

# Technical specification DECAPRESS DP764/51212/FD with FSG-Drive

## ■ Description

The decanter centrifuge for separation consists of the rotor, the housing, the base frame that supports the rotor and the bowl and scroll drive system. The rotor is composed of the feed pipe, the scroll, an adjustable unit for 3-phase separation, the cylindrical bowl in which separation takes place and the conical bowl in which the scroll presses and then discharges the solids.

## ■ Application

For the highly efficient separation of solids with simultaneous separation of two liquid phases, the HILLER decanter was developed in 3-phase technology. The specific density of the solid is higher than that of the two liquid phases. The liquid phases also differ in density. (Example: water/oil or oil/glycerine). This decanter design can be converted to 2-phase operation at any time by simple measures.

## ■ 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

The main bearings and the scroll bearings are lubricated with grease.

## ■ Operating principle 3-phase separation

The feed suspension enters the rotating bowl through a stationary feed pipe and is centrifuged radially against the bowl wall. Due to the centrifugal force, the solid particles are deposited on the bowl wall and are conveyed via the scroll conveyor to the solids discharge openings. While the liquid mixture is moved along the liquid discharge zone, the centrifugal force causes the separation of the immiscible light and heavy phases. The light phase is concentrated inwards towards the axis of rotation, whereas the heavy phase moves towards the bowl wall. The light phase is concentrated via a retaining disk and discharged via an adjustable unit. Discharge takes place via a separate discharge chute or via the double-walled feed pipe. The heavy phase is discharged from the decanter via an overflow weir and a separate discharge chute.

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

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**Machine data**

Inside bowl diameter [mm]	760
Bowl length [mm]	3200
Max. operating speed [ $\text{min}^{-1}$ ]	2700
Acceleration [x g]	3078
Ratio of bowl length to diameter	4.2

Length [mm]	5450
Width [mm]	1900
Height [mm]	1550
Weight of the machine (w/o filling) [kN]	106,0

**Standard Materials**

Parts in contact with process-product	Stainless steel version
Bowl material	1.4470
Scroll material	1.4404 / 1.4408
Housing material	1.4301
Parts not in contact with process-product	carbon steel, cast steel
Bolts in contact with process-product and if statically possible: stainless steel (A4)	

**Wear protection**

Part		Standard
Scroll	Feed chamber	Hardened acceleration plate
	Flight face	*TC flame-sprayed
	Feed ports	Replaceable Tungsten carbide bushings
Bowl	Solids discharge ports	Replaceable Tungsten carbide bushings
Housing	Solids discharge side	stainless steel liner

\*TC= tungsten carbide

**Seals**

Scroll bearing	Slide ring seal
Main bearings	Labyrinth seal
Housing	Vapour-proof

**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 $\mu\text{m}$
Top coat	Two-component polyurethane-structure varnish half-shiny, structure medium	RAL 7015	60-80 $\mu\text{m}$

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### ■ Bowl drive

The bowl of the centrifuge is driven by an electric motor, which runs by frequency converter installed at the plant side to generate a variable bowl speed.

Electric motor data	
Output [kW]	90
Rotation speed [ $\text{min}^{-1}$ ]	1500
Voltage [V] (50 Hz)	400/690
Type	280M
Efficiency class	IE4
Design	B3
Type of protection	IP55

### ■ Scroll drive

The FSG-Drive generates a differential speed between the bowl and the scroll. The FSG-Drive consists of an electric motor, which also runs by frequency converter installed at plant side, and a planetary gearbox. The electric motor is connected to the scroll via the shaft of the planetary gearbox.

Gearbox data	
Type	FD330/140
Gear ratio	139,62
Differential speed [ $\text{min}^{-1}$ ]	5-20
Torque * [Nm]	30000

\* The maximum torque depends on the differential speed!

Electric motor data	
Output [kW]	75
Rotation speed [ $\text{min}^{-1}$ ]	1500
Voltage [V] (50 Hz)	400/690
Type	200L
Efficiency class	IE4
Design	B3
Type of protection	IP55

**Technical specification DP764/51212/FD with FSG-Drive****■ Device for machine safety**

- Vibration switch mounted on the base frame for monitoring vibrations according to DIN EN ISO 13849-1
- Speed sensors and frequency measuring converter (installation in the switch cabinet) for safe limitation of bowl speed according to DIN EN ISO 13849-1
- Resistance thermometer mounted on the main bearing pillow blocks for temperature monitoring

**■ Control system HILLER SEE-Control pro**

- Display 10“ ProCap Touch with high performance
- Switchable local operating mode for operating on the device and remote operation mode for operating via master PLC or via the terminal strip.
- Simple and intuitive operation with plain text display: multiple languages selectable
- Complete process visualization of the centrifuge (bowl speed, drive load, differential speed)
- New design with dark-light-mode for best operation
- Ability to enter the bowl speed, differential speed, control parameters, etc.
- Torque dependent regulation of the differential speed
- Generation of a clearing speed below a preselect able bowl speed
- Manual operation mode with manually preselect able differential speed
- Generation of 4 parameter sets for different products
- Trend analysis of the bowl speed, differential speed, bearing temperature, vibration, drive torque
- Save trend data one year
- Online fault diagnosis with plain-text error log
- Password protection of the operating data
- Profinet or digital and analog in- and outputs for the comprehensive operation of the device by a master PLC or via the terminal strip
- Painted circuit boards for best protection against corrosion
- Control of slide gate possible

## ■ Frequency inverter

- TOSHIBA VF-AS3 for bowl and scroll drive
- STO
- **SLS, SMS or limiting maximum frequency**
- Contains the line filter according to category C2/C3 IEC 61800-3
- Contains dual-DC choke to comply with harmonic currents standard IEC 61000-3-12 (THD <48%)
- Painted boards
- Ambient temperature -10 ° C to + 60 ° C
- Protection class IP20
- Voltage and frequency range 380-480 V (+10% ... -15%) - 50/60 Hz ( $\pm 5\%$ )
- Flying restart
- Analog output for torque
- Overload capacity  
120% for 60 and 135% for 2s
- External auxiliary voltage
- Operation module
- Power saving mode
- Digital Input for release
- PTC input
- Web server
- Vector control
- Special speed/torque control in the lower frequency range
- Frequency set value accuracy  $\pm 0,2\%$
- Torque calculation accuracy  $\pm 1\%$