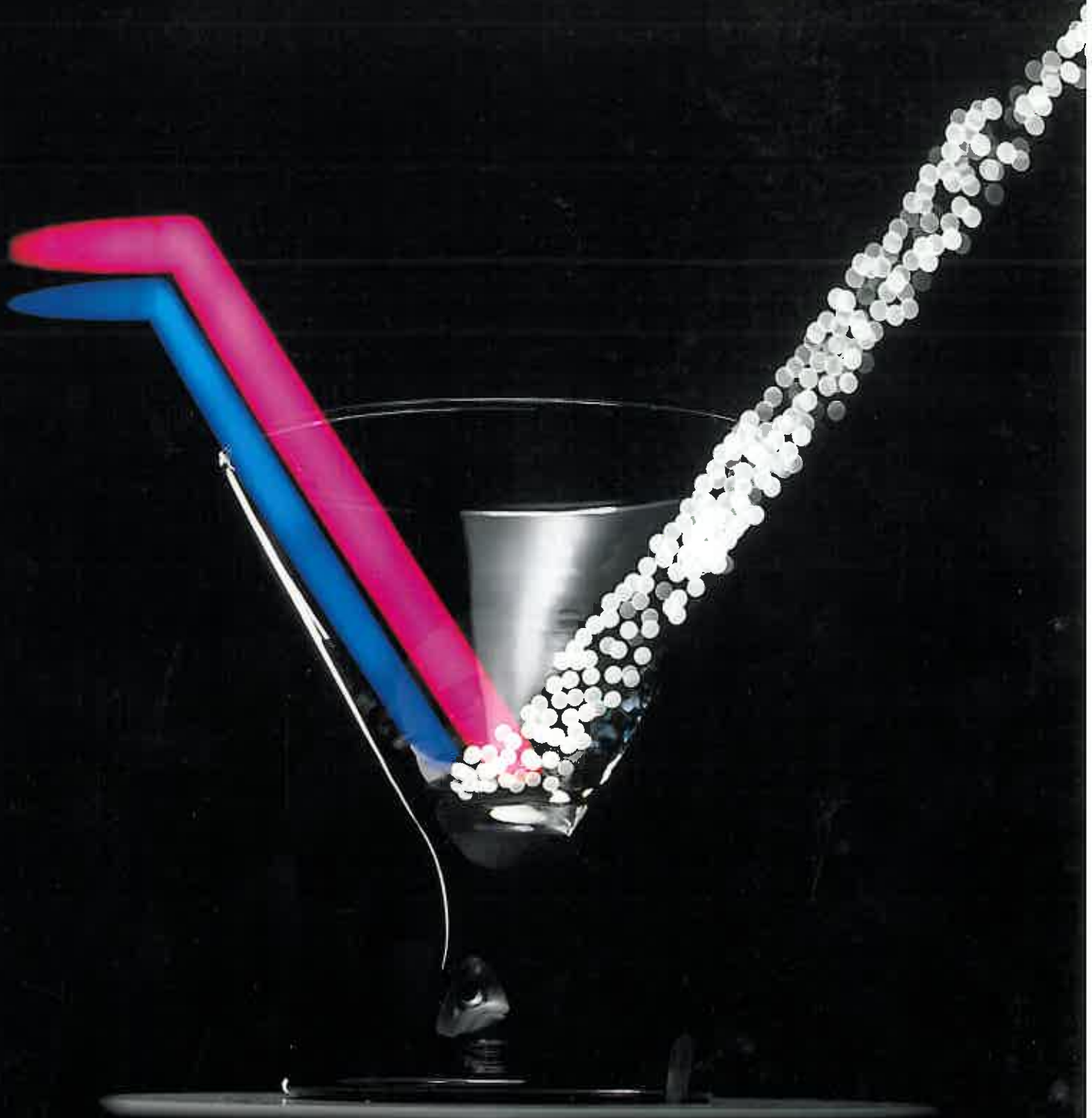


RANNIE
Homogenisers
& High Pressure Pumps



What Is High Pressure Homogenisation?

The homogenisation of fluid mixtures has become an important technique in many industries. Homogenisation produces very small particles, from an initial coarse emulsion or suspension, to give a stable emulsion or suspension.

The homogenising process takes place in the homogenising valve, where the product is pumped through the adjustable small gap under high pressure. This process gives a product velocity of 200-300 m/sec, resulting in a big pressure drop in the

homogenising valve. Cavitation, turbulence and shear forces divide the product into very fine particles.

The advantages of high pressure homogenisation are:

- Better stability

- Improved keeping qualities
- Improved homogeneity
- Higher absorbent qualities
- Savings in expensive additives
- Changes of viscosity
- Reduction of reaction time
- For cell rupture

Examples of Application

Dairy and Ice Cream Industries

Chocolate milk - Desserts - Cream - Cream cheese - Fresh milk - Ice cream - Condensed milk - Buttermilk - Milk concentrate - Curd - Recombined milk - Processed cheese - Butter oil - Sterilized milk - Curdled milk - UHT-milk - Yoghurt



Chemical Industry

Disinfectants - Emulsifiers - Enzymes - Fuel oil - Photo-emulsions - Insecticides - Paints - Latexes - Oil emulsions - Paraffin emulsions - Silicone emulsions - Cutting oil - Lubricating grease - Lubricating oil - Starch - Soap - Wax emulsions



Pharmaceutical Industry

Antibiotics - Cultures of bacteria - Cell rupture - Intravenous emulsions - Creams - Ointments - Tablet coating - Vitamin preparations

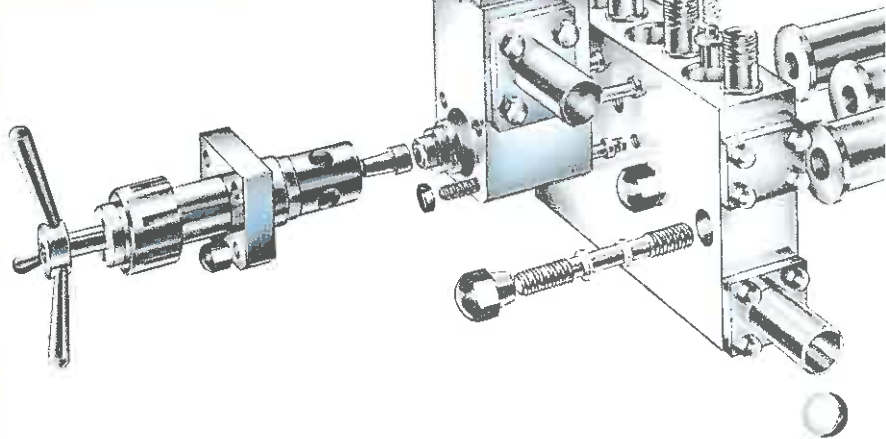


Food Industry

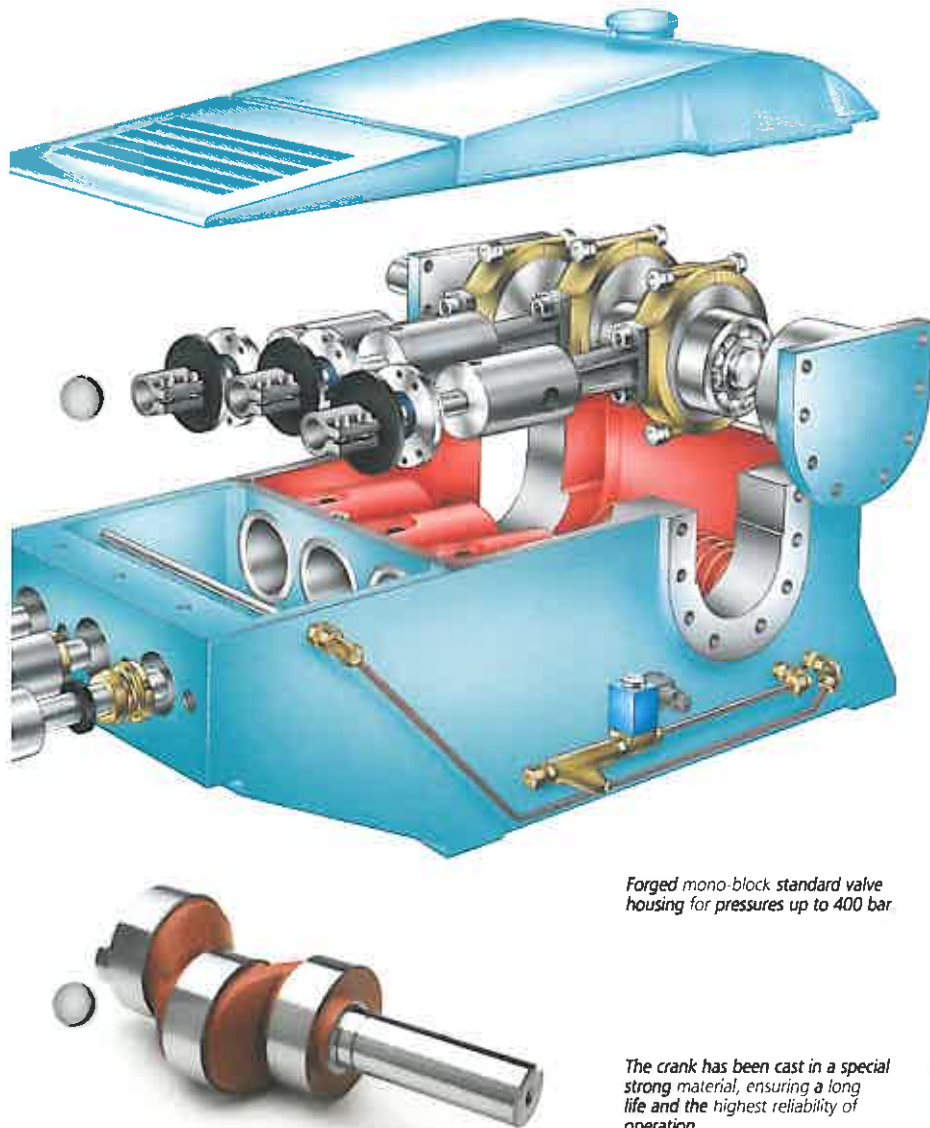
Aromatic compounds - Baby food - Desserts - Dressings - Artificial cream - Fruit juice - Fruit concentrate - Vegetable juice - Liqueurs - Sauces - Soy milk - Tomato ketchup - Liquid egg products

Cosmetic Industry

Hair products - Cream - Lotion - Perfumes - Shampoo



The Design of the High Pressure Homogeniser



Forged mono-block standard valve housing for pressures up to 400 bar

The crank has been cast in a special strong material, ensuring a long life and the highest reliability of operation.

The homogeniser consists of a high pressure piston pump equipped with a homogenising bracket and a homogenising valve.

The power is transferred direct to the eccentric or the crank by means of motor and belt pulley.

The homogeniser is equipped with dip or splash lubrication.

A cooling coil is mounted in the crankcase for cooling of the oil.

The "Cross-heads" are connected to the product contacting pistons by means of a sleeve coupling. In most cases it is possible, after long

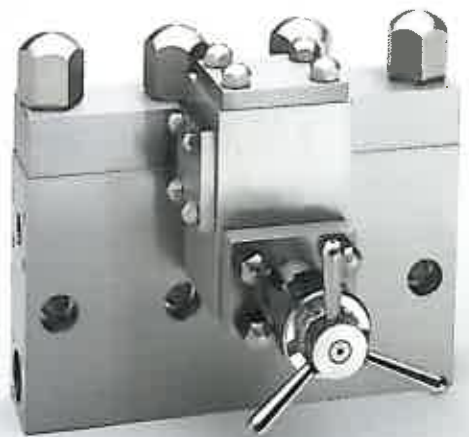
use, to reverse the pistons, which can double piston life, thereby reducing maintenance costs.

The pump housing is a solid cast-iron casing.

Standard material used in the construction of valve block, cylinders and pistons is stainless steel. Single packings are used for assembly.

For working pressures up to 400 bar, a mono-block valve housing is standard, using poppet type suction and delivery valves.

All machines are in sanitary design for cleaning in place and 3-A approval.



Homogenising Valves

RANNIE LW Universal homogenising Valve

The LW (Liquid Whirling) homogenising valve with whirling chambers gives a high homogenising effect with low power consumption.

The LW valve consists of a top and a bottom part, where the angles and faces of the valve are mounted exact co-relation to each other.

The use of the LW valve gives very good cavitation at

low pressures to produce a high homogenising effect.

Use of the LW valve will save electrical energy and may be used for most fluid products which do not contain hard particles.

- Standard design available in stainless steel with hard chrome coating.
- Special design available in Stellite for abrasive products.



Flat Homogenising Valve

A flat homogenising valve made of special ceramic materials is used for abrasive products.

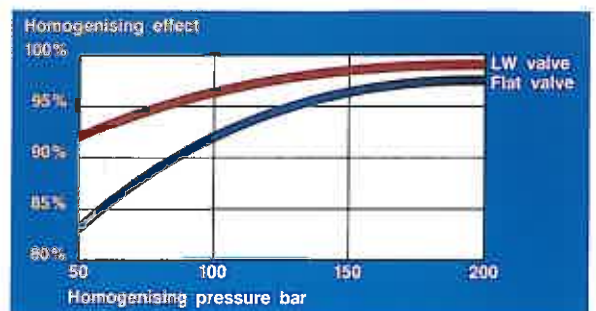
With a somewhat higher homogenising pressure the same homogenising effect as for the LW valve is obtained.

Homogenising Effect

The curves show the homogenising effect measured by The Government Research Institute of the Dairy Industry in Denmark. The degree of

separation is measured after a standing period of 72 hours.

Product: Milk with 3.5% fat
Homogeniser: Type 50.79
Capacity: 6,000 l/h



The Complete Delivery High Pressure Homogeniser

Model BLUE-TOP-PLUS



The RANNIE BLUE-TOP-PLUS model is an advanced homogeniser/pump with a maximum noise level of 80 dB(A). The homogeniser/pump is totally enclosed in a sound-insulated cabinet made up of removable sound-insulated panels of

polished stainless steel.

The model is supplied with either 3 or 5 pistons depending on the capacity range. The 5-piston homogeniser/pump is provided with comprehensive equipment, viz.: safety valve, pipe protection valve, automatic

controls for oil lubrication and cooling water, ammeter, as well as hydraulic pressure adjustment for safe operation and working. Used in all industries where efficiency, safety, and design are specified.

Model BLUE-TOP



Programme of and High Pressure Pumps

Model INDUSTRY

The RANNIE BLUE-TOP model is in 3-piston design, and all product contact surfaces are of polished stainless steel. The homogeniser/pump is totally enclosed in a sanitary cabinet constructed in polished stainless steel. There are no external screws or bolts and the "BLUE-TOP" removable top cover is in fibre-glass.

All BLUE-TOP models are designed for the hygienic industries to give an aesthetic and elegant appearance, when coupled with other process equipment in the dairy and food industries.



The RANNIE homogeniser/pump model INDUSTRY is in enamelled finish, mounted on a steel profile frame with the motor placed behind the homogeniser. The model is

supplied either with 3 or 5 pistons, depending on the capacity range. All parts in contact with the product are made of polished stainless steel.

The "INDUSTRY" design is widely used throughout the general chemical, pharmaceutical and some food industries.



Model LAB

The RANNIE LAB model is a 3-piston laboratory homogeniser/pump designed for product research and development, pilot plants, and for small scale production. Good reproduceability, when scaling up to full scale production. All product contacting parts are constructed in polished stainless steel. The homogeniser is enclosed in a polished stainless steel cabinet, with blue painted removable aluminium top cover.

Additional Equipment and Special I

RANNIE homogenisers and high pressure pumps are supplied with a wide range of additional equipment ensuring optimal safety of operation and adaption to all types of process plants.

Air Vessels

Mounted on the inlet and/or outlet side to equalize pressure variations in a closed pipe system. Available only for capacities of more than 400 l/h.

Safety Valve

Available and recommended for all models, capacities and pressures – to secure the homogeniser/pump against overload.

By-Pass Arrangement

Used for the circulation of detergent or for commissioning and sampling.

Comprises by-pass swing cock, funnel, and three-way cock. Available for capacities up to max. 3,300 l/h.

Pipe Protection Valve

Mounted on the outlet side to protect a closed pipe system, plate heat exchangers, etc., in case of incorrect operation. Available only for capacities of more than 400 l/h.

Two-Stage Arrangement

Two homogenising systems connected in series. Used for products with a high fat content. Giving lower viscosity and improved heat stability.

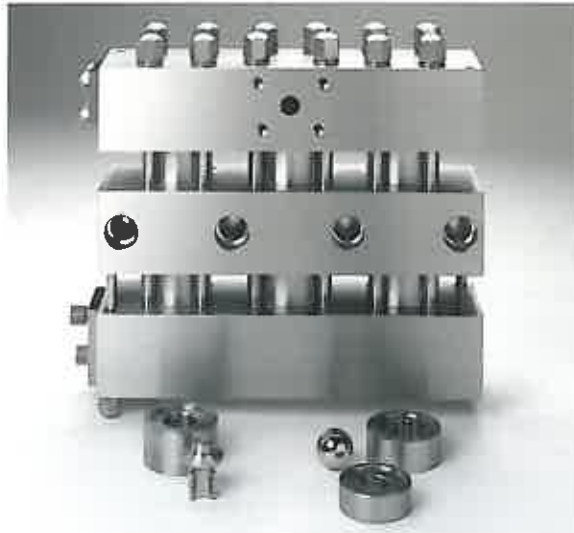
Available for capacities up to 30,000 l/h.

Hydraulic Pressure Adjusting Arrangement

For on/off regulation of a pre-adjusted working pressure together with remote control. Supplied complete with hydraulic unit.

Also available for automatic pressure control.

Apart from the delivery programme of standard equipment, a wide range of special equipment is available for the treatment of especially difficult products and for installation in totally automatic process plants.



RANNIE "Three-Part" Valve Housing

The three-part valve housing is a result of product development and RANNIE expertise. The system of mounting the middle part prevents the possibility of the block cracking.

The design/construction provides the user with the capability to interchange and reverse the valve seats to give double lifetime when compared to conventional designs. The entire valve housing is simple to dismantle. For viscous or abrasive products, ball valves instead of poppet valves can be supplied.



Special Packings and Ceramic Pistons

Special packings with solid ceramic pistons and closed water lubrication system give the pistons and pack-

ings a long life even with very abrasive products. Packing materials in different qualities and designs can be supplied to meet special applications.

New Products

RANNIE Application Laboratory

The RANNIE Application Laboratory is available as a free analysis and testing service. Our laboratory staff conduct homogenising tests on various products to provide the customer with an analysis and test report to produce the optimum solution for the particular homogenising application.

All such testing and reports are treated in strict confidence.

RANNIE PRODUCT INFORMATION is a series of publications available as a service to our customers. These contain information about the homogenisation process, giving details such as operating pressures and temperatures on a wide range of products for the food and dairy industries as well as for the chemical and pharmaceutical industries.



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Standard Programme Homogenisers & High Pressure Pumps



Pressure Transducer

Pressure transducer with amplifier and digital display is available for all capacities.

Capacity Regulation

For infinitely variable capacity regulation, either gear speed governor, electric governor (i.e. Thyristor regulation), or hydraulic governor can be supplied. Available for all capacities.

Special Material Qualities

For very abrasive products, all parts in contact with the product can be supplied in acidproof stainless steel or in another special material.

Available for all capacities. Special packing material and design available.

Automatic Pressure Control System

Primarily used on machines with variable capacity regulation. The system is automatically controlling the pre-set pressures and consists of pressure transducers with a signal of 4-20 mA, step or A.C. brake motors, and a specially designed micro processor. Digital display of the pressure and adjustable stop for maximum and minimum pressures can be supplied.

Aseptic Homogenisers

RANNIE aseptic homogenisers are designed for UHT-dairy products, where the homogeniser is placed down stream, and for other sterile products demanding a high protection against infections.

The aseptic homogenisers are based upon pre-sterilization of all product contacting parts with steam or hot water at a temperature of 130-140°C.

During operation a continuous sterilization takes place by feeding steam con-

densate to the pistons and cylinders.

The aseptic homogenisers have a reduced capacity and a low piston velocity which gives the piston packings long life.

The aseptic pre-sterilization and steam condensing system is available with manually operated valves or with solenoid valves for automatic control.

		Model INDUSTRY		Model BLUE-TOP		Model LAB		Model BLUE-TOP-PLUS	
Type	Max. Capacity l/h							Max. pressure bar	psi
12.50	200	●						400	5800
16.50	350	●						400	5800
22.51	800	●	●					400	5800
30.51	1500	●	●					230	3335
24.60	1100		●	●				400	5800
30.60	2000		●	●				350	5075
40.60	3500		●	●				210	3045
30.72	2500		●	●				400	5800
36.72	3300		●	●				310	4495
45.72	5000		●	●				250	3625
50.72	6700		●	●				200	2900
50.79	8000		●	●	●			400	5800
58.79	10000		●	●	●			300	4350
63.79	12500		●	●	●			250	3625
70.79	14500		●	●	●			200	2900
63.80	10000		●	●	●			400	5800
70.80	13000		●	●	●			350	5075
75.80	15000		●	●	●			310	4495
80.80	17500		●	●	●			270	3915
85.80	20000		●	●	●			200	2900
100.80	25000		●	●	●			140	2030
50.90	15000		●	●				400	5800
58.90	20000		●	●				300	4350
63.90	25000		●	●				250	3625
70.90	30000		●	●				200	2900
80.90	40000		●	●				150	2175

The above capacities are based on water-like products. Apart from the models already mentioned we also supply special slow-speed machines (long stroke) for high-viscous and very abrasive products.

Please contact our sales department for further particulars.

World-wide Sales and Service

For more than 70 years, RANNIE have been recognized as world leaders in the design and manufacture of homogenisers and high pressure pumps. Through their long experience and continued research and product development,

RANNIE can supply the most technically advanced systems. Today RANNIE high pressure homogenisers and high pressure pumps are serving processors throughout the world, providing RANNIE's proven dependability and long life.

RANNIE ... lead the world in high pressure homogenisers and pumps.



 EURO CITRUS BV

2 RANNIE homogenisers, model BLUE-TOP-PLUS 58.79, in sound-insulated design, capacity 10.000 l/h, working pressure 250 bar, for homogenisation of fruit juice concentrate.

Delivered to Euro Citrus BV, The Netherlands, who also have other, smaller RANNIE homogenisers.



RANNIE homogeniser model BLUE-TOP 45.72. Two-stage homogenising system with variable capacity. Combined homogeniser and pump installed in a spray drying plant producing milk powder. Two-stage homogenisation is normally used in the production of milk powder because of the relatively high contents of fat.