

The right speed

Variable speed fluid couplings



Providing trouble-free service for
over 68 years and power transmission
ranging from 100 kW up to 35 000 kW,
Voith variable speed fluid couplings.





Proven and reliable speed control

Controlling drive line speed and ensuring consistency, Voith variable speed couplings are proven in the field and are particularly well suited for pump, fan and compressor applications.

Typical applications

- Power plants
 - Oil and gas industry
 - Chemical industry
 - District heating plants
 - Iron and steel industry
 - Water management
-

Increasing system availability

Increasing system availability in your power plant, refinery, oil platform or other industrial drive line is of paramount importance. Successful operation ensures continuous production, this is what we specialize in.

Increase reliability

Whether it's in the desert, a tropical rainforest, withstanding coastal conditions, or in a potentially explosive environment, Voith variable speed fluid couplings operate with peerless reliability. They are impervious to external influences thanks to their compact and robust design.

Reduce energy consumption

Save energy and reduce operating costs! Drive motor power consumption is lower when compared to a fixed speed unit, with throttle control.

Reduce costs

Wear-free hydrodynamic power transmission keeps maintenance costs low by allowing long intervals between scheduled maintenance. Unlike systems with power electronics, no additional investment is needed.

Extend service life

Load-free motor start-up and smooth acceleration of the driven machine reduces the overall load on the driveline. The hydrodynamic variable speed fluid coupling also dampens torsional vibrations and shocks, protecting the motor and the driven machine. This increases the service life of your entire driveline.

Save space — with an integrated lube oil system

The lube oil system, which is integral to the Voith variable speed coupling, supplies oil to the motor and driven machine, if needed. This saves spaces and money.

Currently in use in more than

15 000

drives around
the world

Service life up to

4x

longer than a variable frequency drive

More than

68
years

of use

Power ratings up to

35 000 kW

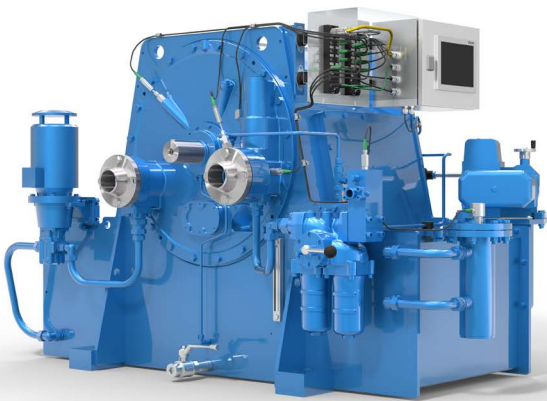
Operating temperatures from

-40 °C to +50 °C

(ambient temperature)

OnCare.Health IOLIS – New digital measurement system for variable speed couplings

OnCare.Health IOLIS for variable speed fluid couplings



Enabling easy monitoring of operating data, OnCare.Health IOLIS, is a compact measurement system for variable speed couplings that transmits process data from the coupling to the control room via bus protocols (ProfiNet, ModBus TCP, and Ethernet IP). Additionally, this system is easily integrated into existing and new couplings.

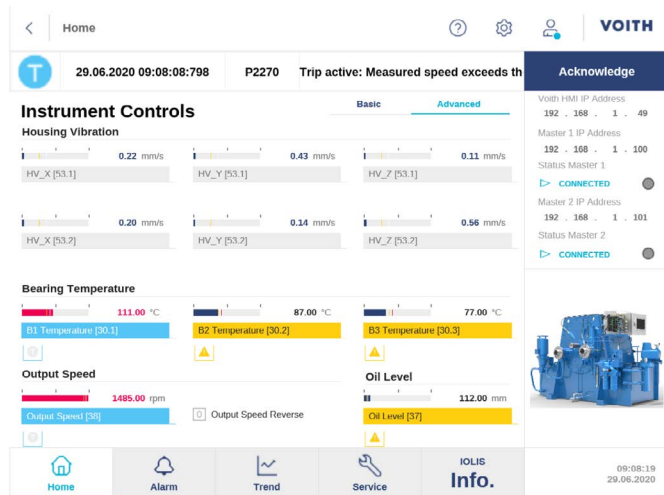
Easy to install and handle, all components and sensors are available worldwide, thanks to the standardized IO-Link sensor system design and consists of IO-Link ready sensors, IO-Link measurement components and a display for visualization of process data.

Benefits

- + Smart and simple sensor system
 - + Minimal wiring
 - + Easy maintenance and handling
 - + Quick and precise data transfer
 - + Fast replacement
-



Real time process data: OnCare.Health IOLIS home screen



Core functions:

- Measured process data overview
- Real time scoop tube position display
- Detection and display of reverse rotation
- Urgent warning/alarm display
- IO-Link master status

Temperature, pressure or scoop tube position, trends and irregularities are all intuitively displayed via the home screen. Anomalies can be identified at an early stage, this facilitates corrective action before the onset of a potential failure.

Platform for IoT

Preparing your operation for the IoT future, OnCare.Health IOLIS, has the potential to be integrated into network systems via an Ethernet connection.

This enables:

- Condition monitoring
- Trend indications
- Secure remote access
- Predictive maintenance
- Remote maintenance





Our range

Working together with you, we establish the best fluid coupling for your drive line.

Type	Features
SVTL	Comprises of a tunnel housing and shafts with anti-friction bearings.
SVNL SVNL G	The SVNL features a housing that is split horizontally. Shafts in the SVNL have anti-friction bearings and the SVNL G is equipped with sleeve bearings.
SVL M	The SVL M features an especially high power density and has a cast iron housing split horizontally. Furthermore, the shafts are equipped with sleeve bearings.

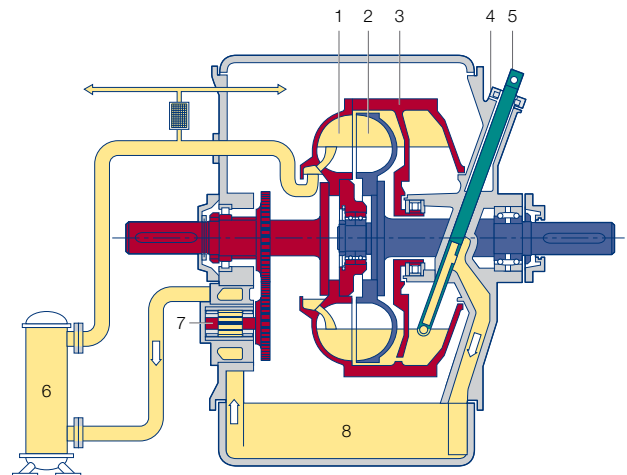
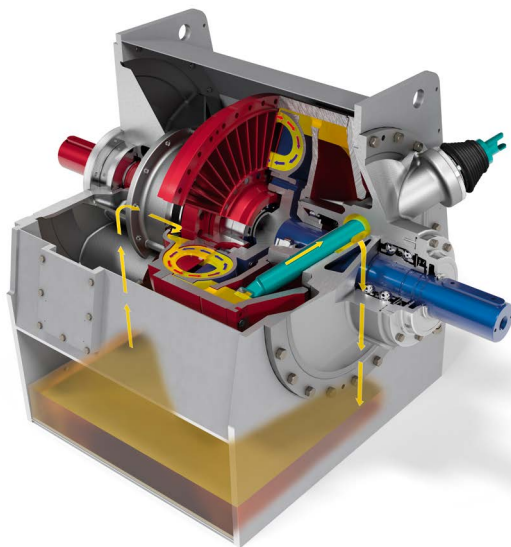
Compact, simple, robust

How it works

Voith variable speed couplings are fluid couplings. They link the drive machine — generally an electric motor — with the corresponding driven machine. The power is transferred through the fluid energy of the working fluid. This fluid flows in an enclosed working chamber between the pump wheel (linked to the input shaft) and the turbine wheel (linked to the output shaft).

The coupling fill level can be adjusted between 0 % and 100 % during operation, enabling precise and continuously variable driven machine speed control. The control range depends on the load characteristic (torque to speed ratio).

Variable speed fluid coupling – 3D sectional diagram and simplified longitudinal section



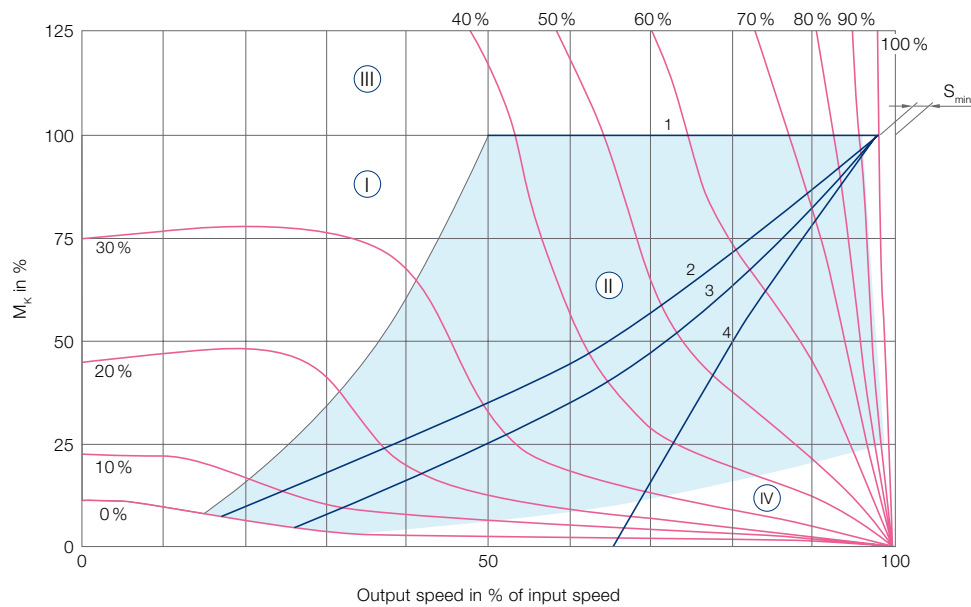
- | | |
|----------------------|--------------|
| 1 Pump wheel | 5 Scoop tube |
| 2 Turbine wheel | 6 Cooler |
| 3 Shell | 7 Oil pump |
| 4 Scoop tube housing | 8 Oil tank |

Torque curves

Operating range

The performance diagram shows the transmittable coupling torques M_k for various scoop tube positions versus the output speed. The desired output speed is the result of a stable intersection point of the coupling torque M_k and the load torque (load characteristic).

Torque curves for different driven machines in the variable speed fluid coupling characteristic diagram



Operating ranges

The exact characteristic curve is dependent on the size of the coupling, the amount circulating, and the oil viscosity.

- I, IV Starting range
- II Control range
- III Overload range

Parameters

Scoop tube position in % of scoop tube stroke.

M_k Coupling torque

S_{min} Nominal slip at design point

$S = (1 - n_2/n_1) \cdot 100 [\%]$

n_1 Input speed

n_2 Output speed

Typical load characteristics

- 1 Constant torque
(e.g., volumetric pumps with constant backpressure and compressors)
- 2 Decreasing torque
(e.g., boiler feed pumps with floating pressure operation)
- 3 Parabolic torque
(resistance parabola, pumps with no backpressure, fans)
- 4 Decreasing torque
(e.g., boiler feed pumps operating with fixed pressures)

SVTL

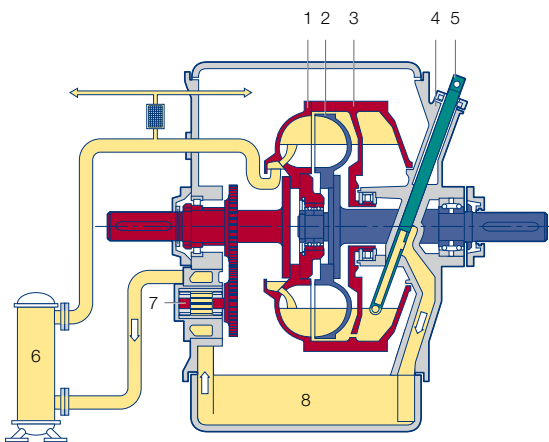
The SVTL coupling is a self-supported design featuring a tunnel housing. The rotating parts are encased in an enclosed oil-proof housing. Connecting couplings link the electric motor and driven machine with the variable speed fluid coupling. The oil tank is built into the housing and the oil pump is driven by the input shaft. The shafts are equipped with anti-friction bearings lubricated by a mechanically driven lubricating oil pump in the variable speed fluid coupling.

The standard design of the SVTL requires a mixed-oil cooler for the working oil and the lubricating oil. For machines in the higher performance classes, two separate circuits are necessary, with one cooler for the working oil and one for the lubricating oil.

SVTL variable speed fluid coupling

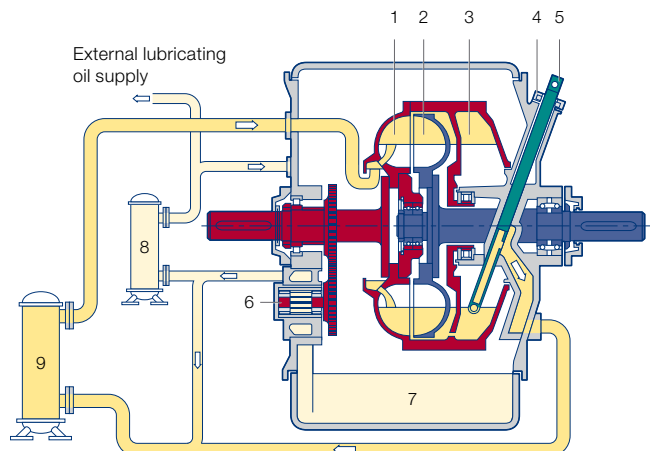


SVTL simplified longitudinal section – Standard design



- | | |
|----------------------|------------|
| 1 Pump wheel | 6 Cooler |
| 2 Turbine wheel | 7 Oil pump |
| 3 Shell | 8 Oil tank |
| 4 Scoop tube housing | |
| 5 Scoop tube | |

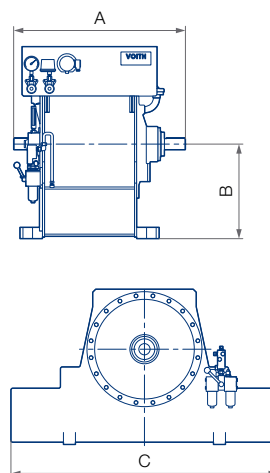
SVTL simplified longitudinal section – Design with two oil circuits



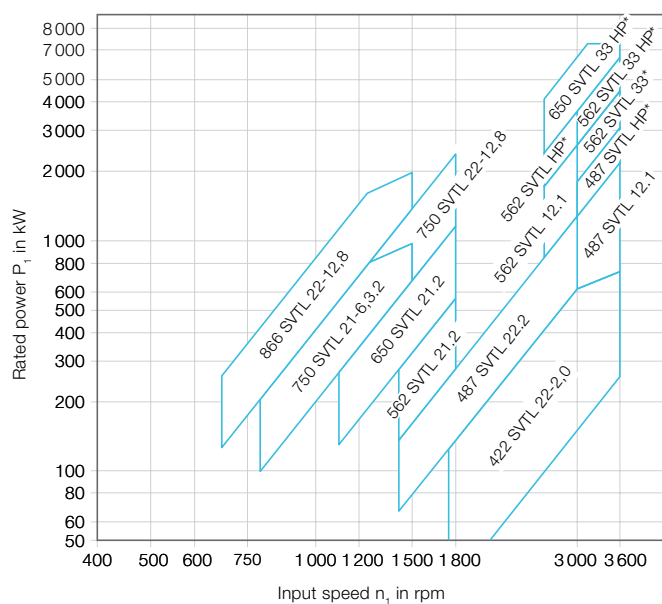
- | | |
|----------------------|--------------------------|
| 1 Pump wheel | 6 Oil pump |
| 2 Turbine wheel | 7 Oil tank |
| 3 Shell | 8 Lubricating oil cooler |
| 4 Scoop tube housing | 9 Working oil cooler |
| 5 Scoop tube | |

SVTL dimensions

Type	A [mm]	B [mm]	C [mm]	Oil capacity [l]	Weight [kg]
422 SVTL 22-2,0	1 120	630	1 780	250	850
487 SVTL 22.2	1 145	630	1 780	250	900
487 SVTL 12.1	1 255	800	1 780	500	1 200
487 SVTL HP*	1 255	800	1 780	500	1 200
562 SVTL 21.2	1 145	630	1 780	250	970
562 SVTL 12.1	1 255	800	1 780	500	1 260
562 SVTL HP*	1 358	800	1 350	450	2 200
562 SVTL 33*	1 358	800	1 350	450	2 200
562 SVTL 33 HP*	1 358	800	1 350	450	2 200
650 SVTL 21.2	1 310	750	2 000	300	1 200
650 SVTL 33 HP*	1 580	800	1 530	470	3 000
750 SVTL 21.2-6,3.2	1 310	750	2 000	300	1 300
750 SVTL 22-12,8	1 469	725	1 400	400	1 750
866 SVTL 22-12,8	1 469	725	1 400	400	1 800



SVTL selection diagram



* Design with two oil circuits

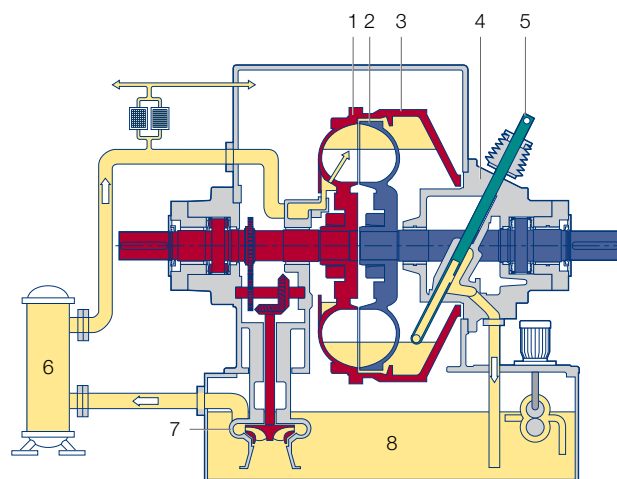
SVNL and SVNL G

The SVNL and SVNL G models are self-supported designs with horizontally split housings. The rotating parts are encased in an enclosed oil-tight housing. Connecting couplings link the main motor and driven machine with the variable speed fluid coupling.

The oil tank is built into the housing and a centrifugal pump serves as the oil pump (some models feature a gear wheel pump) and is driven directly by the input shaft. SVNL coupling main shafts are equipped with anti-friction bearings. The bearings are lubricated with pressurized oil.

SVNL G coupling main shafts are equipped with sleeve bearings. The bearings are force lubricated using pressurized oil. An electrically driven auxiliary lubricating pump is attached for priming lubrication prior to startup.

SVNL G simplified longitudinal section

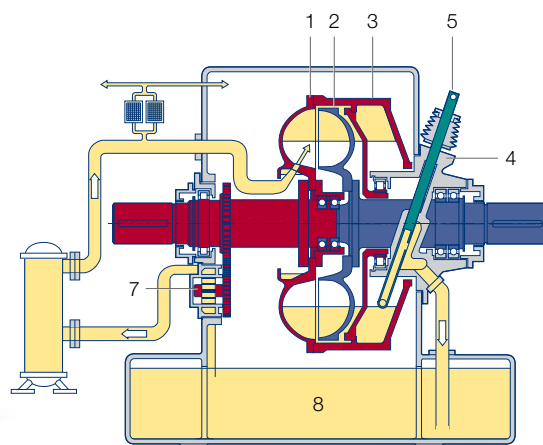


- | | |
|----------------------|--------------|
| 1 Pump wheel | 5 Scoop tube |
| 2 Turbine wheel | 6 Cooler |
| 3 Shell | 7 Oil pump |
| 4 Scoop tube housing | 8 Oil tank |

SVNL variable speed fluid coupling

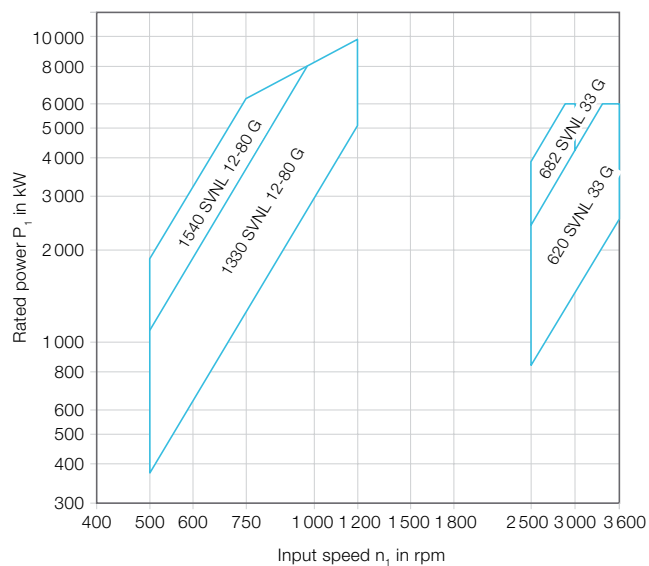


SVNL simplified longitudinal section



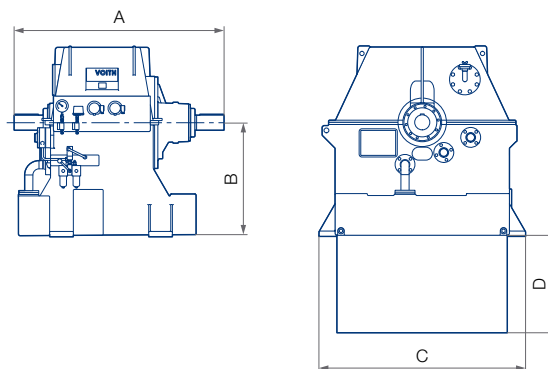
- | | |
|----------------------|--------------|
| 1 Pump wheel | 5 Scoop tube |
| 2 Turbine wheel | 6 Cooler |
| 3 Shell | 7 Oil pump |
| 4 Scoop tube housing | 8 Oil tank |

SVNL G selection diagram

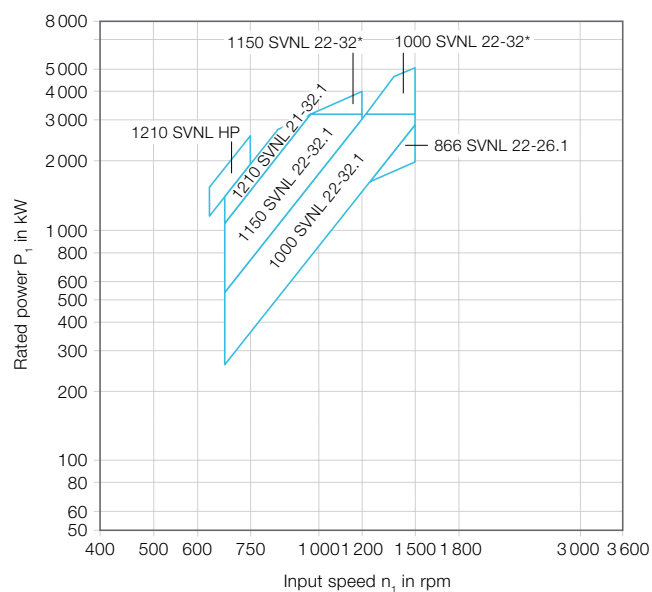


SVNL G dimensions

Type	A [mm]	B [mm]	C [mm]	D [mm]	Oil capacity [l]	Weight [kg]
620 SVNL 33 G	1485	900	2160	–	430	3800
682 SVNL 33 G	1485	900	2160	–	430	3980
1330 SVNL 12-80 G	3150	800	2400	1000	2500	12500
1540 SVNL 12-80 G	3150	800	2400	1000	2500	13800

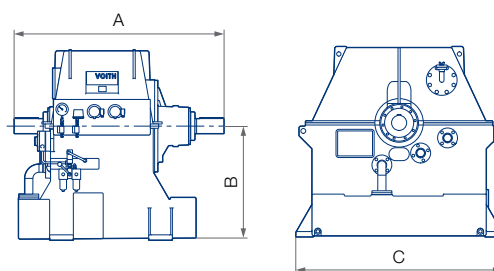


SVNL selection diagram



SVNL dimensions

Type	A [mm]	B [mm]	C [mm]	Oil capacity [l]	Weight [kg]
866 SVNL 22-26.1	1760	1060	1920	780	3650
1000 SVNL 22-32.1	1950	1060	1920	780	3650
1000 SVNL 22-32*	1950	1060	1920	780	3650
1150 SVNL 22-32.1	1950	1060	1920	780	3800
1150 SVNL 22-32*	1950	1060	1920	780	3800
1210 SVNL 21-32.1	1950	1060	1920	780	4000
1210 SVNL HP	1950	1060	1920	780	4000



* Design with two oil circuits, see the diagram on page 12

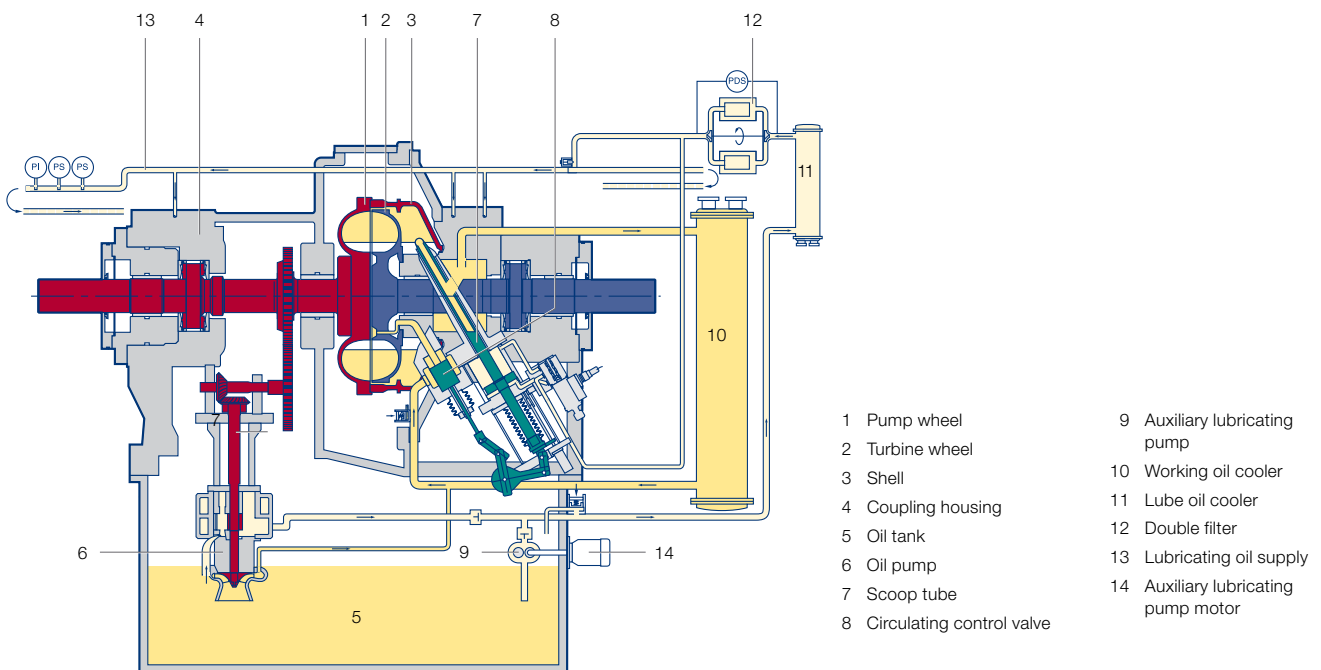
SVL M

The SVL M variable speed coupling model is a self-supported design with a high power density. The input and output shaft are each individually encased in a cast iron housing. Connecting couplings link the main motor and driven machine with a variable speed fluid coupling.

The oil tank is bolted to the bottom of the housing. The coupling features two oil circuits: a working oil circuit and a lubricating oil circuit.

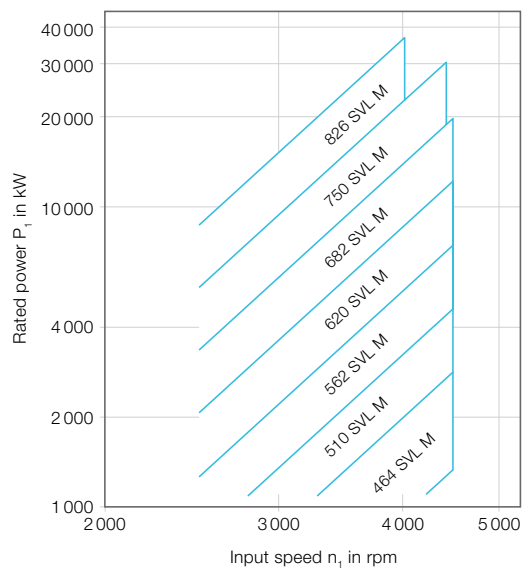
Both circuits are supplied by mechanically driven pumps. An energy-saving flow control valve is used to adjust the circulating oil. The shafts are equipped with sleeve bearings. The bearings are force lubricated using pressurized oil.

SVL M variable speed fluid coupling – Simplified longitudinal section



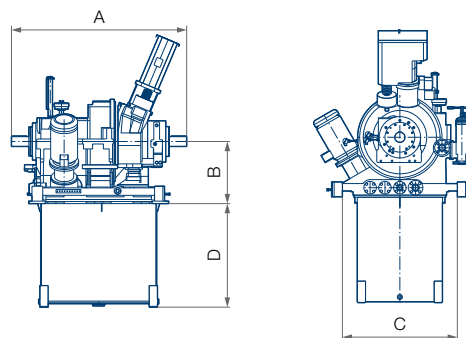


SVL M selection diagram



SVL M dimensions

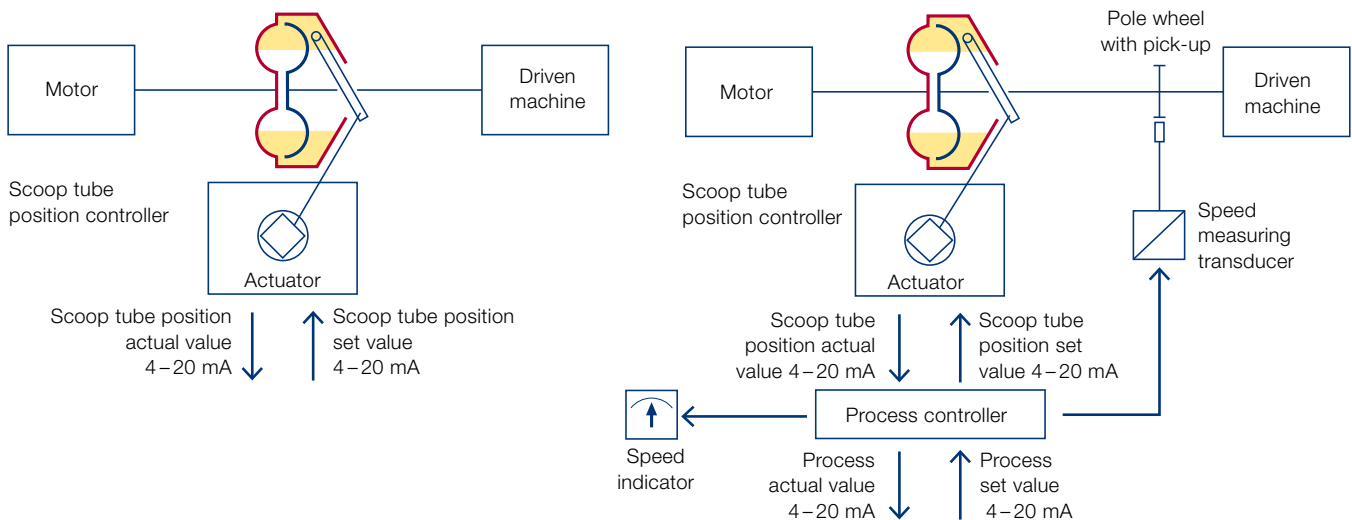
Type	A [mm]	B [mm]	C [mm]	D [mm]	Oil capacity [l]	Weight [kg]
464 SVL M	1855	720	1540	1280	1460	6700
510 SVL M	1985	720	1540	1280	1460	6800
562 SVL M	2045	720	1540	1280	1460	6900
620 SVL M	2115	720	1540	1280	1460	7000
682 SVL M	2265	720	1540	1280	1460	7100
750 SVL M	2705	920	1610	1130	1700	7600
826 SVL M	2910	920	1610	1130	1700	8000



Control circuit integration

Variable speed fluid couplings are often integrated into an automatic process.

Comparison of position and process control circuit



Position control circuit

- Scoop tube control drive, including position controller for continuous control

Process control circuit

- Process controller
- Scoop tube actuator, including position control for continuous control

A speed measurement device is required in cases where the speed is to be used, displayed, or fed in as the process value.

As with the speed, a process value (e.g., pressure or flow rate) can be incorporated into a control circuit. This process value is then used as set value.

Voith Service

Increasing the efficiency, safety and availability of your system, Voith's worldwide service network of engineers and technicians are here for you.

Offices worldwide



Our services

- Installation and commissioning
- Training
- Maintenance
- Original spare parts
- Modernization, retrofits and upgrades
- Service contracts

The benefits for your system

- + Improved operational reliability
 - + Increased service life
 - + Assured productivity
 - + Optimized maintenance costs
 - + Planned life cycle costs
-

Voith Group
St. Poeltener Str. 43
89522 Heidenheim, Germany

Contact:
Phone +49 7951 32-261
vs.drives@voith.com
www.voith.com/vs-coupling



VOITH
Inspiring Technology
for Generations