



# Variable Frequency Drive System with ROTODIFF®

The Variable Frequency Drive System with ROTODIFF includes all components of a hydrostatic drive system. By consistently using the advantages of hydraulic and electrical engineering, a drive system with a very high overall efficiency is created. The variation of the oil flow and the resulting differential speed variation is achieved by changing the pumps rotational speed. This is done by a variation of electric motor speed (VFD).

The differential speed is proportional to the amount of delivered oil volume, which means that automatic control can easily be implemented. The strength of the hydraulics is the direct, low loss transfer of energy from the stationary part of the machine to the rotating components of the centrifuge. The measured system pressure is proportional to the torque and can be used directly as a control variable. Therefore the differential speed can be exactly monitored and automatically controlled with precise accuracy, analogue to the scroll torque and solids loading of the centrifuge.

The frequency converter drive system with ROTODIFF behaves like a frequency converter controlled variable independent gear drive, but has the main advantages of the hydraulic ROTODIFF compared to the gear box solution:

- With the ROTODIFF drive system we reach the absolutely best possible torque/weight ratio.
- Overload protection – a safety valve protects the complete drive system.
- The scroll torque to be transmitted generates a certain amount of waste heat in all drive systems. The generated waste heat frequently leads to mechanical defects. The generated heat frequently leads to mechanical defects, particularly on gearboxes. On a VFD Drive System with ROTODIFF the hydraulic oil is automatically and continuously cooled.
- The connecting power requirement for the scroll drive is minimal. Lowest energy consumption, because no energy is lost through coupling to the bowl – independent scroll drive.

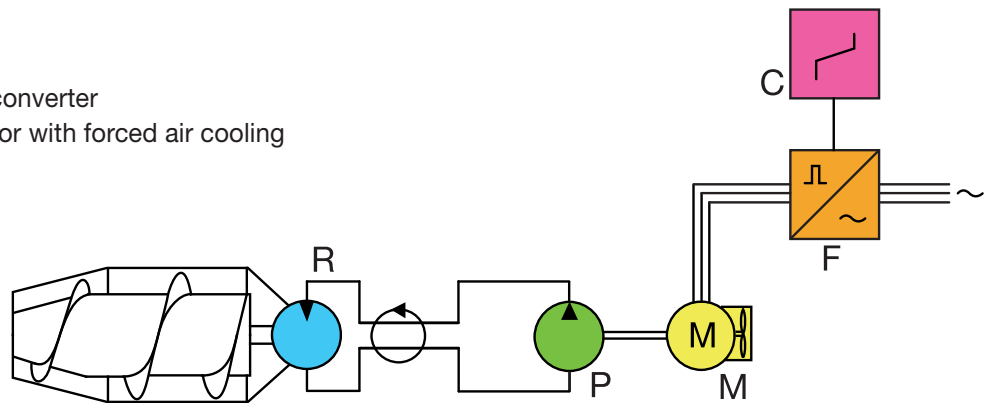
**C** Control

**F** Frequency converter

**M** Electric motor with forced air cooling

**P** Pump

**R** ROTODIFF



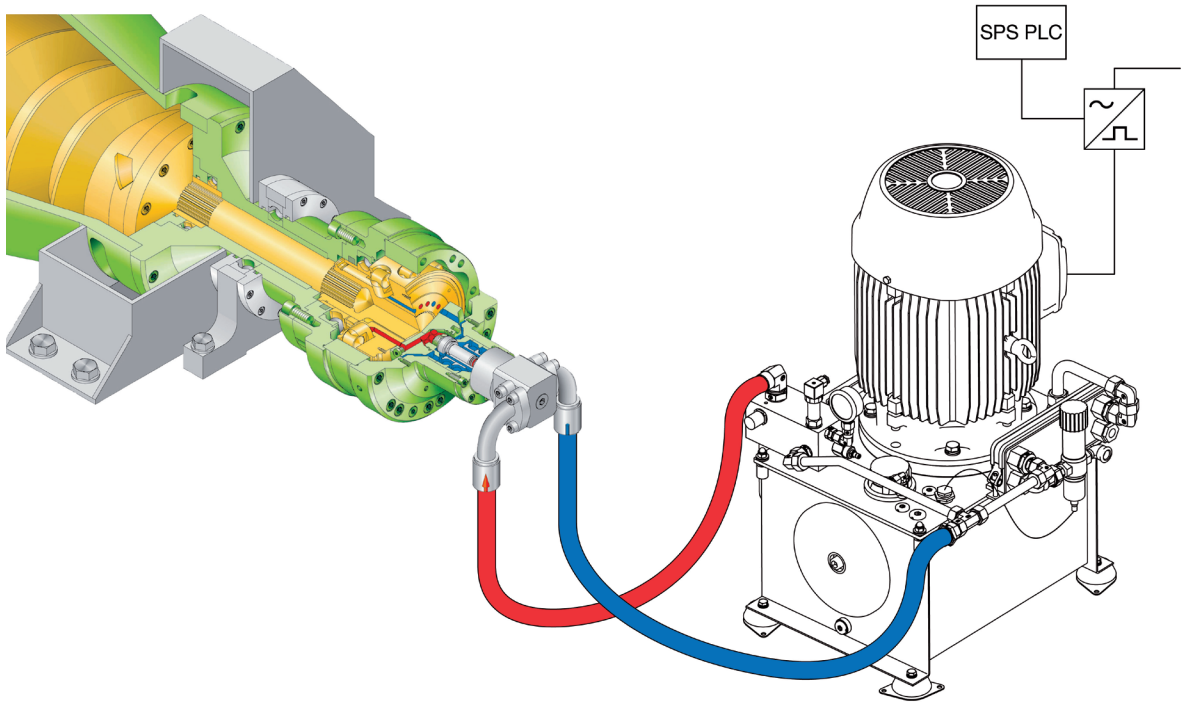
The equipment above comprises the complete VISCOTHERM scroll drive system. The VFD controlled pump unit supplies and controls the oil flow to the ROTODIFF and therefore completes the scroll drive system.

The VFD Drive System with ROTODIFF is independent of the bowl drive due to the fact that it is a cinematically closed circuit in-itself. The differential speed of the scroll can therefore be steplessly and totally independently regulated and controlled regardless of the operating status of the centrifuge (energy recovery is not necessary).

- Full scroll torque capacity is given in any operating condition, regardless of the bowl speed (direct scroll drive).
- CIP, cleaning in place possible even at 0 rpm bowl speed.



# HYDROSTATIC DRIVE SYSTEM FOR DECANTER CENTRIFUGES



Variable Frequency Drive System with ROTODIFF, VFD controlled pump with constant displacement and conditioning unit with oil water cooler or oil air cooler.

Since the hydraulic pump is submerged in the oil tank, versions of hydraulic drive systems with ROTODIFFs can be used in potentially explosive environments (ATEX, IECEx, ...)

Type	Technical Data									
	Power E-Motor	Max. Pressure Pump (Pressure Valve) <sup>1)</sup>	Max. Flow Pump	Working speed range pump	Frequency range	Min. Flow at max. Working Pressure (250 bar)	Max. Flow at max. possible Pressure	Pressure/Power Limit Point max. Flow at max. Working Pressure 250 bar	Tank Capacity	Dimensions (l×w×h)
	[kW]	[bar]	[ccm/U]	[rpm]	[Hz]	[l/min]	[l/min]/[bar]	[l/min]	[l]	[mm]
VFD 3-2.1 Z/HP	3	280	2.1	300-4300	10-152	0.6	8.6 / 179	6.2	50	690×655×675
VFD 5.5-4.5 Z/HP	5.5	280	4.5	300-3600	10-123	1.3	15.3 / 184	11.3	50	690×655×730
VFD 7.5-6.4 Z/HP	7.5	280	6.4	300-3600	10-123	1.8	21.8 / 176	15.4	50	690×660×815
VFD 11-11.5 Z/HP	11	280	11.5	300-3600	10-123	3.2	39.1 / 144	22.6	50	700×650×880
VFD 15-14.1 Z/HP	15	275	14.1	300-3600	10-123	3.9	48.1 / 160	30.8	50	690×655×895
VFD 18.5-16.0 Z/HP	18.5	275	16.0	300-3600	10-122	4.5	54.4 / 175	38.0	50	700×690×915
VFD 22-17.9 Z/HP	22	275	17.9	300-3600	10-122	5.0	60.6 / 186	45.2	75	700×690×955
VFD 30-33.0 Z/HP	30	280	33.0	300-3000	10-102	9.2	93.6 / 164	61.6	100	800×855×1070
VFD 37-39.0 Z/HP	37	275	39.0	300-3000	10-102	10.9	110.7 / 172	76.0	100	800×855×1120
VFD 45-44.0 Z/HP	45	265	44.0	300-2800	10-95	12.3	117.1 / 197	92.4	100	860×830×1125
VFD 55-64.1 Z/HP	55	280	64.1	400-2600	10-88	18.3	161.5 / 180	114.1	250	955×920×1455
VFD 75-80.7 Z/HP	75	280	80.7	400-2400	10-81	23.1	189.0 / 208	155.6	250	1045×920×1600
VFD 90-101.3 Z/HP	90	270	101.3	400-2400	10-81	28.7	235.0 / 200	187.7	300	1245×970×1670
VFD 110-125.8 Z/HP	110	280	125.8	400-2200	10-74	36.3	268.6 / 215	228.2	350	2055×1580×1145
VFD 132-160.8 Z/HP	132	280	160.8	400-2200	10-74	46.4	343.2 / 202	273.9	500	2055×1580×1350
VFD 160-202.7 Z/HP	160	270	202.7	400-2200	10-74	58.3	431.7 / 194	332.0	500	2055×1580×1350