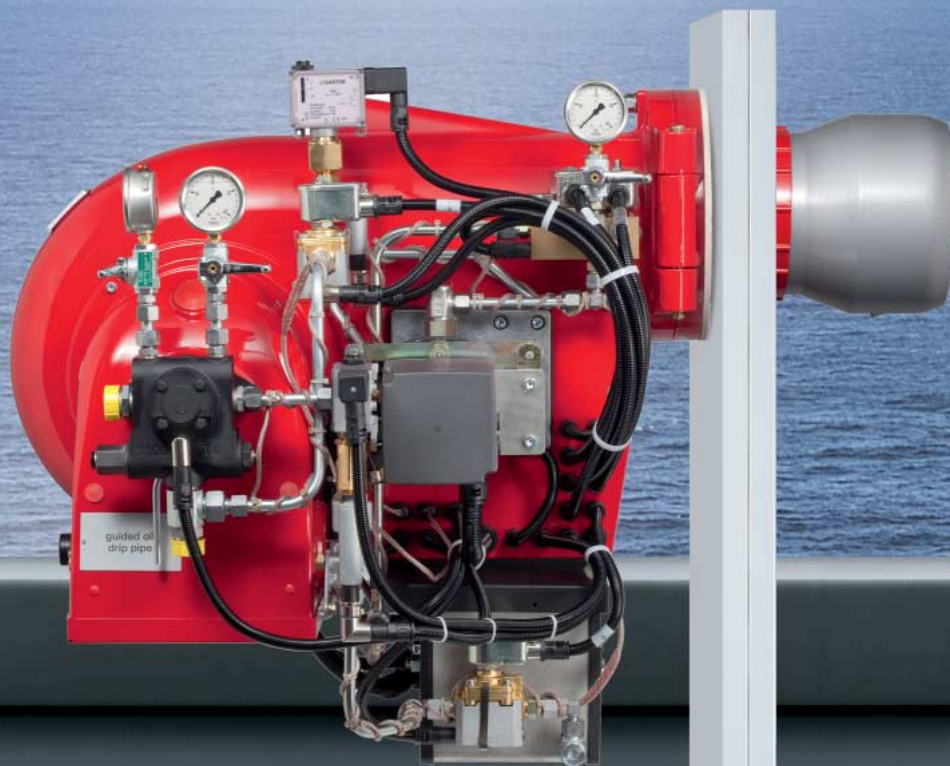


– weishaupt –

# info

Information about burners in marine execution



## Burners in marine execution

for Shipping and Offshore Installations with capacities up to 22 MW

# Progress and Tradition: Burners in marine execution



*Weishaupt products can be found everywhere where reliability is essential*

For over 40 years Weishaupt has designed and produced burners in marine execution for various applications such as auxiliary and hot water boilers for shipping and offshore installations. The in-house Research and Development Centre is constantly working on innovative new developments.

The burners are distinguished by their robust and compact design. They are easy to install and maintain. Total care is taken in the development and production especially when it comes to making servicing easy.

Our commitment to quality goes beyond product and service. Weishaupt offers individual solutions for the control of burners, boilers and supply equipment. This provides you with expertise from a single source.



**Weishaupt burners are equipped to meet the Eco Standards of tomorrow**

Materials and products on ships, whose recycling process does not pose a risk to humans and the environment, are awarded with the "Green Passport", an Eco Pass for ships. Of course, all Weishaupt burners and accessories in marine execution comply with this requirement.

## Modular.

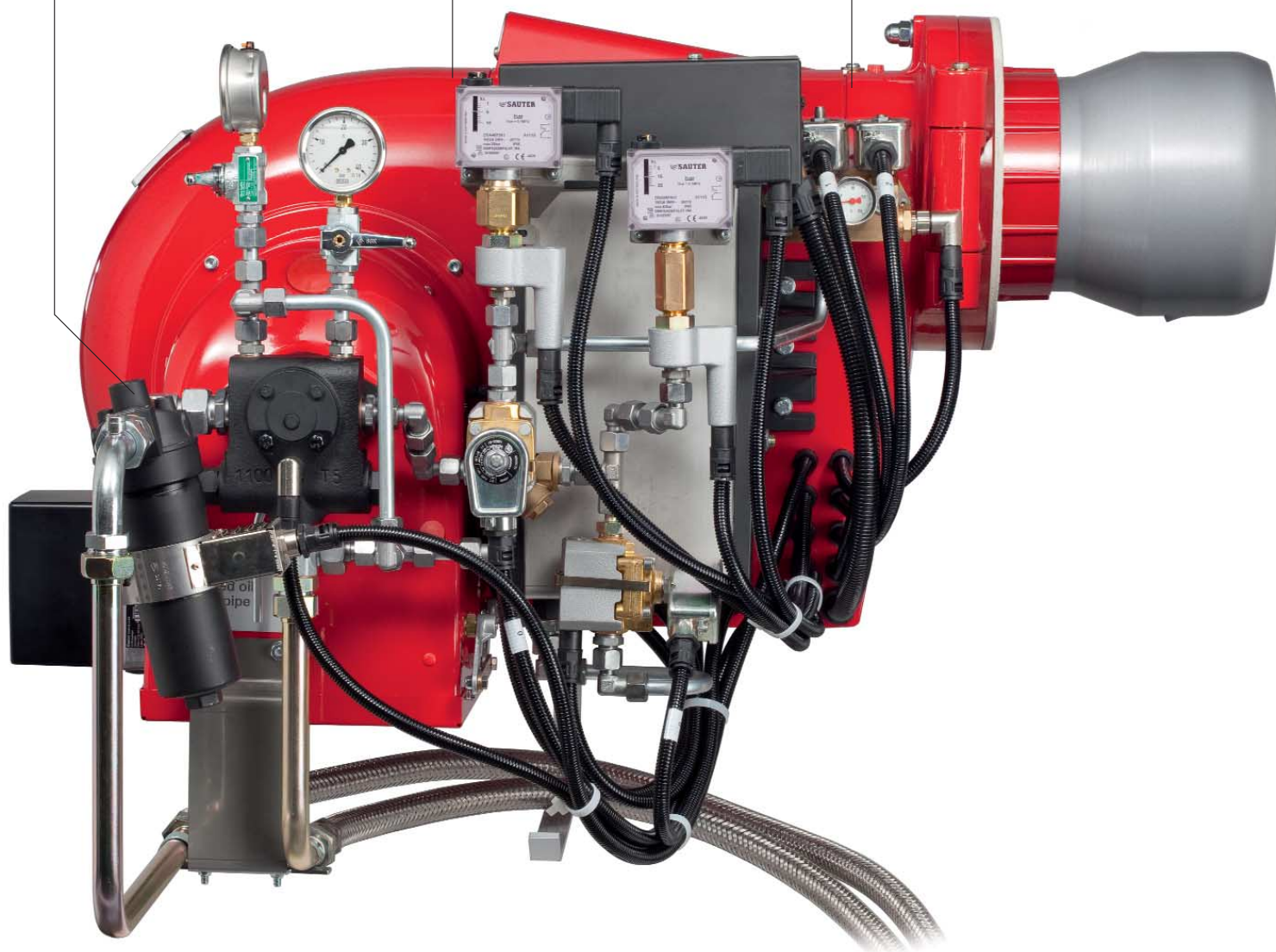
Thanks to their modular construction, Weishaupt burners can meet almost all requirements for shipping and offshore operations.

## Robust.

For many decades, Weishaupt burners in marine execution with their compact construction have proven themselves under the harshest conditions.

## Reliable.

Highest quality is our goal. Each burner is therefore fully tested and approved by Classification Societies.



# Equipped for all ports in the world: A Weishaupt burner for almost any fuel

**Marine Fuel Oils are available in various qualities. MARPOL 73/78 Annex I to VI regulates the use, as well as the emissions of sulphurous combustion products in certain marine territories. This has resulted in oils with a lower sulphur content than required by the regulations being produced.**

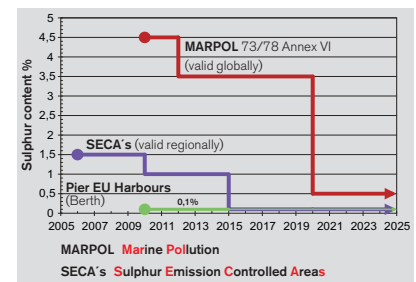
The standard ISO 8217 for marine fuels differentiates between Marine Distillate Fuel Oil and Marine Residual Fuel Oil, whereby Residual Fuels are commonly known as heavy oils (HFO).

The most important specifications limit the density, the viscosity, the water content and the flash point.

In accordance with MARPOL regulations, a sample of each fuel delivered must be available on board. The fuel can only be used once the specification (Bunker Delivery Note) has been released by the test laboratory.

Weishaupt burners in marine execution are approved for Marine Fuel Oils to ISO 8217 2010-06-15 and DIN ISO 8217 2011-09.

For safety reasons, due to its low flash point of 45 °C, DMX quality oil is not approved for combustion in shipping.



Limit values for sulphur content in the fuel

Source: DIN ISO 8217 : 2011-09			Marine fuels (MFO)															
Commercial designations*			Distillate fuels (MDF) e.g. MGO* / MDO*				Residual oils (RFO) e.g. HFO* / Bunker oils*											
Characteristics	Unit	Limit	DMX 1)	DMA	DMZ	DMB	RMA 10	RMB 30	RMD 80	RME (IFO) 180	RMG (IFO)				RMK			
											180	380	500	700	380	500	700	
Viscosity at 40 °C / 50 °C	mm²/s	min.	1.4	2.0	3.0	2.0												
		max.	5.5	6.0	6.0	11.0	10.0	30	80	180	180	380	500	700	380	500	700	
Density at 15 °C	kg/m³	max.	–	890	890	900	920	960	975	991	991				1010			
Sulphur	mass %	max.	1.0	1.5	1.5	2.0	Statutory requirements											
Flash point	°C	min.	43	60	60	60	60	60	60	60	60				60			
Hydrogen sulfide	mg/kg	max.	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0				2.0			
Carbon residue	% (m/m)	max.	–	–	–	0.3	2.5	10	14	15	18				20			
Pour point	winter °C	max.	–	-6	-6	0	0	0	30	30	30				30			
	summer °C	max.	–	0	0	6	6	6	30	30	30				30			
Water	% (V/V)	max.	–	–	–	0.3	0.3	0.5	0.5	0.5	0.5				0.5			
Ash	mass %	max.	0.01	0.01	0.01	0.01	0.04	0.07	0.07	0.07	0.10				0.15			
Weishaupt guide values for the atomising temperature °C			20-40	20-40	20-50	60	90	115	135	135	150	155	160	150	155	160		
Weishaupt Burner			L / RL ² Burners			MS ²) Burners (two stage)										MS ²)		
			MS ²) Burners (two stage) w. fuel change-over operation															
			RMS ²) Burners (sliding two stage/ modulating)															
			RMS ²) Burners (sliding two stage/ modulating) with fuel change-over operation															

<sup>1)</sup> DMX not approved for marine burner operation <sup>2)</sup> L / RL Burners: multi-stage / modulating light oil burners <sup>3)</sup> MS / RMS Burners: multi-stage / modulating heavy oil burners



# Class approved: Weishaupt burners meet all classifications

The Classification Society creates, monitors and documents the compliance of technical regulations on ships and offshore installations.

The so-called Plimsoll line shows by which Society the ship has been classified. On merchant ships this can be found at half ship's lengths on both sides of the hull.



Classification identification by Plimsoll line

The burner can be matched to the ship using the registration code.



Registration code on the burner hinge flange

It is not a legal requirement for the owner of a ship to classify his ship. However, there are only a few states that permit the operation of unclassified ships in their territorial waters. To make the operational radius of a ship as flexible as possible, classification is inevitable.

Ships without classification are not permitted in European waters or ports.

Burners and components, which are approved for use in shipping and on offshore installations are controlled by the **Type Approval** (design approval). This approval is the basis for the final inspection (Final Approval) at the test facility or on site.

## Internationally recognised Societies

IACS International Association of Classification Societies	1.	ABS		American Bureau of Shipping	
	2.	BV		Bureau Veritas	
	3.	CCS		China Classification Society	
	4.	DNV		Det Norske Veritas	
	5.	GL		Germanischer Lloyd	
	6.	KR		Korean Register of Shipping	
	7.	LR		Lloyd's Register	
	8.	NKK		Nippon Kaiji Kyokai	
	9.	RINA		Registro Italiano Navale	
	10.	RS		Russian Maritime Register	

## Type Approval

Classification	Country	Approval Code No.	Burner type
ABS	USA	07-HG211243/1-PDA	L / RL / M / MS / RMS / 1 – 11 + 30 – 70
BV	France	02396/GO BV SMS.W.II/761/B.O	L / RL / M / MS / RMS / 1 – 11 + 30 – 70
CCS	China	HB05A00054	L1 / L3
		HB95A960	L / RL / M / MS / RMS / 5 – 11
		HBA03190125	L / RL / RMS / 30 – 70
DNV	Norway	submitted	
GL	Germany	Drawing approval	L / RL / M / MS / RMS / 5 – 11 + 30 – 70
KR	Korea	HMB04961-BR001	L / RL / M / MS / RMS / 5 – 11
LR	England	Service agreement	
NKK	Japan	Approval by GL	
RINA	Italy	not required	
RS	Russia	09.04031.250	L / M 1 – 3
		09.04030.250	L / RL / M / MS / RMS / 5 – 11
		09.04029.250	L / RL / RMS / 30 – 70
		10.05019.250	

Other classifications can be met on request

# You have a demanding requirement: Weishaupt has a suitable burner

## Step by step to your tailor-made burner

We require the following information from you to select your burner:

### 1. Fuel

Marine Gases		Marine Oils								
LNG	LPG	DMA	DMZ	DMB	RMA	RMB	RMD	RME	RMG	RMK

### 2. Boiler type and construction (combustion chamber geometry)

Heating and hot water (warm water / hot water / steam)	Auxiliary boiler (steam / thermal fluid)	Process plant (e.g. waste incineration/oil refining processes)
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### 3. Installation position of the burner

Horizontal	Horizontal deviation (10 to 30°)	Vertical
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### 4. Burner rating required and combustion chamber pressure

Monoblock burners		Duoblock burners
Monarch 1 – 11 (0,2 – 5,2 MW)	Industrial burners (up to 10.9 MW)	WK burners (1.2 to 22 MW)

### 5. Type of regulation required

multi-stage	modulating
<ul style="list-style-type: none"> <li>(viscosity up to 570 mm<sup>2</sup>/s at 50 °C)</li> <li>(viscosity up to 380 mm<sup>2</sup>/s at 50 °C in conjunction with MFO-Fuels alternating operation)</li> </ul>	<ul style="list-style-type: none"> <li>(viscosity up to 700 mm<sup>2</sup>/s at 50 °C)</li> </ul>

### 6. Classification required

ABS	BV	CCS	DNV	GL	KR	LR	NKK	RINA	RS
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Our modular burner program offers optimum flexibility and maximum individuality

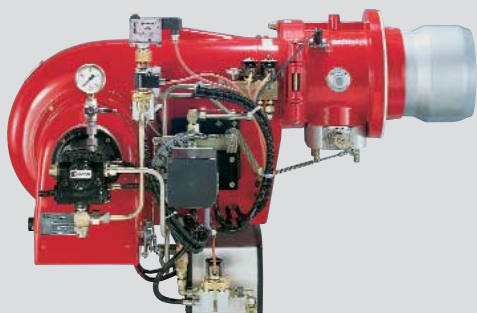
## Index type of regulation / fuel

L / M / MS	Oil burners	two stage
RL / RMS / WKMS	Oil burners	sliding two stage or modulating
G / RGL / RGMS / WKG / WKGL / WKGMS	Gas / dual fuel burners	sliding two stage or modulating

## Gas and dual fuel burners

Version LNG and LNG/MFO

Version LPG and LPG/MFO



Type	Capacity range* (Partial load ( )) Full load RGMS ( ) Full load ( )
G1	(60) 200 – 335 kW
G/RGL3	(90) 320 – 630 kW
G/RGL5	(200) 550 – 1.000 kW
G/RGL/RGMS7	(300) 1.000 – 1.575 RGMS / 1.750 kW
G/RGL/RGMS8	(400) 1.200 – 2.050 RGMS / 2.275 kW
G/RGL/RGMS9	(500) 1.750 – 3.240 RGMS / 3.600 kW
G/RGL/RGMS10	(500) 2.200 – 3.690 RGMS / 4.100 kW
G/RGL/RGMS11	(900) 2.600 – 4.275 RGMS / 4.750 kW
G/RGL/RGMS50	(550) 2.900 – 5.400 kW
G/RGL/RGMS60 <sup>1)</sup>	(800) 3.500 – 6.100 kW
G/RGL/RGMS70 <sup>1)</sup>	(1.400) 5.400 – 10.700 kW
WKG/WKGL/WKGMS <sup>2)</sup>	Duoblock burners (300) 1.200 – 22.000 kW
















<sup>1)</sup> RGMS 60 and RGMS 70 external high pressure oil supply <sup>2)</sup> External high pressure oil supply

\* A detailed capacity selection must be made taking into account the combustion chamber resistance with the relevant capacity graph (product brochure / manual)

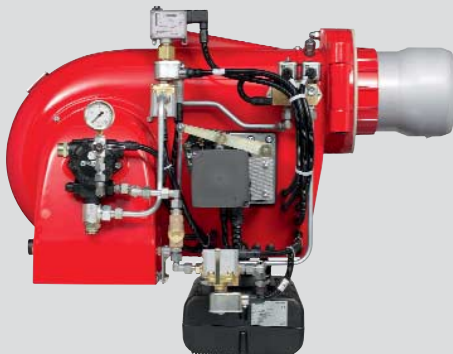
## Oil burners














### Version for distillate fuels



Type	Capacity range* (Partial load  Full load 
L1	 (70) 200 – 415 kW
L/RL3	 (120) 320 – 775 kW
L/RL5	 (180) 550 – 1.190 kW
L/RL7	 (320) 930 – 1.965 kW
L/RL8	 (595) 1.300 – 2.740 kW
L/RL8/2	 (620) 1.600 – 3.215 kW
RL9	 (715) 1.870 – 3.690 kW
RL10	 (955) 2.200 – 4.525 kW
RL11	 (1.430) 2.600 – 5.240 kW
RL50	 (715) 3.000 – 6.170 kW
RL60	 (1.310) 4.000 – 7.265 kW
RL70	 (1.905) 5.600 – 10.900 kW
WKL/WKMS	 Duoblock burners (300) 1.200 – 22.000 kW

### Version for residual oils (RM..)<sup>1)</sup>

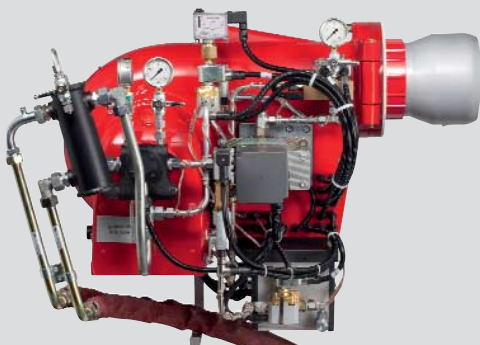











M1	 (90) 200 – 415 kW
M3	 (120) 320 – 775 kW
M5	 (225) 550 – 1.190 kW
MS/RMS7	 (450) 930 / 1.000 RMS – 1.965 kW
MS/RMS8	 (675) 1.300 – 2.740 kW
MS/RMS8/2	 (675) 1.600 – 3.155 kW
RMS9	 (900) 1.870 – 3.690 kW
RMS10	 (1.010) 2.200 – 4.525 kW
RMS11	 (1.460) 2.600 – 5.240 kW
RMS50	 (715) 3.000 – 6.170 kW
RMS60 <sup>2)</sup>	 (1.310) 4.000 – 7.265 kW
RMS70 <sup>2)</sup>	 (1.905) 5.600 – 10.900 kW
WKL/WKMS <sup>2)</sup>	 Duoblock burners (300) 1.200 – 22.000 kW

<sup>1)</sup> DM.. only as auxiliary fuel for startup and shutdown of the boiler and burner purging

<sup>2)</sup> External high pressure oil supply

### Version for distillate fuels (DM..) and residual oils (RM..) for alternating fuel operation (an oil side adjustment is not required)



MS/RMS7	 (450) 930 / 1.000 RMS – 1.965 kW
MS/RMS8	 (675) 1.300 – 2.740 kW
RMS9 <sup>2)</sup>	 (900) 1.870 – 3.690 kW
RMS10 <sup>2)</sup>	 (1.010) 2.200 – 4.525 kW
RMS11 <sup>2)</sup>	 (1.460) 2.600 – 5.240 kW
RMS50 <sup>3)</sup>	 (715) 3.000 – 6.170 kW
RMS60 <sup>3)</sup>	 (1.310) 4.000 – 7.265 kW
RMS70 <sup>3)</sup>	 (1.905) 5.600 – 10.900 kW
WKL/WKMS <sup>3)</sup>	 Duoblock burners (300) 1.200 – 22.000 kW

<sup>2)</sup> Available from March 2012

<sup>3)</sup> In conjunction with external high pressure oil supply per fuel

\* A detailed capacity selection must be made taking into account the combustion chamber resistance with the relevant capacity graph (product brochure / manual)

# In detail:

## Weishaupt burners offer many advantages

**Weishaupt burners are manufactured to individual requirements. This means we deliver a product, which has been exactly matched to the customer's needs.**

**But Weishaupt burners also stand out through a multitude of innovative ideas:**

### **Reliable and convenient fuel change-over**

Whether switching from Gas (LNG) to MFO or from a high viscosity fuel to a low viscosity fuel, regardless of the type of fuel change-over required, we have the right solution.

The key advantage of the Weishaupt design is that no fuel-side adjustment is needed for fuel change-over.

Alternating operation with different MFO fuels:

A high degree of operational reliability is achieved by using standard pressure monitoring, even when switching between liquid fuels of different viscosity.

To ensure that our high standards for operational reliability are met when switching from a high viscosity fuel to a low viscosity fuel, the temperature of the oil supply system must be reduced to a temperature of 40 – 60 °C prior to switching to the low viscosity fuel. This is usually achieved with an auxiliary fuel with a viscosity of > 3 mm<sup>2</sup>/s at 40 °C.

In order to prevent a possible explosion caused by the overheating of the low viscosity fuel, a temperature switch is required in the oil supply.

No matter which port you are heading for, Weishaupt offers a convenient and practical solution with this reliable fuel change-over.



*Precise leakage diversion ensures maximum safety (standard for version with different MFO fuels in alternating operation)*

### **Maximum safety provided by precise leakage diversion**

When using MFO fuel the shaft seal is placed under extreme mechanical strain. Weishaupt offers an optimum solution with an innovative design and the use of high quality materials.

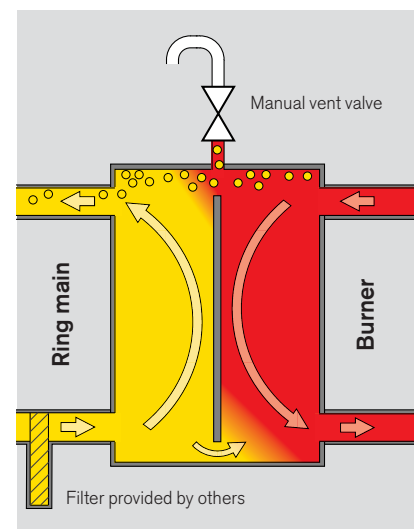
With the multi-fuel pumps UHE-WH, the oil is diverted into a separate reservoir by precise leakage diversion in the event that the shaft seal fails. This prevents a possible explosion caused by oil entering the air inlet.



*The integrated dual circuit oil reservoir provides greater reliability and convenience (standard on RMS burners version with different MFO fuels in alternating operation)*

### **Energy saving provided by dual circuit oil reservoir**

The separation into different temperature zones from ring main to burner supply ensures that the oil preheater is used in the most efficient way. This saves energy and operating costs. The straightforward connection to the oil supply also minimises installation costs.



*The separation into different temperature zones saves energy and costs*





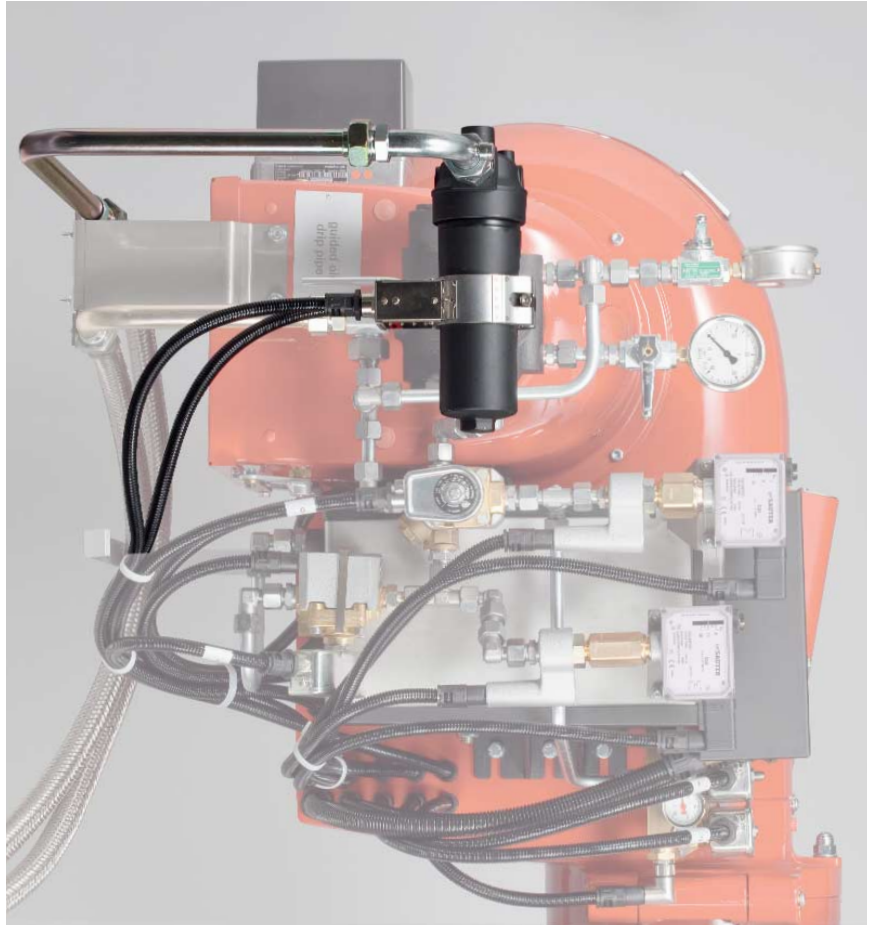
*The integrated oil filter is easily accessible  
(standard on MS burners version with different MFO  
fuels in alternating operation)*

#### **Oil filter fitted as standard**

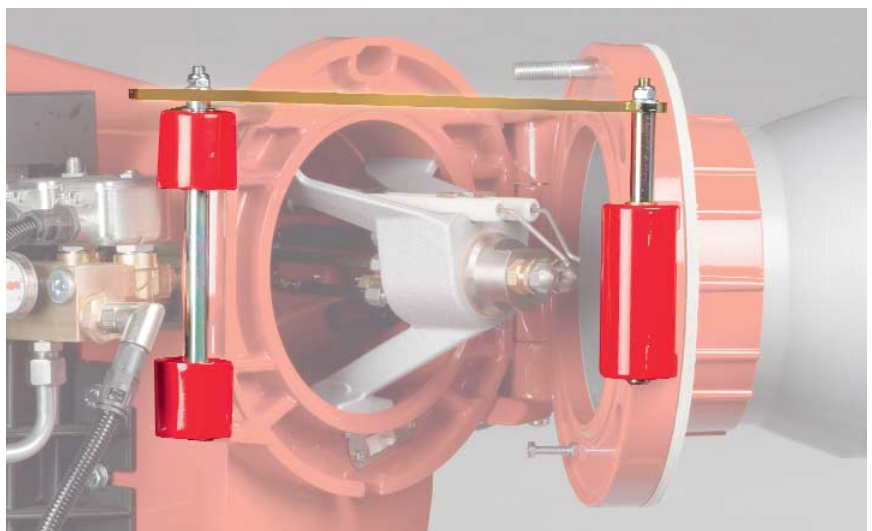
The heated, integral oil filter is easily accessible and easy to service. Due to the flexible construction of the oil filter the burner can be positioned as required.

#### **Increased safety during servicing**

The hinge securing mechanism supplied as standard ensures that the burner can not swing close during servicing.

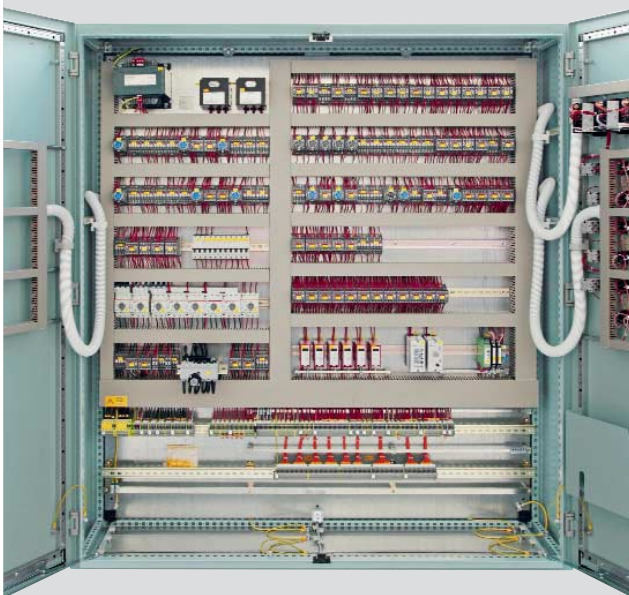


*Due to the flexible construction of the heated oil filter the burner can be installed in any position required  
from horizontal to vertical*



*Increased safety during servicing provided by the integrated hinge flange with securing mechanism*

# We control to your requirements: Analogue or digital



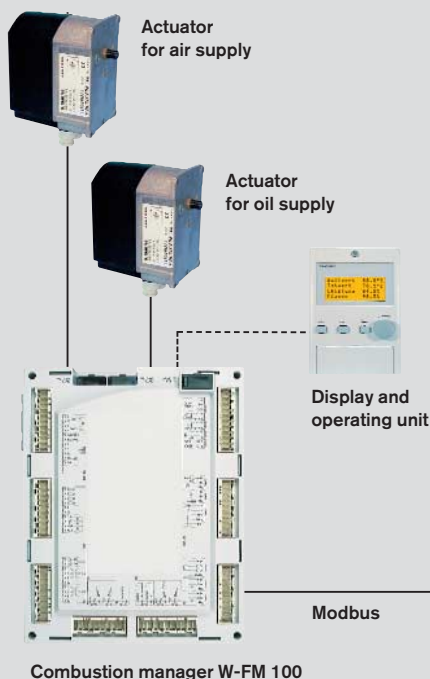
Weishaupt offers individual control systems to meet all requirements of the ship's classification with the usual voltages and frequencies



Highest safety provided by 100% redundancy of burner control systems

## Digital combustion management offers:

- Precise setting accuracy
- Reproducible setting values
- Convenient handling
- Flexible communication
- Data backup / fault analysis
- Menu selection via clear text display

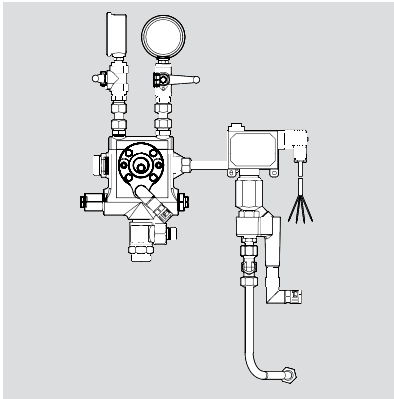


In conjunction with classification society LR: Digital combustion management makes burner operation convenient and reliable

## Simple and time saving conversion with ready-to-install conversion kits

### Ready-to-install conversion kits

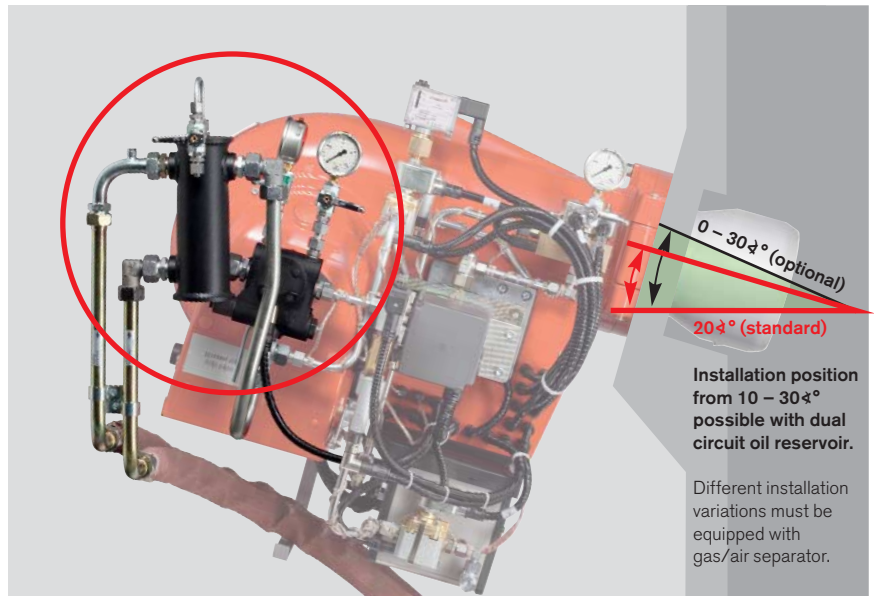
for example for conversion from residual oils to distillate/residual oils, offer a time saving and service friendly possibility to adapt burners already installed to meet changing requirements.



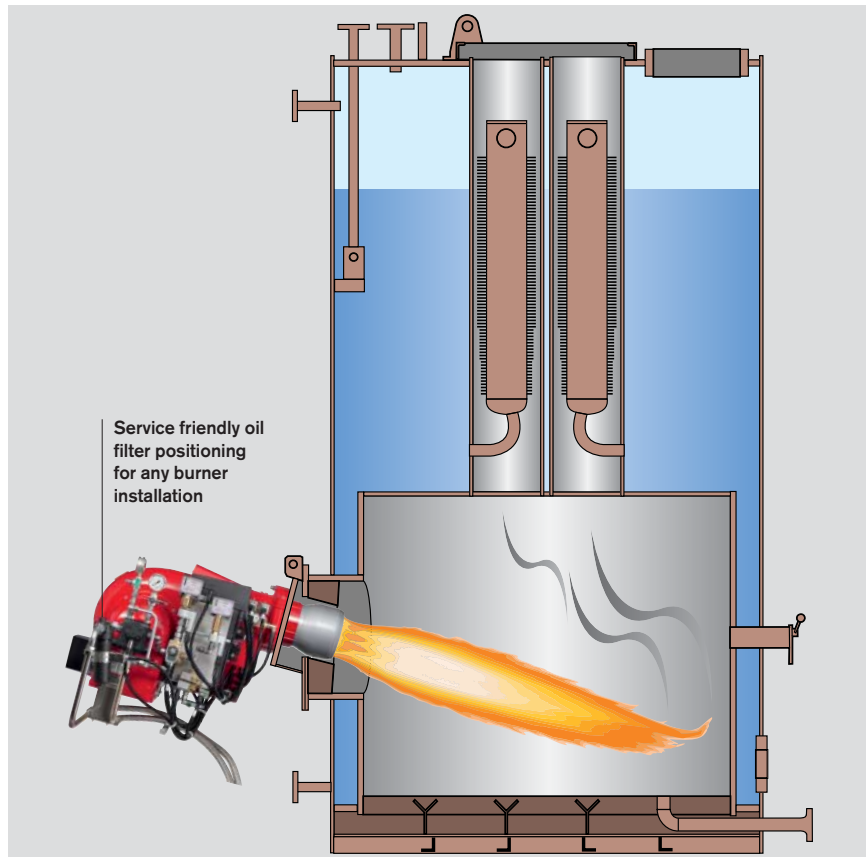
Conversion kit for RMS7 / RMS8



Conversion kit for MS7 Z / MS8 Z



Ready-to-install conversion kits facilitate the conversion of an existing burner and are easy to install (example RMS7 / RMS8)



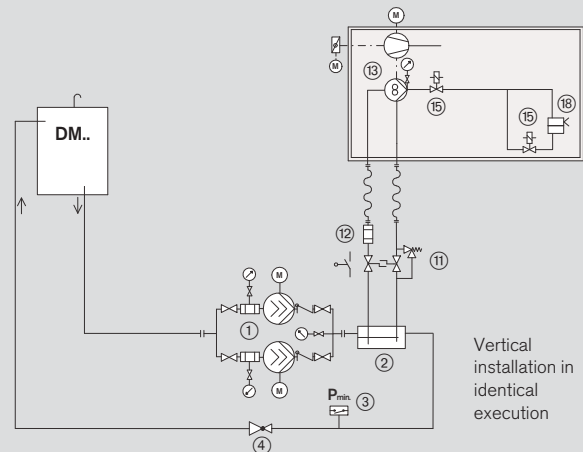
With the MS conversion kit (example MS7 / MS8) installation is possible from horizontal to vertical

# Technology in detail: Fuel supply /fuel change-over

## Version for distillate fuels (DM..) <sup>1)</sup>

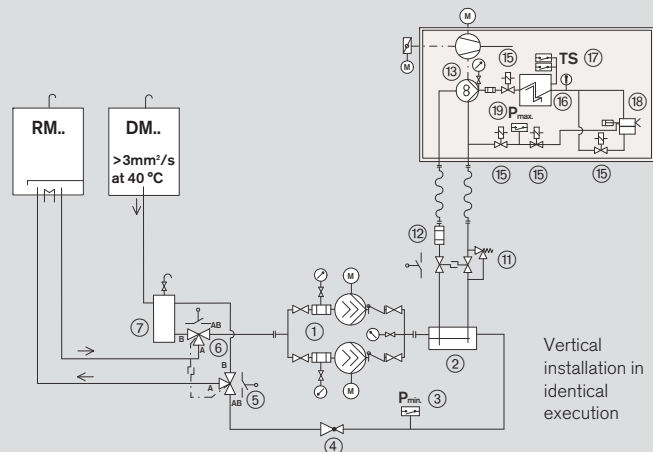
L burners

- |   |                                   |
|---|-----------------------------------|
| ① Suction pump assembly   | ⑨ Heating (60 – 90 °C)            |
| ② Dual circuit oil reservoir / gas/air separator                                      | ⑩ Temperature switch (40 – 60 °C) |
| ③ Min. pressure switch  | ⑪ Shut off combination            |
| ④ Pressure regulating valve   | ⑫ Oil filter                      |
| ⑤ 3 way ball valve (return)   | ⑬ Burner pump                     |
| ⑥ 3 way ball valve (supply)   | ⑭ Strainer                        |
| ⑦ Venting vessel  | ⑮ Solenoid valve                  |
| ⑦ a Cooler (20 – 40 °C) for operation with viscosities < 3mm <sup>2</sup> /s at 40 °C | ⑯ Oil preheater                   |
| ⑧ 3 way ball valve (DM../DM..)  | ⑰ Temperature monitor/switch      |
|   | ⑱ Two stage nozzle assembly       |
|   | ⑲ Max. pressure switch            |



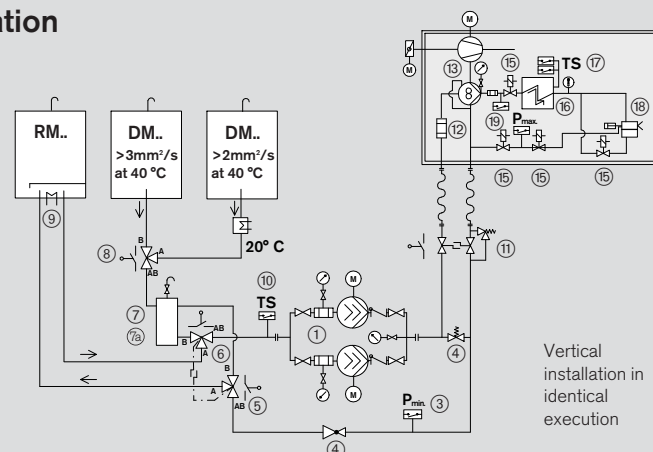
## Version for residual oils (RM..) <sup>1)</sup>

MS burners



## Version for distillate fuels (DM..) and residual oils (RM..) in alternating operation <sup>2)</sup>

(an oil side adjustment is not required)



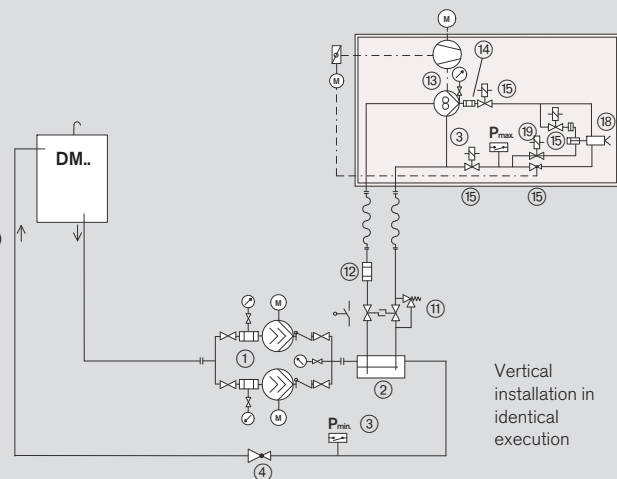
<sup>1)</sup> MDO only as an auxiliary fuel for startup and shutdown of the boiler and burner purging <sup>2)</sup> Except for type 8/2



## Version for distillate fuels (DM..)

RL3 – RL11 burners

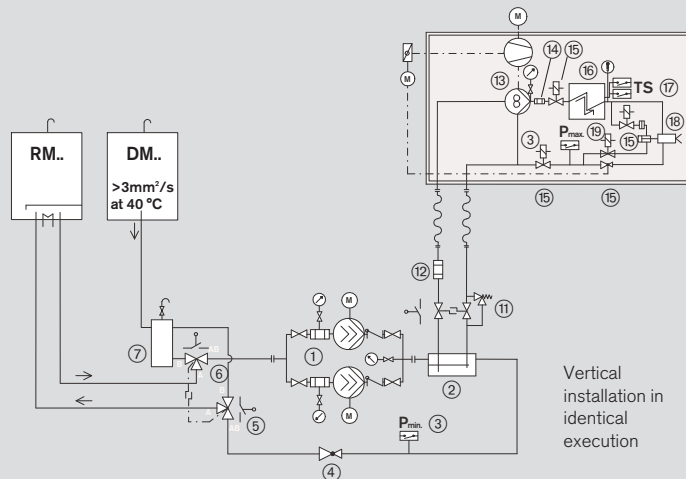
- |   |                                   |
|---|-----------------------------------|
| ① Suction pump assembly   | ⑨ Heating (60 – 90 °C)            |
| ② Dual circuit oil reservoir / gas/air separator                                      | ⑩ Temperature switch (40 – 60 °C) |
| ③ Min. pressure switch  | ⑪ Shut off combination            |
| ④ Pressure regulating valve   | ⑫ Oil filter                      |
| ⑤ 3 way ball valve (return)   | ⑬ Burner pump                     |
| ⑥ 3 way ball valve (supply)   | ⑭ Strainer                        |
| ⑦ Venting vessel  | ⑮ Solenoid valve                  |
| ⑦ a Cooler (20 – 40 °C) for operation with viscosities < 3mm <sup>2</sup> /s at 40 °C | ⑯ Oil preheater                   |
| ⑧ 3 way ball valve (DM../DM..)  | ⑰ Temperature monitor/switch      |
|   | ⑱ Two stage nozzle assembly       |
|   | ⑲ Max. pressure switch            |



Vertical installation in identical execution

## Version for residual oils (RM..) <sup>1)</sup>

RMS7 – RMS11 burners

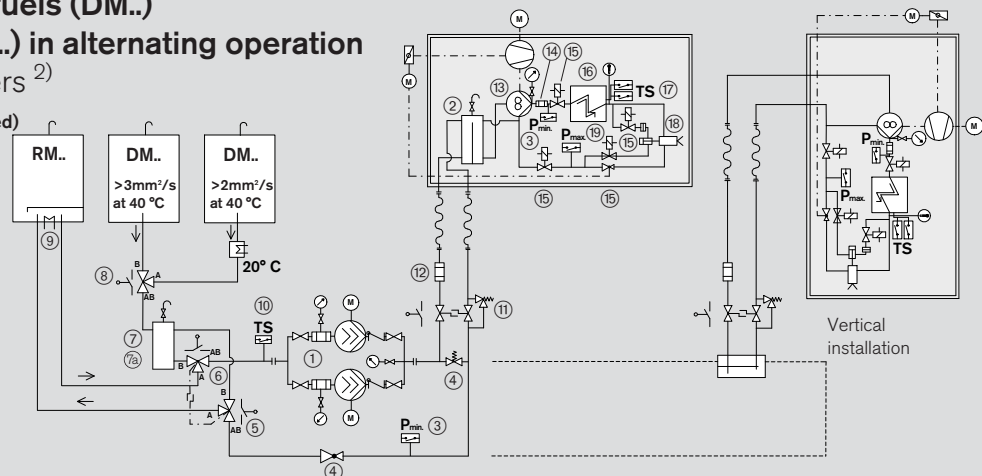


Vertical installation in identical execution

## Version for distillate fuels (DM..) and residual oils (RM..) in alternating operation

RMS7 – RMS11 Burners <sup>2)</sup>

(an oil side adjustment is not required)

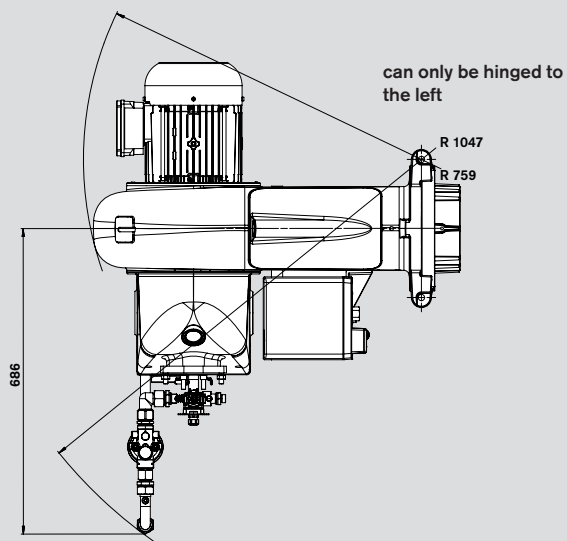
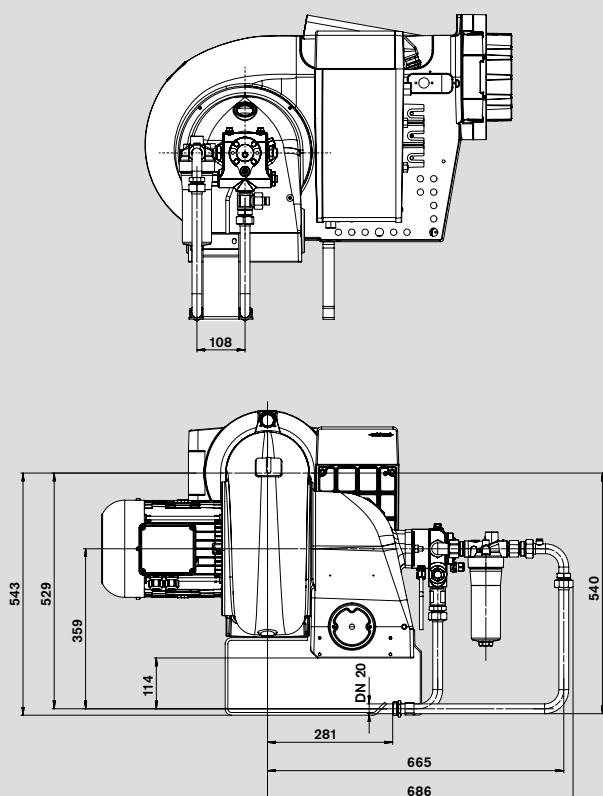


Vertical installation

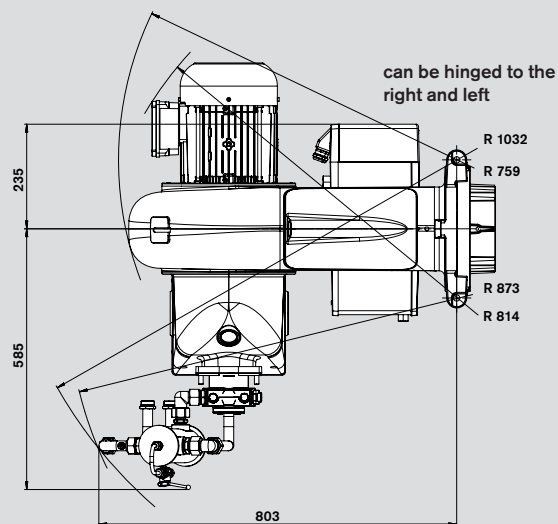
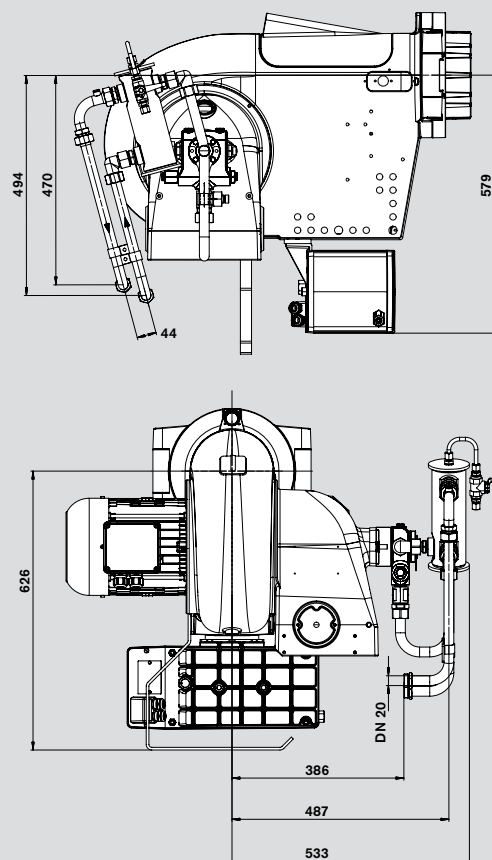
<sup>1)</sup> MDO only as an auxiliary fuel for startup and shutdown of the boiler and burner purging <sup>2)</sup> Except for type 8/2

# Dimensions and hinge ranges for series 7/8 version MGO-MDO-HFO

**Oil burners MS 7**



**Oil burners RMS 7**



Other dimensions can be found in the product documentation

## Our suggestion: Weishaupt equipment versions

Classification Society			ABS	BV	CCS	DNV	GL	KR	LR	NKK	PRS	RINA	RS
Burners general	Marine execution	<ul style="list-style-type: none"><li>All burner castings painted inside</li><li>Motor terminal box sealed with captivated screws</li><li>Cable protection provided by flame retardant hose</li><li>Marine cable entries to DIN 89280</li><li>Fully wired to terminal strip</li><li>Type tested stainless steel oil hoses<sup>1)</sup></li><li>Hinge securing mechanism for servicing</li><li>Burner motor in IP 54, F, IE2</li></ul>	●	●	●	●	●	●	●	●	●	●	●
	optional	<ul style="list-style-type: none"><li>Oil filter in spheroidal cast iron or cast steel<sup>1) 2)</sup></li></ul>	●	●	●	●	●	●	●	●	●	●	●
Oil burners													
Control	Controller/ combustion manager	<ul style="list-style-type: none"><li>2x LAL2.25 (selectable) in control panel</li></ul>	●	●		●	● <sup>3)</sup>	●	●	●	●	●	●
		<ul style="list-style-type: none"><li>1x LOK16.250 in control panel</li></ul>			●		●						
		<ul style="list-style-type: none"><li>1x W-FM100 on burner</li></ul>							●				
	Flame sensor	<ul style="list-style-type: none"><li>1x RAR9</li></ul>			●		●						
		<ul style="list-style-type: none"><li>2x RAR9 (selectable)</li></ul>	●	●		●		●	●	●	●	●	●
		<ul style="list-style-type: none"><li>1x QRI2 (in conjunction with W-FM100)</li></ul>							●				
Monitoring	Oil pump fitted	<ul style="list-style-type: none"><li>LGW air pressure switch</li></ul>		●	●								●
		<ul style="list-style-type: none"><li>Min. oil pressure switch (vers. HFO-MDO-MGO)</li><li>Max. oil pressure switch (MS / RL / RMS burners)</li><li>Oil pressure gauge with ball valve</li></ul>	●	●	●	●	●	●	●	●	●	●	●
	Oil pump external	<ul style="list-style-type: none"><li>Air pressure switch</li><li>Min. oil pressure switch in oil supply</li><li>Oil pressure gauge with ball valve in supply</li></ul>	●	●	●	●	●	●	●	●	●	●	●
Component heating	Version HFO	<ul style="list-style-type: none"><li>Oil solenoid valves /oil pressure switch (22W)</li><li>Nozzle assembly 110W</li><li>Oil quantity regulator 22W (on RMS burners)</li><li>Filter fitted 300W<sup>2)</sup></li></ul>	●	●	●	●	●	●	●	●	●	●	●
		Oil pump	<ul style="list-style-type: none"><li>E4-7 80W, T/TA/UHE-WH.. 110W</li></ul>	●	●	●	●	●	●	●	●	●	●
	500–700 mm²/s at 50 °C	<ul style="list-style-type: none"><li>Heated oil line and oil distributor 22W</li><li>Heated oil hoses 62W</li></ul>	●	●	●	●	●	●	●	●	●	●	●
Gas and dual fuel burners (Gas/Oil)													
Control	Controller/ combustion manager	<ul style="list-style-type: none"><li>2x LFL1.333 (select. via switch) in control panel</li></ul>	●	●		●	● <sup>3)</sup>	●	●	●	●	●	●
		<ul style="list-style-type: none"><li>1x LGK16.333 in control panel</li></ul>			●		●						
		<ul style="list-style-type: none"><li>1x W-FM100 on burner</li></ul>							●				
	Flame sensor	<ul style="list-style-type: none"><li>2x QRA2 (select. via switch)</li></ul>	●	●		●		●	●	●	●	●	●
		<ul style="list-style-type: none"><li>1x QRA53/55</li></ul>			●		●						
		<ul style="list-style-type: none"><li>1x QRI2 (in conjunction with W-FM100)</li></ul>							●				
Monitoring		<ul style="list-style-type: none"><li>Air pressure switch</li><li>Magnetic coupling (RGL / RGMS burners)</li><li>Max. oil pressure switch in oil return (on RGL / RGMS Brenner)</li></ul>	●	●	●	●	●	●	●	●	●	●	●
		<ul style="list-style-type: none"><li>Min. oil pressure switch in oil supply (with magnetic coupling and/or external pump)</li><li>Oil pressure gauge with ball valve</li></ul>	●	●	●	●	●	●	●	●	●	●	●
Component heating	HFO (vers. RGMS)	<ul style="list-style-type: none"><li>Oil solenoid valves / oil pressure switch 22W</li><li>Nozzle assembly 110W</li><li>Oil quantity regulator 22W (on RMS Brenner)</li></ul>	●	●	●	●	●	●	●	●	●	●	●
		Oil pump	<ul style="list-style-type: none"><li>E4-7 80W, T/TA/UHE-WH.. 110W</li></ul>	●	●	●	●	●	●	●	●	●	●
	500–700 mm²/s at 50 °C	<ul style="list-style-type: none"><li>Heated oil line and oil distributor 22W</li><li>Heated oil hoses 62W</li></ul>	●	●	●	●	●	●	●	●	●	●	●
Optional	Add. solenoid valve in supply/return as third shut off device		●	●	●	●	●	●	●	●	●	●	●
Gas valve train			<ul style="list-style-type: none"><li>Version on request</li></ul>	●	●	●	●	●	●	●	●	●	●

<sup>1)</sup> Oil and dual fuel burners (Gas/Oil)

<sup>2)</sup> Standard on MS7 and MS8 burners in version HFO-MDO-MGO

<sup>3)</sup> Except for ships flying the German flag

# Weishaupt burners in operation: Everywhere where quality is essential



A Weishaupt RGL5 burner provides steam on the Research Ship Polarstern



Waste incinerator on the luxury liner "MS Empress" with two L1 burners



Thermal fluid oil is heated by a heavy oil burner type MS8 from Weishaupt



Many of the tanker from the shipyard Odense are equipped with Weishaupt burners such as MS / RMS 7-8

## At home on all oceans

The demands on marine applications are high. Highest reliability and operational safety are therefore imperative.

Decades of experience coupled with the highest product quality and service makes us one of the leading companies in the industry.

Weishaupt burners in marine execution are used around the world under the harshest conditions, for example on:

- Cruise Ships
- Ferries
- Tankers
- Container Ships
- Bulk Carriers
- Floating platforms
- Drilling rigs

Applications:

- Auxiliary and hot water boilers
- Process plant, e.g. for
  - waste incineration
  - oil refining processes





Crude oil from the drilling rigs in the South China Sea is stored temporarily on central ship depots

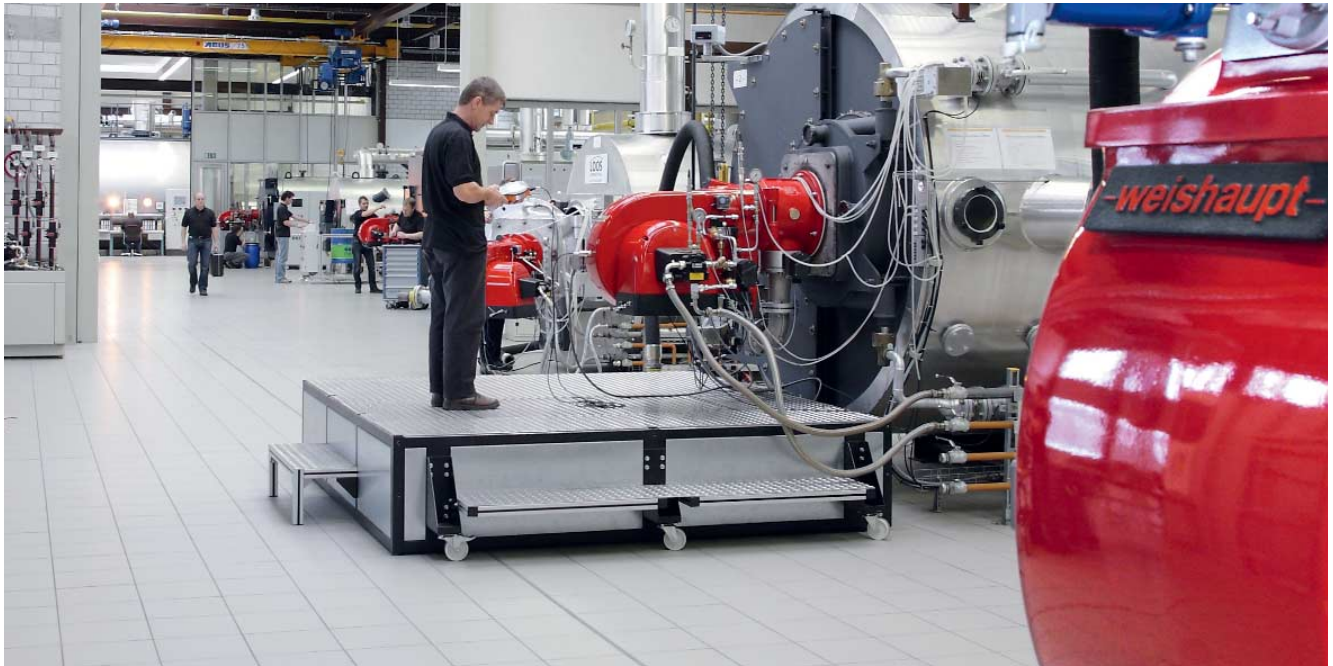


Four RGL70 burners on thermal fluid boilers ensure the crude oil can be pumped



Two RGMS70/2 burners with digital combustion management provide the necessary process heat on the oil production platform CNOOC LUDA 27-2

# Our recipe for success: Innovation and modern production



*The burner technology of tomorrow is tested in the Research and Development Centre*

**Innovative strength** is provided by the in-house Research and Development Centre, which for decades has been setting standards with new product developments. Cleaner, more economical and convenient are the demands placed on new burners and heating systems.

At present, around 100 specialists are committed to fulfilling this task in Schwendi. A team, which combines special training, experience, craftsmanship, skill and creativity and is second to none in the industry.

Skill and knowledge for Weishaupt's future-proof workshops is also provided by reference sites in the field and continued customer interface. The work is carried out using modern test equipment and design offices.

**Modern production methods** combine optimum working conditions and maximum conservation of resources. Automated manufacturing centres, bright manufacturing facilities and efficient work processes are essential ingredients. Highest reliability of our products is the goal.

A willingness to invest ensures a modern manufacturing facility and thus quality and efficiency. Burners for worldwide use are manufactured at the parent company in Schwendi.

**Care, diligence and discipline** shape our business. Every action and the smallest of items is important, if the high level of customer care is to be 'built' into the burners and heating systems.

It's about the effectiveness of the test and control systems, the use of modern technology and the quality of materials as well as logistics and organisation. And it is decided by the human factor: "We deliver precision work," the motto of every Weishaupt employee.



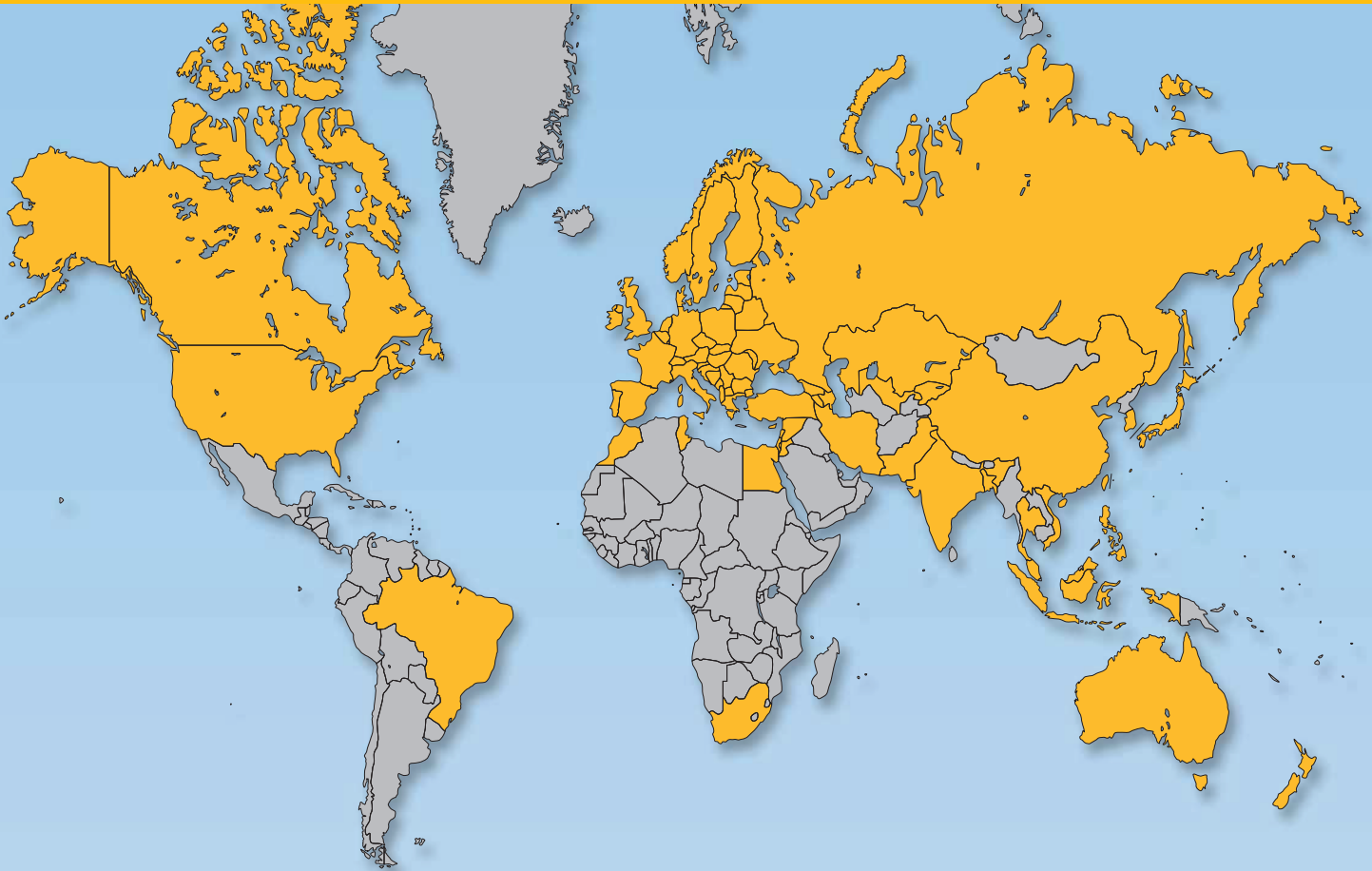


*Burners for worldwide use are manufactured in a modern workshop*



*All burners in marine execution are fully tested on special test beds prior to delivery*

## Weishaupt service worldwide: 24 hours, 365 days



Weishaupt worldwide:  
The Branch Offices in Germany  
and the Daughter Companies,  
representatives and agencies  
abroad provide local expertise.

Germany:  
Augsburg  
Berlin  
Bremen  
Cologne  
Dortmund  
Dresden  
Erfurt  
Frankfurt  
Freiburg  
Hamburg  
Hanover  
Karlsruhe  
Kassel  
Koblenz  
Leipzig  
Mannheim  
Munich

Münster  
Neuss  
Nuremberg  
Regensburg  
Reutlingen  
Rostock  
Schwendi  
Siegen  
Stuttgart  
Trier  
Wangen  
Würzburg  
  
Daughter  
Companies:  
Belgium  
Bosnia and  
Herzegovina

Canada  
Croatia  
Czech Republic  
Brazil  
Danmark  
France  
Great Britain  
Hungary  
Italy  
Poland  
Rumania  
Serbia  
Slovakia  
Slovenia  
South Africa  
Sweden  
Switzerland (East)  
USA

Representatives:  
Bulgaria  
China  
Lithuania  
  
Agencies:  
Algeria  
Australia  
Austria  
Bangladesh  
Cyprus  
Egypt  
Estonia  
Finland  
Greece  
India  
Indonesia  
Iran

Ireland  
Israel  
Japan  
Jordan  
Korea (South)  
Kuwait  
Latvia  
Lebanon  
Luxembourg  
Macedonia  
Malaysia  
Moldova  
Morocco  
Netherlands  
New Zealand  
Nigeria  
Norway  
Pakistan

Philippines  
Portugal  
Russia  
Switzerland (West)  
Singapore  
Spain  
Syria  
Taiwan  
Thailand  
Tunisia  
Turkey  
Ukraine  
United Arab  
Emirates  
Vietnam