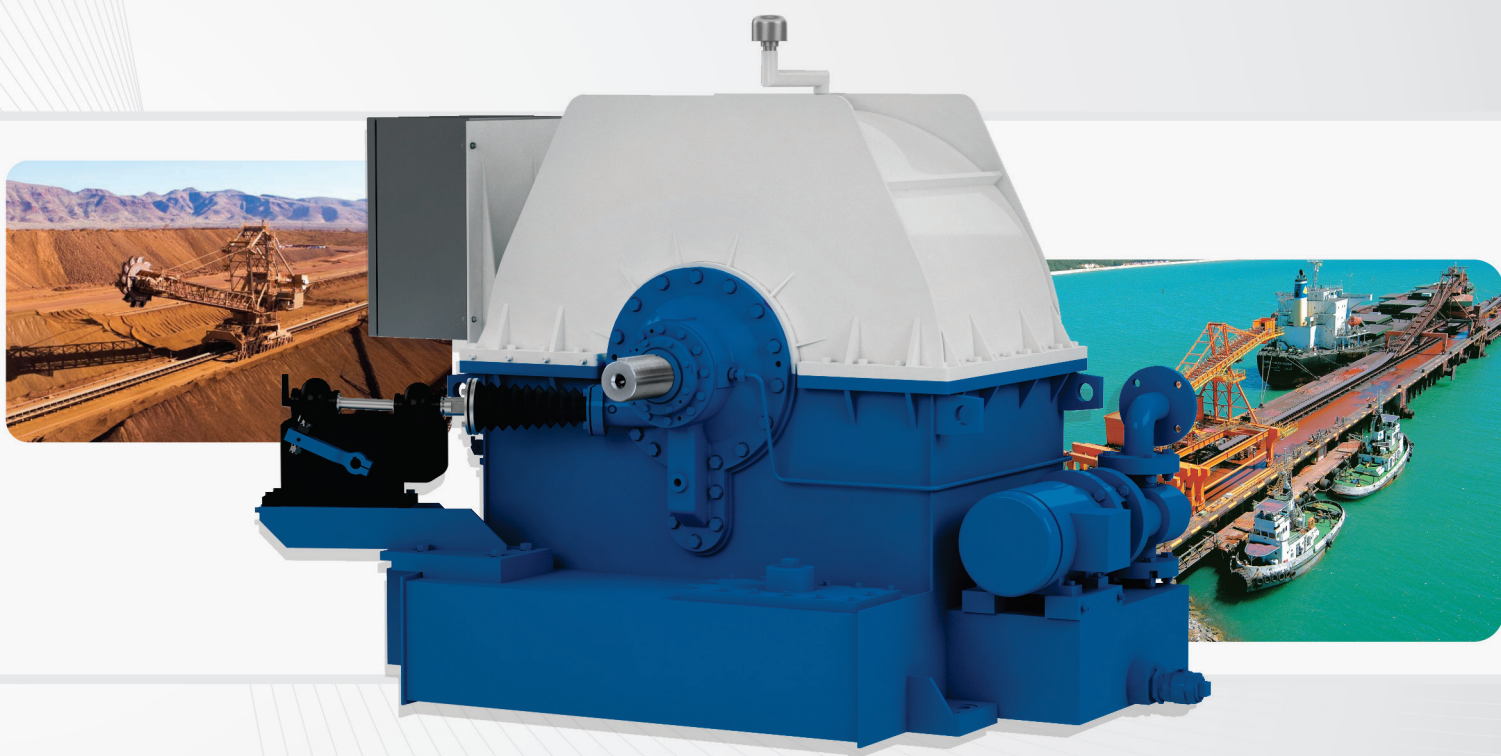




SOLUTIONS FOR DRIVE SYSTEMS



Technical Catalog

VARIABLE SPEED
HFPM



Operating since 1981, installed in the city of Jaboticabal, Sao Paulo State, Brazil, Henfel Indústria Metalúrgica Ltda manufactures Bearing Housings, Hydrodynamic Couplings, Variable Speed Hydrodynamic Couplings and Flexible Couplings. These products are applied to many kinds of equipments and bulk material handling systems of industrial sectors such as mining, ports, steel, paper and cellulose, sugar, and alcohol, among others.

Installed in an area of 25 thousand square meters, the company has a vertical production structure, and, therefore has most of the transformation technology needed for the manufacturing of its products. Its methods and processes are monitored by quality management system certified by the ISO 9001:2008 standard, which assures the manufacturing of high quality products.

The Professional environment at Henfel encourages collaboration, team work and development of leaderships able of taking decisions and creating solutions, which impacts the service quality. An example of it is the organizational identity of the company, developed and established by its collaborators during the strategic planning of 2010, and that contemplates the Values that guide the relationships in all the company's hologram, its Mission, and Vision.



Values: Responsibility, respect, honesty, team work, excellence, commitment, ambition, courage, and discipline.



Mission: To provide solutions that allow customers to gain competitive advantages required to leverage and consolidate their businesses. To promote and encourage the development of its employees, and work with social and environmental responsibility. To make the results bring fair return for their investors and employees.

Vision: To serve with excellence, providing innovative solutions in order to obtain customer's satisfaction and loyalty, solid growth, job creation and sustainable development.

Concerned about the environment preservation, the company keeps works policies with the perspective of minimizing the impacts of its productive activities in the internal and external environments. Internally, equipments that allow the maximum reuse of the generated waste are used, allowing for a lower amount of waste. The correct analysis and characterization of the remaining waste contributes for this waste to be stored in proper places and authorized by the proper agencies, avoiding, thus, any contact and possibility of contamination.

Social responsibility is also part of the Henfel managers agenda. Therefore, investments programs are kept with entities that work in the children care and education in a national and local scope.



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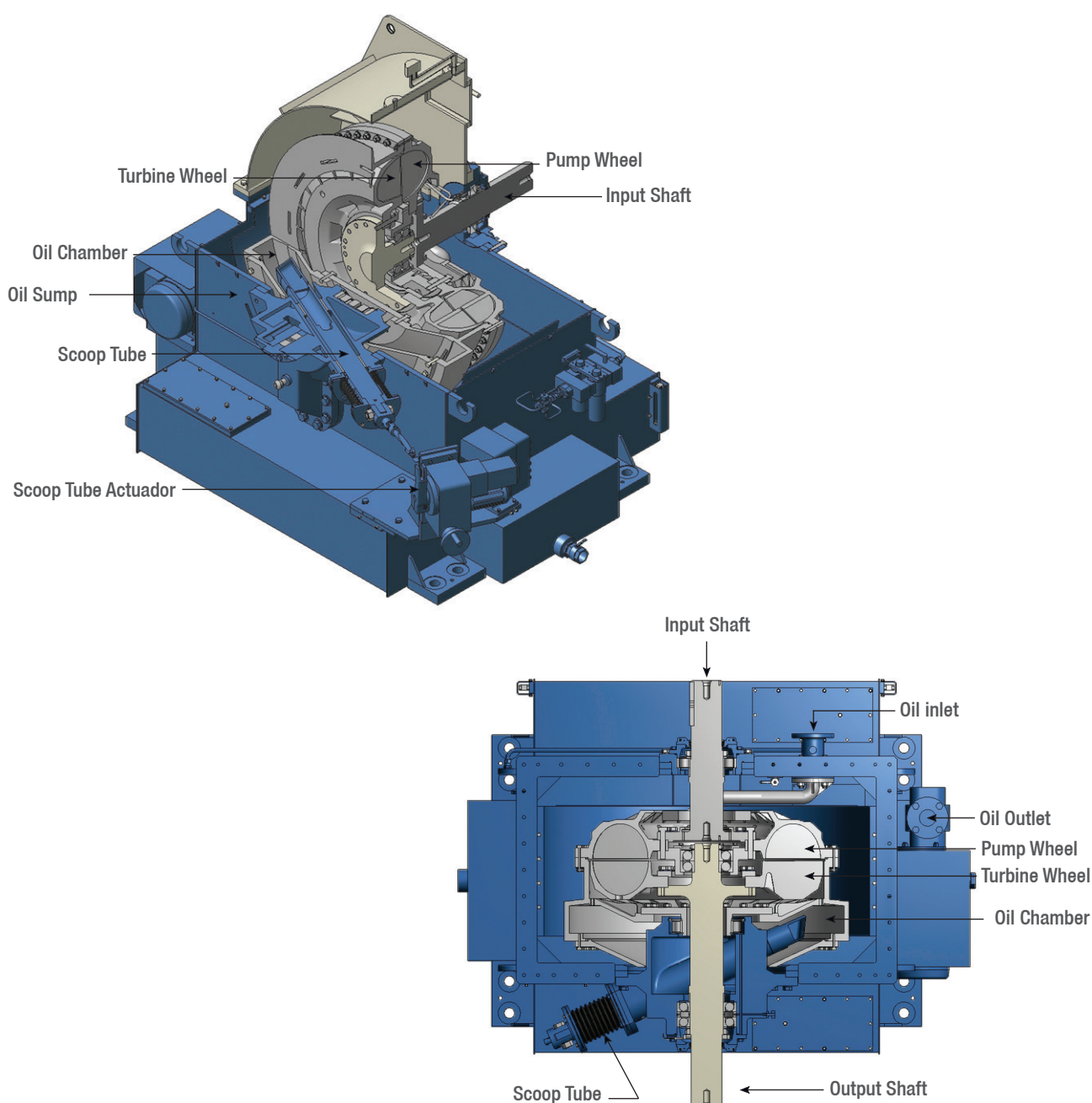
Description

The HFPM variable speed hydrodynamic couplings are applied on drives which require reliability, efficiency and economy to the production. Since their utilization provide advantages such as energy savings, motor and driven equipment increased life and maintenance reduction, they guarantee the economical return of the project's investment.

PRINCIPLES OF OPERATION

The HFPM variable speed hydrodynamic couplings are applied connecting the prime mover (in most cases an electric motor) and the driven machine. They transmit power by means of the kinetic energy from the fluid circulating inside a working chamber which is between the pump wheel, connected to the input shaft, and the turbine wheel, connected to the output shaft.

The operating fluid flow provides torque transmission with no mechanical contact whatsoever and free of torsional vibrations that is resulted from the power input and output operations.



Power plants

- Fans
- Pumps

Mining

- Slurry pipeline
- Belt conveyors

Chemical Industry

- Fans
- Pumps
- Mixers
- Centrifuges

Petrochemical Industry

- Pumps
- Compressors
- Oil pipelines

Siderurgy

- Fans
- Impulsors
- Air compressors
- Turbo-compressores

Water treatment and supply

- Water supply pump
- Elevation pumps
- Sewage pumps

Paper Industry

- IDFan
- Water pumps
- Gas treatment fans

ADVANTAGES

- Possibility of fast adjustable speed control of the driven machine during the operation;
- Realization of special operational conditions, such as: load free start up, starting torque limitation, acceleration and deceleration limitation and precise rotation adjustments with no oscillations;
- Easy operation and low maintenance;
- Wear-free power transmission with no mechanical contact through hydrodynamic energy of the operating fluid;
- Smooth acceleration of heavy masses;
- Increase drive and driven machines service life;
- Suitable for a wide variety of climate conditions;
- Absorption of torsional vibrations and shock loads;
- Low investment cost;
- External control elements with easy maintenance;
- External low maintenance / low cost components, such as the fluid pump that has common motorization ;
- External control panel with IP66, with easy maintenance;
- Scoop tube control activated by 4 to 20 mA signal in IP 66, which provides easy maintenance conditions;
- Self supporting structure. They are connected to the machines by elastic shaft couplings;

The HFPM variable speed hydrodynamic couplings have split housing where the internal components are set, such as pump and turbine wheels and their shafts. The main motor and the driven machine are connected to it by elastic couplings.

The fluid sump is integrated into the housing, and the oil is pumped by an external pump with independent drive motor. That contributes to simplify the maintenance whenever it is necessary.

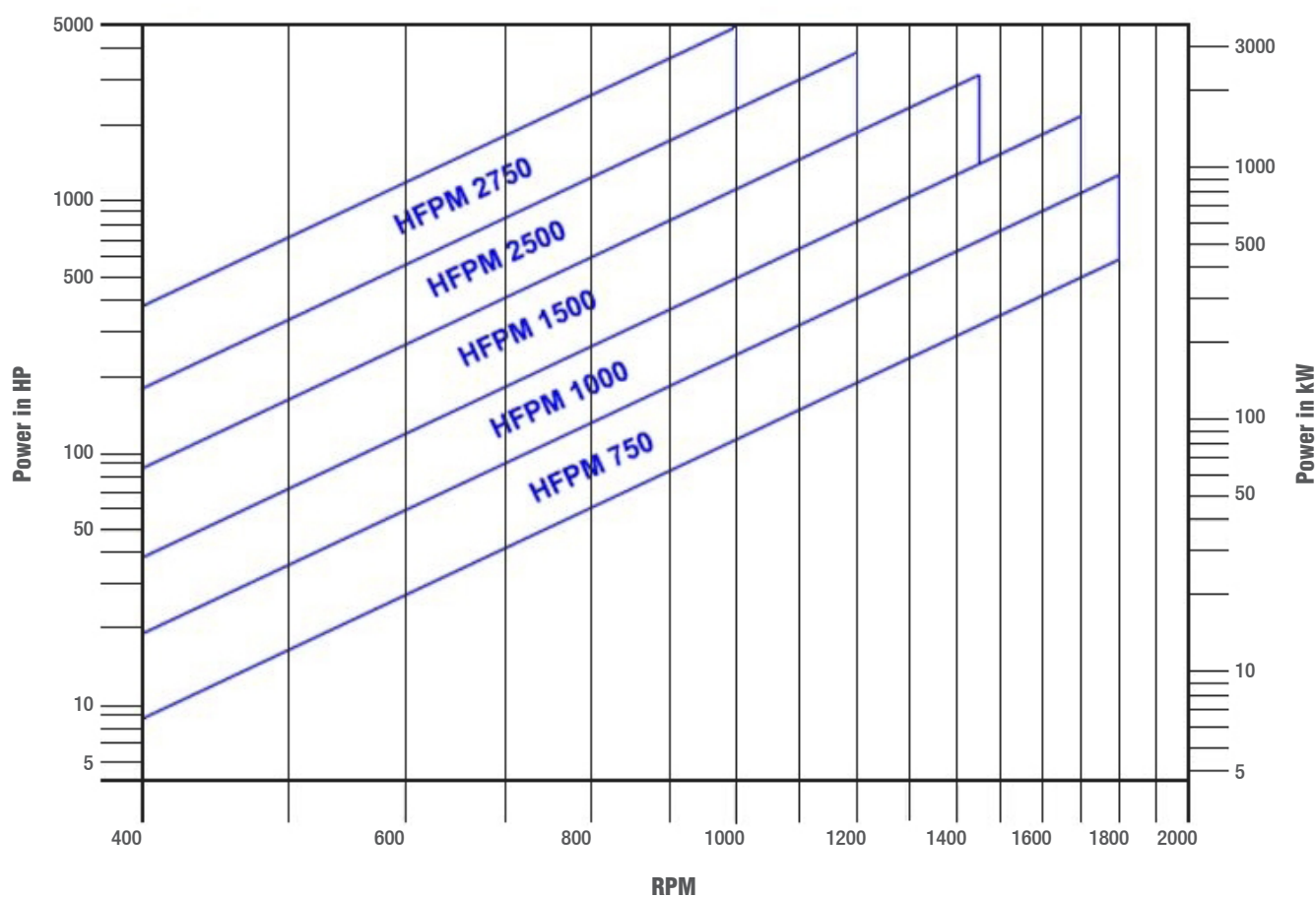
The shafts are supported by bearings that are continuously force lubricated and monitored.

The oil cooler varies according to the application, and it can be Air-Oil type, Water-Oil Type, etc.

SELECTION GRAPH

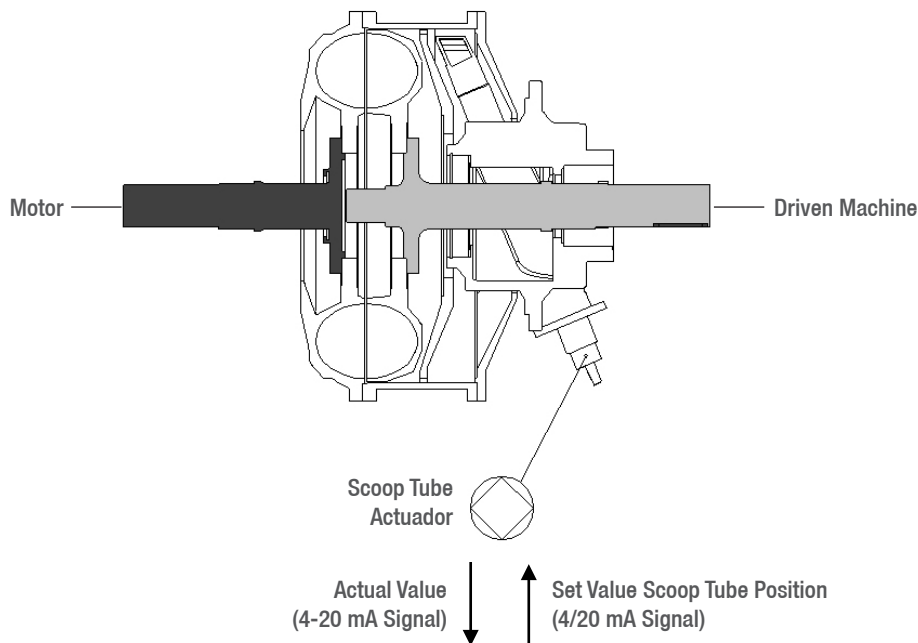
The selection graphic presented below serve only as a size prior-selection guide. The correct selection of the couplings depends of specific application technical information that is provided by the customer, which can eventually change the prior selection results. Therefore, the manufacturer will have to be consulted for the final selection.

HFPM Variable Speed Hydrodynamic Couplings



Variable speed hydrodynamic couplings serve to control the speed of driven machines. In many cases, this control is automatically integrated to the system via PLC/SCDC, commanded by the user's process parameters.

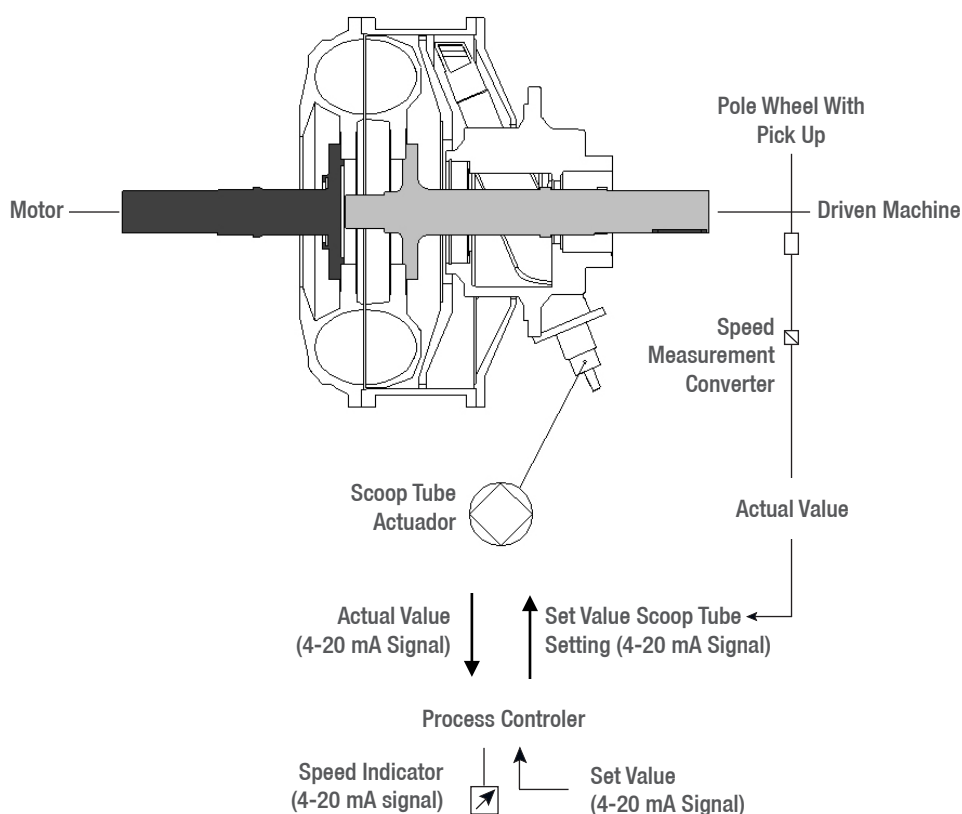
EXAMPLE 1 – POSITION CONTROL CIRCUIT



Position control circuit Components:

- Scoop tube actuator including position control for continuous control operation

EXAMPLE 2 – POSITION CONTROL CIRCUIT

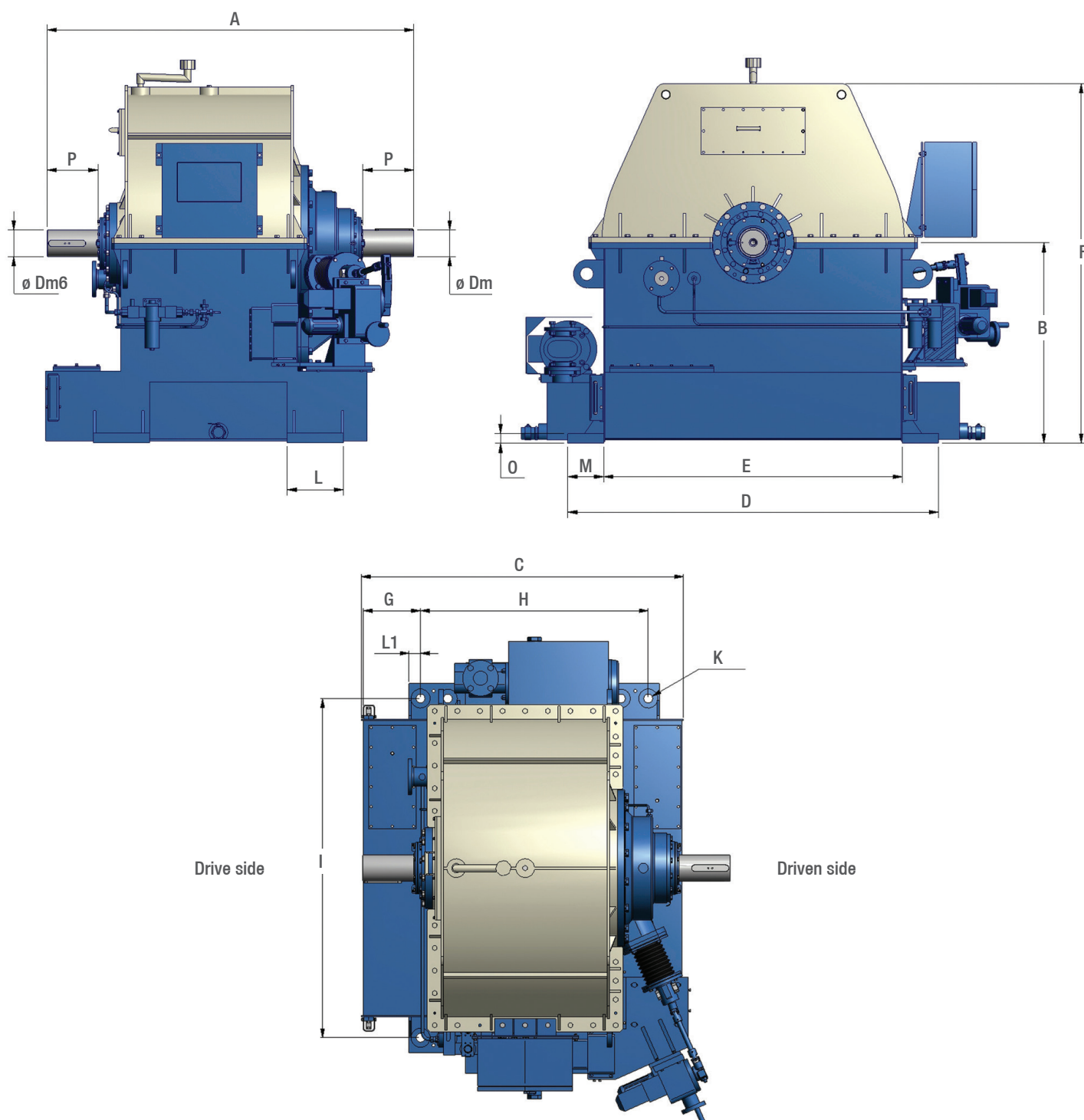


Process Control Circuit Components:

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

If the speed is to be used as a process value, or if it is to be displayed or incorporated, a speed measuring device is required.

Similar to the speed, a process value (pressure, flow, etc.) can be incorporated into a control circuit. Then this process value can be used as set value.



COUPLING SIZE	WEIGHT (WITHOUT OIL)	OIL LOAD	A	B	C	$\varnothing D$	D	E	F	G	H	I	K	L	L1	M	O	P	DIN 6885 FEATHER KEY	FIXATION BOLT
750	1200	350	1325	725	1330	85m6	1350	1110	1317	238	740	1250	40	190	134,7	120	42	170	22 x 14	M36 X 630
1000	1300	350	1325	725	1330	85m6	1350	1110	1317	238	740	1250	40	190	134,7	120	42	170	22 x 14	M36 X 630
1500	2500	500	1750	850	1600	120m6	1500	1280	1540	325	930	1400	40	230	100	110	50	230	32 x 18	M36 X 630
2500	4000	780	1950	1060	1710	140m6	1960	1580	1900	380	1135	1800	48	300	138	190,5	50,8	270	36 x 20	M42 x 630
2750	4200	780	1950	1060	1710	140m6	1960	1580	1900	380	1135	1800	48	300	138	190,5	50,8	270	36 x 20	M42 x 630

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