

Submersible Pumps & Water Filled Motors



PLEUGER

Submersible Pump Units Offshore Industry

From the very beginning of the offshore industry, Pleuger Worthington has been supplying pumps for platforms. Their design is based on the experience of submersible units since 1929. The pump units are operating as **seawater lift pumps, drains caisson, fire, crude oil export, ballast and deballast pumps.**

After the change of philosophy in the offshore industry the "wet" motor driven pumps have been used to displace the lineshaft driven pumps which in the case of the fire pumps has led to a dual role. Today it is not unusual for the pump to operate as an auxiliary pump in continuous service, and in the event of a fire they are automatically switched to the fire main thus ensuring an instant supply of fire water.

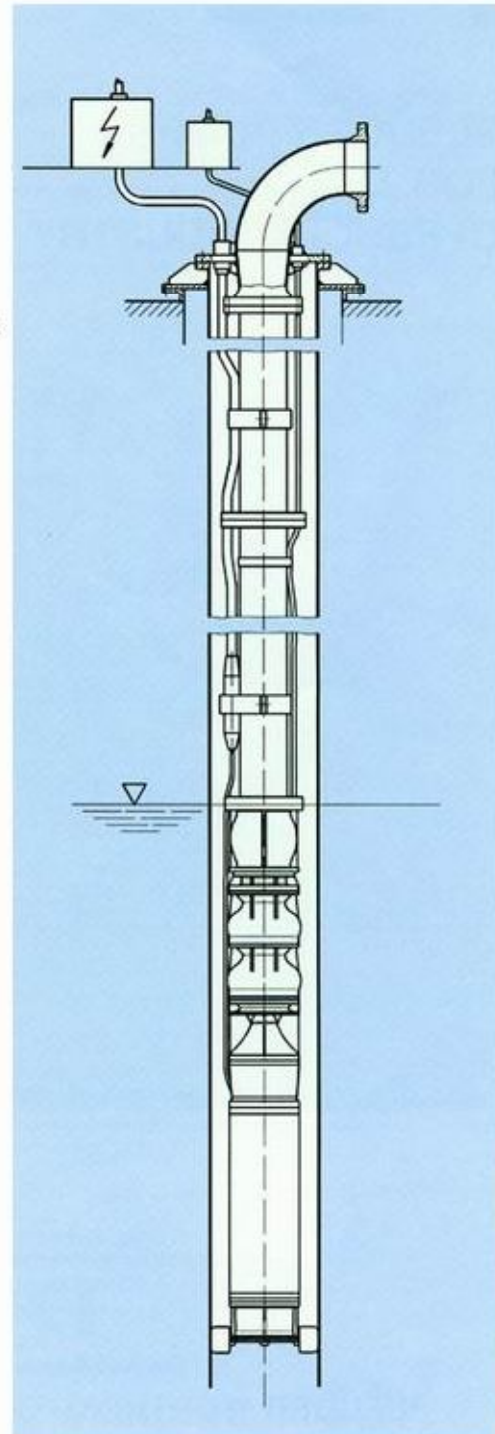
The pumps are therefore designed both in accordance with API 610 and NFPA 20.

The heart of such a compact pump unit is the so-called "wet" electric motor directly coupled to the pump. Such a unit is usually installed in a caisson or stilling tube, freely suspended at the rising main and needs no space on deck except for the electric power supply cable and the discharge pipe.

A further advantage of pump units with water filled ("wet") motors is, that at larger sizes the motor can be operated with voltages up to 6600 Volts, giving a corresponding reduction in the cross section of the supply cable.

The motor bearings are lubricated by the motor filling water and the pump bearings by the pumped fluid giving maintenance free operation. In the event of leakage at the motor seal and the mixing of the motor filling water with the pumped fluid, the motor still remains operational. This being especially advantageous on emergency services, which is not the case with the oil filled type of motor.

Picture 1 shows such a typical pump Unit installation
Picture 2 shows the pump unit itself



Picture 1



Picture 2

Seawater Lift Pumps

type:	200VT-2H + VI22-200-4	
capacity	: 1525	m ³ /h
head	: 113,3	m
voltage	: 6000	V
frequency	: 50	Hz
motor output	: 750	kW
weight	: 7	t
length	: 5,5	m

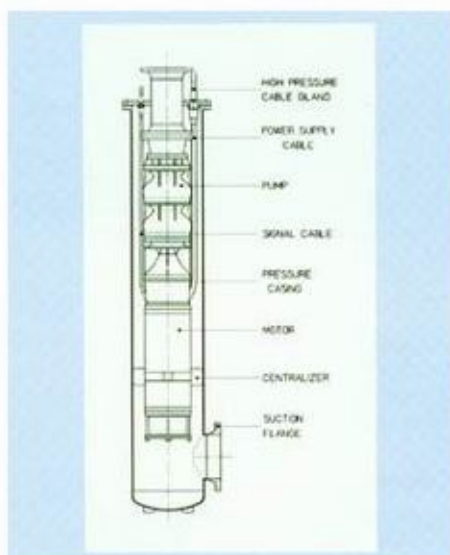
Based on the life expectancy required for each specific service, be it temporary or permanent Pleuger Worthington is manufacturing these offshore units in various materials of construction from zinc free bronze through to 6 Mo (UNS - S 31254).

The Quality Assurance aspect in offshore can be compared with the nuclear power industry and Pleuger Worthington is following this demand

Also due to the structure of the Pleuger Worthington Company the order handling and manufacturing for these mostly tailor made units is guaranteed.

The ballast and deballast pumps, are mainly installed in pressure casings which are manufactured in accordance with the ASME code for boilers and pressure vessels.

Picture 3 shows such an installation and Picture 4 such a unit itself.



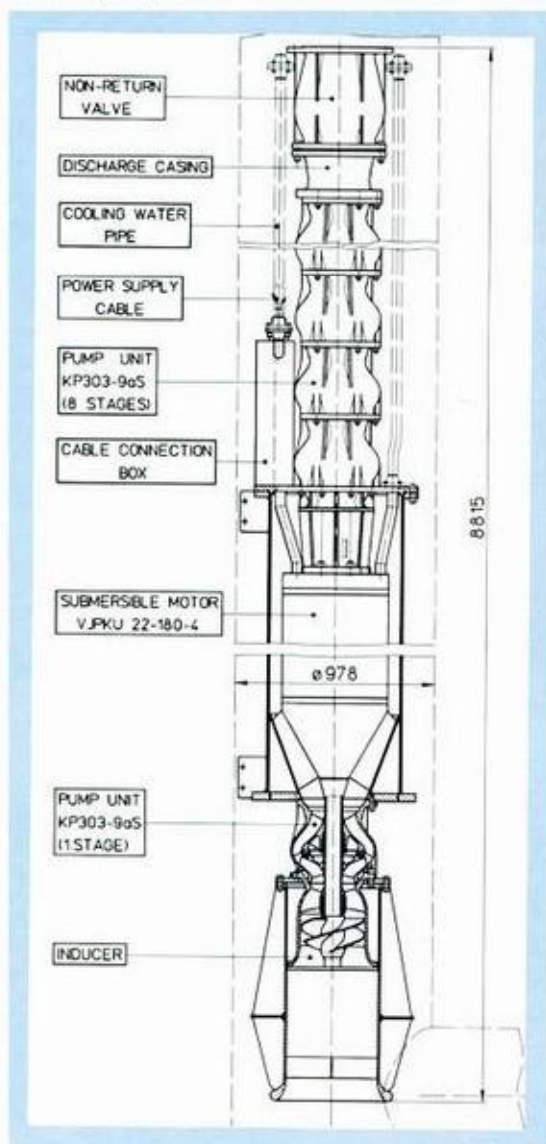
Picture 3



Picture 4

Due to the length of legs of large GBS's (Gravity Base Structure) the installation depth is at 300 m, consequently an internal pressure of 30 bar can occur. Pleuger Worthington has a well proven design of cable penetration through top flange that can withstand pressures up to 100 bar. And the motor itself is pressure compensated and therefore does not need to be sealed against high pressure.

Picture 5 and 6 shown a typical tailor made offshore pump.



Picture 5

This unit was designed for a GBS where crude oil is temporary stored in the cells of platforms foundations. The goal of minimizing the dead stock in the cells was achieved by using an inducer in front of the first stage of a bottom intake pump. The main pressure is produced with the additional 8 stages above the motor. In addition the motor is also equipped with made to order power supply cable which is resistant to the composition of the crude oil being pumped.



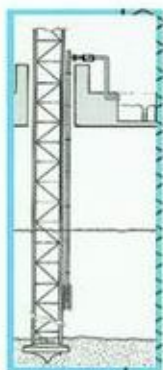
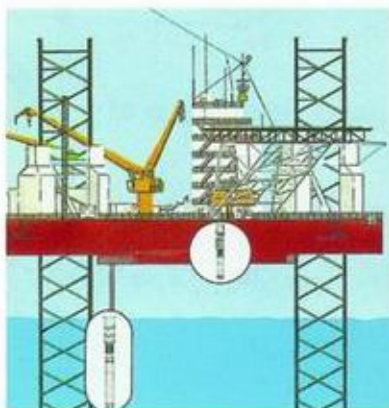
Picture 6

Oil -Export Pumps

type:	KP 303-9aS + VJPKU 22-180-4	
capacity	: 750	m ³ /h
head	: 201,8	m
NPSH _R	: 2,7	m
voltage	: 6000	V
frequency	: 50	Hz
motor output	: 600	kW
weight	: 8	t
length	: 9	m



Offshore platform in the North Sea equipped with Pleuger Worthington auxiliary pumps



Further examples of installation with submersible pump units in offshore



PLEUGER Submersible Unit
KN357-2A + MI16-185-4
1100 m³/h ; 65 m ; 290 KW



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