

INSTALLATION AND USER'S GUIDE

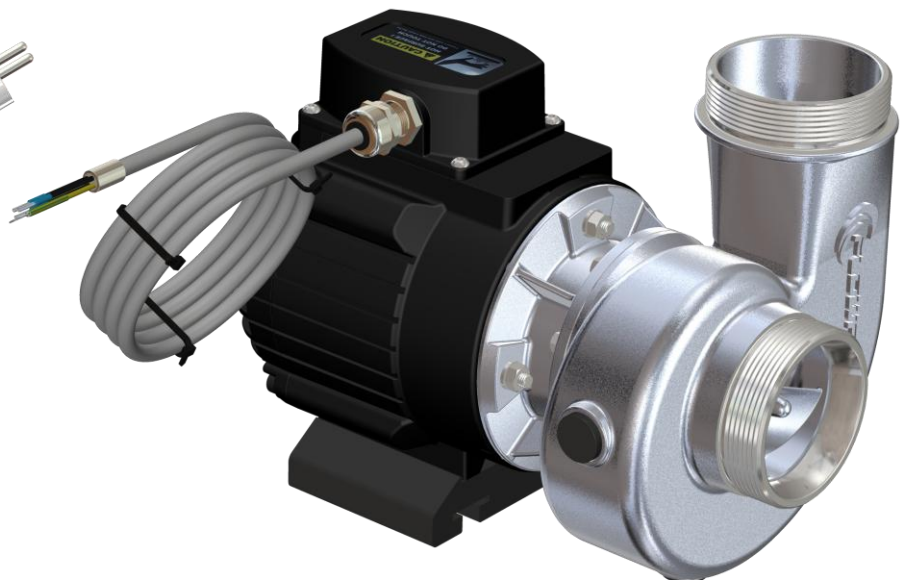


IMPORTANT SAFETY INSTRUCTIONS
 READ AND FOLLOW ALL INSTRUCTIONS
 SAVE THIS INSTRUCTIONS



FLOWFRIEND® - JUNIOR

HIGH EFFICIENCY WATER PUMPS
 HIGH FLOW – MEDIUM HEAD



Jos Huttenhuis	15.01.2026	Version 2.0 – Minor changes – FlowFriend logo changed
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1. Introduction

Congratulations on purchasing your FlowFriend® water pump. You have chosen a product designed for maximum efficiency, reliability, and durability.

This manual provides all the information needed to:

- install the pump safely,
- operate it correctly,
- maintain it properly,
- and troubleshoot possible malfunctions.

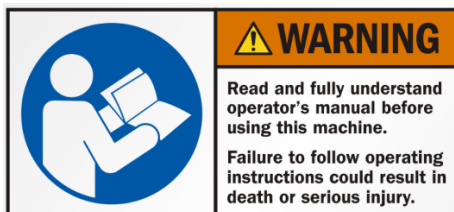
All FlowFriend® products are subject to the general terms and conditions of Stiloh B.V.

1.1 Target Group

This manual is intended for users, installers, maintenance technicians, and service partners. Anyone working with this product must read and fully understand this manual.

1.2 Important Safety Information

- Read the entire manual before installation and operation.
- Failure to follow the instructions may result in serious injury or damage.
- Children under 16 and persons lacking the ability or knowledge to assess risks must not use the pump.
- Improper use or deviation from the described procedures voids the warranty.
- The pump may only be used for its intended purpose.
- The manufacturer accepts no liability for misuse.
- Electricity and water can be a dangerous combination—handle with care during installation.



1.3 Responsibility

The user, installer, and maintenance technician are responsible for following all instructions and safety measures. The manufacturer cannot be held liable for damage or injury resulting from improper use or installation.

2. Defects, Liability, and Legal Notice

2.1 Product Responsibility and Scope

Stiloh B.V. guarantees that the delivered product meets the specifications stated in the official documentation at the time of transfer to the customer.

Minor variations in appearance or design that do not affect the intended function are excluded from warranty.

Only written specifications issued by Stiloh B.V. are binding. Any verbal information or advertising claims are not legally valid unless confirmed in writing by Stiloh B.V.

If the product is used for purposes other than those intended, the customer is fully responsible for verifying suitability. Stiloh B.V. accepts no liability for such use unless explicitly confirmed in writing.

Unauthorized modifications void all warranty rights. Users are solely responsible for correct installation, operation, and maintenance. Stiloh B.V. accepts no liability for damage or injury resulting from improper installation, misuse, or inadequate maintenance. Damage caused by lime deposits, sand, or other foreign particles is excluded from warranty coverage.

2.2 Warranty Coverage and Exclusions

For **business customers (B2B)**, the warranty is limited to repair or replacement of defective components, at Stiloh's discretion. If correction is not possible, the customer may withdraw from the contract.

For **consumers (B2C)**, the product is covered by a statutory two-year warranty period under EU law, starting from the date of delivery. During this period, any defect existing at delivery will be repaired or replaced free of charge, unless the defect results from misuse or external damage.

The warranty applies only to the product itself and does not extend to consequential or indirect damage such as flooding, livestock loss, or downtime. This exclusion does not apply in cases of intent or gross negligence by Stiloh B.V., or where prohibited by law.

2.3 Inspection and Reporting of Defects

The customer must inspect the goods immediately upon receipt. Any visible or transport damage must be reported to both the carrier and Stiloh B.V. within 24 hours.

Hidden defects must be reported as soon as they are discovered. Failure to report defects in time may result in loss of warranty rights.

2.4 Improper Use and Wear

Stiloh B.V. is not liable for damage caused by improper use, incorrect operation, insufficient maintenance, or unauthorized modifications.

Normal wear and tear and damage caused by thermal, chemical, or electrical influences are not covered by warranty.

2.5 Returns and Transport

When returning a product, the customer must ensure proper and protective packaging. Any damage during transport due to inadequate packaging is the sender's responsibility.

2.6 Claims and Limitation Period

For business customers, claims expire one year after delivery, except where prohibited by law (e.g., fraud, gross negligence, or personal injury).

For consumers, statutory limitation periods apply as provided by national and EU law.

If investigation shows that a reported defect resulted from misuse or negligence, Stiloh B.V. may charge reasonable costs for inspection and handling.

2.7 Spare Parts Availability

Replacement parts will be available for at least five (5) years after the date of product delivery, at prices published on Stiloh's website.

2.8 Product Modifications

Stiloh B.V. reserves the right to modify product design, specifications, or performance without prior notice, provided these changes do not affect the product's essential function or compliance with declared specifications.

2.9 Governing Law and Jurisdiction

These terms are governed by the laws of the Netherlands.

Any disputes shall be submitted to the competent court in the district of Overijssel (Netherlands), unless mandatory EU consumer protection law grants another jurisdiction to the consumer.

2.10 Possible Situations, Causes, and Effects (example table)

The following example situations are not covered by warranty

Situation	Example	Consequence
Dry running	Starting without a filled pump	Damage to impeller, bearings, and mechanical seal surfaces
Freezing	Storage or operation in freezing conditions	Cracks in pump housing or piping
Contaminated water	Sand, gravel, lime, or aggressive chemicals	Premature wear or damage
Incorrect electrical connection	Wrong voltage, frequency, or missing grounding	Electronic failure, safety hazards
Insufficient maintenance	No cleaning of impeller or seal	Reduced capacity, poor efficiency, overheating
Incorrect installation or setup	Excessive bends or varying pipe diameters	Flow resistance causing overload
Unauthorized modifications	Use of non-original parts	Warranty void
Unqualified personnel	—	Warranty void
Operation outside working range	NPSHa (available) must exceed NPSHr (required)	Cavitation damage
Overheating	Direct sunlight, poor ventilation, to high pump speed	Damage of electronics

3.0 General Information

The FlowFriend® pump is designed for reliable, energy-efficient operation in various water circulation and filtration systems.

All components are manufactured to high quality standards and comply with general EMC requirements for household and similar environments.

Installation, operation, and maintenance must always be performed according to this manual. Incorrect handling, improper installation, or use outside the specified limits may cause damage and void the warranty.

3.1 Description

High-efficiency, electronically controlled water pump built for long service life and a wide range of applications.

The High-End FlowFriend Junior – HFP 70 is a true powerhouse, far ahead of its time and unmatched in proven performance, efficiency, and reliability.

It's advanced mixed-flow hydraulics enable the transfer of large water volumes at medium head with exceptionally low energy consumption.

Built like a tank, using precision-cast and machined stainless-steel components for outstanding durability and performance.

The pump easily handles particles up to 5 mm without clogging.

Designed for sustainability, it features replaceable components for easy repair and reduced environmental impact.

The perfect choice where reliability is essential—proven technology with thousands of units operating worldwide.

3.2 Safety Warnings








- Installation and maintenance must be carried out by qualified personnel only.
- Disconnect the power supply before performing any work.
- Do not touch the water while the pump is connected to power.
- Use a grounded outlet protected by a residual current device (max. 30 mA).
- Use only suitable, approved cables and accessories.
- Never pull the pump by its cable; keep cables dry and protected from heat or sharp edges.
- Do not open the pump housing or control electronics—service must be performed by authorized technicians only.

3.3 Symbols Used

Below are the main symbols and their meanings.

These symbols indicate important information, attention, or potential hazards.

Familiarize yourself with them before proceeding with this manual.

	WARNING – Risk of Serious Injury
	ELECTRICAL HAZARD – Risk of Severe Electric Shock
	MOVING PARTS – Risk of Entanglement or Cutting Injury
	HOT SURFACE – Risk of Burns
	INFORMATION – Important Tips
	PROHIBITED – Actions Not Allowed
	FROST HAZARD – Risk of Freezing and Component Damage

4.0 Applications

Never use the pump with any liquids **other** than water.

FlowFriend pumps are designed for pumping fresh water. They can handle clean and moderately contaminated water but are **not suitable for large particles**.

Maximum particle size: **5-6 mm**. In general, the pump should only be used for **clean-water applications**, meaning water free of solids that could damage the impeller, bearings, carbon ring, or pump housing.

Examples of unsuitable substances include:

- Sand
- Lime deposits
- Residues from potassium permanganate treatments (e.g., in ponds)

Damage caused by such contamination is **not covered by warranty**.

FlowFriend pumps are mainly used in **filtration or recirculation systems** (aquariums, ponds, breeding systems, and swimming pools), **industrial circulation systems**, and **streams or waterfalls**.
The pump is **not self-priming** and it is not recommended to **install the pump above the water level**.

Limitations:

Water temperature: 2–40 °C

Ambient temperature: 0–40 °C

Maximum static pressure: 2 bar

Motor protection class: IP67 – (maximum 2 hours on 1 meter depth)

VSD protection class: IP66



Protect the pump and VSD from direct sunlight and rain.

Always install the pump under a shelter or cover.

Direct sunlight and rain can overload and cause irreversible damage to the pump.

Ensure proper ventilation for pump and VSD.

Due to cooling requirements, the VSD must never be used in a horizontal position.

Avoid to high pump speed.

4.1 Industrial Applications

Cooling Water / Heating HVAC: Water is used extensively in industries for cooling and heating purposes. In HVAC systems, water circulates through heat exchangers to maintain optimal temperatures. Cooling towers often rely on water circulation to dissipate heat.

Water Supply: Industrial facilities rely on a steady supply of water for their operations, including process cooling, cleaning, and manufacturing.

Pressure Increase: Water circulation systems are often used to increase pressure for industrial processes, such as in pumps or pressurized systems.

4.2 Water Features

Waterfalls, Streams, Fountains: In landscaping and decorative architecture, water circulation is used to power water features like waterfalls, streams, and fountains. These systems often rely on pumps to circulate water continuously.

4.3 Sanitary Water Use

Sanitary Water Systems: In residential or commercial buildings, water circulation ensures that sanitary water is delivered to faucets, showers, and toilets.

4.4 Swimming Pools and swimming Ponds

Swimming Pools: Water circulation in swimming pools helps maintain cleanliness and temperature.

Filtration systems circulate the water through filters to remove debris, and pumps keep the water moving to avoid stagnation.

Swimming Ponds: Similar to swimming pools, swimming ponds use circulation systems for water quality management. They often incorporate biological filters to maintain the ecosystem.

4.5 Aeration

Aeration Systems: Used in various applications like wastewater treatment or aquaculture, aeration ensures the water has enough oxygen to support aquatic life and promote microbial digestion of organic waste.

4.6 Agriculture

Water Circulation for Irrigation: In agriculture, water circulation is crucial for irrigation systems. It ensures water reaches plants evenly, whether through drip irrigation, sprinklers, or canals.

4.7 Livestock and Zoos

Water Circulation for Livestock: Livestock require fresh, clean water for hydration and health. Circulation systems help maintain water quality in troughs, tanks, and reservoirs.

Zoos: In zoo environments, water circulation is often part of habitat design for animals that need aquatic environments, such as fish, amphibians, or aquatic mammals.

4.8 Aquaculture

Aquaculture Filtration Systems:

Bead Filter: A type of mechanical filtration used in aquaculture to remove suspended solids.

Trickle Filter: A biological filter that provides a large surface area for beneficial bacteria to grow, converting toxic substances like ammonia into less harmful compounds.

Drum Filter: A rotating filter that captures particles from the water by using a mesh drum.

Multi-chamber Filter: A filtration system with multiple chambers that can handle both mechanical and biological filtration to maintain water quality.

Belt Filter: Used for continuous filtration of larger quantities of water, often employed in industrial-scale aquaculture systems.

4.9 Fish Ponds

Fishpond Circulation Systems: Maintaining water circulation in fishponds is essential to keep oxygen levels high and remove waste products. Aeration, filtration, and regular water movement are key components of pond management to ensure a healthy environment for fish.

4.10 Aquaponics

Aquaponics is a sustainable agricultural method that combines aquaculture (fish farming) and hydroponics (soil-less plant cultivation) in a closed-loop system. Fish waste provides organic nutrients for plants, while plants naturally filter and purify the water, which is recirculated back to the fish tank. This system conserves water, reduces the need for chemical fertilizers, and allows for the simultaneous production of both crops and fish, making it an efficient and environmentally friendly method of food production.

These systems rely on pumps, filters, and often energy-efficient technology to ensure that water is continuously circulated, ensuring it stays clean, healthy, and properly managed for both industrial and recreational uses. Would you like to dive deeper into any of these specific applications? Don't hesitate and contact us.

5.0 Features

Highly efficient	PMSM motor and high-tech hydraulics, very high efficiency even on low speeds
Low noise (fanless)	Extreme quietly operation
Precision casted Stainless steel	Robust, no bending due to tension in the piping Easy control: By display or external devices using optional accessories.
Built to last	Reliable pump construction, build like a tank
Optimized hydraulics	Using state of art CFD (Computed Fluid Design) and scaled model test
	Frost protection: No risk of frost damage due to the use of stainless-steel type 316L
Low NPSH	Smaller chance of cavitation and pump damage
Low energy consumption	Savings of up to 85% possible compared to traditional pumps.
Efficient:	Highly efficient at both low and high discharge heads and flows.
Dry running rotor technology	Compared to wet-running submerged motors, the dry-running rotor is superior in terms of efficiency and reliability, with no rotor blockages due to scale or solid particles.
Safety	Much safer than a wet runner (canned motor type), a submerged motor can result in motor voltage on the water.
Available spare parts	Replaceable spare parts.
Low vibration	Almost vibration-free due to high balancing and vibration dampers Mechanical seal: High performance shaft sealing with high-end mechanical seal Bearings: Heavy duty bearings, sealed and lifetime lubricated > maintenance free.

6.0 Installation



Attention:

Read this manual carefully before installing the pump. Damage resulting from failure to follow the instructions is **not covered by warranty**.

When unpacking, check that all components are complete and undamaged. Any visible damage must be reported to your supplier within **24 hours of purchase**.

Inspect the pump before operation and **do not use it if damaged**. Using a damaged pump voids all warranty and liability.



During installation, the pump must **not be connected to the power supply**.

Unplug the unit and ensure it cannot be accidentally switched on.

To prevent injury, make sure your hands or fingers **cannot reach the pump opening** while it is connected to electricity.

7. Commissioning the Pump

IMPORTANT:

Never operate the pump without water flow.

The pump may **start automatically** when connected to the mains.

The pump casing discharge can be installed **horizontally or vertically**.

The **preferred position** is **horizontal**, allowing automatic venting.

Always place the pump on a **stable surface**.

Lay the piping to avoid **air pockets**, which can occur when the line rises and then falls. Air accumulation increases flow resistance and will not easily clear at low speeds.

Suction side:

Install the pipe horizontally or slightly upward toward the pump.

Discharge side:

The pipe should always rise to allow self-venting.

The pump must be installed **dry (not submerged)** and protected from **direct sunlight**.

Position it as **close as possible to the inlet**, keeping suction pipes **short, straight, and with minimal bends**.

Maintain at least **10 cm clearance** from walls and ensure **adequate ventilation** to prevent condensation.

7.1 Pump Placement

The FlowFriend Junior pump has **protection class IP67** and de VSD has **protection class IP66**.

This rating does **not** mean the pump may be exposed directly to rain or sunlight. IP66 only refers to temporary water-spray testing, IP67 means submersed maximum 2 hours at maximum 1 meter depth.

Electronics and water do not mix — always **protect the VSD from rain**. Water damage is **not covered by warranty**.

Install the pump **above floor level** to prevent flooding in case of leaks.

It is recommended to install the pump **below the water level**.

If installed **above the water level**, a **check valve is mandatory**, and the suction line must be **filled with water before startup**.

If the check valve fails, there is a **high risk of dry running**, which is **not covered by warranty**.

A **small sump pump** in the pump chamber is recommended to remove any leakage water.

7.2 Inlet (Suction Side)

Excessive suction resistance can cause **cavitation**, recognizable by a crackling sound (like small stones inside the pump).

Prolonged cavitation can cause vibration and impeller damage.

If cavitation occurs:

Reduce pump speed.

Decrease suction line resistance.

Use a larger suction diameter (preferably **PVC 75 mm** or better **90 mm**).

Minimize bends.

Ensure at least **7× pipe diameter of straight pipe** before the pump inlet for smooth flow.

Adjust head height as needed.

All joints must be **completely airtight**.

If a flexible hose is used, it must have a **smooth inner wall** and be rated for suction use.

If the suction line exceeds **10× its diameter**, use a **1–2 sizes larger pipe** than the pump inlet.

7.3 Outlet (Discharge Side)

The discharge pipe must be **at least the same diameter** as the pump outlet to minimize pressure loss, flow noise, and resistance.

Avoid sudden diameter changes and use **as few bends as possible** — and only **large-radius bends** when necessary.

For discharge lines longer than 10 m, increase the pipe diameter immediately after the pump.

Never reduce the outlet diameter.

A well-designed piping system lowers dynamic losses and improves energy efficiency.

7.4 Electrical Connection

Verify that the **voltage and frequency** match the values on the nameplate.

The installer must ensure proper **grounding** according to legal standards.

The circuit must be protected by a **residual current device (RCD) ≤ 30 mA**.

8. Maintenance and Cleaning



Always disconnect the pump from the mains before performing any maintenance.

FlowFriend pumps require **minimal maintenance**. Regular checks are usually limited to inspecting the impeller for **blockages or contamination**.

Remove debris from the impeller with a thin, pointed tool. A reduced flow rate is often caused by dirt or lime scale inside the pump or piping.

Any lime scale can be removed using a **mild acid**, such as vinegar.

The **pump head of the FlowFriend Standard** can be fully and easily disassembled for cleaning.

8.1 Rotating and Removing the Pump Head

The **FlowFriend Junior** pump housing can be rotated in **45° increments**, allowing the discharge outlet to be positioned horizontally or at various angles.

The impeller does **not** need to be removed to rotate the pump housing.

For convenience, place the pump vertically on a workbench with the **motor facing upward**.

Unplug the power and carefully remove the pump from the installation.

Unscrew the **eight bolts** at the back of the housing and gently remove the pump head.

Inspect the impeller and housing for contamination.

If buildup is present, clean the impeller carefully.

Note: Damage caused by blockages or incorrect disassembly is **not covered by warranty**.

8.2 Descaling and Cleaning the Impeller

Descale the pump **only with mild acids**.

Never use hydrochloric acid, even when diluted, as it can severely damage the pump.

Suitable products include **formic acid, vinegar, or household descaling agents** (such as those used for coffee machines).

Before descaling, remove heavy deposits with a **soft brush** and **lukewarm water**.

Always observe **safety precautions** when handling acids — wear protective clothing and safety goggles.





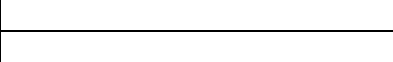
Regular maintenance ensures **optimal performance** and **extends the pump's service life**.

9. Touch Buttons – Menu

9.1 7-segment digits

The FlowFriend is equipped with a keypad and a digital display featuring six 7-segment digits. All advanced options are disabled by default to keep operation of the pump simple.

	<p>The pump is not connected to the power supply.</p> <p>The VSD is equipped with five push buttons. The green (start) button and red (stop) button have no function. This ensures that, after a power failure, the pump always returns to the manually set speed.</p> <p>The square button is the function key, and the up and down arrows are used to adjust the pump speed.</p>
	<p>After power is applied, the motor will start up from 0 to 499 rpm. After a few seconds, the pump will return to 0 and enter standby mode.</p>
	<p>The pump is in standby mode and ready for operation. The displayed standby mode indicates the pump is not running and de speed is 0.</p>
	<p>Press the ▲ (up) button to start the pump at the preset speed — in this case, 500 rpm, the lowest possible speed. Use the ▲ (up) arrow to increase the speed in 1 rpm steps, up to a maximum of 3000 rpm. It is recommended to start at the lowest speed (500 rpm) and carefully monitor the system during ramp-up to prevent filter overflow.</p> <p>If the set speed is lower than 499 rpm, the pump will return to standby mode.</p>

	<p>The maximum speed is 3000 rpm. Do not run the pump faster than necessary. Lower speeds result in lower power consumption and a longer service life of the pump.</p> <p>Be cautious when increasing the pump speed too quickly — excessive pressure may develop that the piping system is not designed to handle. In particular, commonly used rubber couplings may detach from the piping if the pressure becomes too high.</p>
	<p>DISPLAY FUNCTION Button (Squared symbol) Pressing the DISP FUNC button cycles through different information values on the display. This information is for reference only, cannot be changed, and may be requested during service or support.</p> <p>A on the display followed by a numeric value indicates the Amperage of the VSD drive.</p>
	<p>Press the DISPLAY FUNCTION button again to display a P followed by a numeric value. This value, for example P 0.06, represents the power consumption in Kilo watts — the actual electrical usage of the pump.</p> <p>The value multiplied by 1000 is the power consumption in watts.</p>
	<p>Press the DISP FUNC button again to display a H followed by a numeric value. This value, for example H250.0, indicates the motor frequency in Hz.</p>
	

9.2 External control of the pump / VSD.

Remote control of the pump by means of analog or digital inputs is prepared as standard in the VSD unit. Only properly qualified electrical personnel are permitted to connect and configure this option. The **special manuals** for this features will be sent on **request**.

10. Pump Specification

10.1 Pump

Make: Stiloh

Brandname: FlowFriend

Pumptype: Junior HFP 70

Nickname: Junior

Hydraulic: Mixed flow type

Display: 6-digit blue letters

Analog and digital signals: standard for external voltage or amperage for adjusted speed regulation

Automatic restart: after power failure to prevent fish mortality

Bearings: Lifetime greased, lifetime calculated on >100.000h

Wearing: Hardened in pumpcasing

Power measurement: Absorbed power included in the software

Failure: Normal, failure and overload LED

MEI > 0.7: classed benchmark for the most efficient pumps in the market

10.2 Motor

Motor type: Electronically controlled Permanent Magnet Synchronous Motor (PMSM EC) - Sinewave back EMF (Not brushless DC - BLDC)

P1 motor power: 390 W

P2 motor power: 800 W

Degree of protection: IP67 (maximum 2 hours and maximum 1 meter depth)

Efficiency index: IE5+

Magnets: Ferrite magnets, dry running outer rotor

Fan: Fan less – no fan noise at all - uncooled

Voltage: 230V +/- 10% (115V on request possible with special VSD)

Frequency: 50 Hz (60Hz on request)

Certification: CE (Others on request)

Speed: 500-3000 rpm

Bearings: Heavy duty lifetime grease lubricated

Buttons: Membrane keyboard

EMC: Class B (Household, commercial and industrial use)

Cable: Shielded EMC cable, PVC, Lapp, 5 meter, 230V EU Schuko (other type stecker on request)

10.3 Performance

Capacity: Max. 40 m3/hour - adjustable from 2 - 40 m3/hour

Head: Max. 5.5 m.w.c. - adjustable from 0.1 - 5.5 m.w.c.

Speed: adjustable speed 500 - 3000 rpm

Motor efficiency: 88-94%

Controller efficiency: >98%

Hydraulic efficiency: >86%

Mechanical efficiency: >87%

10.4 Connections

Discharge side: G 2 1/2" x L=20mm threaded connection

Suction side: G 2 1/2" x L=20mm threaded connection

10.5 Shaft seal

Mechanical seal: Eagle Burgmann, MG1, A/Q1VGG

Material stationary seat: Silicon carbide

Material rotary seat: Carbon

Material elastomers: Fluor elastomer (Viton)

Spring material: 1.4571 - Stainless steel 316 Ti

10.6 Materials

Pump casing: 1.4408 - CF8M - Cast stainless steel 316L

Pump cover: 1.4408 - CF8M - Cast stainless steel 316L

Impeller: 1.4408 - CF8M - Cast stainless steel 316L

Impeller nut: 1.4408 - CF8M - Cast stainless steel 316L

Wearing: Non replaceable – hardened seat in pump casing

Elastomers: O-Rings NBR 70 shore, Elastomers mechanical seal Viton

E-Motor: Aluminium

Mechanical seal: A/Q1VGG

Impeller key: 1.4571 - Stainless steel 316 Ti

Extended motorshaft: Stainless steel 1.4122 or 1.4404

10.7 Test

Hydrostatic test: 1.5 bar / 2 hours

Performance test: According ISO 9906 - class C

PMI test: Positive Material Identification (PMI test)

Runout test: Runout test pump rotor

Balancing pump impeller: Quality according DIN ISO 1940-1 Grade G2.5

11. Trouble Shooting

11.1 Overheating



Protect the electronics for overheating.

Identify and resolve the cause of overheating (e.g., dirt buildup, fan malfunction, or poor ventilation).

Direct sunlight or **insufficient ventilation** in the pump chamber can also cause overheating.

⚠ Caution: The surface of the control module may be **very hot**. Do not touch it until the surface temperature



VERY IMPORTANT:

If the **residual current device (RCD)** has tripped, **always unplug the pump** from the power outlet **before resetting the RCD**.

The pump must first be **checked for water damage**.

If a short circuit has occurred and the pump is switched on again without inspection, this can cause **irreversible damage to the electronics**.

In case of **water intrusion**, the pump must be **immediately disassembled and dried** to minimize potential damage.

In case of water intrusion, the motor bearings need to be replaced **all** the time

11.2 VSD – Variable Speed Drive

In case of problems with the VSD, consult the VSD user manual.

11.3 Diagnostic chart for centrifugal pump troubles

PROBLEM	POSSIBLE CAUSES
Pump does not deliver water	1 – 2 – 3 – 4 – 6 – 11 – 14 – 16 – 17 – 22 - 23
Insufficient capacity delivered	2 – 3 – 4 – 5 – 6 – 7 – 8 – 9 – 10 – 13 – 16 – 19 – 21 – 22 – 28 – 29 - 30
Insufficient pressure delivered	5 – 13 – 15 – 16 – 19 – 21 – 28 – 29 - 30
Pump loose prime after starting	2 – 3 – 5 – 6 – 7 – 8 – 10 – 11 - 12
Pump requires excessive power	14 – 15 – 16 – 17 – 18 – 19 – 22 – 23 – 25 – 26 – 28 – 32 – 33 - 36
Seal leaks excessively	12 – 23 – 25 – 31 – 32 – 33 – 34 – 35 – 37 – 38 - 39
Seal has short life	11 – 12 – 23 – 25 – 27 – 31 – 32 – 33 – 34 – 35 – 36 – 37 – 38 - 39
Pump vibrates or is noisy	2 – 3 – 4 – 9 – 10 – 20 – 22 – 23 – 24 – 25 – 26 – 27 – 29 – 34 – 35 – 40 - 41 – 42 – 43 – 44 – 45 - 46
Bearings have a short life	23 – 25 – 26 – 27 – 34 – 35 – 40 – 41 – 42 – 43 – 44 – 45 - 46
Pump overheats and seizes	1 – 4 – 20 – 21 – 23 – 26 – 27 – 34 – 35 - 40

Suction troubles			
1.	Pump not primed	25.	Shaft bent
2.	Pump or suction pipe not completely filled with water	26.	Rotating part rubbing on stationary part
3.	Suction pipe lift too high	27.	Bearings worn
4.	Insufficient margin between suction pressure and vapor pressure, check NPSHa and NPSHr values	28.	Wearing rings worn
5.	Excessive amount of air or gas in liquid	29.	Impeller damaged
6.	Air pocket in suction line	30.	Casing gasket defective permitting internal leakage
7.	Air leaks in suction line	31.	Shaft worn or scored at the housing
8.	Air leaks into pump through mechanical seal	32.	Mechanical seal improperly installed

9.	Foot valve too small or partially clogged	33.	Incorrect mechanical seal for operating conditions
10.	Inlet of suction pipe insufficiently submerged	34.	Shaft running off center because of worn bearings or wrong run-out of shaft
11.	Water seal pipe plugged	35.	Rotor out of balance resulting in vibration
12.	Seal cage improperly located in seal chamber, preventing sealing fluid entering space to form seal	36.	Air in the pumped water or pump casing not vented correctly
System troubles		37.	Mechanical seal elastomers not sufficient for the application
13.	Speed too low	38.	Wrong assembly of the mechanical seal
14.	Speed too high	39.	Dirt, grit or other abrasives in the pumped liquid, leading to scoring of shaft and/or mechanical seal
15.	Wrong direction of rotation	40.	Excessive thrust caused by a mechanical failure inside the pump
16.	Total head of system higher than design head of pump	41.	Excessive grease or oil in bearing housing or lack of cooling, causing excessive bearing temperature
17.	Total head of system lower than design head of pump	42.	Lack of lubrication
18.	Specific gravity of liquid different from design	43.	Improper installation of antifriction bearings (damage during assembly, incorrect assembly of stacked bearings, use of unmatched bearings as a pair, ect.)
19.	Viscosity of liquid different from design criteria	44.	Dirt or water getting into bearings
20.	Operation at very low capacity	45.	Rusting of bearings due to water getting into housing
21.	Parallel operation of pumps unsuitable for such operation	46.	Excessive cooling of water cooled bearing resulting in condensation in the bearing housing from moisture in the atmosphere
Mechanical troubles			
22.	Foreign matter in impeller		
23.	External forces on pump casing too high		
24.	Foundations not rigid		

12. External Analog or digital control

The FlowFriend can be operated using an **external control signal**.

In this mode, the **speed is no longer set via the display**, but by an external controller (e.g. PLC, flow controller, or climate computer).

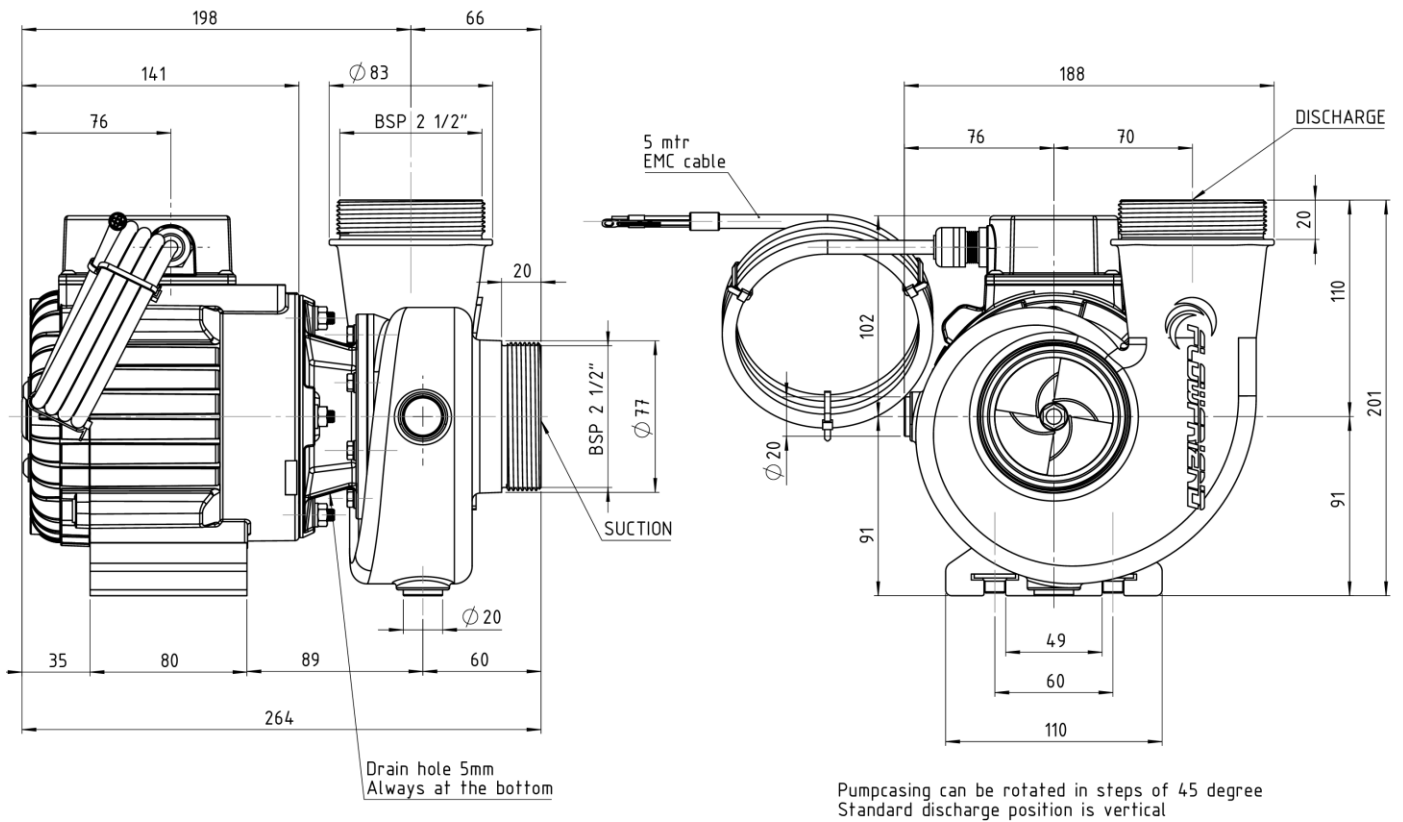
Remote control of the pump by means of analog or digital inputs is prepared as standard in the VSD unit.

Only properly qualified electrical personnel are permitted to connect and configure this option.

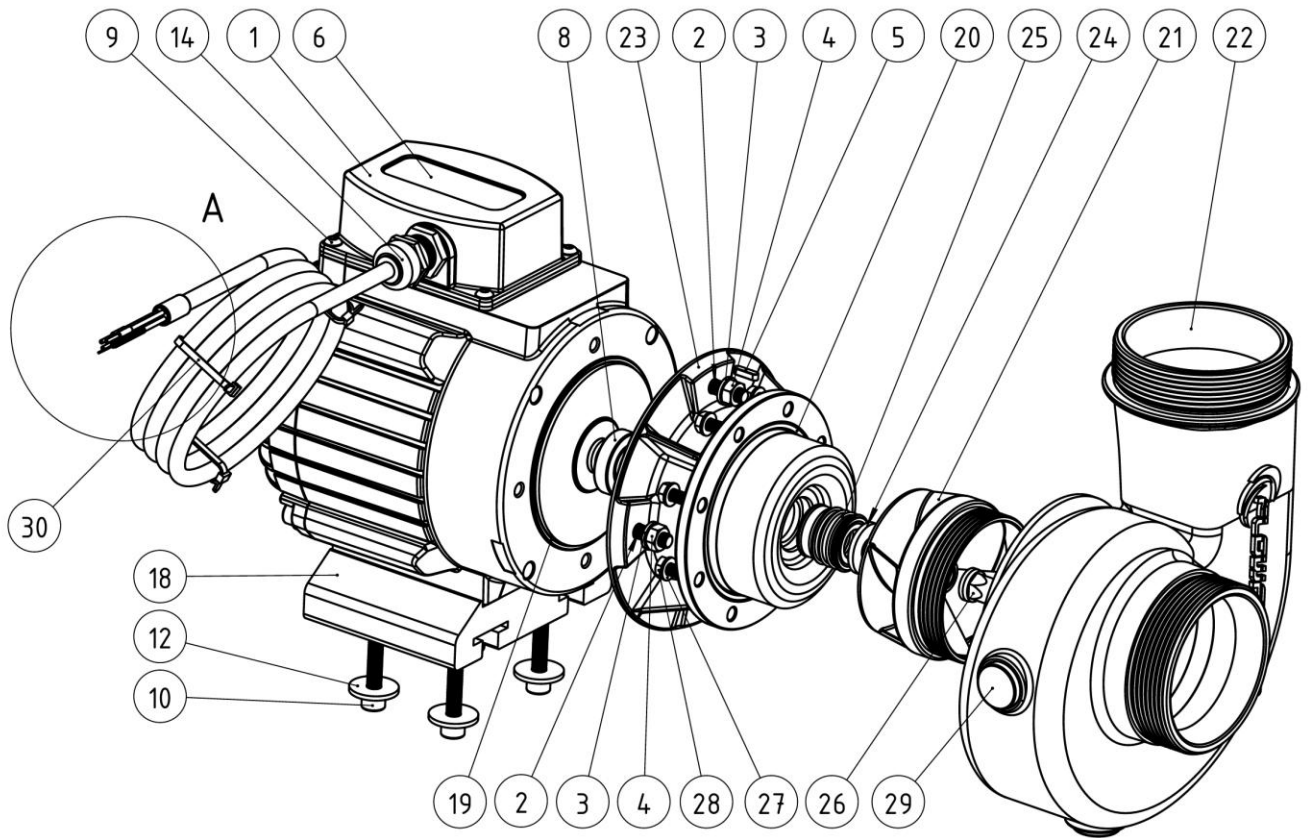
The **special manuals** for this features will be sent on **request**.

Fieldbus	Built in	CANopen	125–1000 kbps
		Modbus RTU	9.6–115.2 kbps selectable
I/O Specification	Power Supply	24 Volt DC, 100mA, Short Circuit Protected 10 Volt DC, 10mA for Potentiometer	
	Programmable Inputs	4 Total 2 Digital 2 Analog / Digital Selectable	
	Digital Inputs	8 – 30 Volt DC, internal or external supply Response time < 4ms	
	Analog Inputs	Resolution: 12 bits Response time: < 4ms Accuracy: ± 2% full scale Parameter adjustable scaling and offset	
	Programmable Outputs	2 Total 1 Analog / Digital 1 Relay	
	Relay Outputs	Maximum Voltage: 250 VAC, 30 VDC Switching Current Capacity : 6A AC, 5A DC	
	Analog Outputs	0 to 10 Volt	
Application Features	PI Control	Internal PI Controller Standby / Sleep Function	
	Fire Mode	Bidirectional Selectable Speed Setpoint (Fixed / PI / Analog / Fieldbus)	
Maintenance & Diagnostics	Fault Memory	Last 4 Trips stored with time stamp	
	Data Logging	Logging of data prior to trip for diagnostic purposes: Output Current Drive Temperature DC Bus Voltage	
	Monitoring	Hours Run Meter	

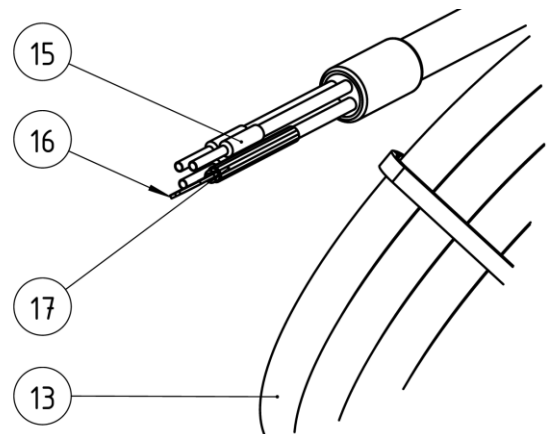
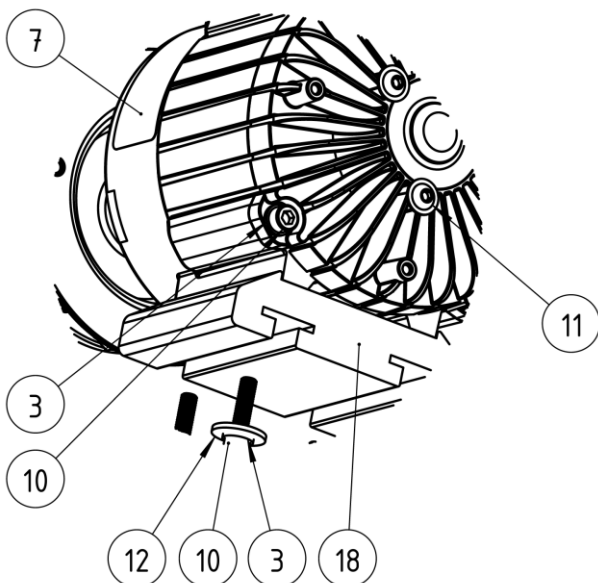
13. Dimensions



14. Exploded view and Parts list | BOM



1. Use Berulub grease to fill the Domsel Shaft seal
2. Motor painted in black, RAL 9005 semi gloss
3. Motorflange must be sealed with Polymer Polymax



Cable connections

PM Motor	VSD Controller
U = 1	U = 2
V = 2	V = 1
W = 3	W = 3

15. Parts list | BOM

<i>POS</i>	<i>QTY</i>	<i>SKU NR.</i>	<i>DESCRIPTION</i>	<i>DIMENSION</i>	<i>MATERIAL</i>
1	1	FP.589002	PM Motor 800W	HFP 70	-
2	4	FP.589056	Stud, 1.25xD	M6x16	A4-70 - AISI 316
3	12	FP.589049	Washer, DIN 125A	M6	A2 - AISI 304
4	4	FP.589052	Hexagon Nut, DIN 934	M6	A4 - AISI 316
5	1	FP.589057	Parallel Key	3x3x12	A4 - AISI 316
6	1	FP.589068	Sticker, Caution Hot Surface		-
7	1	FP.589074	Sticker, Typeplate Motor HFP 70		-
8	1	FP.589029	Domselring, Type A	14x28x7	NBR 70 shore
9	4	FP.589045	Screw, ISO 7380	M4x10	A2-70 - AISI 304
10	8	FP.589050	Sockethead Screw	M6x25	A2-70 - AISI 304
11	3	FP.589046	Screw, ISO 7380-2	M6x12	A2-70 - AISI 304
12	4	FP.589047	Washer, 440R	M6	A2 - AISI 304
13	1	FP.589009	EMC Cable	L=5 mtr	-
14	1	FP.589006	Cable Gland IP68	M16x1.5	-
15	6	FP.589010	Cable Sleeve		-
16	2	FP.589011	Cable Eye	Klemco M4	-
17	2	FP.589012	Schrink Tube	6.4 x L=30mm	-
18	1	FP.589059	Anti Vibration Damper	HFP 70	-
19	1	FP.589019	O-Ring	82.27x1.78	NBR 70 shore
20	1	FP.589020	O-Ring	72,69 x 2,62	NBR 70 shore
21	1	FP.589031	Impeller	HFP 70	1.4408 (A743 CF8M)
22	1	FP.589032	Pumpcasing	HFP 70	1.4408 (A743 CF8M)
23	1	FP.589033	Lantern	HFP 70	1.4408 (A743 CF8M)
24	1	FP.589034	Ring, Distance	HFP 70	1.4401 (X5CrNiMo17-12-2)
25	1	FP.589015	Mechanical Seal EMG1	12-g6 - AQ1VGG	-
26	1	FP.589035	Nut, Impeller	HFP 70	1.4408 (A743 CF8M)
27	8	FP.589048	Washer, DIN 125A	M5	A2 - AISI 304
28	8	FP.589055	Hexagon Screw, DIN 933	M5x12	A4-70 - AISI 316
29	2	FP.589018	Disc, Rubber	20x5	NBR 70 shore
30	3	FP.589014	T-raps	3.6x203	PA

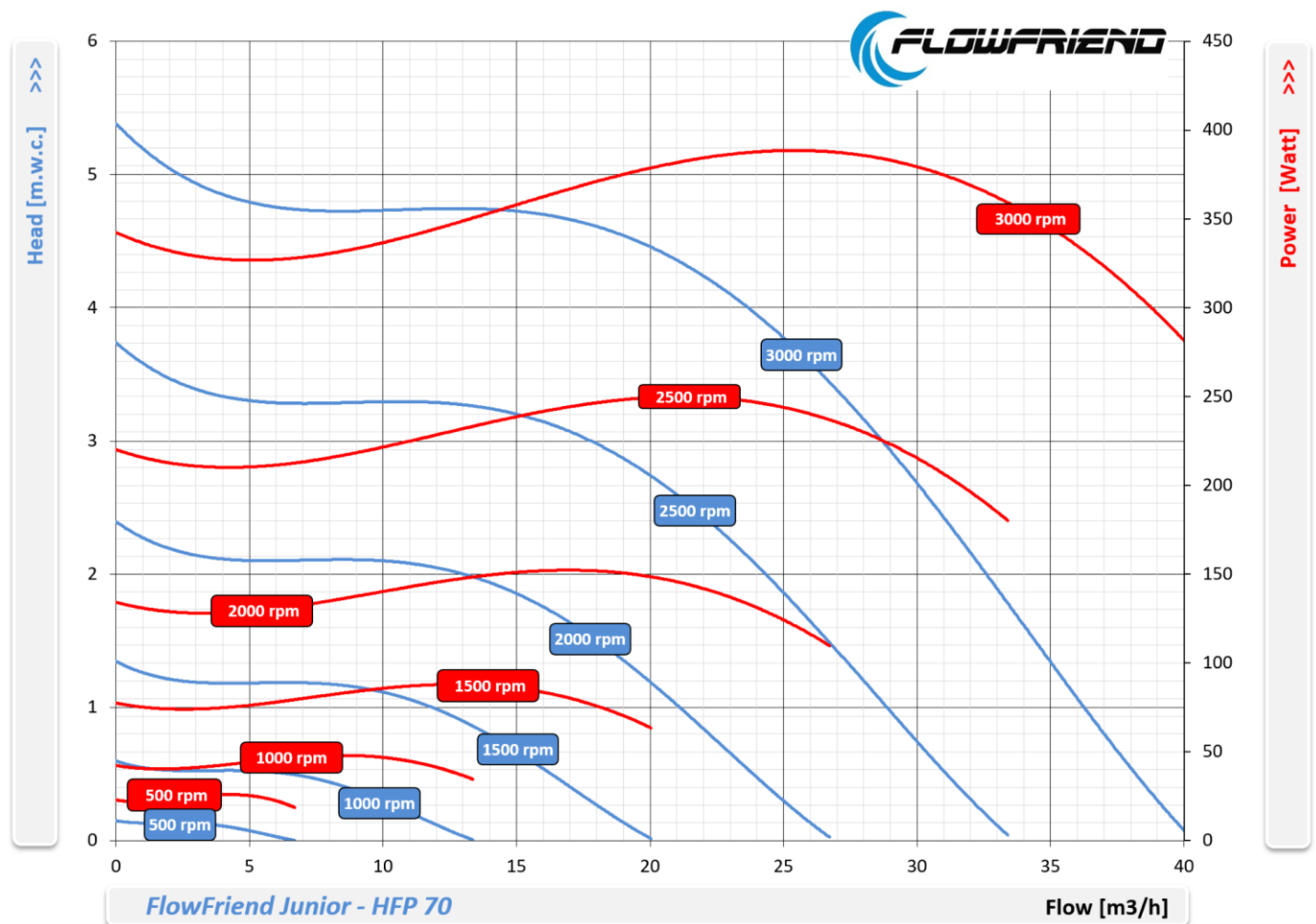
16. NOT detailed Performance curve

Performance Curve Information

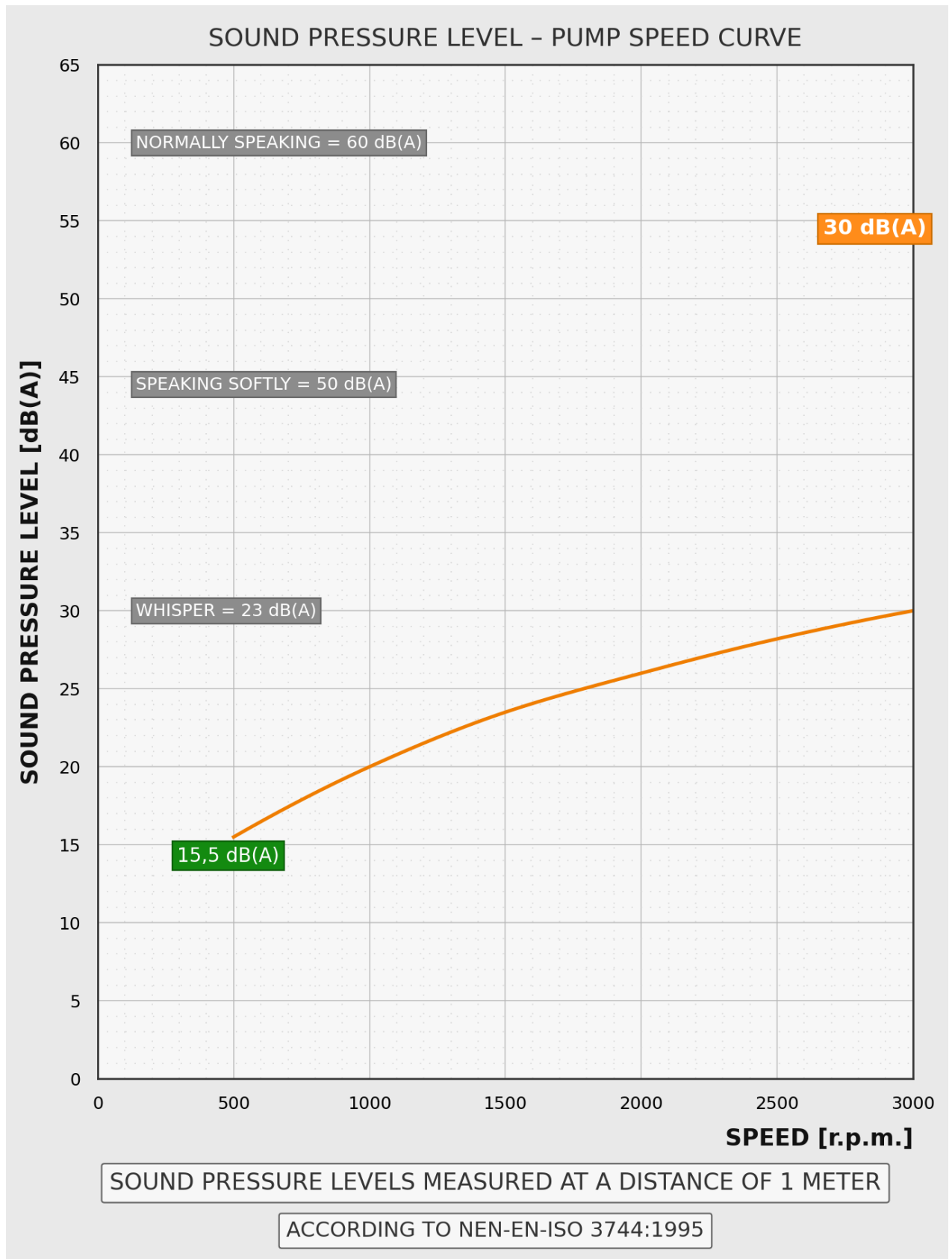
This curve provides only a **general performance overview**.

For detailed information, please refer to the **comprehensive performance curves (Q/Hman/Eta/Power)**, which are available for the entire speed range in **increments of 100 rpm**.

For the **NPSHr (required)** data, please refer to the **detailed NPSH curves**.



17. Sound levels



18. EU Conformity Declaration

The manufacturer:

Stiloh B.V.

Oliemolen 2

7587 SH

De Lutte

The Netherlands

Hereby declares under sole responsibility that the product:

FlowFriend water pump

Model: **FlowFriend Junior HFP70**

complies with the following directives:

- 2014/35/EU – Low Voltage Directive (LVD)
- 2014/30/EU – Electromagnetic Compatibility (EMC)
- 2011/65/EU – Restriction of Hazardous Substances (RoHS)
- 2009/125/EC – Ecodesign Directive

Applied harmonised standards include:

EN 60335-1, EN 61000-6-2, EN 61000-6-3, EN 50581

De Lutte, 05.01.2026

Authorized representative

J.Huttenhuis, R&D manager

