

THIN-FILM EVAPORATION UNIT IN MINIPLANT TECHNOLOGY TYPE DV



STANDARD APPARATUS FOR CONTINUOUS OPERATION

M103E.2

GENERAL

This continuously operating thin-film evaporation unit, type DV, in Miniplant technology having an evaporation surface of 0,05 and 0,1m² can universally be used for the purification of temperature sensitive products. The special advantage of the rotating wiper system is especially convenient for highly viscous products.

The standard unit for throughputs of 0,2 to 10l/h is used for synthesis in kg-scale as well as for process development. It is suitable for product liquids at ambient temperature.

The advantages of this unit are:

- It is a versatile unit, since the operating temperature may be up to 200°C and the operating pressure can continuously be controlled between 0,01 and 1000mbar.
- Due to the counter-current flow of the liquid and the vapours a high separation efficiency is achieved.
- In addition, the evaporator body made of glass allows the visual observation of the liquid flow. A film completely covering the evaporation surface can therefore be ensured.
- The wiper system is leaklessly connected by a leak-fremagnetic coupling to the motor drive. The distillation of substances sensitive to air is therefore possible.
- Apart from the wiper cage, which is as standard made of stainless steel, all components coming into touch with the product are made either of borosilicate glass 3.3 or PTFE.
- Beside the laboratory distillate receiver all glass parts are equipped with the robust QVF flat end safety flanges.
- The unit can be completely discharged.
- The modular control and measuring system provides the possibility of a successive extension from manually operated to a fully automatic system.

CONSTRUCTION

Apart from the usually customer supplied present vacuum pump the scope of delivery of the thin film evaporator is as indicated in figure 1.

The essential part of the unit is the evaporator made of glass. It is heated by a thermostat, which is part of the additional equipment. The Rotafilm or roller wiper system is tightly connected via a high vacuum suited magnetic coupling to the motor.

The product is continuously fed to the evaporator via a feed funnel with Mariotte tube. Via an inlet tube going into the thin-film evaporator the product flows onto a distributing disc mounted to the wiper shaft. It is then centrifuged to the inner wall of the evaporator and equally distributed along the walls and guided downwards by the wiper blades.

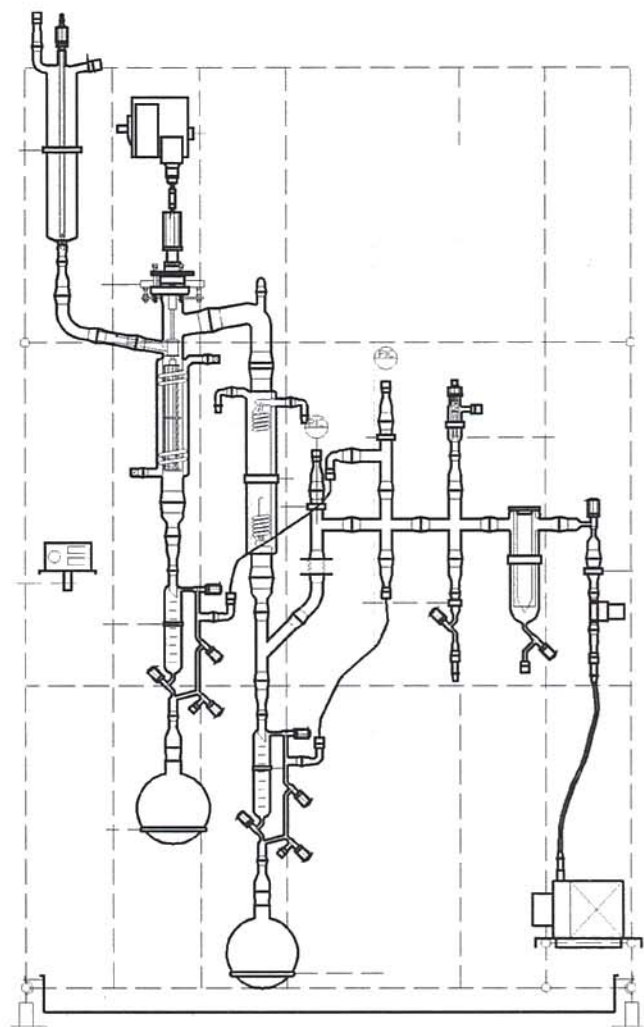


Figure 1: Thin-Film Evaporation Unit

The unevaporated liquid flows via a graduated Anschütz-Thiele receiver into a bottom receiver which is of same size as the feed funnel. This flow rate can be measured in the above mentioned Anschütz-Thiele receiver.

The vapours condense in a descending condenser and enter the final distillate receiver also via the Anschütz-Thiele receiver.

The evaporation unit is provided with a vacuum connection made of DN25 glass pipe for low pressure drop, a cold trap and a vacuum control system. The vacuum control is effected from 0.01 up to 1000 mbar by means of one pressure sensor for the higher and one for the lower pressure range.

ADDITIONAL EQUIPMENT

The unit can be extended apart from the vacuum pump and the thermostat with numerous additional equipment due to modular construction. A pre-degassing system for the feed for example can be added as easily as additional temperature measuring devices. Operation can be further improved by a process control system and a PC visualisation.

Selection of additional equipment optional:

- Thermostat
- Circulating evaporator
- Temperature measuring of the vapours and at the in- and outlet of the double mantle
- Pre-degassing system for feed
- Process control system
- PC visualisation

OPTIONAL EQUIPMENT

Contrary to additional equipment the optional equipment replaces parts of the standard unit.

The extension of the unit with for example different wiper elements or with completely tempered pipes for substances being liquid only at higher temperatures is possible due to the modular construction of the Miniplant-Technology.

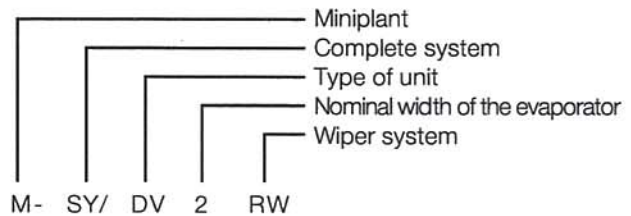
It is of special advantage that the standard thin-film evaporator may be subsequently re-equipped to a short-path evaporator unit by an internal condenser. The extension with optional equipment is therefore almost unlimited and permits solutions totally different to the standard which we would gladly elaborate with you.

Selection of available optional equipment:

- Evaporator for temperatures up to 350°C made of metallic materials
- Mechanical seal
- Receivers, pipes and valves with tempering jacket
- Balance controlled dosing system
- Continuous product withdrawal out of the vacuum
- ¾" tubular structure made of stainless steel

CODE FOR ORDER NUMBERS

(see technical data)



TECHNICAL DATA ¹⁾

Nominal width of evaporator body	DN	50	80
Evaporating surface	m ²	0,05	0,1
Throughput	l/h	0,2 - 5	0,5 - 10
Capacity of feed and final receiver	l	2	5
Speed of the wipers	1/min	50 - 2000	50 - 1500
Wiper system ²⁾		Rotafilm wiper (RF) / roller wipers (RW)	
Operating pressure ³⁾	mbar	0,01 - 1000	
Operating temperature	°C	20 - 200	
Voltage supply ⁴⁾	V / Hz / W	220 / 50 / 3000	220 / 50 / 3000
H x W x D	m	3 x 1,5 x 0,75	2,5 x 1,75 x 0,75
Order No.		M-SY/DV 2 RF	M-SY/DV 3 RF

¹⁾ Other versions are available upon request

²⁾ Blade wiper are available on request

³⁾ Absolute pressure

⁴⁾ Voltage supply of the standard unit without additional equipment

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