

3:1
MODULATION



MDP

MODULATING OIL PUMP

- ▶ Modulation range 3:1
- ▶ Volumetric oil dosing
- ▶ Unsusceptible to gas inclusions in the oil feed
- ▶ Engine pump unit with integrated electronic drive control
- ▶ Electronic control concept
- ▶ Energy-saving magnetic drive



herrmann
OIL - AND GASBURNER

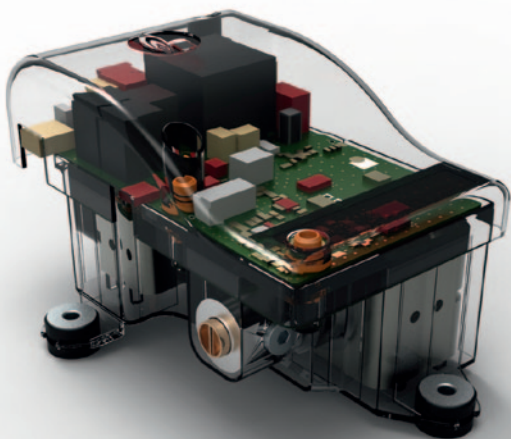
The new pump generation for climate-friendly oil burners

The high standard of insulation of modern buildings results in a massive reduction of the heating load.

Simultaneously, solar radiation, internal heat sources as well as the heat requirements due to ventilation have a strong impact on the thermal balance of the building. The irregular occurrence of these heat flows leads to strong variations in the heating load. Another consequence of the improved heat insulation is that the power requirements to heat up drinking water increase in relation to the heating load.

The power requirement to reload the drinking water deposit in modern residential dwellings is between one to three times as high as the normal heating load. Designed for these load relations the heating system is therefore oversized by two to three times in relation to the normal heating load. Especially in case of a low heating load one- and two-stage burners have a high switching rate. Consequently, the emission of pollutants and the wear and tear of the firing system increase.

Therefore, we recommend running the modern Blue flame burner in a modulating way. In particular, in case of part-load operation it is possible to achieve lower exhaust gas temperatures and higher levels of condensate separation. The resulting energy gain leads to a significant increase in efficiency of the heating system and thus fuel savings.

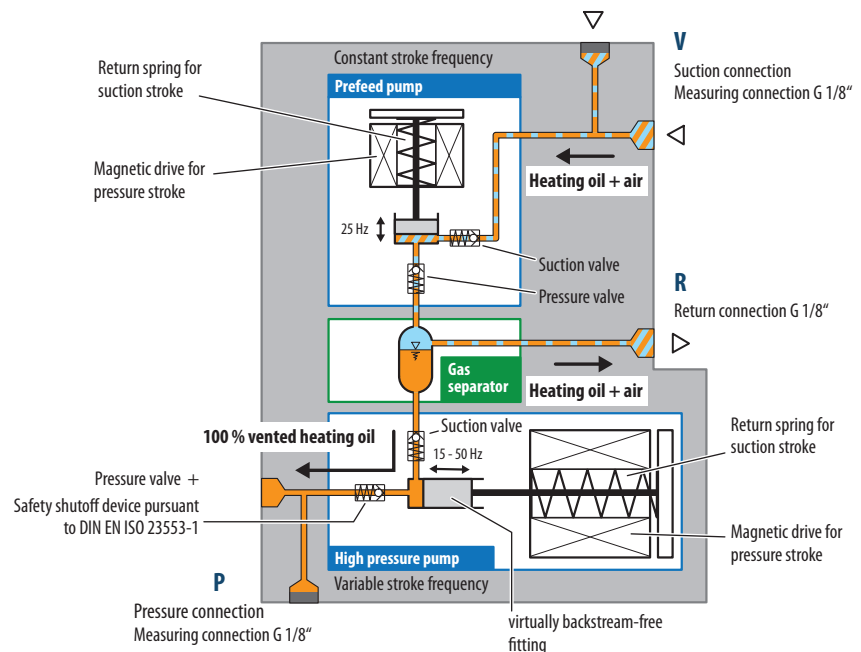


STRUCTURE

MAGNETICALLY DRIVEN RECIPROCATING PUMP (MDP)

The oil pump MDP doses the fuel mass flow within the modulation range of 3:1 in a linear and stepless way. In accordance with the current heating energy demand indicated by the control the stroke frequency is controlled very precisely. Independent from the size of the nozzle, the injected amount of fuel is solely determined by the stroke frequency. Therefore, the pump and not the nozzle, as before, controls the dosing.

The MDP is available in two performance ranges: 650 to 1950 g/h (MDP 20) and 1000 to 3000 g/h (MDP 30).



TWO PUMPS IN ONE

A pre-feed pump with ventilation function and the high pressure pump with dosing function are combined in one casing. They both have their own direct magnetic drive.

As the dosing function is totally separated from the oil circulation, the pump is not susceptible to inadequate oil supply systems.

Only 100% vented fuel reaches the high pressure pump and with this the pressure outlet. The sucked in air can fully escape through the return pipe. Therefore, even dry suction is possible and causes no problems.

Due to the construction the movable parts of the pump are exposed to very low mechanical load. Even very small fuel remains inside the pump are sufficient to fully lubricate it during dry operation.

ELECTRONIC CONTROL CONCEPT AND DIAGNOSIS

If there is a frequency signal at the control input of the pump, the electronic system of the pump generates the corresponding driving voltage for the magnetic drives: both for the prefeed pump which functions at a constant frequency and the high pressure pump with a variable stroke frequency. The control monitors the correct execution of every stroke and reports it back. Consequently, the MDP supplies all prerequisites for an electronic fuel/air ratio control system.

HYDRAULIC DIAGNOSIS

To determine the injection pressure and the pressure relations at the suction entrance the relevant measuring connections are fitted on the pump casing.

HYDRAULIC CONNECTIONS

Connection of suction pipe	G1/8" with sealing surface for copper ring $\varnothing_{\max} = 14,7$ mm
Connection of pressure pipe	G1/8" with sealing surface for copper ring $\varnothing_{\max} = 14,7$ mm
Connection of return pipe	G1/8" with sealing surface for copper ring $\varnothing_{\max} = 14,7$ mm
Measuring connection of suction pipe	G1/8" with sealing surface for copper ring $\varnothing_{\max} = 14,7$ mm
Measuring connection of pressure pipe	G1/8" with sealing surface for copper ring $\varnothing_{\max} = 14,7$ mm

THE ADVANTAGES



PIONEERING

By implementing a large modulation range in connection with very small injection amounts in the lower load point the MDP enables innovative burner solutions for modern condensing boilers.

The new concept of the motor-pump combination with integrated drive electronics improves the comfort during installation, operation and maintenance.



ECONOMICAL

The exact dosing of the fuel enables the reliable operation of the burner with little air surplus, which increases the efficiency of the heating system.

During full load operation the pump requires less than 60 W of electrical energy thanks to its energy-saving magnetic drive and the low circulation rate of the fuel at low pressure.



RELIABLE

The automatic ventilation of the fuel ensures consistent fuel injection without interruptions. This is a definite advantage when using the MDP in a Blue flame burner, particularly for small firing capacities.

Nozzle tolerances and depositions are automatically compensated by moving the dosing function into the pump.



ROBUST

The pump functions thanks to its design virtually wear-free and thus enables a long lifespan.

Due to the permanent automatic ventilation the pump is very robust against air incorporation in inadequately installed oil systems. Therefore, it can be connected to existing oil supply systems without hesitation. Even the dry suction of fuel is permitted and cannot damage the pump.



QUIET

Elastomer elements buffer the movement of the pistons before they reach their end positions. This causes less noise than in an impact without braking. The casing which is isolated from vibration reduces the noise even further.



EASILY COMBINABLE

The pump can be used in the burner with pressure atomizing systems common on the market.

The electronic specification of the discharge and the output of the feedback signal after every correctly executed delivery stroke facilitate the incorporation of the pump in fuel/air control systems.

TECHNICAL DATA

	MDP 20	MDP 30
Discharge at 15 Hz	650 g/h	1000 g/h
Discharge at 46 Hz	1950 g/h	3000 g/h
Frequency range stroke frequency	15-50 Hz (51 Hz)*	
Maximum discharge pressure	50 bar	
Dispersion of volume flow from pump to pump	+/- 4 %	
Negative pressure due to suction (minimal value)	-0,3 bar	
Max. suction height	3 m	
Required filter fineness, maximum pore width	40 µm	
Fixation	3x Ø 6.1 (for screw connection M6)	
Mounting position	Vertical suction connection pointing upwards	
Weight	2,3 kg	
Maximum requirement of electric energy at maximum discharge pressure	60 W	
Supply voltage	230 V AC	
Type of protection	IP 20	
Electronic diagnosis	Monitoring for excessive discharge	
Ambient temperature during operation	5 - 60°C	
Fuel temperature	5 - 40°C	
Viscosity range of fuel	2 - 12 mm ² /s	

FUELS

Heating oil EL pursuant to DIN 51603-1

Low-sulphur heating oil EL pursuant to DIN 51603-1

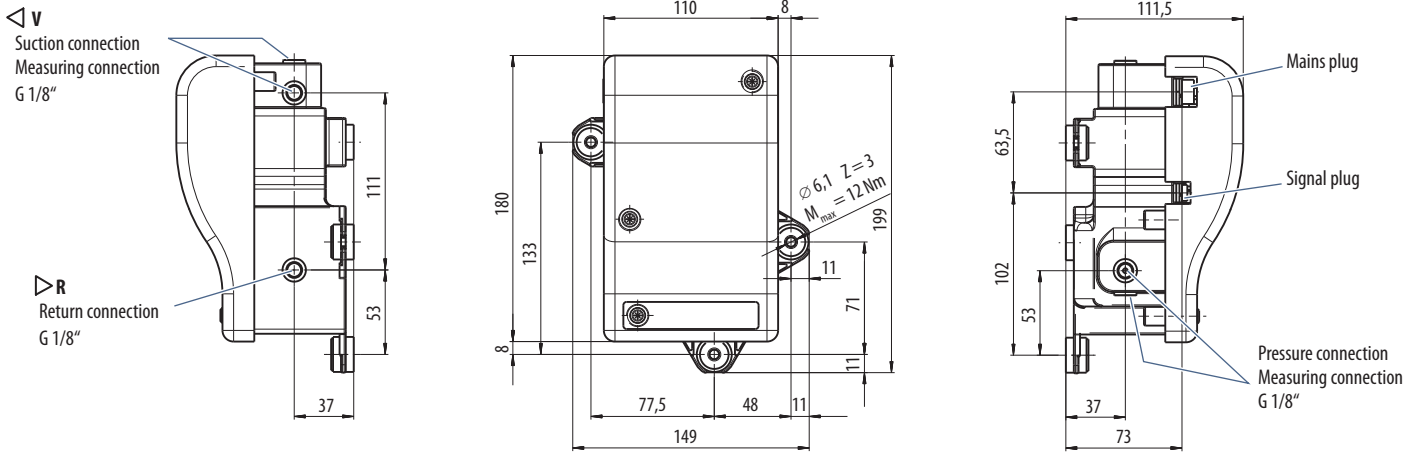
Heating oil EL A Bio 10 pursuant to DIN SPEC 51603-6, Low-sulphur heating oil EL with up to 10 % FAME part according to the quality requirements of DIN 14214

TESTS

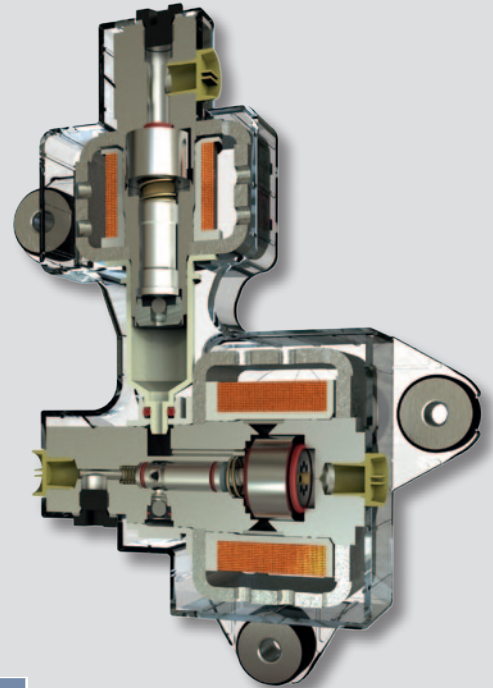
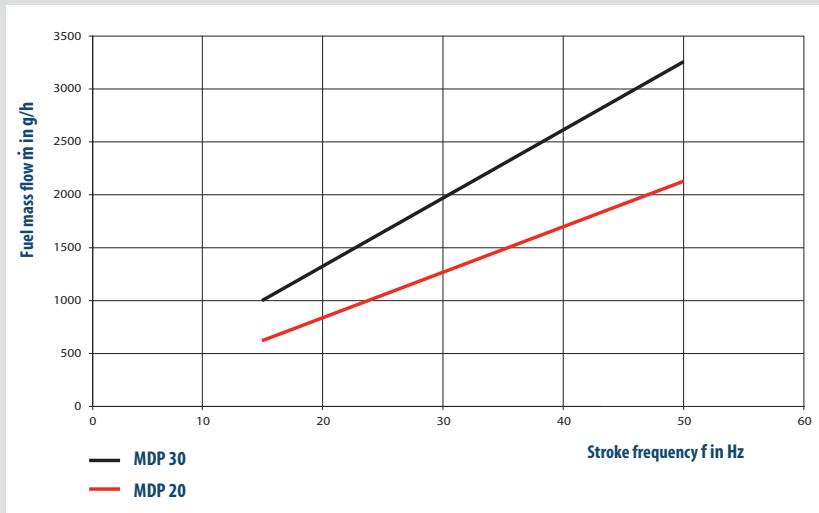
according to DIN EN 620335: Security of electrical devices for domestic use and similar purposes (also includes: EMC Directive, Machinery Directive, Low Voltage Directive)

pursuant to DIN EN ISO 23553-1: Safety and control facilities for oil burners and oil burning devices - Specific requirements - part 1: Stop valves for oil burners

* Activating start booster function for the pump by application of a frequency signal of 51 Hz + 2 Hz. The brief increase in conveying capacity at start-up with low levels of injection pressure creates a steep pressure flank.



CHARACTERISTIC CURVE

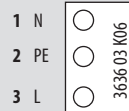


ELECTRICAL CONNECTION AND PIN ALLOCATION

MAINS PLUG

Plug of circuit board edge suitable for Lumberg RAST-5 plug connectors (Lumberg order number: 3636 03 K06)

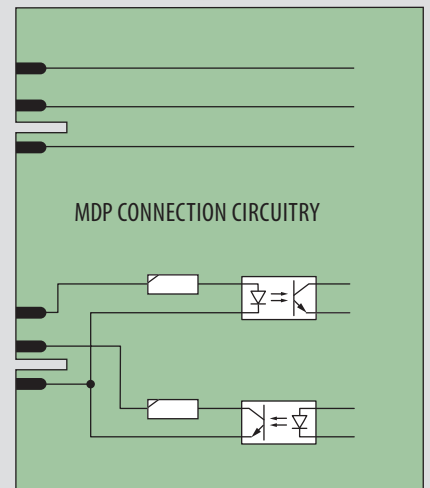
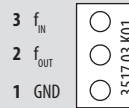
Pin no.:	Symbol	Name
1	N	Neutral
2	PE	Phase (230 V AC)
3	L	Earthing



PLUG FOR SIGNAL INPUT AND SIGNAL OUTPUT

Plug of circuit board edge suitable for Lumberg RAST-2.5 plug connectors (Lumberg order number: 3517 03 K01)

Pin no.:	Symbol	Name	Frequency	Amplitude	Start-up time
3	f_{IN}	Frequency signal	15 - 50 Hz (51 Hz)*	U_{FIN} 5V TTL	t_{FIN} 2ms +/- 1ms
2	f_{OUT}	Feedback signal from control device	15 - 50 Hz (51 Hz)*	U_{FOUT} 5V TTL (inverted)	t_{FOUT} 2ms +/- 1ms
1	GND	Common mass	0V		



ORDER DATA

Article name	Article number
Modulating oil pump MDP20	10019.00049
Modulating oil pump MDP30	10019.00050