOx
Up to 20% NOx reduction
by flue gas recirculation



Easy Maintenance
Replace quartz rings
in a few hours



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SES-Turboflame air assisted marine burner range

Burner type	Fuel oil range Kg/h ¹⁾	Produced steam Ton/h ¹⁾	Integrated Comb. air fans	O ₂ %
TF 10	30 – 140	0.5 – 2.1	Yes	2.5 – 3.5
TF 80/30	75 – 300	1.1 – 4.5	Yes	2.5 – 3.5
TF 80/40	100 – 400	1.5 – 6	Yes	2.5 – 3.5
TF 80/60	100 – 600	1.5 – 9	Yes	2.5 – 3.5
TF 80	130 – 800	2.2 – 12	Yes	2.5 – 3.5
TF 125	200 – 1400	3.0 – 21	No ²⁾	2.5 – 3.5

¹⁾ With acceptable fuel oil quality. ²⁾ Separate primary air fan, integrated or separate secondary air fan

The SES-Turboflame air assisted marine burner was designed for many types of fuels i.e. very heavy fuel oils and different gases.

The small burners are made in mono block design. The bigger burners have separate primary air fans and integrated or separate secondary air fans. Option: Silencer.

The burners are equipped with an oil circulating system through valve block, regulator, burner head and oil flow meter. As a result the fuel oil is kept warm through the complete fuel system making reliable burner starts after a long stand still period. Option: Electrical tracing.

The SES-Turboflame system is very well suited for marine use. It is reliable, easy to operate and requires a minimum of maintenance.

Two different combustion control systems



The Turboflame standard system

Wide range of fuel/air ratio control

From mechanical cam and links to separately programmable combustion curves for fuel and air fans.



SES Mod 400 system (from 2008)

SES Combustion
+ **Turboflame**
= **SES-Turboflame**

40 years profound experience in marine automation

40 years profound experience in industrial burners

Reliable marine burners with efficient combustion

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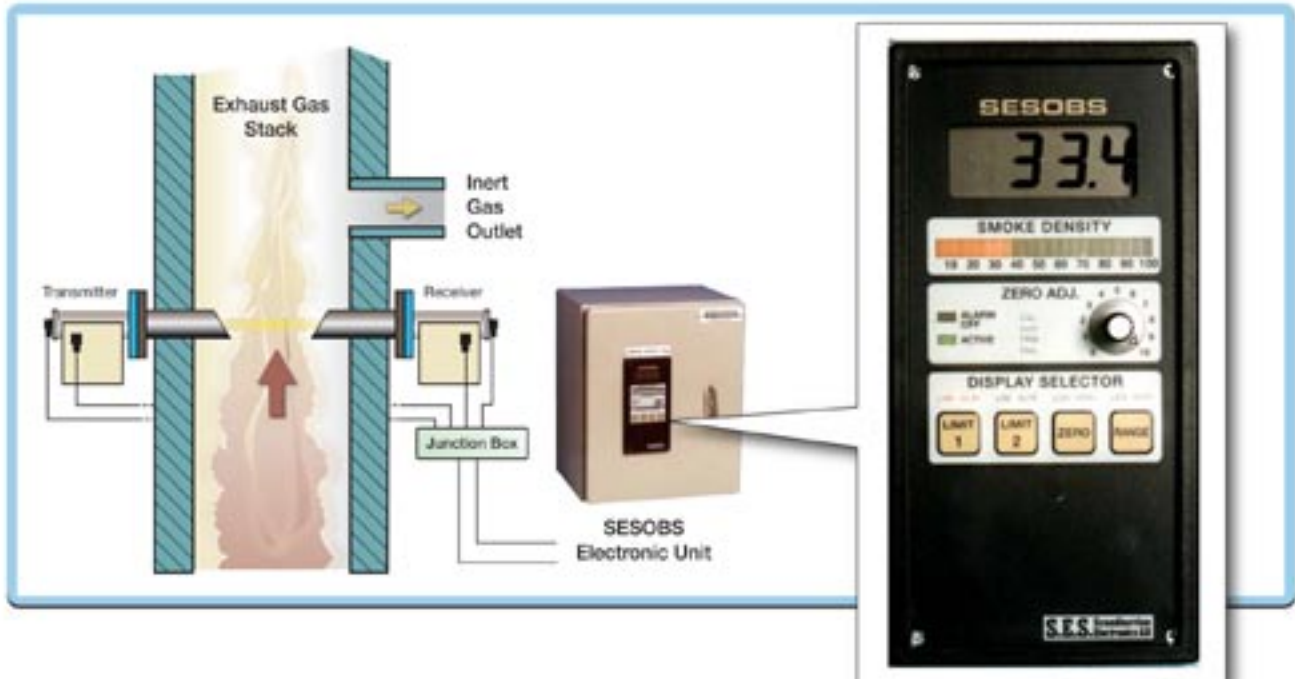
SESOBS

Smoke density monitor was not available in the good old days but today...



...you can prevent expensive environment polluting smoke discharge

- *Designed for ships*
- *Internal sealing air fans*
- *Easy to install*
- *2 alarm limit switches*
- *Individual alarm time delay*
- *Alarm for dirty lens*
- *Easy lens cleaning*
- *Alarm interlock from BMS*
- *4-20 mA for indicator*



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TECHNICAL DATA

	Wall box	Panel mounting DIN box	Transmitter/receiver with fan	Transmitter/receiver without fan	Stack adapter	Translation flange
Dim. w x h x d mm	250x330x220 ¹⁾	72x144x210	102x220x260 ^{2,3)}	80x87x260 ^{2,3)}	Ø54x350 ^{2,3)}	170x170x15 ⁴⁾
Weight kg	6,7	1,2	3,4	1,7	3,8	5,2
Material	Steel	Noryl/Al	Stainless steel/Al	Stainless steel/Al	Iron	Iron
Colour	Grey (RAL 7032)	Black	Natural	Natural	Rust protect.	Rust protect.
Stack dia. m			0,3 - 6	0,3 - 6		
Pressure in stack			10 mm w.g.	Limited only by external sealing air fan		
Environment temperature °C	0 - 55	0 - 55	0 - 70	0 - 70		

CE	Power supply VAC	Power consumption	Fuse	Alarm contacts	Input max. load	Output
Wall box	220-230 ±15% (110-115 ±15% on request)	70 VA	1 A internal	24V 0,5A 10W	24VDC ±20% internal/external source	4-20mA R _L ≤200Ω int.source
Panel mounting DIN box	45-66Hz	15 VA	315mA internal ⁵⁾ (slow blow)			R _L ≤50x(VCC-8) external source

¹⁾ Cable glands 1 pce TGC 5-14, 4 pcs TGC 5-10. ²⁾ Measures not complete. ³⁾ Flange DIN 2576, PN10 DN50.

⁴⁾ Fits existing adapters of other make: RT3E, Mark2, OM-80. Connection to other makes on request.

⁵⁾ External fuse for sealing air fans is required. 1A is recommended for transmitter/receiver with internal sealing air fans.



Wall box



Panel mounted DIN box



Transmitter/receiver with fan



Transmitter/receiver without fan



Stack adapter



Translation flange

ORDERING INFORMATION

Type No. 220-230 VAC (110-115 VAC on request)	Wall box	Panel mounted DIN box	Internal sealing air fan	For external sealing air fan	5 m cable trm/rec.	Stack adapter	Translation flange
043907-42	X		X		X		
043912-42	X			X	X		
043463-42		X	X		X		
043911-42		X		X	X		
043480-41						X	
043890-31							X

SES Combustion AB are specialists in control systems for oil- and solid fuel fired steam boilers and exhaust gas boilers

Other products:

- SESCON** PID controller, very operator friendly
- SESSEL** Ratio unit for combustion curves
- SESMON** Flame scanner amplifier with sequence indication
- SESLIM** 2-channel limit switch
- SESEQUAL** Signal comparator

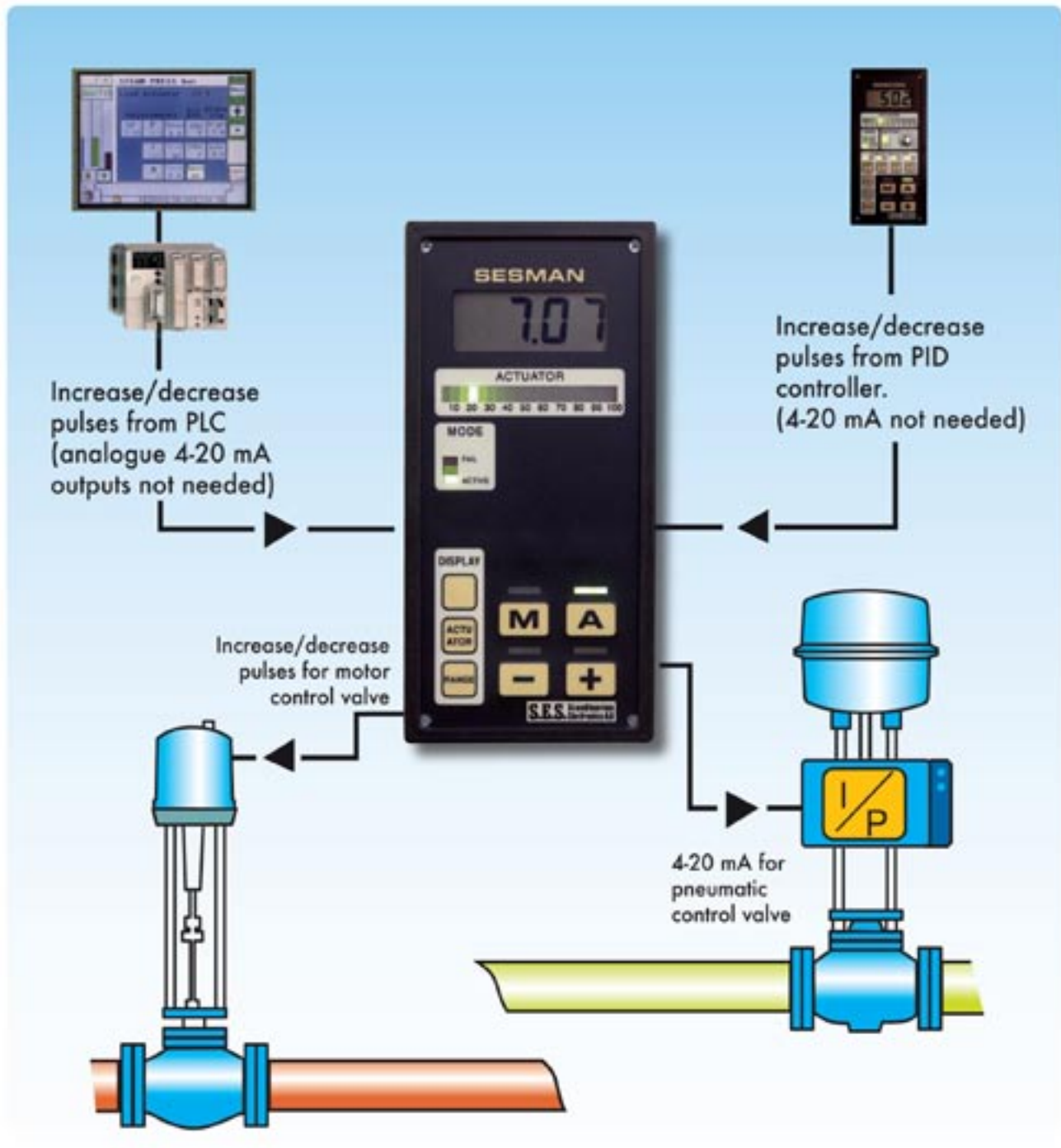
COMPLETE PLC-BASED CONTROL SYSTEMS

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SESMAN

Manual Operation Unit



The more advanced automation – the more need for MANUAL backup

TECHNICAL DATA

DIMENSIONS:	W x H x D	72x144x130 mm
	Depth behind panel cables included	140 mm
	Depth in front of panel	8 mm
	Panel cut out	67x137 mm + 0.5 mm
	Max panel thickness	25 mm
	Weight	0.5 kg
	POWER SUPPLY:	24 VDC \pm 5%
AMBIENT TEMP:	-10 to +55 °C	IEC 68-2-30 Db
MOTOR RELAY CONTACTS:	AC 230V 2A 600VA DC 300V 0.5A 100W	
ANALOGUE SIGNAL OUTPUT:	Control output	4-20 mA max load=500 Ω
CONTROL INPUT:	24V DC \pm 20% (internal or external supply)	10 mA each input
TRANSMITTER INPUT:	4-20mA	R in 110 Ω approx.
ACTUATOR POSITION INPUT:	100 Ω - 1 k Ω	R in 1 M Ω approx
DISPLAY ADJUST RANGE:	0.250-1999	

ORDERING INFORMATION

Type	Order No
SESMAN A101 for 4-20 mA actuators	004761-41
SESMAN P40 for motor actuators	004760-41



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All equipment you need for good combustion



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