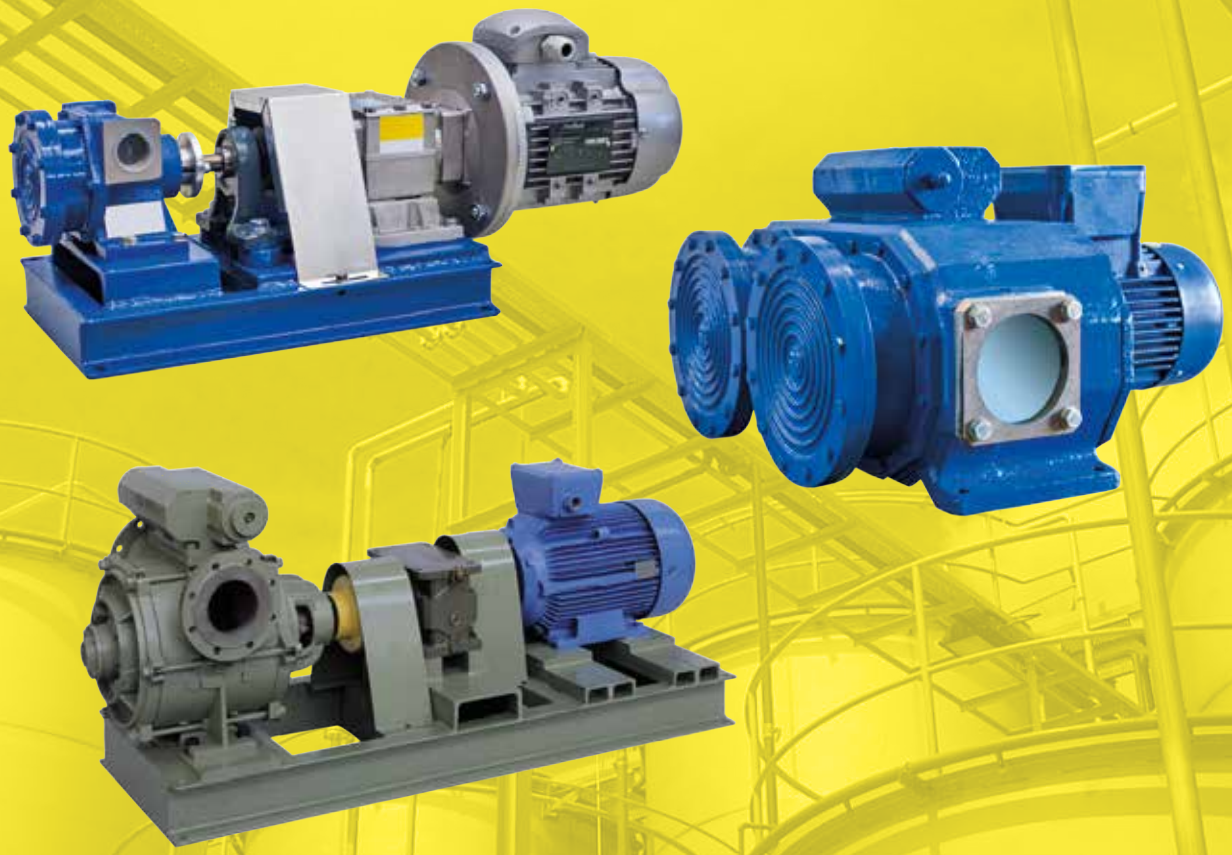
tapflo®

HOLLOW ROTARY DISK PUMPS

2020 | 1



All about your flow™

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All about your flow™

We began our journey 40 years ago in Kungälv, a small town on the Swedish west coast, as a family company with an ambition to one day become a global player on the pump market.

Since 1980, we have taken pride in delivering a wealth of knowledge and passion for pumps to the industry, whilst supplying a wide range of premium products for various industrial applications.

Over the years, the company has developed into a global Tapflo Group with branches and distributors present in nearly every region of the world.

One thing did not change - we are still a family company.

Our solutions are designed and manufactured in Europe and distributed globally to offer the best service and flow solutions to our customers for a variety of applications.

Our values, Commitment, Quality and Simplicity are reflected both in our product and business approach.

For fast and flexible service and high-quality products readily available worldwide, choose Tapflo.

Quality commitment

At Tapflo we are simply committed to quality. As a result, our production standards, as well as products quality, comply with various globally recognised certification and quality control standards. The Tapflo manufacturing process is certified according to ISO 9001:2015, confirming that our processes are appropriate, effective, customer-focused and continuously improved.

CE ATEX ISO 9001:2015 FDA CERTIFIED EHEDG TYPE EL CLASS I EAC REACH Compliant ROHS Compliant

Tapflo values

Our culture is concluded in Our values

Commitment

We are different from our competitors because of our willingness to exceed the customers' expectations, move fast and be flexible. Our culture is based on the spirit of togetherness, enthusiasm and integrity. We come from all over the world but we share the same values and we respect each other. We are committed.

Quality

We understand that the quality in our work is never better than the weakest link, that's why we focus on every small detail. We share a common passion for continuously finding more efficient and effective ways to provide value to our customers. As a manufacturer we have control of the complete process both in terms of our products and the way we operate internally. That is why we manufacture the highest quality pumps in our segment.

Simplicity

We have a saying, "Simple is art" which means we try to find smooth and uncomplicated solutions in everything. By keeping it simple we can focus on the essential, like designing uncomplicated pumps with few components. For us it is a key to success; strive to simplify what is complex.

Hollow Rotary Disk Pumps

Positive Displacement Pumps

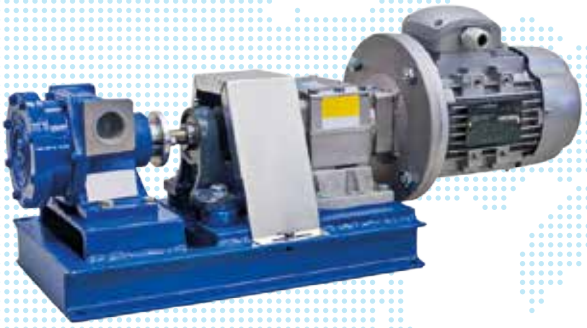
The Hollow rotary disk pumps are rotating positive displacement pumps.

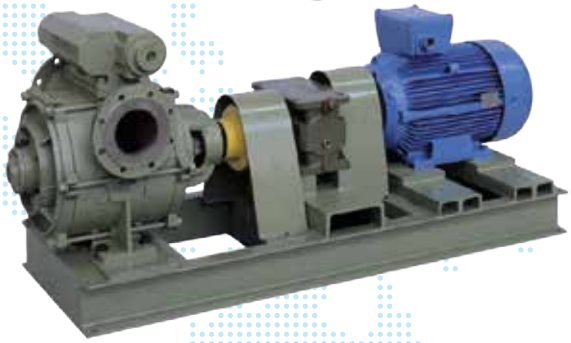
Their trim consists mainly of one hollow rotating disk that oscillates inside the pump casing, pumping the fluid from the inlet to the outlet port.

The hollow rotary disk pumps are self-priming, reversible, capable of handling solid particles, highly reliable and long-lasting thanks to their low rotating speed.

These pumps can be supplied with one or two hollow rotary disks properly phased together.

A wide range of executions, customizations and accessories are available.





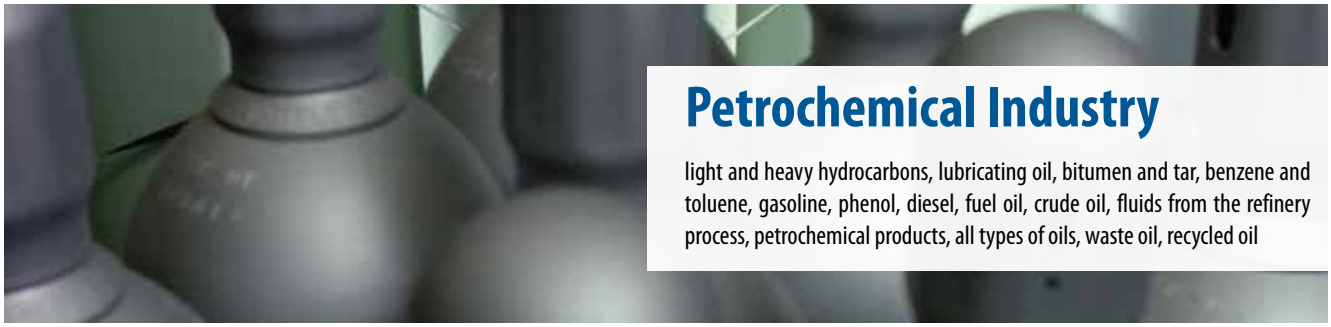
Fast facts

Flow Rate:	**up to 250 m^3/h**
Pressure:	**up to 12 bar**
Suction Lift:	**about 7–8 meters**
Temperature:	**up to 280 °C**

Features & Benefits

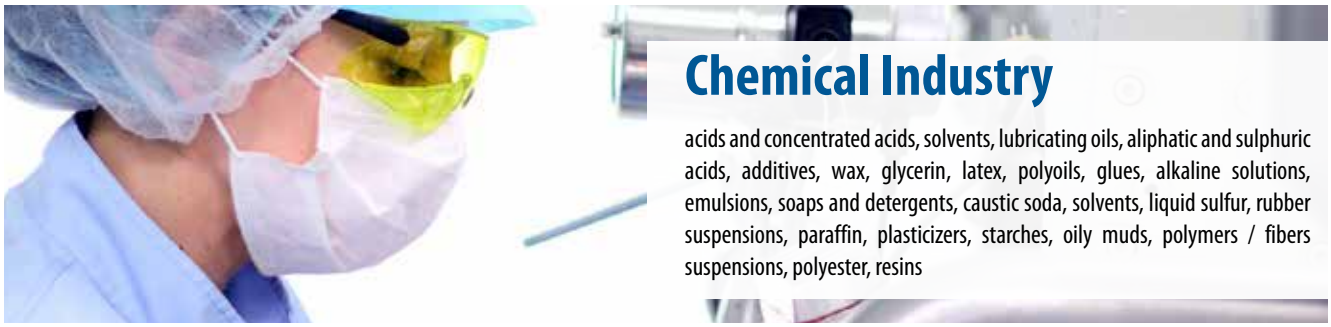
- **Self-priming without any auxiliary devices**
- **Low operating speed**
- **Reverse flow**
- **Elasticity of the disk**
  With self-recover of the worn out parts and of the thermal expansions, allowing the passage of solid particles in the fluid.
- **Low noise level and low vibrations**
- **High efficiency**
- **Average flow rate is constant regardless of changes in viscosity**
- **One pump can fit many fluids**
- **Simplicity of the mechanism:**
- **Compact design and dimensions, easy access for maintenance;**
- **Entrapped air or gas in the liquid are tolerated in small percentages**
- **Capability of dry running**
- **Good dosing capability**

Wide range of applications



Petrochemical Industry

light and heavy hydrocarbons, lubricating oil, bitumen and tar, benzene and toluene, gasoline, phenol, diesel, fuel oil, crude oil, fluids from the refinery process, petrochemical products, all types of oils, waste oil, recycled oil



Chemical Industry

acids and concentrated acids, solvents, lubricating oils, aliphatic and sulphuric acids, additives, wax, glycerin, latex, polyoils, glues, alkaline solutions, emulsions, soaps and detergents, caustic soda, solvents, liquid sulfur, rubber suspensions, paraffin, plasticizers, starches, oily muds, polymers / fibers suspensions, polyester, resins

Pulp & Paper, Inks

acid water, iso-cyanate, caustic soda, mud, several process fluids, starch, cellulose / fibers suspensions, glues, fuel oils, general industry, thickenersk, additives, industrial water, lye, sewage, enamels and paints, emulsions, lime

Marine & Shipbuilding

transfer of tanker fluids, diesel, bilge water, sludge, ooze, seawater, sewage cargo load and offload, service fluids and water, residues

Food & Beverage, Pharmaceutical

vegetable and animal oils, fruit juices, pastes, jam, syrups and molasses animal fats, lecithin, cream, alcohol & liquors, chocolate, caramel and fudge, sauces and dough, dairy products, wines

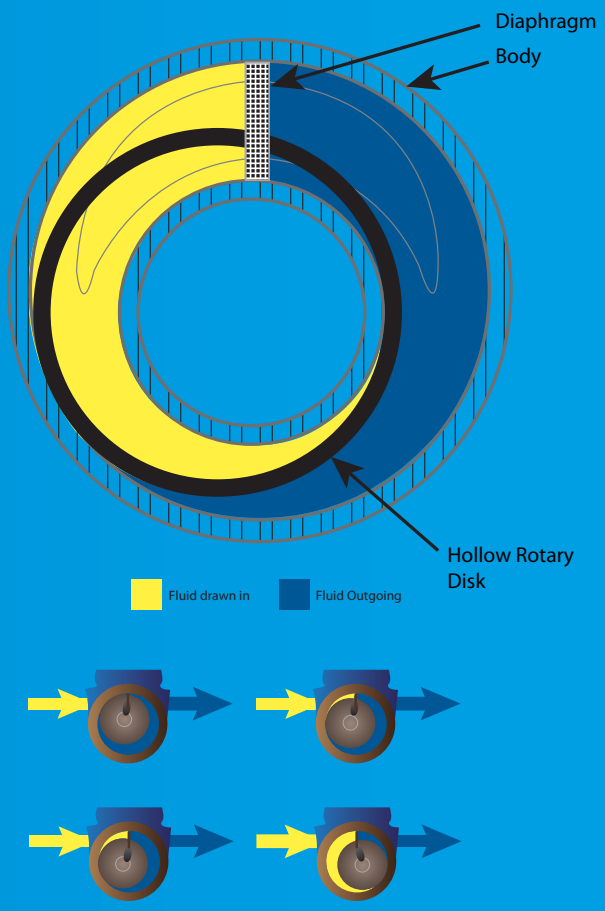
Working principle

The Hollow Rotary Disk, during its oscillating movement, adheres with the internal and circumferential surface of the pump casing, creating a depression in the suction line that causes the fluid to flow into the cavity and that pumps the fluid from the cavity into the supply line.

Looking more in details the Pump components and principle of operation, we can see that the disk is mounted eccentrically to the pump shaft and is guided by the diaphragm: the axis rotation will cause the disk to oscillate and to adhere either with the internal circumferential area of the pump casing either with the eccentric end of the shaft and the diaphragm, thus creating two separate leak-tight chambers.

The volume of the chamber in contact with the inlet line increases constantly, creating the vacuum that allows to suction the fluid into the pump; on the other chamber, the volume is decreasing constantly, causing the fluid to be pumped out to the supply line.

A complete revolution of the shaft equals to the hollow disk pump cavity volume to displaced and the equivalent amount of fluid is pumped out (just minor leaks through the disk contact points, but this loss is stable if viscosity does not change).



Components and details

POSITION-DESCRIPTION

1	Cover
2	Casing
3	Base
4	Hollow Disk (Impeller)
5	Diaphragm
6	Impeller Bushing
7	Shaft Bushing
8	Cap Spring
9	Spring
10	Shaft
11	Mechanical Seal
12	Bypass with Relief Valve

Construction

The Pompe 3P® Hollow Disk Rotary Pumps have been designed using a Modular Construction Concept. This solution allows to change eventual spare parts with simple maintenance operations, without the need of disassembling the pump from the piping.

The pump parts subject to higher wear-out can be changed by simply disassembly the cover from the body (generally connected with bolts), and then disassembling each internal part without the need of any particular tool. The maintenance on this pump is economical and takes short intervention times; the 3P Prinz Genuine Spare Parts are immediately available, allowing the Pump to become as good as new within a very short time and with reduced costs.

In addition, most of the Wear-out components of the M Series (with One Disk) and D Series (with Two Disks) are in common, so they can be interchangeable.

High reliability in severe conditions and low speed

The Pompe 3P® Hollow Rotary Disk Pumps operate at a Low Angular Speed and have very little moving parts. This is a guarantee that they are Long-Lasting and Highly Reliable, allowing thus an higher plant reliability too. In addition, their construction assembly does not include any valve, piston, diaphragm, moving seals (except mechanical seals), palettes and other weak components.

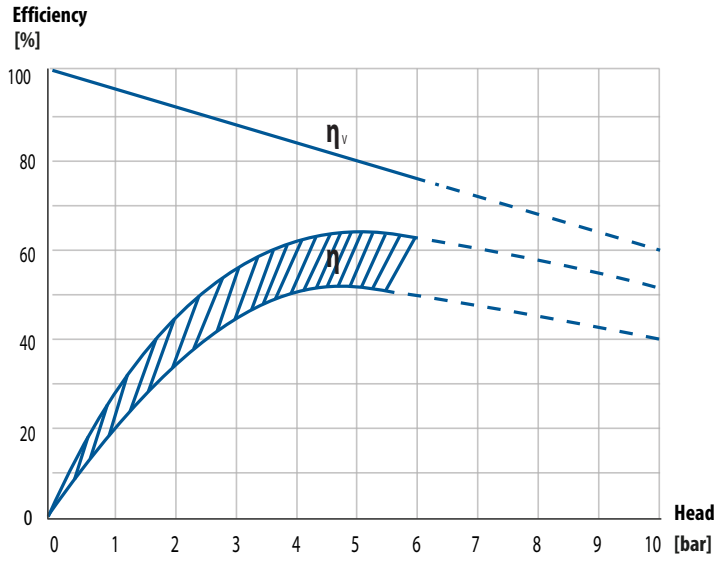
This peculiarity allows the Pompe 3P® Hollow Rotary Disk Pumps to be used in highly severe conditions and with very high viscosity products.

High efficiency

The Pompe 3P® Hollow Rotary Disk Pumps have the highest Efficiency that can be obtained, particularly thanks to their construction simplicity:

- They need only two supports, they operate at low angular speeds, there is only Rolling Friction (no Sliding Frictions), the Pressures are balanced.
- The Volumetric Efficiency ηv is very high (see below figure) and is generally between 75% and 90% along all the complete operational range of Flow Rates, Heads and Viscosities.
- This high efficiency has been achieved thanks to high machining tolerances, long-year experience, proven design and extensively tested assemblies, accurate study of each component and cavities design, oversizing of the parts, accurate sizing of the elastic device.
- The Overall Efficiency η, on a Pump with max 8 bar operating pressure, has its maximum in the pressure range between 4 and 5 bar and can be 60% or higher (depending also on the pump size).

This advantage brings, particularly on the D Series Pumps (with Double Hollow Disk Construction), a better usage of the Installed Power and the Smaller Power Consumption compared to other pump types that have equivalent performances.



Volumetric efficiency

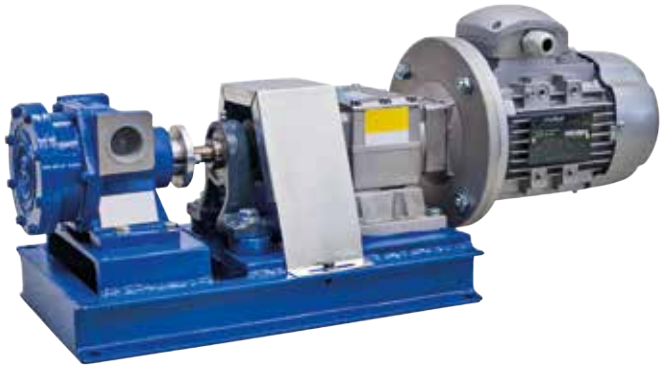
ηv and overall efficiency η on pompe 3P Hollow Rotory Disk pumps

M series

are ideal to transfer liquids with medium, high and very high viscosity containing also small amounts of suspended solids.

The hollow disk M series, during its rotary-oscillating motion, causes a vacuum, sucking the fluid inside the pump; in the meantime, it pushes the fluid already present in the chamber to the downstream pipe.

Because of their particular features, 3P Prinz® hollow disk pumps are recommended for pumping liquids with low, medium, high or very high viscosity even in presence of moderate contents of solid particles in suspension.



Features & Benefits

- **Self Priming without any auxiliary devices**
- **Disk's Elasticity**
- **Low operating speed**
- **Reverse flow by operating in reverse rotation and keep constant capacity**

Technical data

Maximum manometric head:	8 bar [116 PSI] - option 12 bar [174 PSI] or 20 bar [290 PSI]
Flow rates:	from 0,3 to 100 m^3/h [from 1.3 to 440 GPM]
Viscosity of the pumped fluid:	up to 200.000 cSt (from medium to very high)
Viscosity:	up to 1.000.000 cSt
Pipe Nominal Size DN:	from 25 to 150
Rotation speed:	up to 500 rpm
Temperature range:	-20 / +280 °C [-4 / 536 °F]
Handling Solid Particles & Dirty Fluids:	Yes
Handling Aggressive Fluids:	Yes
Pulsations:	Yes
Dosing capability:	Good
Flanged connections:	UNI PN10; ANSI 150; DIN PN 16
Bearing types:	Bearings + Bushings
Seal types available:	Mechanical Seals; DIN 24960 Unified Mechanical Seals; Packing type Seals; Cartridge type Seals; Double Mechanical Seals; Double Viton Radial Seals; Seals flushed to API PLANS; MAG Magnetic Drive; JOHN CRANE Seals on request

D series

are ideal to transfer fluids with medium and high viscosity and are designed to be used with piping, valves, fittings, etc..

These pumps, with two impellers, allow a reduced size of the piping, valves, fittings etc. while keeping a high flow rate: thanks to the phased movement of the two disks, they create a continuous flow in the piping, avoiding vibrations and shaking of the structure.

The electrical motor is generally coupled directly to the pump in which, into its casing, an oil filled reduction gear is assembled.

The hollow disk D series, during its rotary-oscillating motion, causes a vacuum sucking the fluid inside the pump; in the meantime, it pushes the fluid already present in the chamber to the downstream pipe.

Because of their particular features, 3P Prinz® hollow disk pumps are indicated for pumping liquids with low, medium, high or very high viscosity even in presence of moderate contents of solid particles in suspension.

Features & Benefits

- **Self Priming without any auxiliary devices**
- **Disk's Elasticity**
- **Low operating speed**
- **Reverse flow by operating in reverse rotation and keep constant capacity**

Technical data

Maximum manometric head:	8 bar [116 PSI] - option 12 bar [174 PSI] or 20 bar [290 PSI]
Flow rates:	from 20 to 250 m^3/h [from 88 to 1100 GPM]
Viscosity of the pumped fluid:	up to 200.000 cSt (from medium to very high)
Pipe Nominal Size DN:	from 100 to 200
Rotation speed:	up to 500 rpm
Temperature range:	-20 / +280 °C [-4 / 536 °F]
Handling Solid Particles & Dirty Fluids:	Yes
Handling Aggressive Fluids:	Yes
Pulsations:	Very low
Dosing capability:	Good
Flanged connections:	UNI PN10; ANSI 150; DIN PN 16
Bearing types:	Bearings in oil bath
Seal types available:	Mechanical Seals; Double Viton Radial Seals; Other types of Seals are available for the double impeller version on the "DN" Series

DN-CN-MN Series

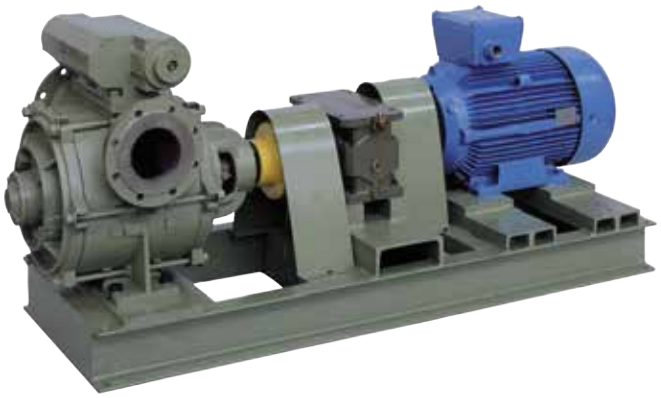
to be widely employed in fields with special plant requirements

These pumps, with single or double impeller are characterized by external bearings and special technical and patented innovations, in order to make them more performing in areas with special installation requirements.

They are suitable for the transfer of fluids even at very high viscosities, containing small amounts of suspended solids. Generally, DN-CN-MN Series Pumps are supplied with motor or variable speed drive and mounted on a suitable skid.

The hollow disk DN-CN-MN series, during its rotary-oscillating motion, causes a vacuum sucking the fluid inside the pump; in the meantime, it pushes the fluid already present in the chamber to the supply pipe.

Because of their particular features, 3P Prinz® hollow disk pumps are recommended for pumping liquids with low, medium, high or very high viscosity even in presence of moderate contents of solid particles in suspension.



Features & Benefits

- **Self Priming without any auxiliary devices**
- **Disk's Elasticity**
- **Low operating speed**
- **Reverse flow by operating in reverse rotation and keep constant capacity**

Technical data

Maximum manometric head:	8 bar [116 PSI] - option 12 bar [174 PSI] or 20 bar [290 PSI]
Flow rates:	from 0 to 90 m^3/h [from 0 to 396 GPM]
Viscosity of the pumped fluid:	up to 200.000 cSt (from medium to very high)
Pipe Nominal Size DN:	from 65 to 125
Rotation speed:	up to 500 rpm
Temperature range:	-20 / +280 °C [-4 / 536 °F]
Handling Solid Particles & Dirty Fluids:	Yes
Handling Aggressive Fluids:	Yes
Pulsations:	Only DN series: very low
Dosing capability:	Good
Flanged connections:	UNI PN10; ANSI 150; DIN PN 16
Bearing types:	Special and patented executions; bearings in oil bath on DN series
Seal types available:	Mechanical Seals; DIN 24960 Unified Mechanical Seals; Packing type Seals; Cartridge type Seals; Double Mechanical Seals; Double Viton Radial Seals; Seals flushed to API PLANS; JOHN CRANE Seals on request; MAG Magnetic Drive; Special Seals Executions

TURBIK Series

are ideal to transfer fluids with medium and high viscosity and are designed to be used with piping, valves, fittings, etc..

The hollow rotary disk Turbik series, during its rotary-oscillating motion, causes a vacuum sucking the fluid inside the pump; in the meantime, it pushes the fluid already present in the chamber to the downstream pipe.

Because of their particular features, 3P Prinz® hollow disk pumps are indicated for pumping liquids with low, medium, high or very high viscosity even in presence of moderate contents of solid particles in suspension.

Features & Benefits

- **Self Priming without any auxiliary devices**
- **Disk's Elasticity**
- **Low operating speed**
- **Reverse flow by operating in reverse rotation and keep constant capacity**

Technical data

Maximum manometric head:	4 bar [58 PSI]
Flow rates:	up to 3 m^3/h [up to 13 GPM]
Viscosity of the pumped fluid:	up to 3.000 cSt (from medium to high)
Pipe Nominal Size DN:	Suction NPS 1½"; Outlet NPS 1"
Rotation speed:	up to 950 rpm
Temperature range:	0 / +100 °C [32 / 212 °F]
Handling Solid Particles & Dirty Fluids:	Yes
Handling Aggressive Fluids:	Yes
Pulsations:	Yes
Dosing capability:	Good
Connections:	Standard: Threaded Connection GAS ; Available NPT-F and BSPP Threaded Connections
Bearing types:	Bearings + Bushings

Product range

Positive Displacement Pumps


Diaphragm pumps


Sinusoidal pumps


Rotary lobe pumps


Gear pumps


Steinle filter press pumps


Eccentric screw pumps


Dosing pumps


Peristaltic pumps


Sanitary screw pumps


Sliding vane pumps

Centrifugal Pumps


CT & CTH centrifugal pumps


CTS self-priming centrifugal pumps


CTV vertical centrifugal pumps


CTP plastic centrifugal pumps


CTM magnetic drive centrifugal pumps


Process centrifugal pumps


Industrial centrifugal pumps


Drum pumps


Vertical pumps


Side chanel pumps

Accessories


Homogenizers

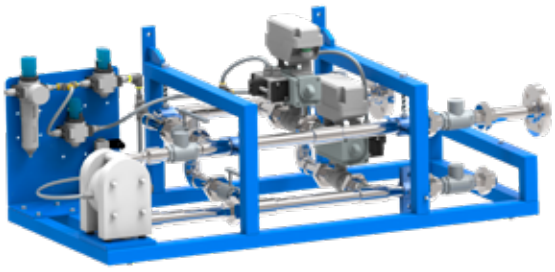

Trolleys


Hygienic valves


FT Filter units


Frequency inverters

Unique constructions at a high level



Custom design aims to adapt standard solutions for non-standard needs in industrial processes. This is often achieved by making small modifications to standard products and thus becoming applicable to specific process requirements.

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Tapflo Serbia is part of the international Swedish Tapflo Group

Tapflo products and services are available in 75 countries on 6 continents.

Tapflo is represented worldwide by own Tapflo Group Companies and carefully selected distributors assuring highest Tapflo service quality for our customers' convenience.

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