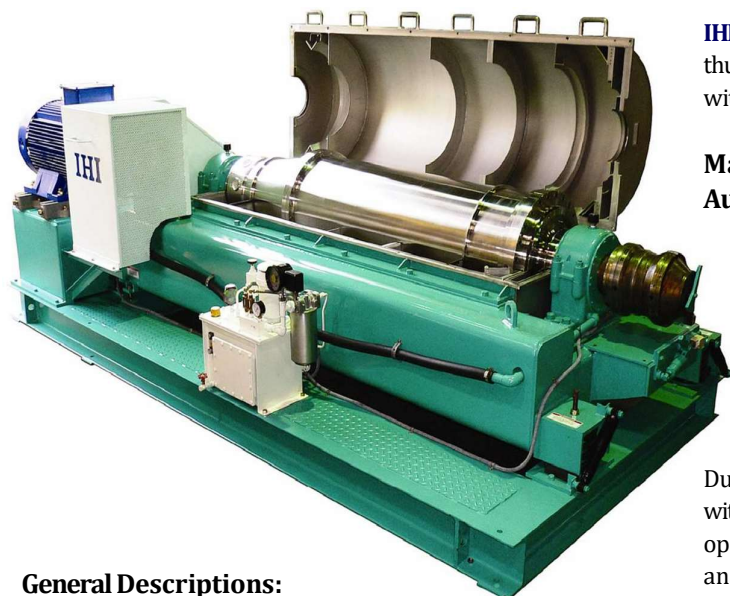


IHI Corporation, Japan

Equipment Data Sheet

The New Generation High Performance 3-Phase Palm Oil Decanter System IHI Type TPZ Series Model HS-55TPZ / HS-56TPZ



General Descriptions:

The New Generation High Performance 3-Phase Palm Oil Decanter type TPZ Series from **IHI**, Japan is a horizontal operating continuous screw centrifuge equipped with solid wall bowl and screw conveyor rotating assembly.

The TPZ Series decanter is developed with **IHI** advanced rotation technology, purpose built to deliver high centrifugal effects (g-force) and continuous processing duty in the palm oil milling industry for palm oil recovery applications. The TPZ Series decanters are available in 2 models.

Process Application:

The decanter is utilised for continuous recovery of palm oil from de-sanded sludge oil delivered ex-vertical clarifier tank in a palm oil mill. The palm oil recovery process is accomplished efficiently without the conventional nozzle sludge separators or oil purifiers.

Oil recovery by the TPZ Series decanter is effected by way of continuous separation of the sludge oil into three (3) phases e.g. light phase (recovered oil), heavy phase (sludge wastewater) and solid phase (decanter cake).

The TPZ Series decanter is a robust heavy duty continuous processing centrifuge with high performance capability and treatment capacity.

IHI has incorporated various features into the TPZ Series decanter thus resulting in out-standing durability, user-friendly operation with minimum requirement for service and maintenance.

Main Bearings and Automatic Oil Lubrication System:

The TPZ Series decanter is fitted with heavy duty high speed main bearings that are continuously oil lubricated and cooled by an **IHI** automatic oil lubrication system. The lubricating oil is continuously re-circulated, filtered and cooled by a 10 μ filter and heat exchanger inbuilt within the automatic oil lubrication system.

Due to the continuous cooled oil lubrication, temperature rise within the bearings are significantly minimised during continuous operation resulting in extended service life, lower maintenance and operating costs.

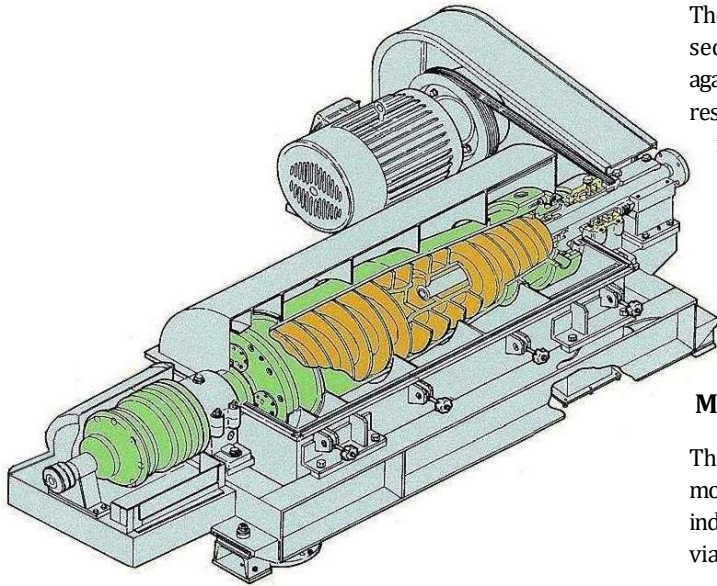
The **IHI** automatic oil lubrication system is enabled for automatic pre-lubrication and post-lubrication to the main bearings, this further contributes to extend service life span of the bearing components.

- **Pre-lubrication:** Lubricating oil is forced fed by the inbuilt oil pump to the main bearings for a set period of time prior to the decanter bowl rotating during starting-up of the decanter.
- **Post-lubrication:** Lubricating oil is continuously cooled and forced fed by the inbuilt oil pump to the main bearings for a set period of time after zero bowl speed is attained during shutting-down of the decanter.

The **IHI** automatic oil lubrication system is equipped with oil pressure regulating mechanism and safety alarm tripping control system for oil pressures and oil temperatures. The tripping limits are adjustable and the control instrument or devices are connected to the decanter local control panel by control cables.



Oil Recovery
simplifying



Main Frame and Casing:

The TPZ Series decanter is equipped with a heavy duty main frame and an independent lower base frame made of welded steel. High efficiency vibration isolations incorporating maintenance-free coil springs and hydraulic dampers are fitted between both frames.

The special vibration isolation system is an innovative feature found in all **IHI** continuous screw type palm oil decanter centrifuges.

The main casing assembly for the rotating bowl consists of an upper cover and a lower shell. The cover in one-piece construction with double hinges enables for easy opening and inspection. Both cover and shell with integrated compartments for the clarified liquids and solids discharges are constructed in Cr-Ni-Mo stainless steel materials for durability.

Bowl and Screw Conveyor:

The solid wall bowl and screw conveyor of the TPZ Series decanter are of heavy duty wear resistant design and constructed in high grade Cr-Ni-Mo stainless steel materials. Optimized configuration of the cylindrical and conical sections of the bowl and screw conveyor enabled the decanter for high centrifugal effects (g-force) and high performance capability.

The inlet feed distributor ports of the screw conveyor are wear protected against the abrasive feed conditions with bolted-on type quick ex-changeable high abrasion wear resistant bushings, thus eliminating requirements of welding for wear protections during servicing at remote installation sites.

The screw conveyor is equipped with heavy duty duplex bearings at both ends providing excellent rotational supports at high centrifugal effects (g-force) and resulting in stable operation. Both the screw conveyor bearings can be easily re-grease from external without need for disassembling and resulting in user-friendly operation, maintenance and extended bearing service life.

The screw conveyor flights and tips in constant contact with the sediment solids inside the rotating bowl are wear protected against the abrasive feed conditions with **IHI** patented super wear resistant tungsten carbide for extended service life, minimum maintenance and downtime.

The solid discharge ports of the bowl are protected against abrasive feed conditions with high abrasion wear resistant exchangeable bushings. These bushings can easily be rotated to various positions during servicing resulting in extended service life and lower maintenance costs.

Main Drive System:

The TPZ Series decanter is driven by a heavy duty 3-phase AC motor with foot mounted. The main drive motor is mounted on an independent lower base frame and power transmission is effected via pulleys and series of v-belts.

The special motor mounting configuration prevent transfers of high frequency vibrations (resonance) between the main frame, rotating bowl assembly and motor components during operation resulting in smoother running and extended service life to the rotating components. The special mounting configuration is a standard feature found in all **IHI** continuous screw type palm oil decanter centrifuges.

Screw Conveyor Back Drive System:

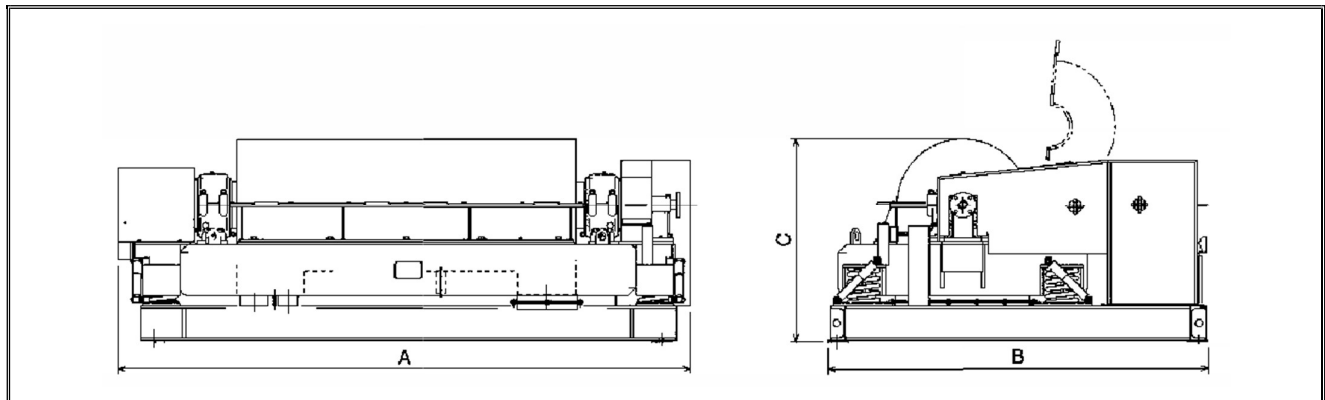
The TPZ Series decanter is fitted with a screw conveyor back drive system incorporating a dynamically balanced heavy duty high torque gearbox to produce the screw conveyor differential speed. The screw conveyor back drive system also incorporates an overload safety torque tripping device for protection.

The rotating gearbox is oil lubricated and mounted outside the main casing assembly for easy access and operation under cooler ambient conditions. The mounting configuration eliminate any direct contacts between the gearbox and clarified discharges from the rotating bowl assembly and likewise effectively eliminated any possible wear and tears to the gearbox external components.

Materials of Construction:

All the wetted component parts of the **IHI** TPZ Series decanter that comes into contact with the feed products are made of Cr-Ni-Mo stainless steel. Gaskets and sealing components for the decanter are made of NBR or similar materials which are suitable for high temperature applications.

The decanter is painted in accordance with JIS (Munsell System), consisting two coats of rust-proof paint and two coats of synthetic paint of **IHI** standard colour. The machine is designed, manufactured and tested in accordance with JIS standards at **IHI** manufacturing facilities in JAPAN.



Technical Specifications		HS-55TPZ	HS-56TPZ
Overall dimensions:	A	4 100 mm	4 700 mm
	B	2 000 mm	2 000 mm
	C	1 150 mm	1 150 mm
Bowl diameter		500 mm Ø	
Maximum centrifugal effects (g-force) ⁽¹⁾		4 150 g*	
Main drive motor		45 kW	55 kW
Motor starting		Auto clutch system / frequency inverter soft-start system	
Bowl and screw conveyor constructions		High grade Cr-Ni-Mo stainless steel	
Bowl solid discharge ports		Quick exchangeable high abrasion wear resistance bushings	
Screw conveyor feed distributor ports		Quick exchangeable high abrasion wear resistance bushings	
Screw flight wear protections		IHI patented super wear resistance tungsten carbide	
Lubrication system:	decanter main bearings screw conveyor bearings backdrive gearbox	Water cooled filtered automatic re-circulating oil lubrication Grease lubrication, re-grease-able from external Oil lubrication	
CIP function during shutting-down		Automatic	
Total weight ⁽²⁾		4 500 kg	5 800 kg
Rated operating capacity for sludge oil ⁽¹⁾		Up to 24 m3 per hour	Up to 30 m3 per hour

Note: ⁽¹⁾ Actual capacity depends on feed, process and operating conditions.

⁽²⁾ Include decanter centrifuge, lower base frame and motor and auxiliary equipment.

⁽³⁾ Actual capacity depends on feed, process and operating conditions

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