

# Technical Specification DecaPress® DP45-422 with Backdrive

## ■ Description

The Decanting centrifuge with scroll comprises of the rotating bowl, consisting of a feed pipe, a cylindrical section where the separation of the suspension takes place and a conical section where the scroll removes the dewatered sludge, the housing enclosing the rotor, the base frame bearing rotor and housing, and the bowl and scroll drive systems.

## ■ Application

High dewatering of sludge. The continuous separation of a solid-liquid suspension in which the specific gravity of the liquid is less than the specific gravity of the solid is accomplished using high bowl speeds and low scroll differential speeds at high scroll torques.

## ■ Operating principle

The feed suspension enters the rotating feed compartment through the feed pipe. There it is accelerated in the direction of rotation and enters the rotating bowl via the feed ports in the scroll hub. The solid particles move towards the bowl wall of the cylindrical section under the effect of the centrifugal forces.

The settled solids are moved by the scroll to and through the conical section, at the end of which they are discharged through the discharge ports of the bowl as dewatered solids („cake“). The liquid effluent is discharged from the bowl over adjustable weir plates at the feed end.

The difference between bowl speed and scroll speed is defined as differential speed.

## ■ Bearing

The rotating bowl is supported by the main bearings, mounted in pillow blocks. Both pillow blocks are bolted and pinned to the base frame. The base frame is flexibly mounted on hollow rubber buffers.

## ■ Lubrication

Lubrication of the main bearings and the scroll bearing is by grease lubrication.

**Subject to technical modifications without prior notice!**


**Technical Specification DP45-422 with Backdrive**
**Machine data**

Inside bowl diameter	450 mm	Length	3541 mm
Bowl length	1964 mm	Width	1470 mm
Max. bowl speed	3800 rpm	Height	1133 mm
Acceleration	3610 x g	Weight of the machine	38.0 kN
Ratio of bowl length and diameter	4.3	Weight of the machine without quartz sand fill	33.5 kN

**Material**

Parts in contact with process-product	Stainless steel version	Carbon steel version
Bowl material	1.44621.4571	St52.0 / 1.0425
Scroll material	1.4408 / 1.4301	St52 / St37
Housing material	1.4301	St37
Parts not in contact with process-product	carbon steel, cast steel	
Bolts in contact with process-product (if mechanically possible from the static) are in stainless steel (A4-80).		

**Wear protection**

Part		Standard	Special (examples only)
Scroll	Feed chamber	Hardsurfing with flame sprayed tungsten carbide powder	–
	Flight face		Replaceable tiles with sintered tungsten carbide, ceramic or silicon carbide
	Feed ports	Replaceable sintered tungsten carbide bushings.	Replaceable ceramic or silicon carbide bushings.
Bowl	Solids discharge ports		

**Seals**

Scroll bearing	Radial shaft seal
Main bearing	Labyrinth seal
Housing	Labyrinth seal

**Paint finish**

Application	Type	Tint	Min.dry-coat thickness
Priming	Two-component metal-prime on the basis of epoxy resin with active protection against corrosion	dull grey	40 µm
Top coat	Two-component polyurethan-structure varnish half-shiny, structure medium	RAL 5002 ultramarine-blue	60-80 µm
Bowl/Scroll (Carbon steel version only)	Coating with Inertol Poxitar SW	black	50 µm


**Technical Specification DP45-422 with Backdrive**
**■ Bowl drive**

The centrifuge is driven with V-belts by means of an electric motor, in combination with a frequency converter for start-up and bowl speed adjustment (absolute necessary for this backdrive system).

<b>Bowl drive motor</b>	
Output	37 kW
Rotation speed	3000 rpm
Voltage	400/690 V (50 Hz)
Type	200L
Design	B3
Type of protection	IP55

**■ Scroll drive**

The mechanical backdrive creates a differential speed between the bowl and the scroll. The planetary gear is mounted inside the bowl (only up to 540 mm DIA.) and the drive shaft of the gear is connected to the screw conveyor. The gear pinion is connected to a variable speed motor (VFD controlled), controlling the scroll differential.

The sedimentation of solids in front of the flights of the scroll causes changes in torque of the scroll. Varying the frequency (of the backdrive) enables smooth adjustment to maintain the differential speed, independent of the bowl speed, to adjust for the torque demands on the scroll..

<b>Planetary gear</b>	
Type	VB 050
Transmission ratio	202
Differential speed	1-12 rpm

<b>Scroll drive motor</b>	
Output	11 kW
Rotation speed	3000 rpm
Voltage	400/690 V (50 Hz)
Type	160M
Design	B5
Type of protection	IP55

**■ Control system EMR 5000**

- Flexible control system for the control of 12 different frequency inverter types.
- Permanent input of all drive parameters.
- Individually programmable torque-dependent control characteristic in four parameter sets.
- Permanent display in a graphics-touch panel of all important process values such as bowl speed, differential speed and scroll load.
- 2 programmable limit values for scroll load.
- Trend analyses over differential speed and scroll load are retrievable.