PUMP SELECTION REPORT

SAMPLE - 60 Hz Industrial Supply

45.00 m³/h at 35.0 m total head | 60 Hz | Clean Water

CUSTOMER	REFERENCE	PREPARED	PUMPS FOUND
Sample Industrial Inc.	CNP-S-003	12 Oct 2026	18

Design basis

Duty point	**45.00 m³/h (12.50 l/s) at 35.0 m**
Operating frequency	**60 Hz**
Liquid and conditions	**Clean Water, max 20 °C, 998 kg/m³, 1 cSt; 60 Hz (catalogue data for this frequency).**
Acceptance tolerance	**GB3216 2016, grade 2B: flow 92 to 108 %, head 95 to 105 %**
System curve	**Friction only, proportional to Q squared through the duty point**
Running cost basis	**3,000 h/year at 0.120 per kWh, 10 year evaluation**

Recommendation

Closest match to the duty point: TD125-32/4 (45.00 m³/h at 34.9 m, +0.0 % flow, -0.4 % head).

Highest efficiency among the listed pumps: TD80-30/2 at 61.5 %.

Lowest energy cost: SJ30-5 at USD 2,755 per year (USD 27,545 over 10 years).

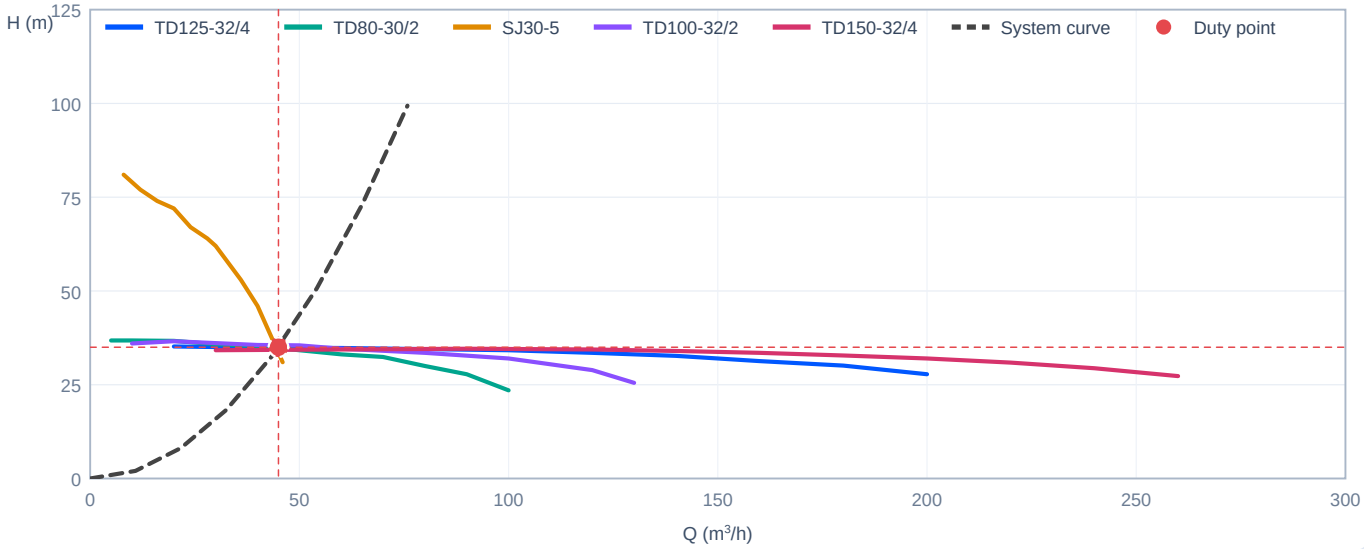
8 warnings across the listed pumps; read the pump pages before choosing.

Matching pumps

#	Model	Operating point	Offset	Eff. %	Shaft kW	Motor	NPSH	Cost/yr
1	TD125-32/4	45.0 m³/h @ 34.9 m	+0.0% Q / -0.4% H	38.3	11.15	22 kW	NPSHr 3.5 m (est.)	USD 4,460
2	TD80-30/2	44.9 m³/h @ 34.8 m	-0.1% Q / -0.5% H	61.5	6.92	11 kW	NPSHr 2.0 m (est.)	USD 2,766
3	SJ30-5	44.5 m³/h @ 34.8 m	-1.2% Q / -0.5% H	61.1	6.89	7.5 kW	NPSHr 7.1 m (est.)	USD 2,755
4	TD100-32/2	45.0 m³/h @ 35.6 m	+0.0% Q / +1.6% H	51.3	8.49	15 kW	NPSHr 2.7 m (est.)	USD 3,394
5	TD150-32/4	45.0 m³/h @ 34.3 m	+0.0% Q / -2.0% H	30.3	13.84	30 kW	NPSHr 4.6 m (est.)	USD 5,535

Catalogue-based selection support. Final suitability must be confirmed against the full catalogue curves and by a technical review.

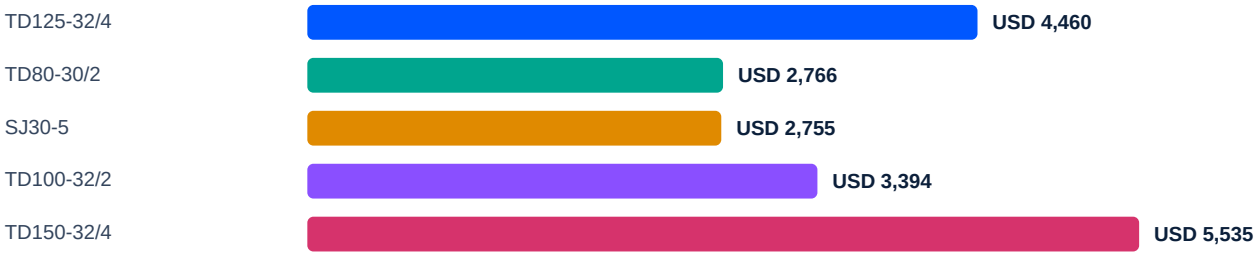
Head curves of the leading pumps against your duty point



Running cost comparison

Model	Shaft kW	kWh per year	Cost per year	Cost over 10 y	Against lowest
TD125-32/4	11.15	37,163	USD 4,460	USD 44,596	+USD 17,050
TD80-30/2	6.92	23,051	USD 2,766	USD 27,662	+USD 116
SJ30-5	6.89	22,954	USD 2,755	USD 27,545	lowest
TD100-32/2	8.49	28,286	USD 3,394	USD 33,943	+USD 6,398
TD150-32/4	13.84	46,126	USD 5,535	USD 55,352	+USD 27,806

Energy cost per year



Energy cost only. Purchase price, installation, maintenance and spares are not included; quote them separately. Motor efficiency assumed 0.90.

Catalogue-based selection support. Final suitability must be confirmed against the full catalogue curves and by a technical review.

RESULT #1 | TD (in-line circulation)

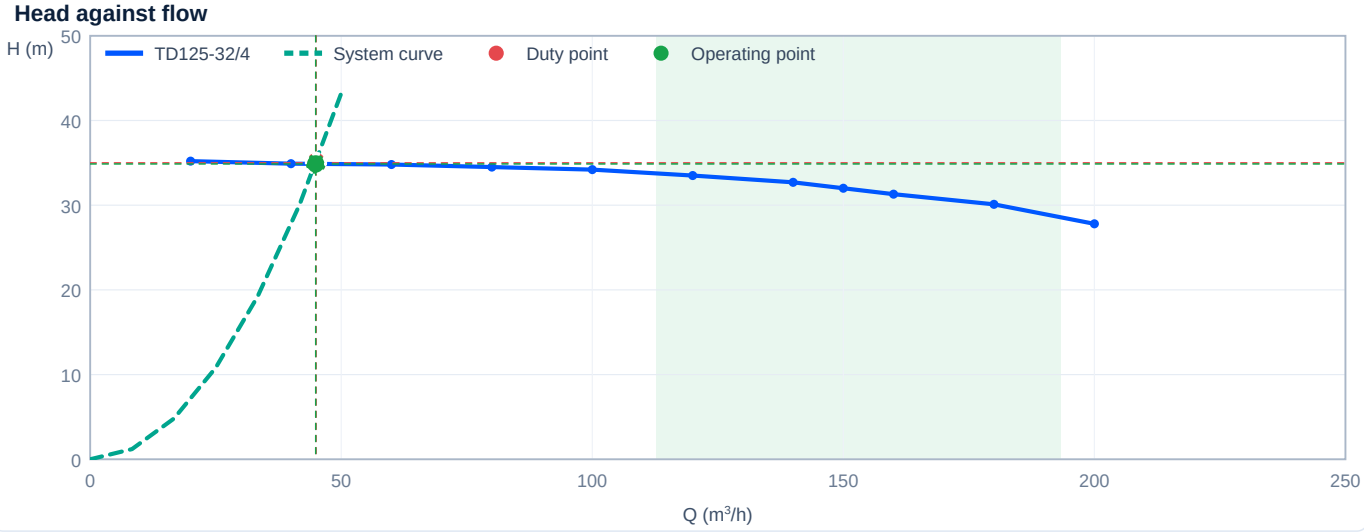
TD125-32/4

60 Hz | 4-pole | source: Performance table, PDF p. 33

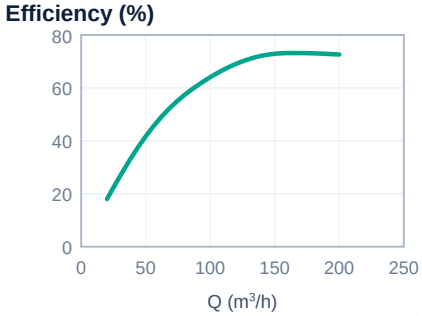
OPERATING POINT	OFFSET FROM DUTY	EFFICIENCY	SHAFT POWER
45.00 m³/h @ 34.9 m	**+0.0 % Q / -0.4 % H**	**38.3 %**	**11.15 kW**

MOTOR	MOTOR LOAD	NPSHR	FLOW VS BEST EFF.
22 kW	**51 %**	**3.5 m**	**28 %**

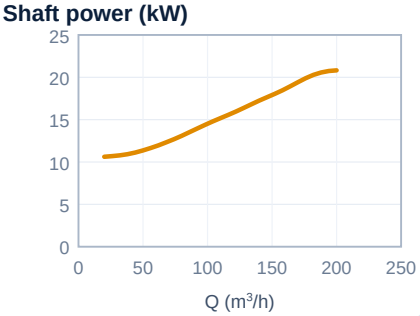
Head against flow



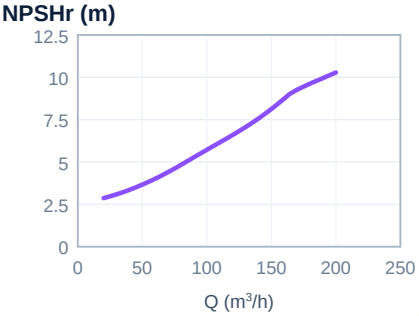
Efficiency (%)



Shaft power (kW)



NPSHr (m)



Efficiency, power and NPSHr: Estimate: blend of the digitized curves of the two nearest sizes.

Shaded band: 70 to 120 % of the best-efficiency flow (preferred operating range).

Checks

Motor check	**51% load (est.)**
NPSH check	**NPSHr 3.5 m (est.)**
Pressure check	**about 3.4 bar at shut-off against 12 bar maximum: OK**
Liquid (Clean Water)	**Suitable**
Electrical	**1~ 220–240 V (small sizes) · 3~ 380–415 V · IP55 · insulation class F**
Weight / length	**356 kg / n/a mm**
Connections	**Flange DN125 (PN16)**
Shut-off head	**35.2 m**
Best-efficiency basis	**estimated curve**

Catalogue-based selection support. Final suitability must be confirmed against the full catalogue curves and by a technical review.

Warnings and cautions

Flow is 28 % of the best-efficiency flow (estimated curve): below the preferred 70–120 % band. Expect lower efficiency, recirculation and more vibration.

Operating point is within 5 % of the shut-off head: avoid continuous running here (heating and recirculation).

Installation notes (from the catalogue)

- Catalogue suction rule: H = Pb × 10.2 - NPSH - Hf - Hv - Hs, with the safety margin Hs at least 0.5 m. NPSHa must exceed NPSHr by at least 0.5 m.
- The catalogue motor ratings hold for an ambient temperature up to 40 °C and an altitude up to 1000 m; above that the motor must be derated or a larger motor used.
- Liquid temperature range -15 to 110 °C.

Wet-end materials

Cast-iron HT200 pump body and head; cast-iron or stainless (304-grade) impeller; carbon / silicon-carbide seal; NBR O-ring.

Running cost

Energy per year	**37,163 kWh**
Energy cost per year	**USD 4,460**
Energy cost over 10 years	**USD 44,596**
Against the lowest-cost pump (SJ30-5)	**+USD 17,050 over 10 years**

Energy = shaft power at the operating point divided by an assumed motor efficiency of 0.90, times running hours (3,000 h/year) and tariff (0.120 per kWh). Maintenance, spares and installation are not included.

Catalogue-based selection support. Final suitability must be confirmed against the full catalogue curves and by a technical review.

RESULT #2 | TD (in-line circulation)

TD80-30/2

60 Hz | 2-pole | source: Performance table, PDF p. 31

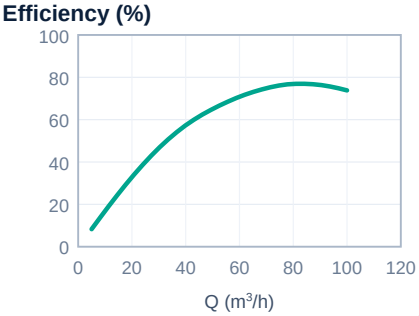
OPERATING POINT	OFFSET FROM DUTY	EFFICIENCY	SHAFT POWER
44.94 m³/h @ 34.8 m	**-0.1 % Q / -0.5 % H**	**61.5 %**	**6.92 kW**

MOTOR	MOTOR LOAD	NPSHR	FLOW VS BEST EFF.
11 kW	**63 %**	**2.0 m**	**54 %**

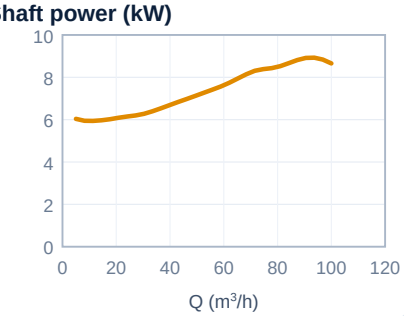
Head against flow



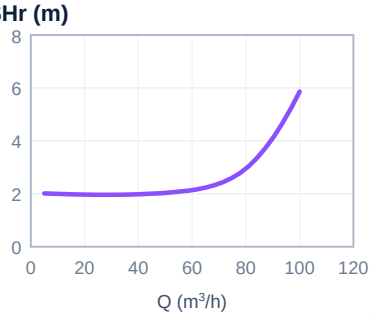
Efficiency (%)



Shaft power (kW)



NPSHr (m)



Efficiency, power and NPSHr: Estimate: blend of the digitized curves of the two nearest sizes.

Shaded band: 70 to 120 % of the best-efficiency flow (preferred operating range).

Checks

Motor check	**63% load (est.)**
NPSH check	**NPSHr 2.0 m (est.)**
Pressure check	**about 3.6 bar at shut-off against 12 bar maximum: OK**
Liquid (Clean Water)	**Suitable**
Electrical	**1~ 220–240 V (small sizes) · 3~ 380–415 V · IP55 · insulation class F**
Weight / length	**194 kg / n/a mm**
Connections	**Flange DN80 (PN16)**
Shut-off head	**36.8 m**
Best-efficiency basis	**estimated curve**

Catalogue-based selection support. Final suitability must be confirmed against the full catalogue curves and by a technical review.

Warnings and cautions

Flow is 54 % of the best-efficiency flow (estimated curve): below the preferred 70–120 % band. Expect lower efficiency, recirculation and more vibration.

Installation notes (from the catalogue)

- Catalogue suction rule: H = Pb × 10.2 - NPSH - Hf - Hv - Hs, with the safety margin Hs at least 0.5 m. NPSHa must exceed NPSHr by at least 0.5 m.
- The catalogue motor ratings hold for an ambient temperature up to 40 °C and an altitude up to 1000 m; above that the motor must be derated or a larger motor used.
- Liquid temperature range -15 to 110 °C.

Wet-end materials

Cast-iron HT200 pump body and head; cast-iron or stainless (304-grade) impeller; carbon / silicon-carbide seal; NBR O-ring.

Running cost

Energy per year	**23,051 kWh**
Energy cost per year	**USD 2,766**
Energy cost over 10 years	**USD 27,662**
Against the lowest-cost pump (SJ30-5)	**+USD 116 over 10 years**

Energy = shaft power at the operating point divided by an assumed motor efficiency of 0.90, times running hours (3,000 h/year) and tariff (0.120 per kWh). Maintenance, spares and installation are not included.

Catalogue-based selection support. Final suitability must be confirmed against the full catalogue curves and by a technical review.

RESULT #3 | SJ (deep-well submersible)

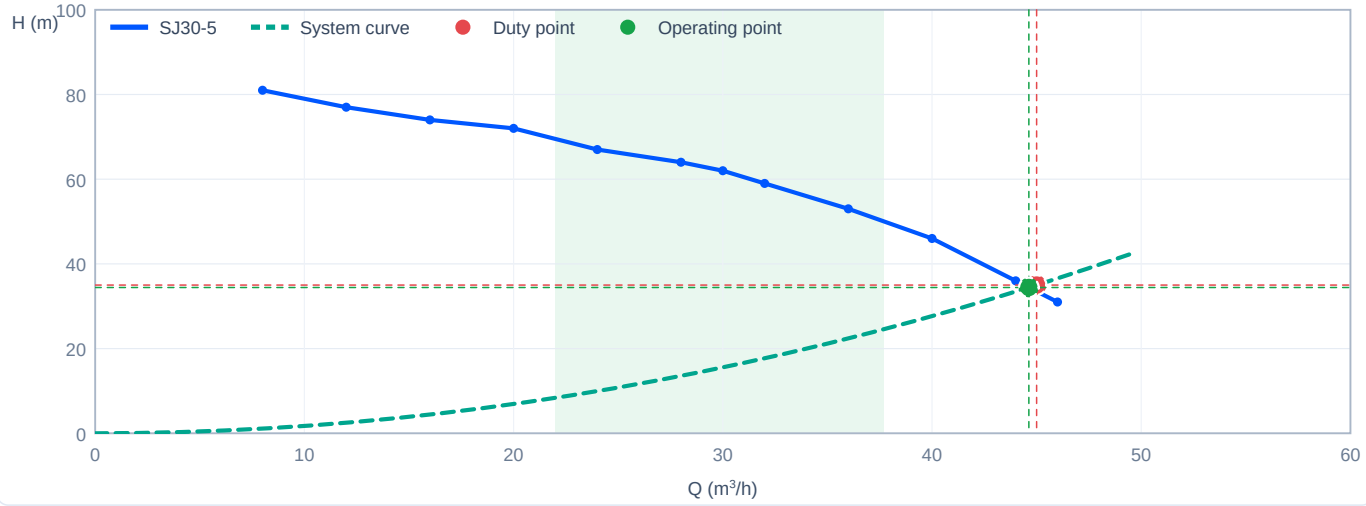
SJ30-5

60 Hz | 2-pole | 5 stages | source: Performance table, SJ 60 Hz size page (PDF p. 11)

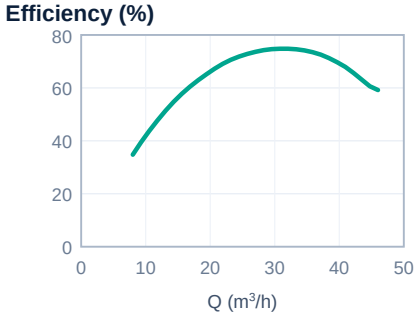
OPERATING POINT	OFFSET FROM DUTY	EFFICIENCY	SHAFT POWER
44.47 m³/h @ 34.8 m	**-1.2 % Q / -0.5 % H**	**61.1 %**	**6.89 kW**

MOTOR	MOTOR LOAD	NPSHR	FLOW VS BEST EFF.
7.5 kW	**92 %**	**7.1 m**	**141 %**

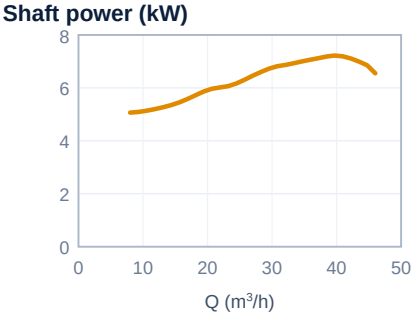
Head against flow



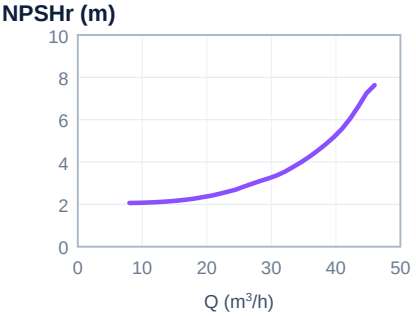
Efficiency (%)



Shaft power (kW)



NPSHr (m)



Efficiency, power and NPSHr: Estimate: blend of the digitized curves of the two nearest sizes.

Shaded band: 70 to 120 % of the best-efficiency flow (preferred operating range).

Checks

Motor check	**92% load (est.)**
NPSH check	**NPSHr 7.1 m (est.)**
Pressure check	**about 7.9 bar at shut-off against 38 bar maximum: OK**
Liquid (Clean Water)	**Suitable**
Electrical	**1~ (0.37–2.2 kW) · 3~ (0.37–7.5 kW and larger)**
Weight / length	**n/a kg / n/a mm**
Connections	**Thread Rp3**
Shut-off head	**81.0 m**
Best-efficiency basis	**estimated curve**

Catalogue-based selection support. Final suitability must be confirmed against the full catalogue curves and by a technical review.

Warnings and cautions

Flow is 141 % of the best-efficiency flow (estimated curve): above the preferred 70–120 % band. Check motor load and NPSH, and expect higher wear.

Installation notes (from the catalogue)

- Submersible with flooded suction; NPSH is not limiting.

Wet-end materials

AISI 304 stainless steel throughout the wet end.

Running cost

Energy per year	**22,954 kWh**
Energy cost per year	**USD 2,755**
Energy cost over 10 years	**USD 27,545**
Position	**Lowest energy cost of the listed pumps**

Energy = shaft power at the operating point divided by an assumed motor efficiency of 0.90, times running hours (3,000 h/year) and tariff (0.120 per kWh). Maintenance, spares and installation are not included.

Neighbouring sizes on your system curve

Model	Direction	Runs at	Efficiency	Shaft kW	Motor
SJ30-4	one stage down	42.7 m^3/h @ 31.5 m (-5 %)	64.7 %	5.64	7.5 kW

Catalogue-based selection support. Final suitability must be confirmed against the full catalogue curves and by a technical review.

RESULT #4 | TD (in-line circulation)

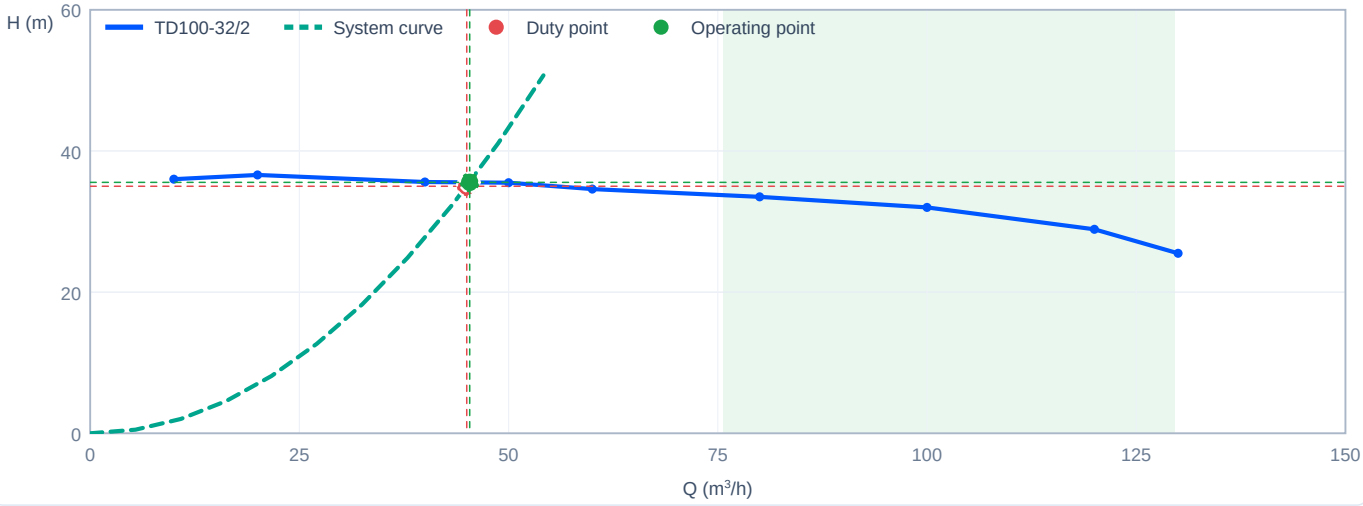
TD100-32/2

60 Hz | 2-pole | source: Performance table, PDF p. 32

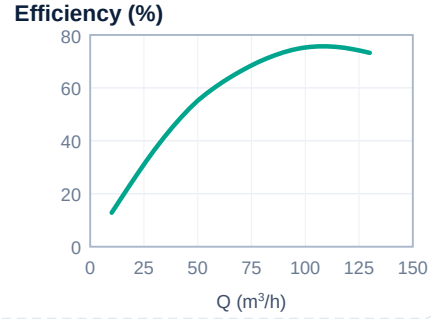
OPERATING POINT	OFFSET FROM DUTY	EFFICIENCY	SHAFT POWER
45.00 m³/h @ 35.6 m	**+0.0 % Q / +1.6 % H**	**51.3 %**	**8.49 kW**

MOTOR	MOTOR LOAD	NPSHR	FLOW VS BEST EFF.
15 kW	**57 %**	**2.7 m**	**42 %**

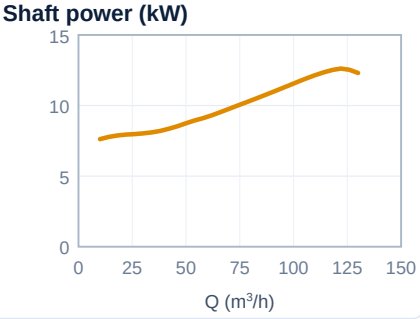
Head against flow



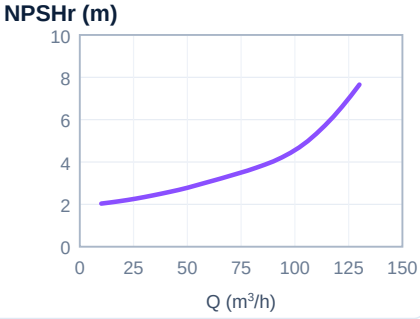
Efficiency (%)



Shaft power (kW)



NPSHr (m)



Efficiency, power and NPSHr: Estimate: blend of the digitized curves of the two nearest sizes.

Shaded band: 70 to 120 % of the best-efficiency flow (preferred operating range).

Checks

Motor check	**57% load (est.)**
NPSH check	**NPSHr 2.7 m (est.)**
Pressure check	**about 3.5 bar at shut-off against 12 bar maximum: OK**
Liquid (Clean Water)	**Suitable**
Electrical	**1~ 220–240 V (small sizes) · 3~ 380–415 V · IP55 · insulation class F**
Weight / length	**207 kg / n/a mm**
Connections	**Flange DN100 (PN16)**
Shut-off head	**36.0 m**
Best-efficiency basis	**estimated curve**

Catalogue-based selection support. Final suitability must be confirmed against the full catalogue curves and by a technical review.

Warnings and cautions

Flow is 42 % of the best-efficiency flow (estimated curve): below the preferred 70–120 % band. Expect lower efficiency, recirculation and more vibration.

Operating point is within 5 % of the shut-off head: avoid continuous running here (heating and recirculation).

Installation notes (from the catalogue)

- Catalogue suction rule: H = Pb × 10.2 - NPSH - Hf - Hv - Hs, with the safety margin Hs at least 0.5 m. NPSHa must exceed NPSHr by at least 0.5 m.
- The catalogue motor ratings hold for an ambient temperature up to 40 °C and an altitude up to 1000 m; above that the motor must be derated or a larger motor used.
- Liquid temperature range -15 to 110 °C.

Wet-end materials

Cast-iron HT200 pump body and head; cast-iron or stainless (304-grade) impeller; carbon / silicon-carbide seal; NBR O-ring.

Running cost

Energy per year	**28,286 kWh**
Energy cost per year	**USD 3,394**
Energy cost over 10 years	**USD 33,943**
Against the lowest-cost pump (SJ30-5)	**+USD 6,398 over 10 years**

Energy = shaft power at the operating point divided by an assumed motor efficiency of 0.90, times running hours (3,000 h/year) and tariff (0.120 per kWh). Maintenance, spares and installation are not included.

Catalogue-based selection support. Final suitability must be confirmed against the full catalogue curves and by a technical review.

RESULT #5 | TD (in-line circulation)

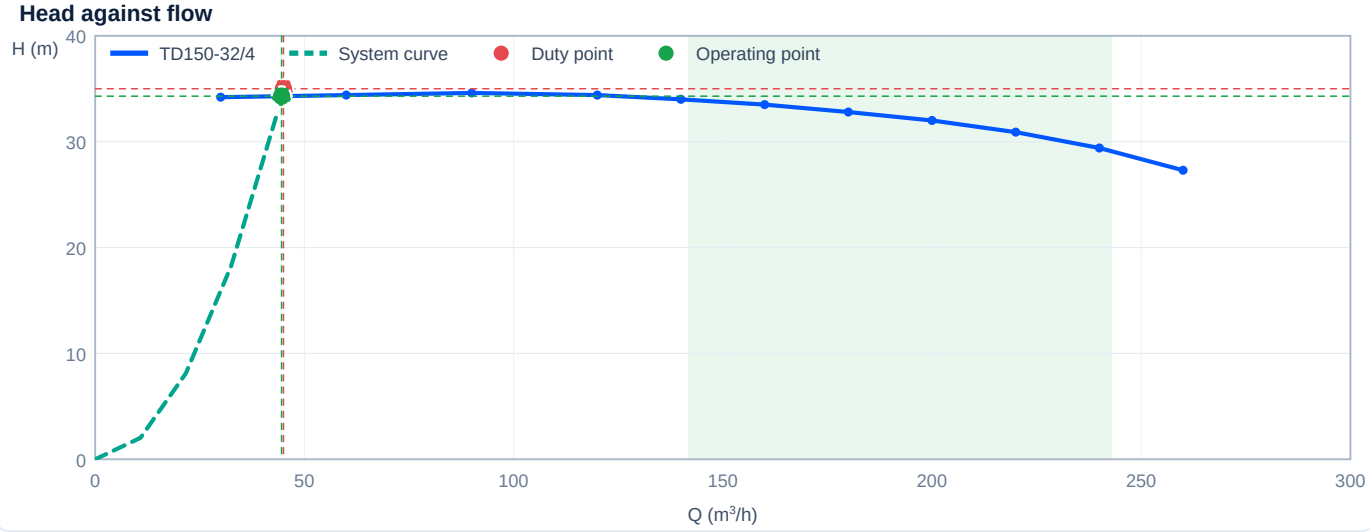
TD150-32/4

60 Hz | 4-pole | source: Performance table, PDF p. 34

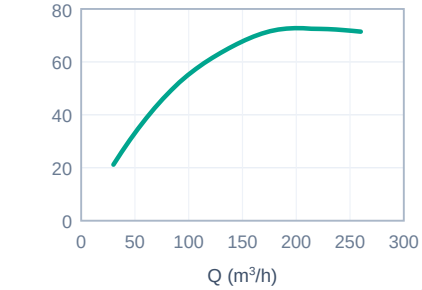
OPERATING POINT	OFFSET FROM DUTY	EFFICIENCY	SHAFT POWER
45.00 m³/h @ 34.3 m	**+0.0 % Q / -2.0 % H**	**30.3 %**	**13.84 kW**

MOTOR	MOTOR LOAD	NPSHR	FLOW VS BEST EFF.
30 kW	**46 %**	**4.6 m**	**22 %**

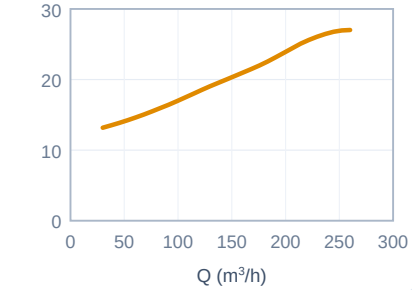
Head against flow



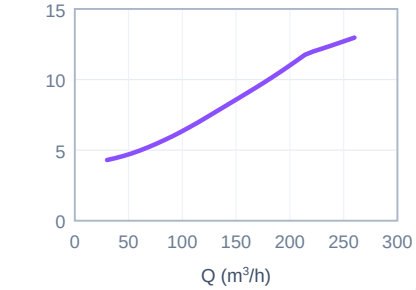
Efficiency (%)



Shaft power (kW)



NPSHr (m)



Efficiency, power and NPSHr: Estimate: blend of the digitized curves of the two nearest sizes.

Shaded band: 70 to 120 % of the best-efficiency flow (preferred operating range).

Checks

Motor check	**46% load (est.)**
NPSH check	**NPSHr 4.6 m (est.)**
Pressure check	**about 3.3 bar at shut-off against 12 bar maximum: OK**
Liquid (Clean Water)	**Suitable**
Electrical	**1~ 220–240 V (small sizes) · 3~ 380–415 V · IP55 · insulation class F**
Weight / length	**403 kg / n/a mm**
Connections	**Flange DN150 (PN16)**
Shut-off head	**34.2 m**
Best-efficiency basis	**estimated curve**

Catalogue-based selection support. Final suitability must be confirmed against the full catalogue curves and by a technical review.

Warnings and cautions

Flow is 22 % of the best-efficiency flow (estimated curve): below the preferred 70–120 % band. Expect lower efficiency, recirculation and more vibration.

Operating point is within 5 % of the shut-off head: avoid continuous running here (heating and recirculation).

Installation notes (from the catalogue)

- Catalogue suction rule: H = Pb × 10.2 - NPSH - Hf - Hv - Hs, with the safety margin Hs at least 0.5 m. NPSHa must exceed NPSHr by at least 0.5 m.
- The catalogue motor ratings hold for an ambient temperature up to 40 °C and an altitude up to 1000 m; above that the motor must be derated or a larger motor used.
- Liquid temperature range -15 to 110 °C.

Wet-end materials

Cast-iron HT200 pump body and head; cast-iron or stainless (304-grade) impeller; carbon / silicon-carbide seal; NBR O-ring.

Running cost

Energy per year	**46,126 kWh**
Energy cost per year	**USD 5,535**
Energy cost over 10 years	**USD 55,352**
Against the lowest-cost pump (SJ30-5)	**+USD 27,806 over 10 years**

Energy = shaft power at the operating point divided by an assumed motor efficiency of 0.90, times running hours (3,000 h/year) and tariff (0.120 per kWh). Maintenance, spares and installation are not included.

Catalogue-based selection support. Final suitability must be confirmed against the full catalogue curves and by a technical review.

Basis, limits and mandatory notes

1. This selection was prepared by our expert engineering team, who carried out the hydraulic calculations and verified the pump data against the manufacturer published performance data as required for this duty. Curves are for clean cold water at the standard test conditions; performance on other liquids, and at other speeds, is corrected only as shown.

2. Acceptance tolerance: GB3216 2016 grade 2B. The pump is selected when its curve passes through the tolerance window around the duty point.

3. Frequency scaling uses the affinity laws (flow proportional to speed, head to speed squared, power to speed cubed). Motor capability is assumed to scale with frequency.

4. NPSH: NPSHa must exceed NPSHr by the margin printed in the catalogue (at least 0.5 m). Where NPSHr is marked as estimated it comes from a typical shape for the series, not a printed chart.

5. Efficiency, shaft power and NPSHr come from catalogue charts where the pump page says so; otherwise they are estimated from the series maximum efficiency and must be confirmed.

6. Maximum working pressure, motor derating (ambient above 40 °C, altitude above 1000 m), liquid temperature and solids limits are checked only where the catalogue prints them.

7. Running cost is energy only: shaft power divided by an assumed motor efficiency of 0.90, multiplied by running hours and tariff. It excludes purchase price, installation, maintenance and spares.

8. This report supports a selection. It is not a performance guarantee. Confirm the final choice against the full catalogue curves, the actual liquid and the installation, and obtain a written quotation from CNP.

Data sources

Pump	Catalogue	Page / table
TD125-32/4	CNP TD in-line circulation pump 60 Hz catalogue (E220402)	Performance table, PDF p. 33
TD80-30/2	CNP TD in-line circulation pump 60 Hz catalogue (E220402)	Performance table, PDF p. 31
SJ30-5	CNP SJ 60 Hz stainless steel deep-well submersible pump catalogue (E180101)	Performance table, SJ 60 Hz size page (PDF p. 11)
TD100-32/2	CNP TD in-line circulation pump 60 Hz catalogue (E220402)	Performance table, PDF p. 32
TD150-32/4	CNP TD in-line circulation pump 60 Hz catalogue (E220402)	Performance table, PDF p. 34

Review and approval

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