# Pump Head, Power and Efficiency — Report



## DOCUMENT

| | |
|---|---|
| Plant / project | **Example Plant** |
| Equipment tag / system | **P-101A** |
| Calculation / document no. | **CALC-PU-001** |
| Revision | **0** |
| Prepared by | **Your name** |
| Checked by | **—** |
| Date | **28-Oct-2026** |

**Calculation basis**

Design / selection check (duty point) · Impeller 560.0 mm at 740 rpm (vendor curve 1) · Liquid: Water · Motor: API 610 margin on the rated power · Curve fits: head quadratic, efficiency cubic; affinity laws (Perry Table 10-7)

Status

**✓ Inputs OK · ℹ️ 15 default value(s) in use: density at the pumping temperature, viscosity at the pumping temperature, specific heat, selected impeller diameter, selected speed, bep flow of curve 1 at the curve speed, minimum continuous stable flow, allowable temperature rise through the pump, preferred operating region, lower end, preferred operating region, upper end, viscosity correction on flow, viscosity correction on head, viscosity co**

## KEY INPUTS

| Input | Unit | Value used |
|---|---|---|
| Pumping temperature | °C | 30.0 |
| Suction pressure at the rated point | bar g | 0.000 |
| Density at the pumping temperature | kg/m³ | 995.6 |
| Installed motor rated output | kW | 630.0 |
| Minimum continuous stable flow (selected impeller and speed | m³/h | 2,594 |
| Rated (duty) flow | m³/h | 6,000.0 |
| Required head at the rated flow | m | 26.00 |
| Minimum operating flow | m³/h | 2,200.0 |
| Maximum operating flow | m³/h | 7,000.0 |

## RESULTS

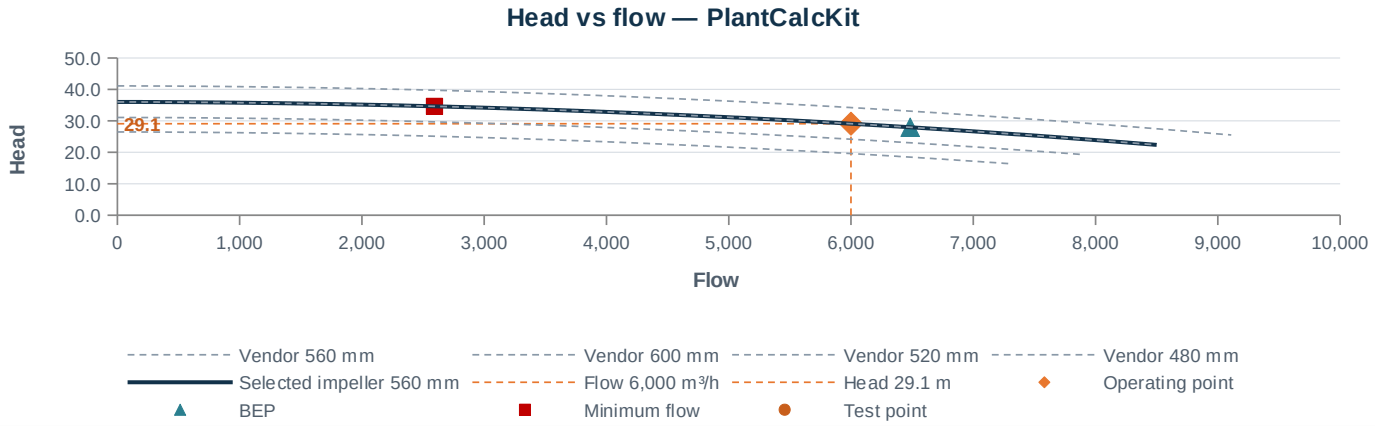
| Result | Unit | Value |
|---|---|---|
| Impeller diameter and speed | mm | 560.0 |
| Shut-off head (zero flow) | m | 36.02 |
| Best efficiency point (BEP) flow | m³/h | 6,484.1 |
| Head at BEP | m | 27.97 |
| Efficiency at BEP | % | 86.1 |
| End of the curve (last vendor point) | m³/h | 8,500.0 |
| Minimum flow used for the checks | m³/h | 2,593.6 |
| Operating flow | m³/h | 6,000.0 |
| Head on the curve at this flow | m | 29.09 |
| Efficiency on the curve at this flow | % | 85.8 |
| Expected shaft power at this flow | kW | 551.9 |
| Operating flow as % of BEP flow | % | 92.5 |
| Head margin over the required head | % | +11.9 |
| Impeller diameter that meets the duty (trim) | mm | 535.3 |
| Shaft power lost by throttling the excess head | kW | 60.3 |
| Minimum operating flow as % of BEP | % | 33.9 |
| Maximum operating flow as % of BEP | % | 108.0 |
| Required motor output | kW | 607.1 |
| Recommended standard motor rating | kW | 630.0 |
| Installed motor load (shaft power ÷ rated output) | % | 87.6 |


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## CURVE TABLE — SELECTED IMPELLER AND SPEED

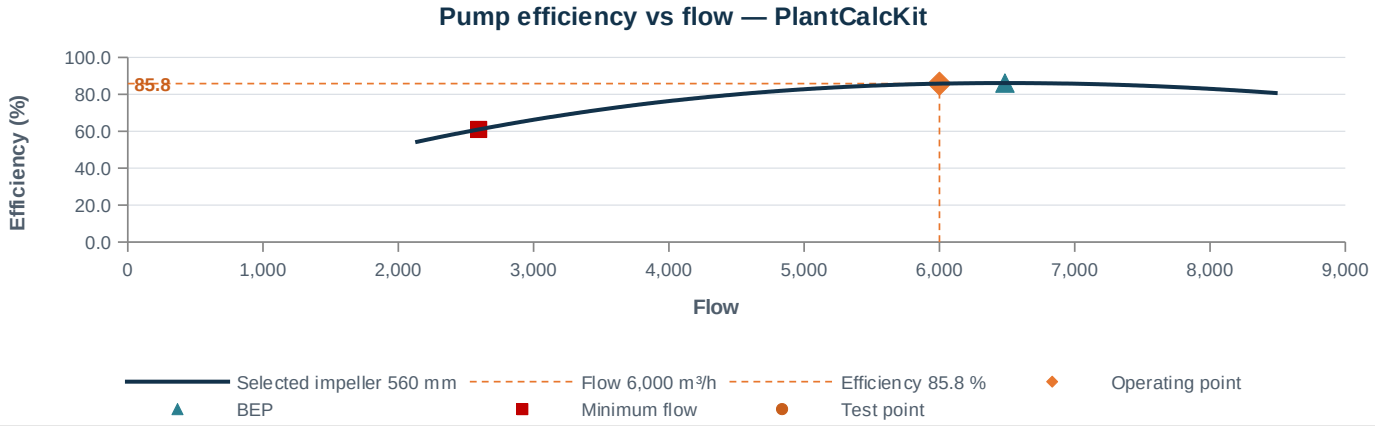
| Flow | % of BEP | Head | Efficiency (%) | Shaft power | Temp. rise (K) | Region |
|---|---|---|---|---|---|---|
| (m³/h) | | (m) | | (kW) | | |
| 0 | 0 | 36.02 | — | — | — | Shut-off |
| 850 | 13 | 35.83 | — | — | — | Below minimum flow |
| 1,700 | 26 | 35.38 | — | — | — | Below minimum flow |
| 2,550 | 39 | 34.67 | 60.4 | 397.2 | 0.05 | Below minimum flow |
| 3,400 | 52 | 33.70 | 70.7 | 439.4 | 0.03 | Below the preferred region |
| 4,250 | 66 | 32.46 | 78.3 | 478.1 | 0.02 | Below the preferred region |
| 5,100 | 79 | 30.96 | 83.2 | 514.8 | 0.01 | Preferred region |
| 5,950 | 92 | 29.21 | 85.7 | 549.9 | 0.01 | Preferred region |
| 6,800 | 105 | 27.18 | 86.0 | 583.1 | 0.01 | Preferred region |
| 7,650 | 118 | 24.90 | 84.2 | 613.4 | 0.01 | Preferred region |
| 8,500 | 131 | 22.36 | 80.6 | 639.2 | 0.01 | Above the preferred region |

## CHARTS (units as chosen on the Calculator; vendor curves moved to the selected speed)



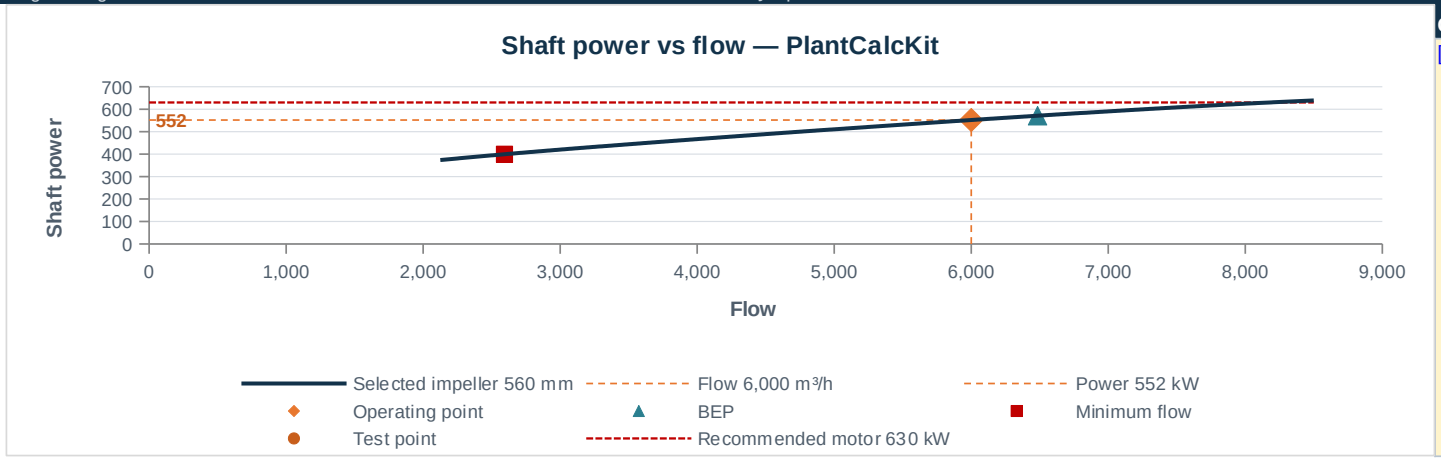

**Observations — head**

[Write your observations here]




**Observations — efficiency**

[Write your observations here]




**Observations — power and motor**

[Write your observations here]

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