Pump Driver Sizing

1. According to API 610 (ISO 13709 – Petrochemical Industry)

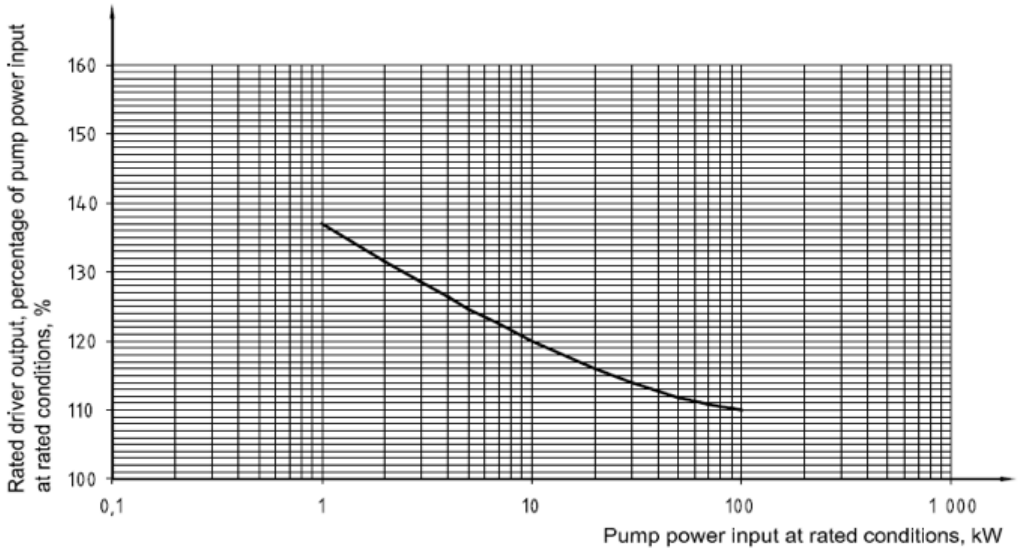
1.1 The purchaser shall specify the type and specification of driver required.
1.2 The driver shall

a) be suitable for satisfactory operation under the site conditions specified,
b) be suitable for the specified utility conditions,
c) be sized to accommodate all specified process variations such as changes in pressure, temperature or properties of the liquid handled,
d) be sized to accommodate all plant start-up conditions,
e) be sized to meet the maximum specified operating conditions, accounting for all losses (e.g. bearing, mechanical seal, external gear and coupling losses).

1.3 Motors shall have power ratings, including the service factor (if any), at least equal to the percentages of power at pump rated conditions given in table below. However, the power at rated conditions shall not exceed the motor nameplate rating. If it appears that this procedure will lead to unnecessary oversizing of the motor, an alternative proposal shall be submitted for the purchaser's approval.

Motor nameplate rating		Percentage of rated pump power
kW	(hp)	%
< 22	(< 30)	125
22 to 55	(30 to 75)	115
> 55	(> 75)	110

2. According to ISO 9905 (Technical specifications for centrifugal pumps- Class I)



3. Standart Pompa Motor Selection Criteria

The installed power PM is the rated power PN of the driver. The installed power should be adequate for the entire specified operating range. Furthermore when assessing the required installed power, certain power additions must be considered. The unavoidable deviations of the

actual conditions from the design data of the pump installation and the pumped media, as well as extra power losses e.g. through the shaft seals, material wear etc. need to be included. If no extreme conditions apply and no special standards or specifications have been laid down, then in practice the following power additions should be included.

a) Power addition for side channel pumps (eg. Vacuum Pumps)

a) Power addition for side channel pumps

for P	< 1,5 kW	25%	$P_M \approx 1{,}25 \cdot P$
	1,5 to 4 kW	20%	$P_M \approx 1{,}2 \cdot P$
	> 4 kW	10%	$P_M \approx 1{,}1 \cdot P$

b) Power addition for centrifugal pumps with radial flow impellers

for P	< 1,5 kW	50%	$P_M \approx 1{,}5 \cdot P$
	1,5 to 4 kW	25%	$P_M \approx 1{,}25 \cdot P$
	4 to 7,5 kW	20%	$P_M \approx 1{,}2 \cdot P$
	7,5 bis 40 kW	15%	$P_M \approx 1{,}15 \cdot P$
	> 40 kW	10%	$P_M \approx 1{,}1 \cdot P$

c) Power addition for mixed flow and axial flow pumps. Power additions for this type of pump are especially influenced by the shape of the pump power input curve and are therefore established for each point and operating range.

d) Power addition for pumps with absorbed power > 100 kW
In these cases the additional power must be carefully calculated to avoid over sizing the driver. The efficiency plays a major role and the selection should be matched to the duty data as closely as possible.