

Gear Pump

January 2005, version 3

Business Mission

We shall, in an innovative, environmentally friendly and goal oriented way and in close cooperation with our customers, develop and offer components, systems and services for the distribution of petroleum products. High quality and technical level focussing on the present and long-term needs of the market shall be our guiding star.

Quality Policy

The quality of our products, systems and services shall be of such class that our customers prefer us to other suppliers.



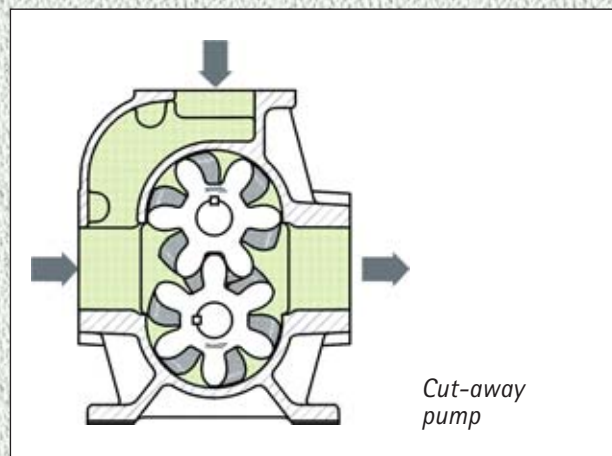
High reliability and robust design combined with active product development have given the Wennstrom gear pump a genuinely good reputation and a long history. The pump has been developed to meet the most varying installations and demands.

Reversible

The latest addition is the double acting relief valve that permits the pump to be reversed thus allowing pipe and hose pipe systems to be emptied with ease. This reduces the risk for product contamination when the same installation is used for pumping different products or grades.

Many applications

The pump is mostly used within the petroleum distribution industry but has also, thanks to its versatility, found many other industrial applications. It is manufactured in three different sizes with capacities from 400 up to 2000 litres per minute.



It can be configured in eight different ways which simplifies installation and pipe layout. The pump can be powered directly linked to an electrical or hydraulic motor or a truck PTO. For truck and PTO installations the pump can be extended with a hydraulic pump to supply other power consuming equipment.

Pump models

Mechanically powered pumps

The basic model is directly connected to a PTO, electric motor or any kind of transmisson.

Hydraulically powered pumps

Running the pump with a hydraulic motor simplifies the installation and piping and facilitates fitting the pump in the most suitable place. It also makes it easier to control speed and direction.

The two smaller pumps, 2 1/2" and 3", can be delivered with a specially designed bracket for VOAC's F12 series and Sunfab's M-series of hydraulic motors. The pump can be ordered with or without the hydraulic motor.

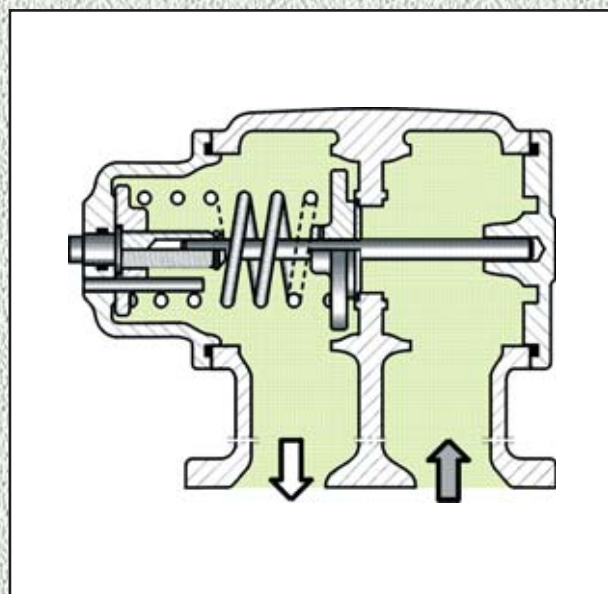
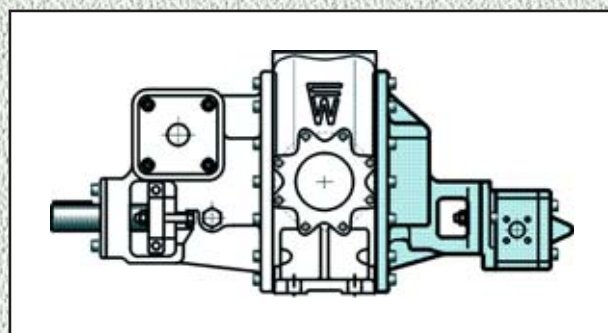
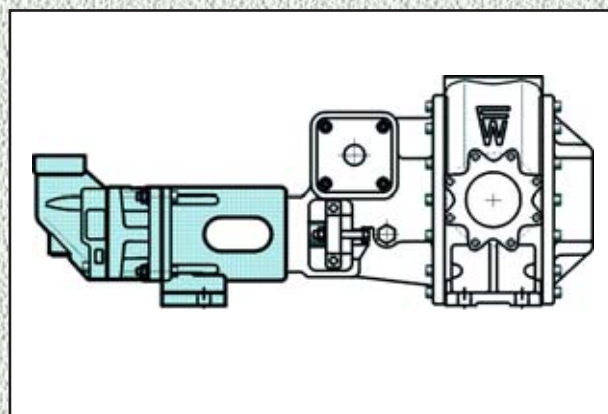
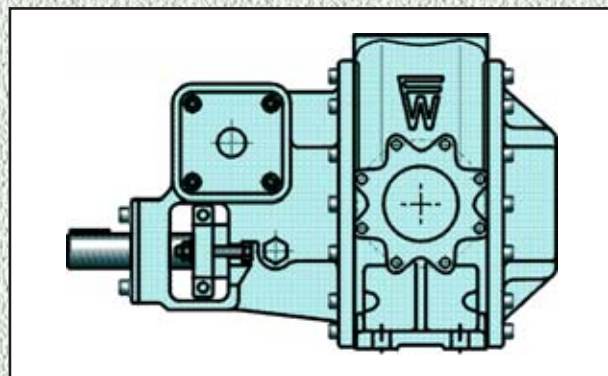
Pumps with hydraulic pump

Wennstromis pump with an extended drive shaft and fitted with a hydraulic pump offers an economical alternative to the hydraulically powered pump. With the pump connected to the PTO it still offers the possibility of hydraulic power to other equipment. Our standard delivery is a Bosch pump giving 16 cm³/revolution and 210 bar maximum working pressure.

Relief valves and pressure control

To achieve the most optimized and safest working conditions the pump pressure can be set between 1.5 and the maximum permissible 10 bar. The two available relief valves are described below.

Spring loaded. Suitable for fixed installations with stable working conditions pumping a liquid with uniform viscosity. The pressure is set by adjusting the tension of the relief spring. Normally the pressure can be set between 4 and 10 bar. If a lower pressure span is required please indicate this when ordering.



Reversible. A pneumatic relief valve with a spring loaded plunger. The pressure in the primary pumping direction is controlled by a pneumatic regulator. In the reverse direction the pump pressure is set by a spring. The relief valve can be opened by shutting off the pneumatic pressure. This will enable fast degassing of a pipe system under gravity pressure.

The reversible 3" pump has the following relation between the pneumatic pressure and the opening pump pressure of the relief valve.

Pneumatic pressure, bar	1.0	2.0	3.0	4.0	5.0	6.0	7.0
The relief valve opens at, bar	0.8	2.0	3.2	4.5	6.0	7.0	8.5

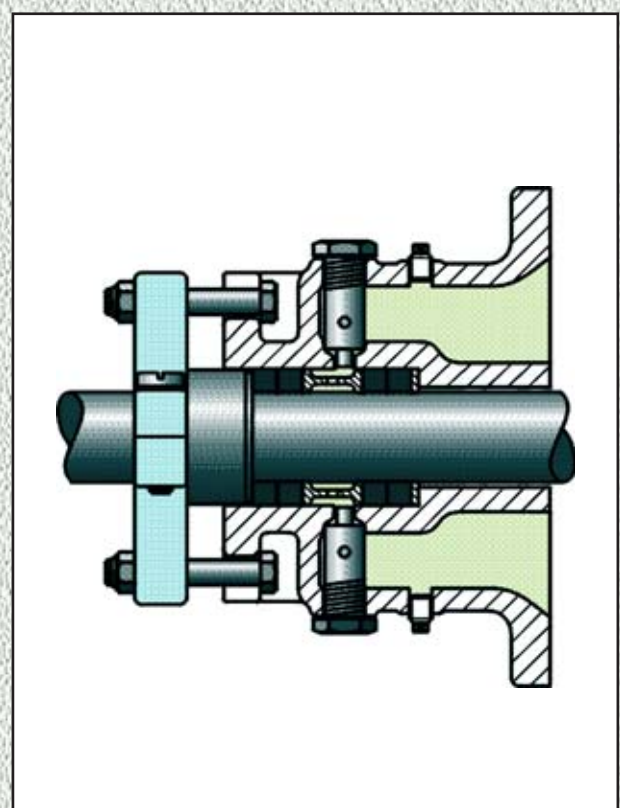
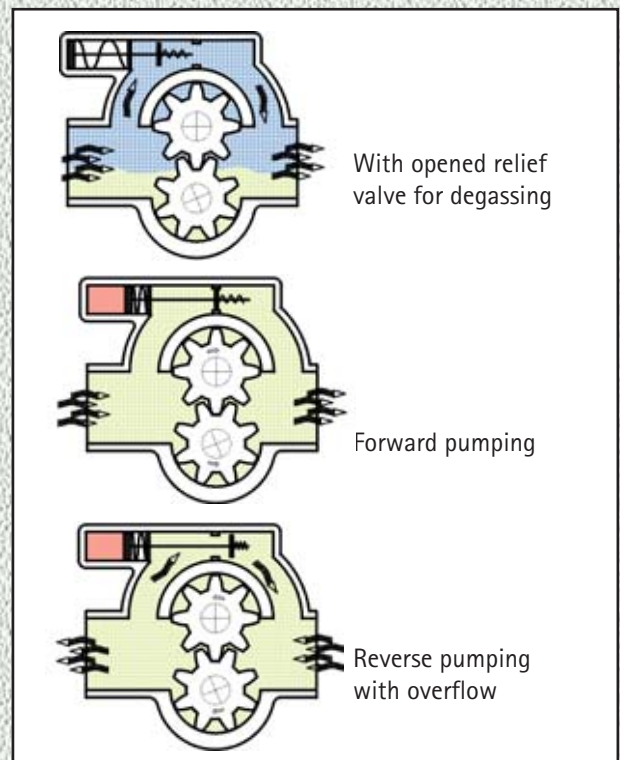
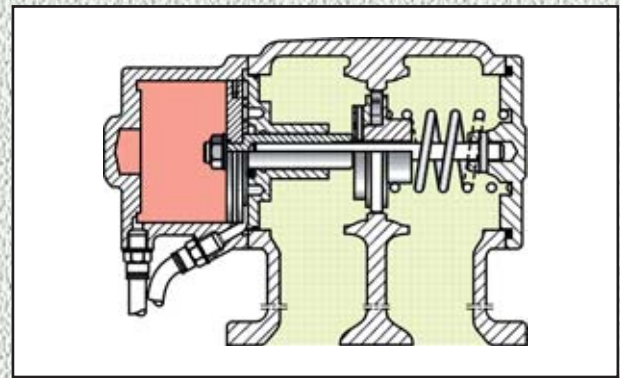
To prevent the pump pressure from exceeding 10 bar (the maximum permissible pressure for a pipe system on a road tanker), the relief valve is designed to give 9.5 bar to a closed pipe system at a pneumatic pressure of 7 bar. Depending on the flow rate and the viscosity of the liquid the total pump pressure will exceed the opening pressure of the relief valve. For diesel oil the pump pressure is about 1 bar above the opening pressure. In reverse the pump will give a maximum pressure of approximately 5 bar.

Road tanker installations

The reversible pump is the best alternative in combination with Wennstrom's other systems for road tankers. Together with the electronic gas separator FlowCheck the pump provides a fast and efficient degassing with gentle degassing stops and starts. This is particularly noticeable when discharging from a drawbar trailer through a pump fitted on the truck. Together with the electronic measurement system VolumeCheck the reversible pump can empty the delivery hose and make the handling of a long and heavy hose much easier.

Shaft seal

A well proven design with both teflon and graphite parts combined with teflon impregnated cotton braid. The seal is lubricated by the pumped liquid and can easily be tightened up which gives a very long life span. When required the seal is easily dismantled and new parts fitted.

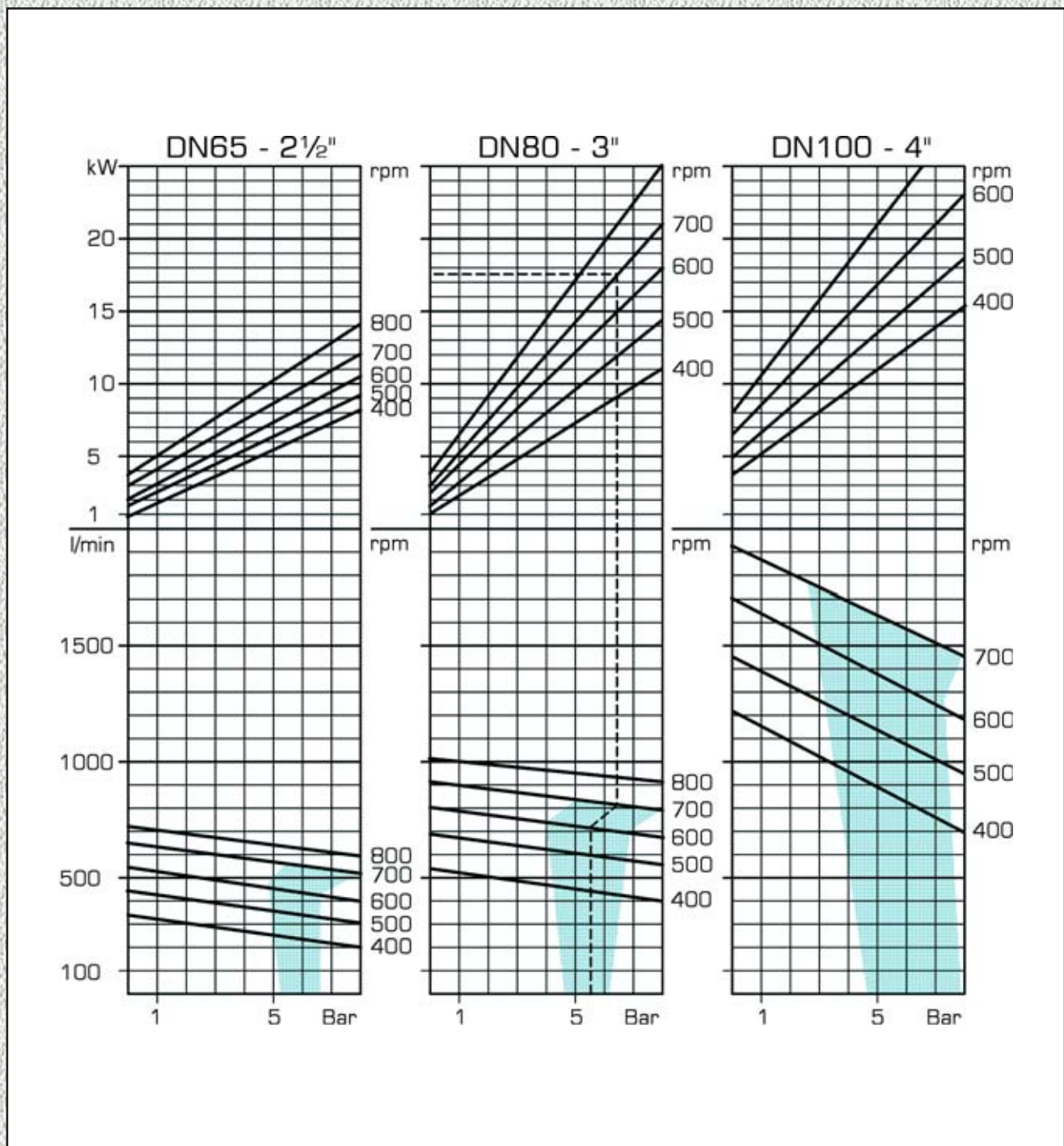


Capacity and Power Requirements

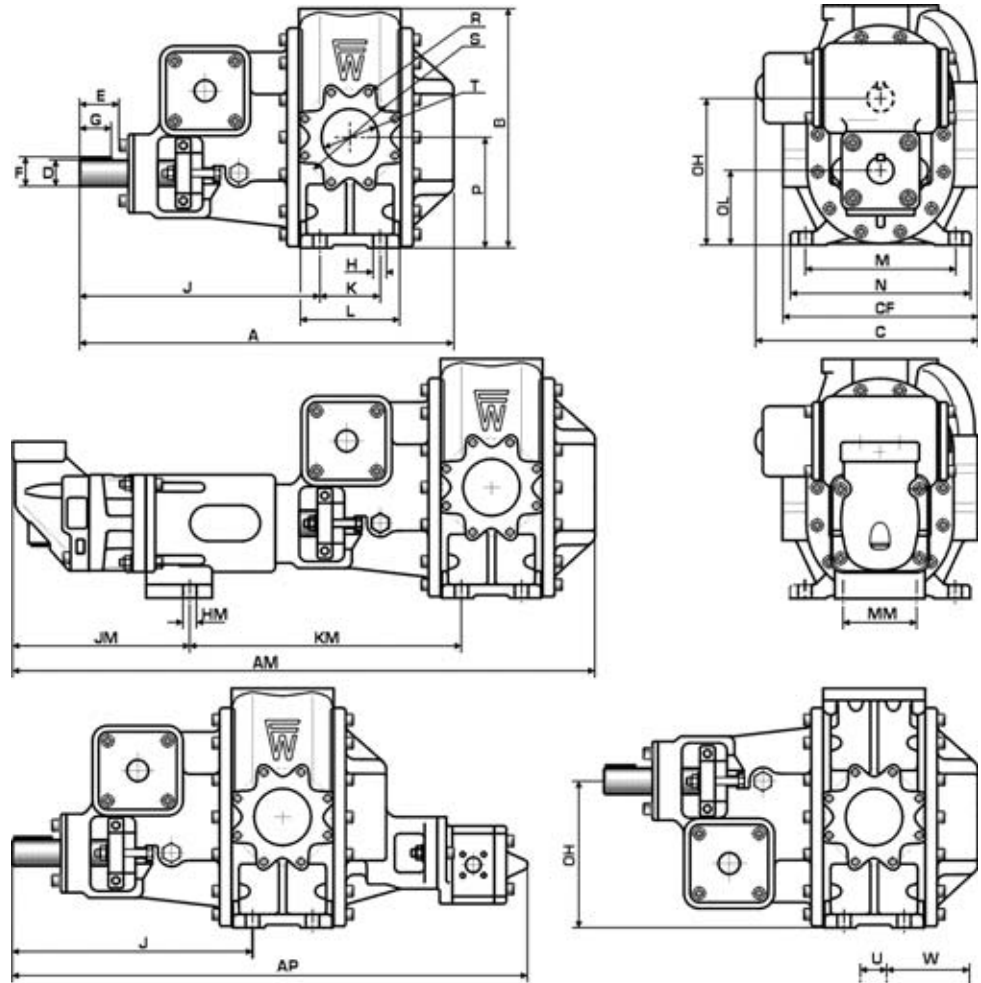
The graphs below are related to pumping a liquid similar to diesel oil with a density of 773 kg/m^3 at 15°C without any pressure on the feed side and with a secured relief valve. The upper part of the each graph shows the power requirement when pumping steadily without any relief flow. When deciding about the motor size considerations must also include the temperature and viscosity of the pumped liquid as well as the pressure drop of the connected pipe system. Remember that very long hoses and pipe systems have a considerable start up resistance. The lower part

of the graphs shows the pumped volume in relation to the speed in rpm. The shaded areas indicate the approximate pressure limits for a pump equipped with a spring loaded relief valve. The size of this area is very much influenced by the viscosity of the liquid. A pneumatically controlled relief valve gives the pump a much wider pressure span.

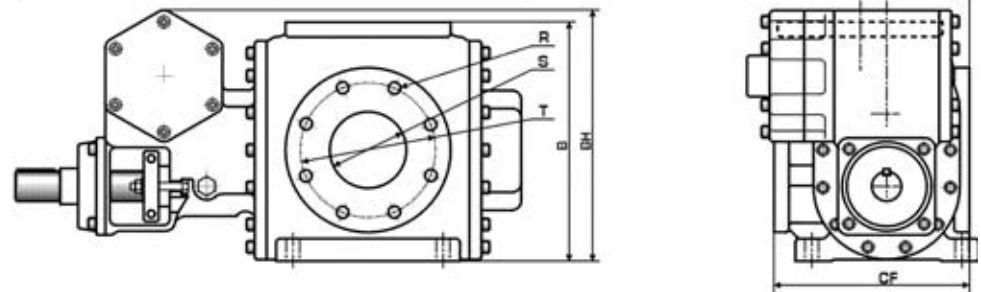
The relation between pump pressure and pneumatic pressure for the reversible relief valve can be found on the previous page.



DN65 & 80



DN100



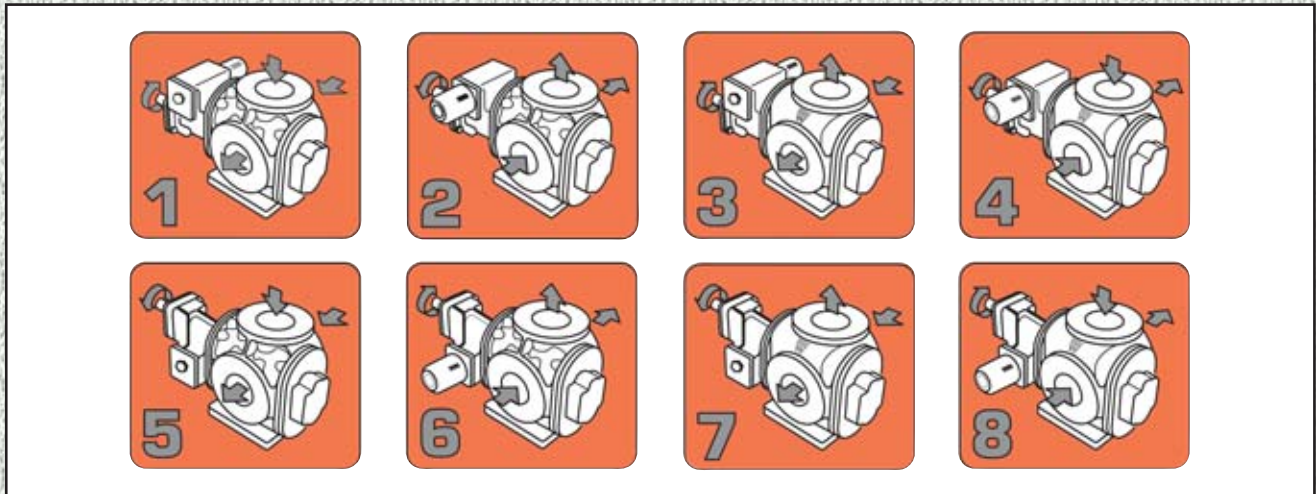
Measurements in mm	A	AM	AP	B	BH	C	CF	ØD	E	F	G
DN65-2 1/2"	450			255	-	250	200	30	45	33	8x40
DN80-3"	500			320	-	300	260	35	55	38	10x50
DN100-4"	675	-	-	335	335	340	260	40	60	43	12x56

Measurements in mm	H	HM	J	JM	K	KM	L	M	MN	N	NM
DN65-2 1/2"	14		270		100		145	140		175	
DN80-3"	18		320		80		130	200		240	
DN100-4"	18	-	370	-	200	-	245	200	-	245	-

Measurements in mm	OL	OH	P	R	T	S	U	W			
DN65-2 1/2"	90	163	126	M10	130	65	-	-			
DN80-3"	99	170	148	M10	130	76	-	-			
DN100-4"	100	197	149	M16	180	102	35	110			

Assembly configurations, flow and rotation directions

The three flange connections of the pump can be used as either in- or outlet and there are two possible shaft positions giving in total eight different assembly possibilities. Configurations one to four have a low fitted main shaft and five to eight come with the top placed shaft. When ordering please state both item number and the desired configuration.



DN65-2 1/2" 200-700l/min

Transmission method	Relief valve		
	Spring loaded	Pneumatisk	Weight
Direct mechanical	111170	115696	48
for hydraulic pump	114184	114185	50
incl. hydraulic pump	114182	114183	54
For hydraulic motor	114188	114190	57
Incl. hydraulic motor	111280	111279	77

DN80-3" 400-1000l/min

Transmission method	Relief valve		
	Spring loaded	Reversible pneum.	Weight
Direct mechanical	111190	111185	70
for hydraulic pump	111180	111183	73
incl. hydraulic pump	111181	111186	77
For hydraulic motor	111282	111184	79
Incl. hydraulic motor	111208	111187	99

DN100-4" 700-2000l/min

Transmission method	Relief valve		
	Spring loaded	Reversible pneum.	Weight
Direct mechanical	77400	128154	118
for hydraulic pump	111216	-	121
incl. hydraulic pump	111218	-	125
For hydraulic motor	-	-	-
Incl. hydraulic motor	-	-	-


Wennstrom
 Intelligent solutions for petroleum distribution

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