

SPECIFICATION

DT-CM-2201

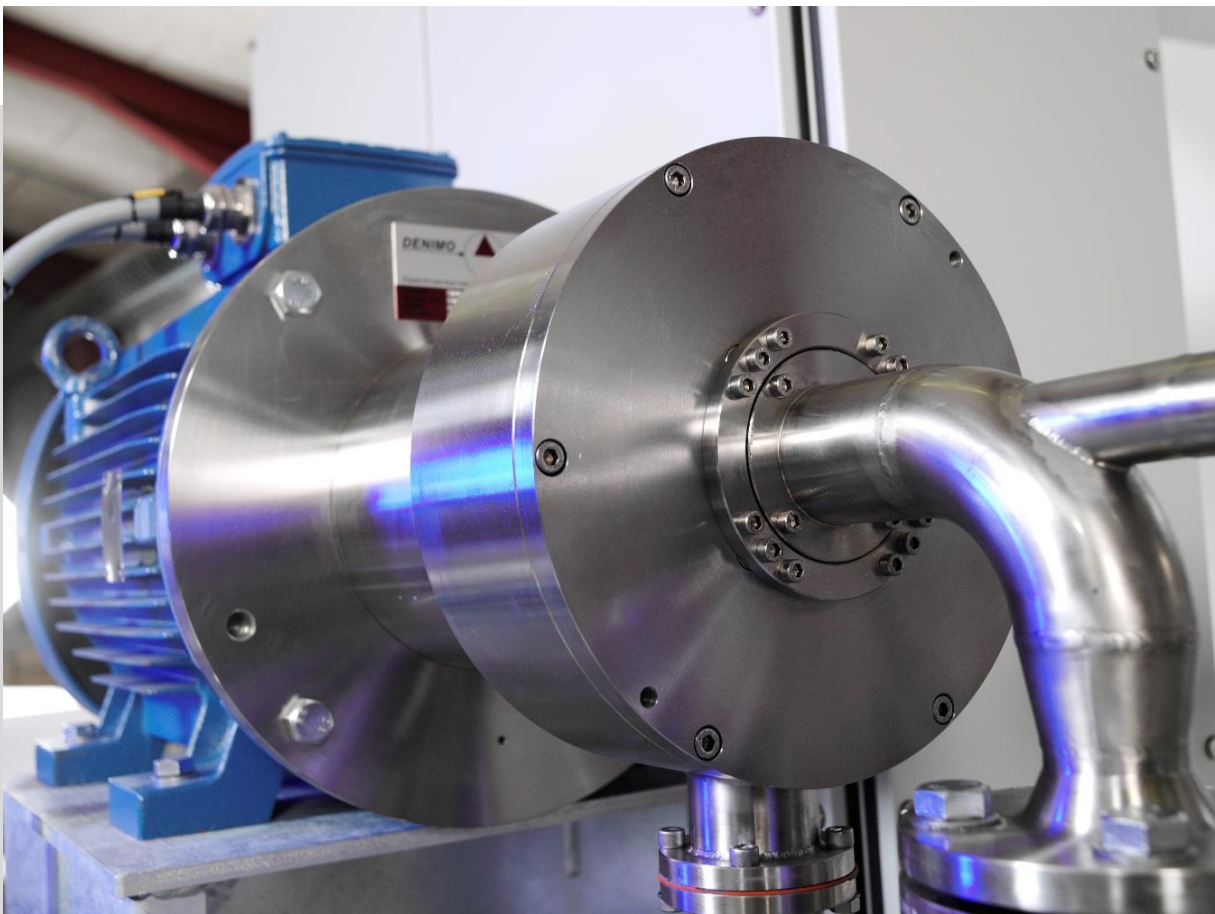


DT COLLOID MILLS

DT-106 | DT-202 | DT-403
FOR BITUMEN EMULSION PRODUCTION
Capacity 12, 20 & 40 TPH.

Manufacturer:

*DENIMOTECH A/S
Haandvaerkervangen 12
DK-5792 Aarslev
Denmark*



PROCESS DESCRIPTION

The DENIMOTECH Colloid mills are specially designed for bitumen emulsion production.

The DENIMOTECH mills provides a homogeneous mixing of water phase and bitumen.

The rotor and stator system are designed to produce a fine and narrow particle distribution which increase the storage stability and a higher viscosity of the emulsion. Emulsion with high content of bitumen especially have benefits from the rotor- & stator system. The higher the content of bitumen in the emulsion, this higher viscosity.



The DENIMOTECH mills consist of an inlet manifold with two flanges, where the water phase and bitumen enter the mill house. Inside the mill house the water phase and bitumen is mixed by the rotor and stator. The fast rotation of the rotor forces the mix of water phase and bitumen through all the teeth and out through the outlet. The mill is directly mounted on the motor flange, which reduce the noise level, saves space and makes it simple to install.

The mills are available in 40, 20 and 12 tonne/hour capacities for production plants and in a 300 litre/hour version for laboratory use (see separate specification). The 12 TPH mill can be “downgraded” to 5 tonne capacity via modified pipe connections and manifold.

High and constant product quality

The DENIMOTECH mills is designed for bitumen emulsion production and build to ensure a high and consistent quality of the product. The DENIMOTECH mills use very low amount of power.

Operational reliability

The mills are designed and build in full compliance with the latest European Standards of process machinery including mechanical and electrical design as well as documentation.

Only high-quality components and materials are used to ensure best possible operational reliability in tropical and tempered climates as well as industrial environment.

Maintenance

All parts are completely numbered and identifiable in manuals and part lists. Extensive manuals go with the mills. Maintenance and service instructions as well as technical data for the various components and systems. These mills from DENIMOTECH can be maintained by the costumer and do not have to be send to DENIMOTECH to be maintained. In the manual, a spare part list for stock purpose is listed and by having these and following the requirements according to the manual, you can easily take care of maintenance yourself. Repair readiness is achieved with a relatively small stock of spare parts because of the uniform system design.

Particle size

End bitumen emulsion products have a size range from below one micron and up to ten microns. Average particle size is one to five microns. Different settings in speed, rotor / stator gap, raw materials, and type of end product formulation will have an effect on particles.

Fast and easy installation

The mills are fully assembled with all the equipment on one platform. Testing is done at the factory prior to shipment.

The mill is mounted directly on the AC motor flange. The mill can be mounted and fastned to the ground by the bolt holes on the motor. The inlet and outlet are designed with standard DIN flange and therefore easy to install in existing equipment and in a DENINOMTECH process plant.

The mills are delivered with special tools for disassembly of the rotor.

EQUIPMENT SPECIFICATION

Colloid mill & emulsion system

The rotor and stator system consist of two discs with a pattern of teeth and grooves. The water phase and bitumen enter the mill house through the inlet manifold, in the centre of the mill house. The milling takes place as the streams are pushed radially out between the rotor and the stator. The colloid mill has all wetted parts in **AISI316, stainless steel**. The rotor and stator are made from **DUPLEX stainless steel**, for corrosion resistance against low pH emulsions and thereby increase the lifetime.



The frequency controlled (optional equipment) motor allows **adjustable speed to optimize the particle distribution** and thereby achieve the desired emulsion characteristics and suit local requirements.

The rotor and stator are designed to create the adequate turbulent forces with a minimum of energy input. The gap between the rotor and stator can be adjusted by replacing the supplied spacers. Standard the gap between the rotor and stator are set to 3 mm. The rotor and stator gap can be adjusted from 2 mm to 4 mm. **There is no maintenance of the teeth.**

The colloid mills are delivered as complete units including electrical motor and a special manifold. The mill consists of a mill head with a rotor and stator system and a bearing housing fitted with high-speed bearings and a flange mount that bolts directly on to the electrical motor.



TECHNICAL DATA

Technical Data for mills with fixed speed

(With standard AC motor)

Parameter	Unit	Plant Size	
Type	DT-106	DT-202	DT-403
Capacity 74-40 % residue	6 – 12 t/h	10 – 20 t/h	20 – 40 t/h
Rotor/stator gap, adjustable	2.0–4.0mm		
Noise level	<80 dB (A)		
Design pressure	10 bar		
Design Temperature	160°C		
Length without manifold	860 mm	960 mm	980 mm
Length with manifold	1060 mm	1250 mm	1350 mm
Pipe connections Water phase / bitumen	DN25 / DN50	DN40 / DN80	DN50 / DN100
Pipe connections Emulsion outlet	DN50	DN80	DN100
Width	350 mm	400 mm	450 mm
Height	450 mm	475 mm	500 mm
Weight	200 kg	275 kg	300 kg
Electrical Data			
Voltage	3 x 400V ~ 3 x 480V +PE		
Power consumption	18,5 kW	30 kW	37 kW
Frequency range	50/60Hz		
Amperage	34,5A	55A	68A
Revolutions per minute (RPM)	3000/3600		

Technical Data for mills with adjustable speed

(With larger motor, prepared for frequency converter)

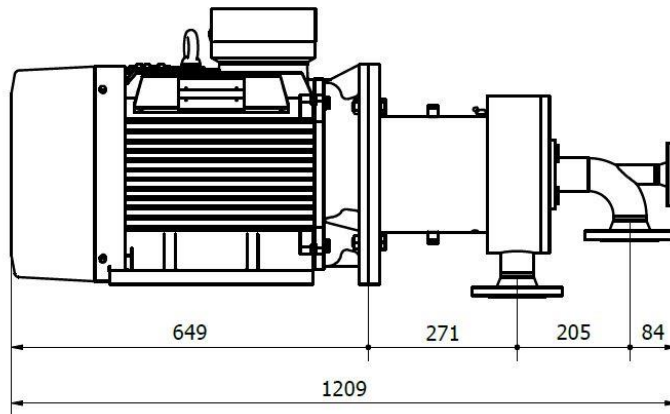
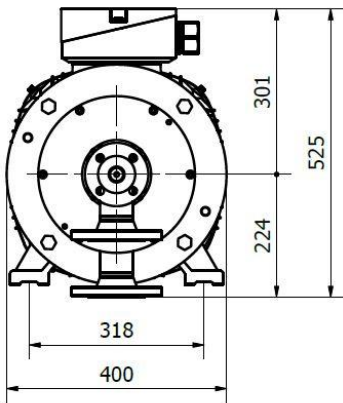
Parameter	Unit	Plant Size		
Type	DT-106	DT-202	DT-403	
Capacity 74-40 % residue	6 – 12 t/h	10 – 20 t/h	20 – 40 t/h	
Rotor/stator gap, adjustable*	2.0–4.0mm			
Noise level**	79 / 88 dB (A)			
Design pressure	10 bar			
Design Temperature	160°C			
Length without manifold	1095 mm	1095 mm	1125 mm	
Length with manifold	1315 mm	1365 mm	1415 mm	
Pipe connections Water phase / bitumen	DN25 / DN50	DN40 / DN80	DN50 / DN100	
Pipe connections Emulsion outlet	DN50	DN80	DN100	
Width	400 mm	400 mm	450 mm	
Height	525 mm	563 mm	670 mm	
Weight	240 kg	300 kg	330 kg	
Electrical Data				
Voltage	3 x 400V ~ 3 x 480V +PE			
Power consumption	30 kW	37 kW	45 kW	
Frequency range	40-70 Hz	40-70 Hz	40-60 Hz***	
Amperage	55A	68A	98A	
Revolutions per minute (RPM)	2400-4200			

*) Bushings for diverging gaps are available

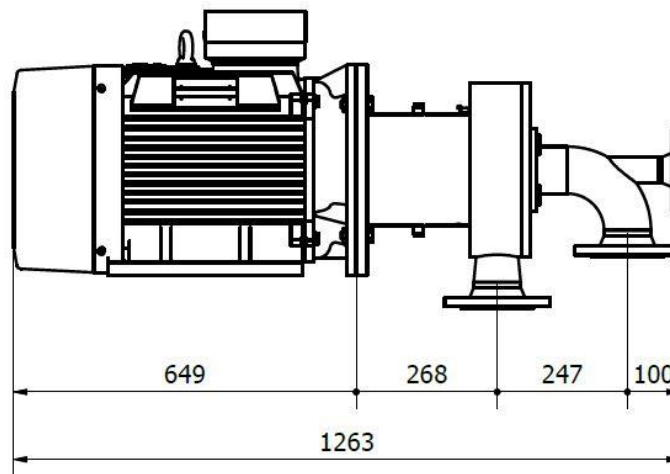
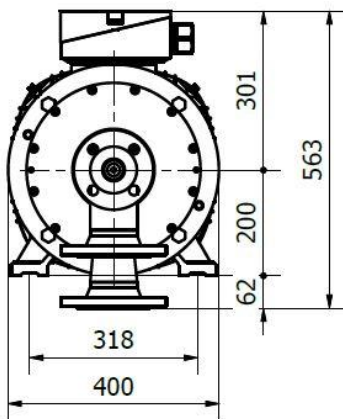
**) Noise shield for damping to level 70 / 74dB(A) at 50 / 70 Hz is available on request.

***) 40 TPH mill is only available with max. 60 Hz, due to the peripheral speed it is more than sufficient with 60 Hz.

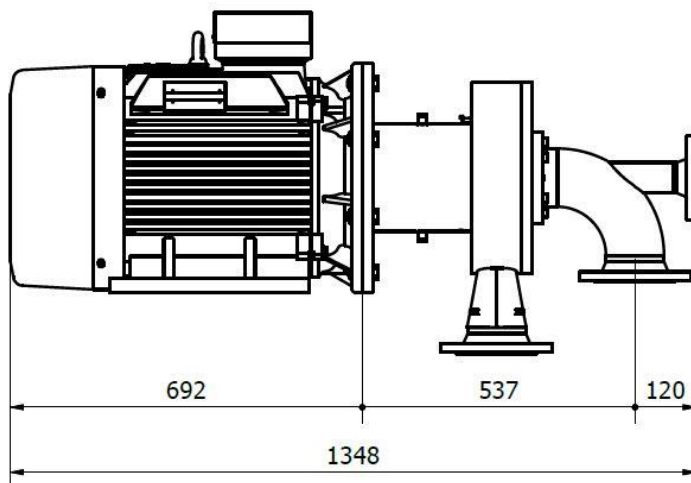
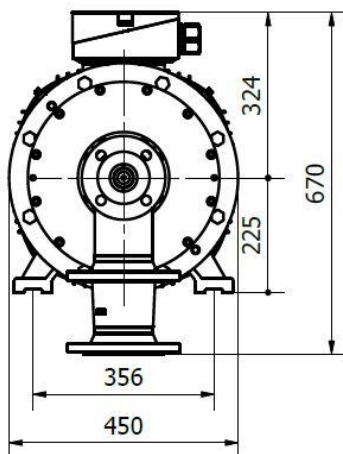
DT-106 (Adjustable speed)



DT-202 (Adjustable speed)



DT-403 (Adjustable speed)



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