

# VAF

INSTRUMENTS



# Oil Blending Systems

# 170

Application Bulletin

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**TO BE  
REALLY  
SURE**

# Introduction

VAF Instruments designs, builds and manufactures in-line blending systems which produce specifically defined grades of oil in any quantity, with utmost speed and accuracy.

Users can be on-shore bunkering installations, bunker barges, refineries, lubricating oil plants etc.

# Principle of operation

The aim of a blender installation is to produce a controlled blend of two different oil products in line. This is done by bringing together a flow of low- and high viscosity medium in a known relation (flow ratio) and thereafter creating a turbulent flow in a static mixer. This mixer will create a homogeneous mix of both products, thus creating an oil product with a lower viscosity grade than the initial heavy product due to accurate viscosity control.

Basic construction of a modern in-line blender system is that both flows are measured with a flowmeter fitted with a pulse transmitter. The flow of the high-viscous product (HFO) is optionally regulated by a frequency controlled pump to a fixed set-point calculated from the desired flow in the outlet. To this product, a flow of MDO is added, controlled by means of a 4-20 mA signal to the frequency control of the MDO-pump or to a control valve. Adjusting the blend ratio by proportional integral control of the MDO-flow gives a changing viscosity grade of the resulting product (blend). To adjust the blend, the viscosity of the blended product is measured in the outgoing line with a ViscoSense viscosity sensor. Together with the measured temperature this viscosity is used to calculate the viscosity at 50°C, at which it is compared with the desired setpoint. Depending on the difference with the setpoint, the ratio between heavy and light product is changed by a 'proportional integral' blend control monitor. The use of a viscosity sensor ensures a constant quality over the batch, even if the quality of the HFO is not stable throughout the batch, as the MDO ratio will be adjusted continuously.

The latter will result in a cost effective operation, since the optimum amount of MDO is used.

A blender unit can, depending on its execution, also be used for straight run delivery of MDO or HFO, or can be used for batch applications. For this application also the Blender Control Monitor can be used to control the valves.

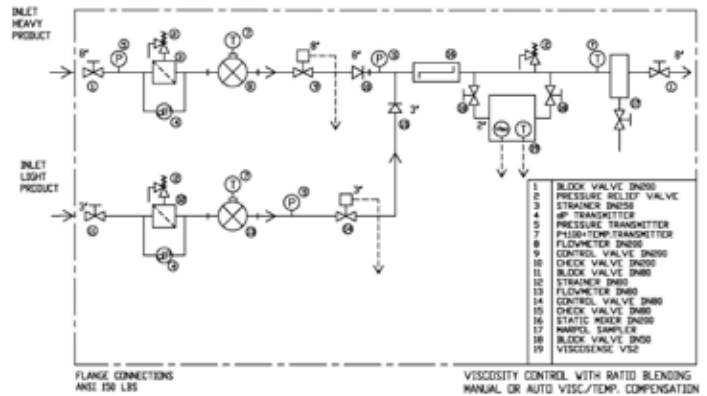
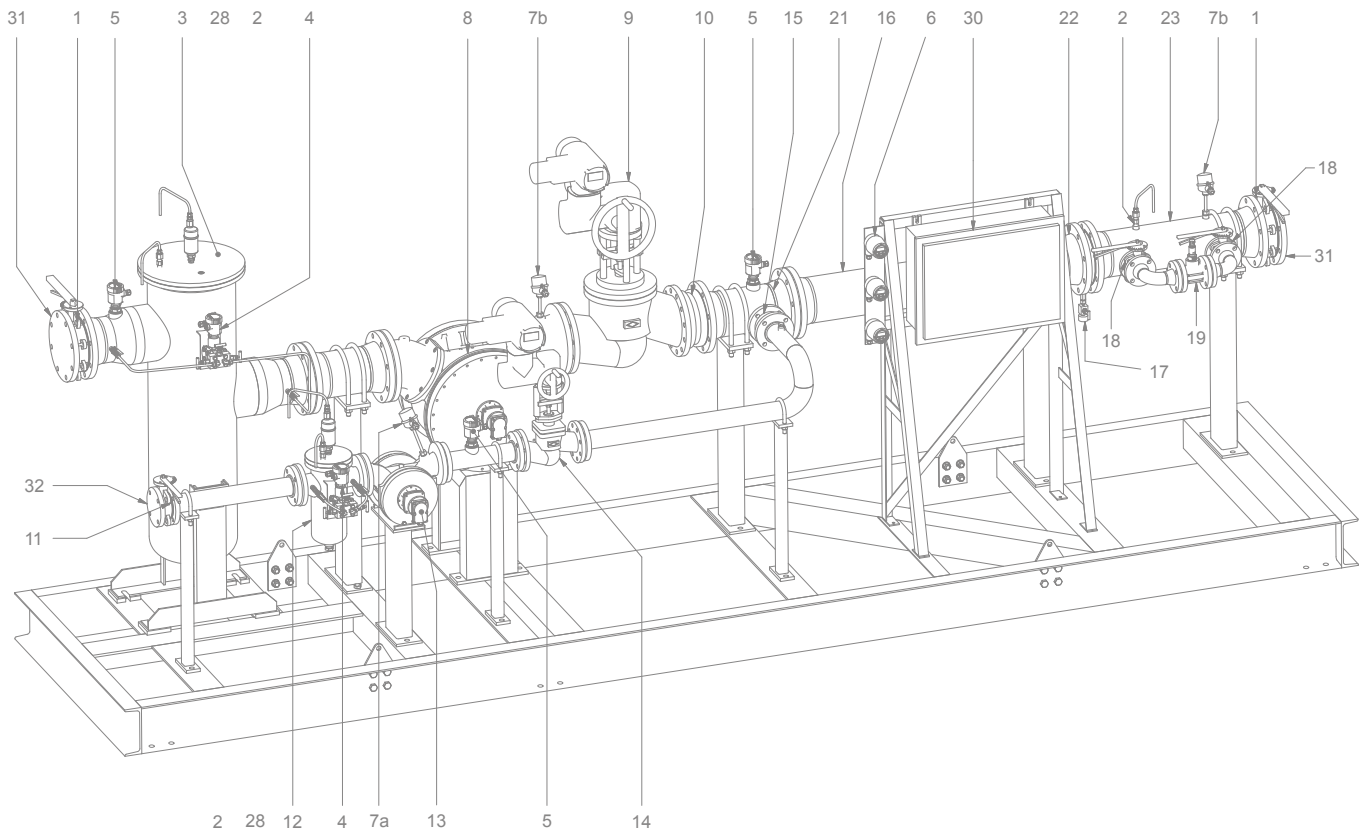
# Example assembly drawing

## Parts list

item	quantity	part number
1	2	block valve DN200
2	3	pressure relief valve
3	1	filter DN200
4	2	dp transmitter
5	3	pressure transmitter
6	3	temperature transmitter
8	1	flowmeter DN200
9	1	control valve DN200
10	1	check valve DN200
11	1	block valve DN80
12	1	filter DN80
13	1	flowmeter DN80
14	1	control valve DN80
15	1	check valve DN80
16	1	static mixer DN200
17	1	marpol sampler DN200
18	2	block valve DN50
19	1	ViscoSense <sup>®</sup> 2
21	1	T-piece DN200_DN80
22	1	settling pipe DN200
23	1	measuring pipe DN200
28	2	air vent valve
30	1	Exd BOX
31	2	blind flange DN200
32	1	blind flange DN80
7a	1	PT100 sensor l = 70
7b	2	PT100 sensor l = 125

# Features & benefits

Features	Benefits
Instantaneous in-line blending	Cost saving
	Time saving
	No unnecessary storage of blended oil
Designed in accordance with customer requirements	Flexible solution to fit your needs
From an ISO 9001 registered company	Assured product quality
Computerized control on viscosity	Spot on blending of required oil grades
Computer interface for remote monitoring and control	Automatic control and fail safe operation preventing operator errors
Alarm functions	
User friendly menu software	No special operator training required



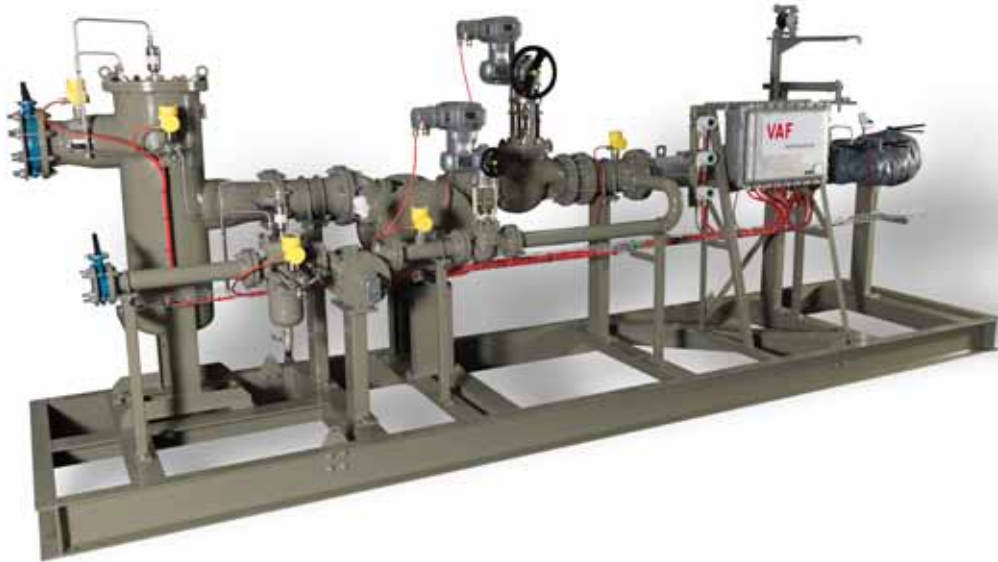
## Applications

Accurate two or more component blending of:

- Fuel oils
- Lubricating oils
- Additives
- Chemical liquids

### Quotation & ordering information

To obtain a dedicated system quotation ask for our Blender Questionnaire.



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Name:

Place and date:

For further information see relevant Product Bulletins  
or [www.vaf.nl](http://www.vaf.nl)

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