PUMP SELECTION REPORT

SAMPLE - RO Plant Feed Pump

8.00 m³/h at 110.0 m total head | 50 Hz | Clean Water

CUSTOMER	REFERENCE	PREPARED	PUMPS FOUND
Sample Water	CNP-S-002	12 Oct 2026	37

Design basis

Duty point	**8.00 m³/h (2.22 l/s) at 110.0 m**
Operating frequency	**50 Hz**
Liquid and conditions	**Clean Water, max 20 °C, 998 kg/m³, 1 cSt; 50 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	**6,000 h/year at 0.100 per kWh, 10 year evaluation**

Recommendation

Closest match to the duty point: CDM5-29 (8.03 m³/h at 110.2 m, +0.3 % flow, +0.2 % head).

Highest efficiency among the listed pumps: CDL10-12 at 65.6 %.

Lowest energy cost: CDL10-12 at USD 2,406 per year (USD 24,058 over 10 years).

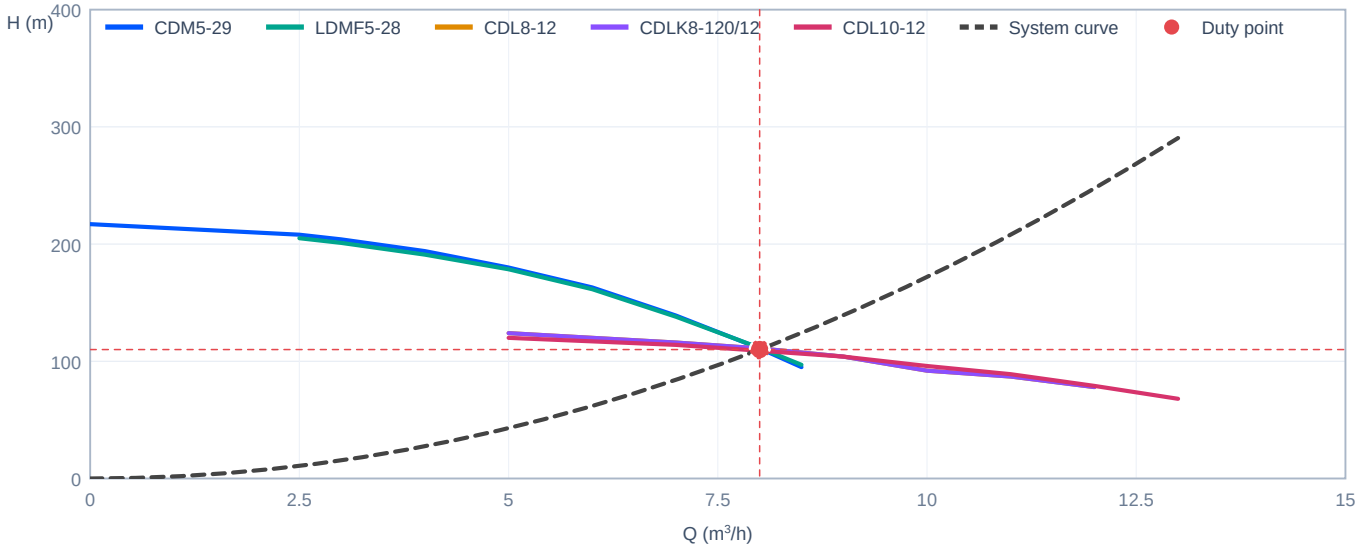
4 warnings across the listed pumps; read the pump pages before choosing.

Matching pumps

#	Model	Operating point	Offset	Eff. %	Shaft kW	Motor	NPSH	Cost/yr
1	CDM5-29	8.0 m³/h @ 110.2 m	+0.3% Q / +0.2% H	58.4	4.12	5.5 kW	NPSHr 2.3 m	USD 2,745
2	LDMF5-28	8.0 m³/h @ 110.3 m	+0.6% Q / +0.2% H	58.5	4.12	4 kW	NPSHr 2.0 m	USD 2,746
3	CDL8-12	8.0 m³/h @ 110.9 m	+0.3% Q / +0.8% H	61.6	3.92	4 kW	NPSHr 1.8 m (est.)	USD 2,616
4	CDLK8-120/12	8.0 m³/h @ 110.9 m	+0.3% Q / +0.8% H	61.6	3.92	4 kW	NPSHr 1.8 m (est.)	USD 2,616
5	CDL10-12	8.0 m³/h @ 109.1 m	-0.3% Q / -0.8% H	65.6	3.61	4 kW	NPSHr 1.7 m (est.)	USD 2,406

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
CDM5-29	4.12	27,447	USD 2,745	USD 27,447	+USD 3,389
LDMF5-28	4.12	27,459	USD 2,746	USD 27,459	+USD 3,402
CDL8-12	3.92	26,160	USD 2,616	USD 26,160	+USD 2,102
CDLK8-120/12	3.92	26,160	USD 2,616	USD 26,160	+USD 2,102
CDL10-12	3.61	24,058	USD 2,406	USD 24,058	lowest

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 | CDM / CDMF

CDM5-29

50 Hz | 2-pole | 29 stages | source: Performance table printed p. 15; dimensions p. 38

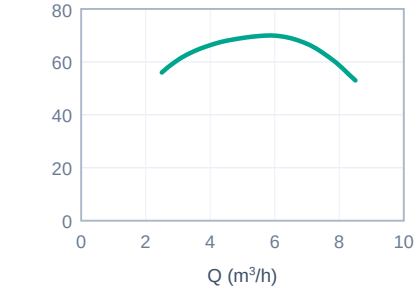
OPERATING POINT	OFFSET FROM DUTY	EFFICIENCY	SHAFT POWER
8.03 m³/h @ 110.2 m	**+0.3 % Q / +0.2 % H**	**58.4 %**	**4.12 kW**

MOTOR	MOTOR LOAD	NPSHR	FLOW VS BEST EFF.
5.5 kW	**75 %**	**2.3 m**	**136 %**

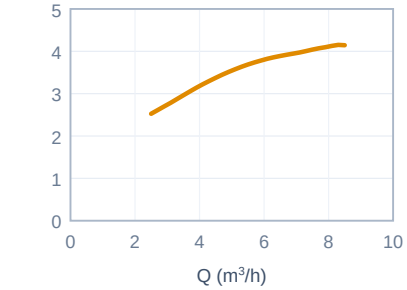
Head against flow



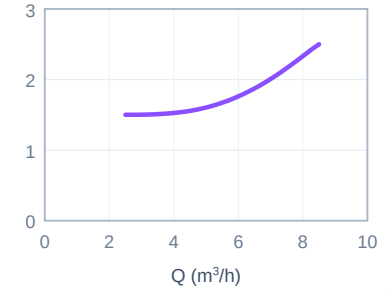
Efficiency (%)



Shaft power (kW)



NPSHr (m)



Efficiency, power and NPSHr: Digitized from the catalogue chart of this pump.

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

Checks

Motor check	**75% load**
NPSH check	**NPSHr 2.3 m**
Pressure check	**about 21.2 bar at shut-off against 16 bar maximum: ABOVE the limit**
Liquid (Clean Water)	**Suitable**
Electrical	**1~ 200–240 V (small sizes) · 3~ 380–415 V · IP55 · insulation class F**
Weight / length	**87 kg / 1,500 mm**
Connections	**DIN flange DN32**
Shut-off head	**217.0 m**
Best-efficiency basis	**efficiency 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 136 % of the best-efficiency flow (efficiency curve): above the preferred 70–120 % band. Check motor load and NPSH, and expect higher wear.

Pressure check: inlet 0.0 bar + shut-off head gives about 21.2 bar, above the 16 bar maximum working pressure of this family. Choose a higher-rated version or a different pump.

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.

Wet-end materials

Cast-iron pump head and chambers; AISI 304 stainless impellers and diffusers; tungsten-carbide / carbon mechanical seal.

Running cost

Energy per year	**27,447 kWh**
Energy cost per year	**USD 2,745**
Energy cost over 10 years	**USD 27,447**
Against the lowest-cost pump (CDL10-12)	**+USD 3,389 over 10 years**

Energy = shaft power at the operating point divided by an assumed motor efficiency of 0.90, times running hours (6,000 h/year) and tariff (0.100 per kWh). Maintenance, spares and installation are not included.

Neighbouring sizes on your system curve

Model	Direction	Runs at	Efficiency	Shaft kW	Motor
CDM5-28	one stage down	7.9 m^3/h @ 107.5 m (-1 %)	59.7 %	3.88	4.0 kW
CDM5-30	one stage up	8.1 m^3/h @ 112.3 m (+1 %)	57.8 %	4.27	5.5 kW

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

RESULT #2 | LDMF (hot water)

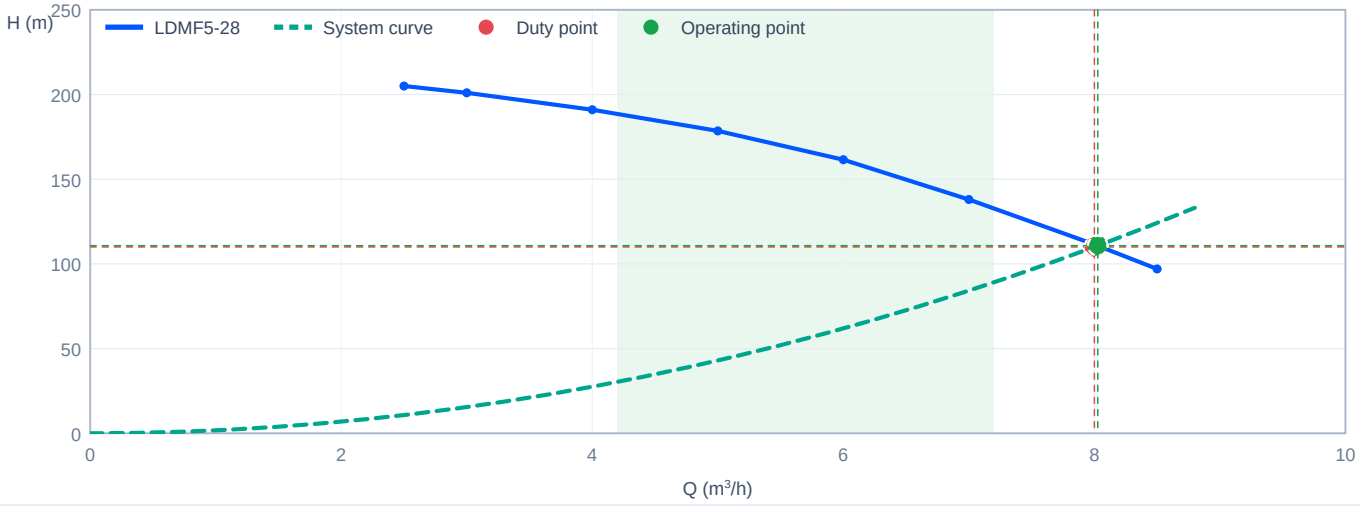
LDMF5-28

50 Hz | 2-pole | 28 stages | source: Performance table printed p. 10; dimensions p. 5

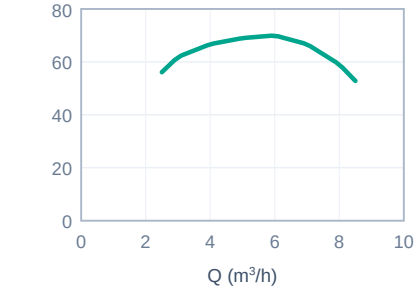
OPERATING POINT	OFFSET FROM DUTY	EFFICIENCY	SHAFT POWER
8.04 m³/h @ 110.3 m	**+0.6 % Q / +0.2 % H**	**58.5 %**	**4.12 kW**

MOTOR	MOTOR LOAD	NPSHR	FLOW VS BEST EFF.
4 kW	**103 %**	**2.0 m**	**134 %**

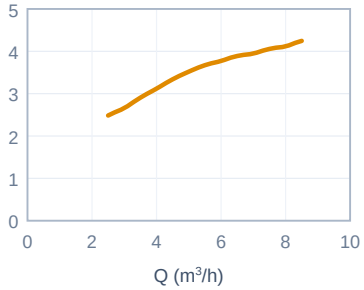
Head against flow



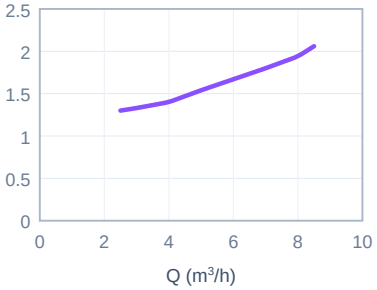
Efficiency (%)



Shaft power (kW)



NPSHr (m)



Efficiency, power and NPSHr: Read by hand from the scanned catalogue chart of this pump.

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

Checks

Motor check	**103% load**
NPSH check	**NPSHr 2.0 m**
Pressure check	**about 20.1 bar at shut-off against 24 bar maximum: OK**
Liquid (Clean Water)	**Suitable**
Electrical	**1~ 220 V · 3~ 220/380 V or 380 V · IP55 · insulation class F**
Weight / length	**62 kg / 1,356 mm**
Connections	**Flange DN32 / cutting ferrule DN32 / pipe thread R1¼ / oval flange G1¼**
Shut-off head	**205.0 m**
Best-efficiency basis	**efficiency 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 134 % of the best-efficiency flow (efficiency curve): above the preferred 70–120 % band. Check motor load and NPSH, and expect higher wear.

At that operating point the motor load is 103 %: overload risk.

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.

Wet-end materials

Cast-iron pump head with AISI 304 stainless lining, chambers and hydraulics; tungsten-carbide / graphite mechanical seals.

Running cost

Energy per year	**27,459 kWh**
Energy cost per year	**USD 2,746**
Energy cost over 10 years	**USD 27,459**
Against the lowest-cost pump (CDL10-12)	**+USD 3,402 over 10 years**

Energy = shaft power at the operating point divided by an assumed motor efficiency of 0.90, times running hours (6,000 h/year) and tariff (0.100 per kWh). Maintenance, spares and installation are not included.

Neighbouring sizes on your system curve

Model	Direction	Runs at	Efficiency	Shaft kW	Motor
LDMF5-27	one stage down	8.0 m^3/h @ 108.7 m (-1 %)	59.4 %	3.96	4.0 kW
LDMF5-29	one stage up	8.1 m^3/h @ 113.6 m (+2 %)	57.5 %	4.37	5.5 kW

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

RESULT #3 | CDL / CDLF

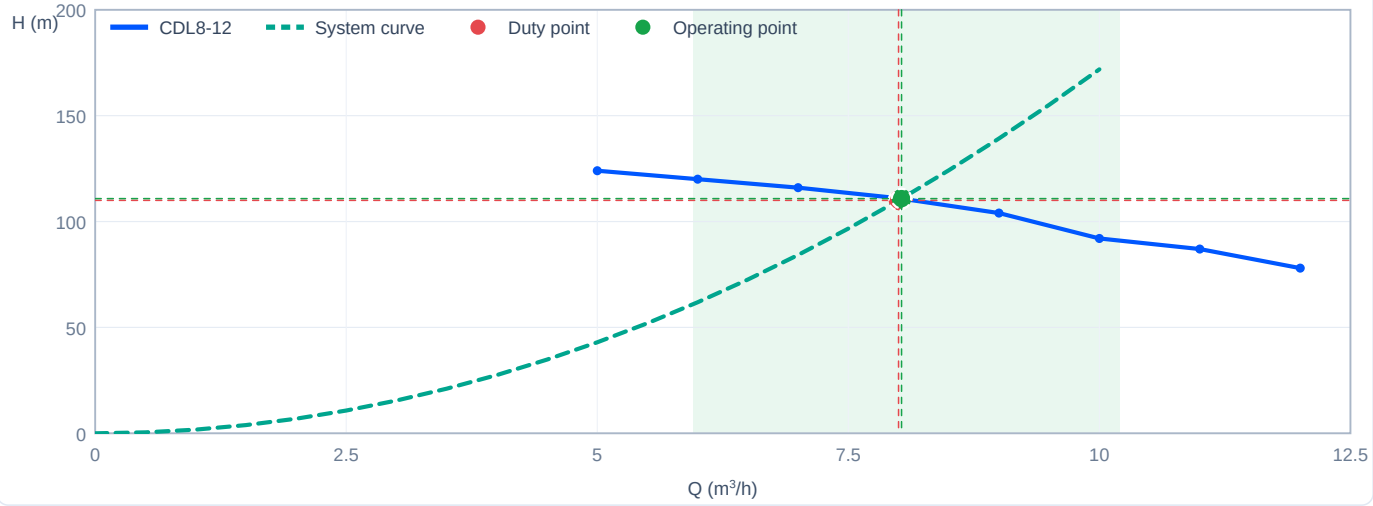
CDL8-12

50 Hz | 2-pole | 12 stages | source: Performance table, printed pp. 21–22

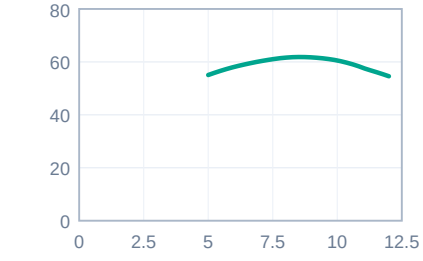
OPERATING POINT	OFFSET FROM DUTY	EFFICIENCY	SHAFT POWER
8.02 m³/h @ 110.9 m	**+0.3 % Q / +0.8 % H**	**61.6 %**	**3.92 kW**

MOTOR	MOTOR LOAD	NPSHR	FLOW VS BEST EFF.
4 kW	**98 %**	**1.8 m**	**94 %**

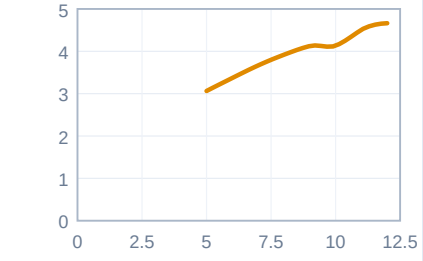
Head against flow



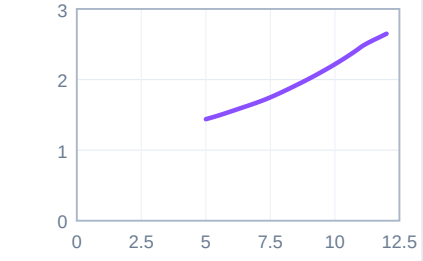
Efficiency (%)



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	**98% load (est.)**
NPSH check	**NPSHr 1.8 m (est.)**
Pressure check	**about 12.1 bar at shut-off against 16 bar maximum: OK**
Liquid (Clean Water)	**Suitable**
Electrical	**1~ 220–240 V (small sizes) · 3~ 380–415 V · IP55 · insulation class F**
Weight / length	**70 kg / 1,022 mm**
Connections	**Flange DN40**
Shut-off head	**124.0 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.

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.

Wet-end materials

Cast-iron pump head and base; AISI 304 stainless impellers, diffusers and sleeves; AISI 304/316L shaft; tungsten-carbide bearings.

Running cost

Energy per year	**26,160 kWh**
Energy cost per year	**USD 2,616**
Energy cost over 10 years	**USD 26,160**
Against the lowest-cost pump (CDL10-12)	**+USD 2,102 over 10 years**

Energy = shaft power at the operating point divided by an assumed motor efficiency of 0.90, times running hours (6,000 h/year) and tariff (0.100 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 #4 | CDLK / CDLKF (immersion)

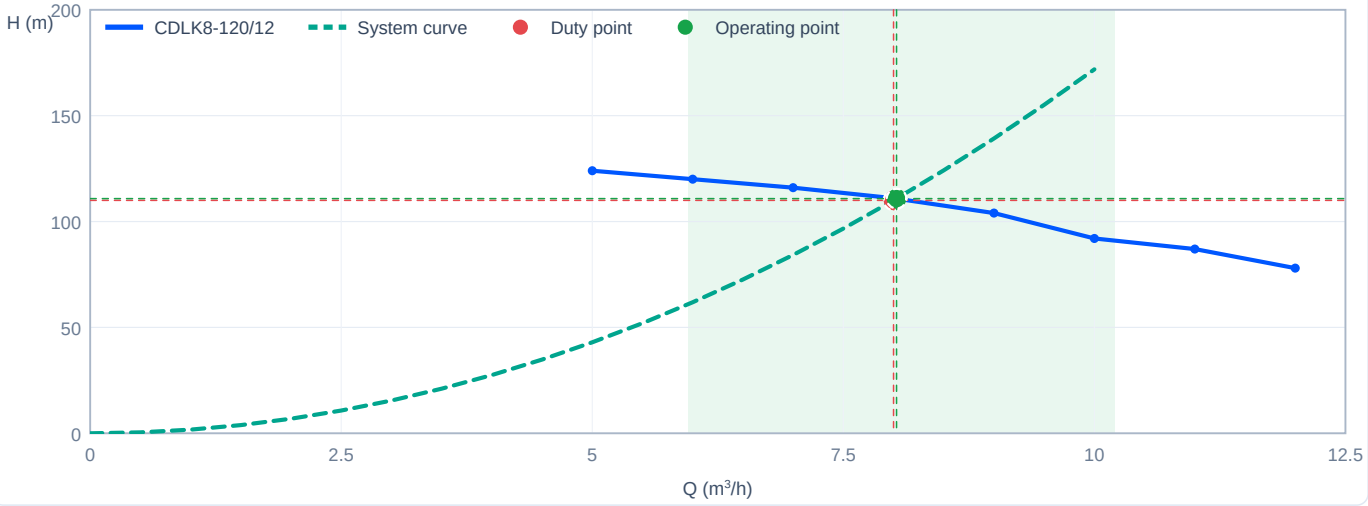
CDLK8-120/12

50 Hz | 2-pole | 12 stages | source: Performance table, printed pp. 21–22

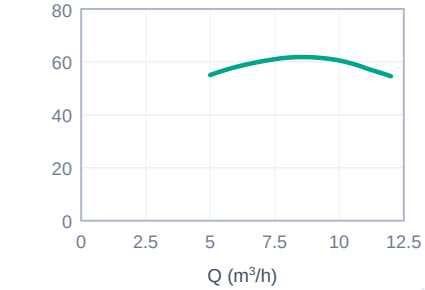
OPERATING POINT	OFFSET FROM DUTY	EFFICIENCY	SHAFT POWER
8.02 m³/h @ 110.9 m	**+0.3 % Q / +0.8 % H**	**61.6 %**	**3.92 kW**

MOTOR	MOTOR LOAD	NPSHR	FLOW VS BEST EFF.
4 kW	**98 %**	**1.8 m**	**94 %**

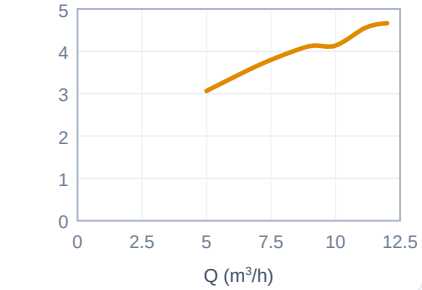
Head against flow



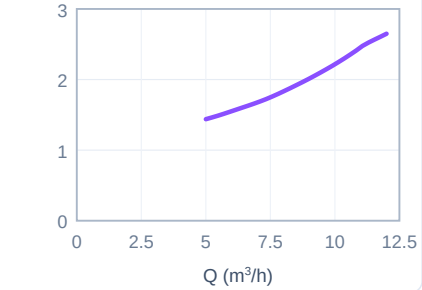
Efficiency (%)



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	**98% load (est.)**
NPSH check	**NPSHr 1.8 m (est.)**
Pressure check	**about 12.1 bar at shut-off against 21 bar maximum: OK**
Liquid (Clean Water)	**Suitable**
Electrical	**1~ 220–240 V (0.37–2.2 kW) · 3~ 380–415 V · IP55 · insulation class F**
Weight / length	**54 kg / 935 mm**
Connections	**Thread G2"**
Shut-off head	**124.0 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.

Installation notes (from the catalogue)

- 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.
- Motor protector (dry running, phase loss, overload) is available on request. Choose the immersion length B and a cavity body to match the tank depth.

Wet-end materials

AISI 304 stainless impellers, diffusers and suction head; AISI 316 shaft.

Running cost

Energy per year	**26,160 kWh**
Energy cost per year	**USD 2,616**
Energy cost over 10 years	**USD 26,160**
Against the lowest-cost pump (CDL10-12)	**+USD 2,102 over 10 years**

Energy = shaft power at the operating point divided by an assumed motor efficiency of 0.90, times running hours (6,000 h/year) and tariff (0.100 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 | CDL / CDLF

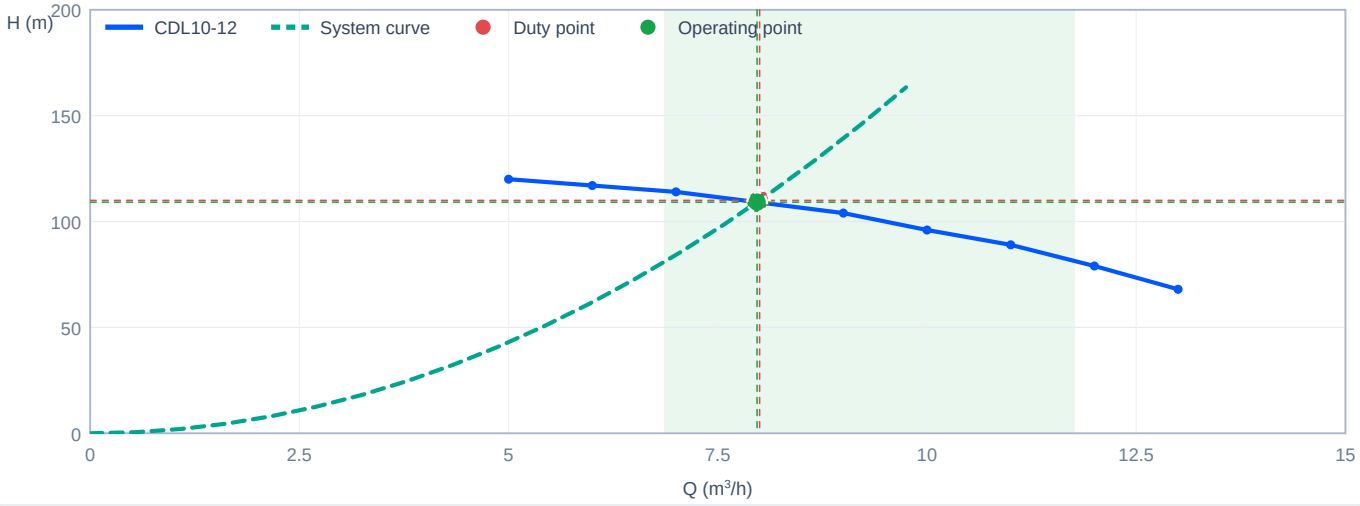
CDL10-12

50 Hz | 2-pole | 12 stages | source: Performance table, printed pp. 23–24

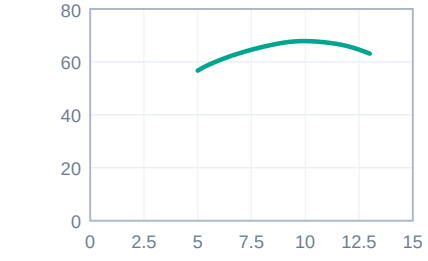
OPERATING POINT	OFFSET FROM DUTY	EFFICIENCY	SHAFT POWER
7.98 m³/h @ 109.1 m	**-0.3 % Q / -0.8 % H**	**65.6 %**	**3.61 kW**

MOTOR	MOTOR LOAD	NPSHR	FLOW VS BEST EFF.
4 kW	**90 %**	**1.7 m**	**81 %**

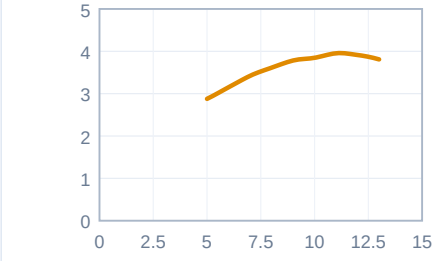
Head against flow



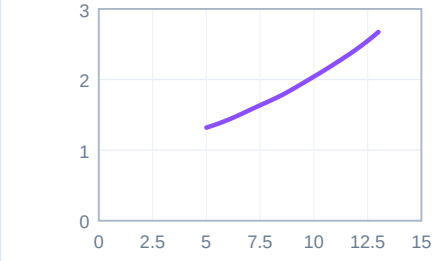
Efficiency (%)



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	**90% load (est.)**
NPSH check	**NPSHr 1.7 m (est.)**
Pressure check	**about 11.7 bar at shut-off against 25 bar maximum: OK**
Liquid (Clean Water)	**Suitable**
Electrical	**1~ 220–240 V (small sizes) · 3~ 380–415 V · IP55 · insulation class F**
Weight / length	**76 kg / 1,022 mm**
Connections	**Flange DN40**
Shut-off head	**120.0 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.

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.

Wet-end materials

Cast-iron pump head and base; AISI 304 stainless impellers, diffusers and sleeves; AISI 304/316L shaft; tungsten-carbide bearings.

Running cost

Energy per year	**24,058 kWh**
Energy cost per year	**USD 2,406**
Energy cost over 10 years	**USD 24,058**
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 (6,000 h/year) and tariff (0.100 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
CDM5-29	CNP CDM/CDMF 50 Hz light vertical multistage pump catalogue (E210603)	Performance table printed p. 15; dimensions p. 38
LDMF5-28	CNP LDMF 50 Hz low-NPSH vertical multistage centrifugal pump catalogue (E200601)	Performance table printed p. 10; dimensions p. 5
CDL8-12	CNP CDL/CDLF 50 Hz catalogue (E220813)	Performance table, printed pp. 21–22
CDLK8-120/12	CNP CDLK/CDLKF 50 Hz immersion-pump catalogue (E190909)	Performance table, printed pp. 21–22
CDL10-12	CNP CDL/CDLF 50 Hz catalogue (E220813)	Performance table, printed pp. 23–24

Review and approval

Prepared by

Name, signature, date

Checked by

Name, signature, date

Approved by

Name, signature, date