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Let's Solve Water

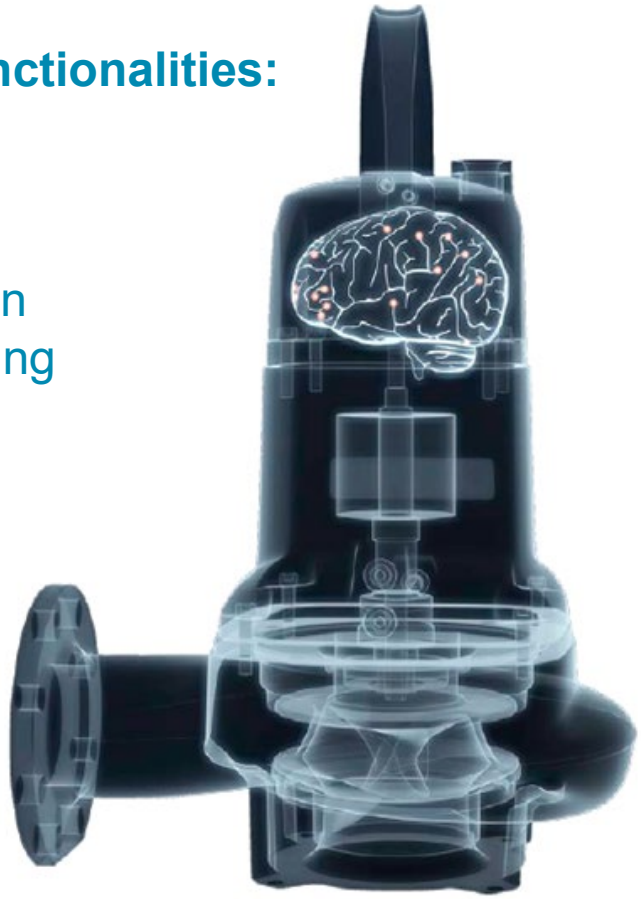
Intelligent Wastewater Pumps

Flygt Concertor® Wastewater Pumping System

What is an Intelligent Pump?

Integrated software functionalities:

- ✓ Clog detection
- ✓ Overload protection
- ✓ Always correct rotation
- ✓ Sump and pipe cleaning
- ✓ Energy Minimizer
- ✓ Soft start and stop
- ✓ VFD function



Hardware components:

- ✓ Adaptive N-hydraulics
- ✓ IE4 motor efficiency
- ✓ Integrated power electronics

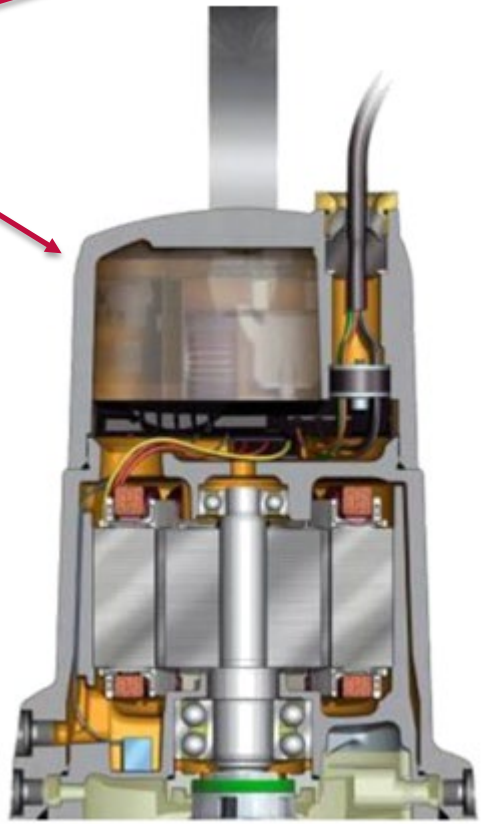
From 100s of variants to 9

Based on 100 years of expertise

Hardware Components

Control system consists of:

- ✓ Processor
- ✓ Software
- ✓ 2x temperature sensors
- ✓ Electronics Module



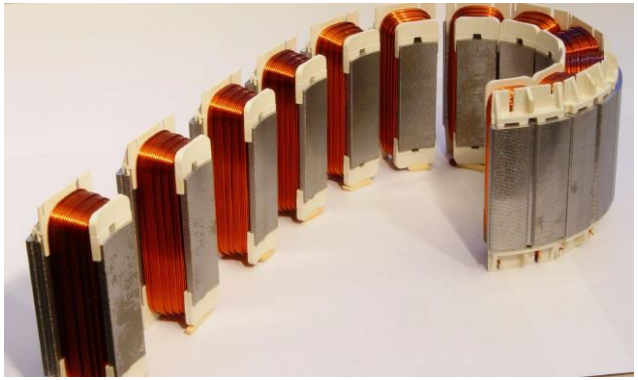
Electronics are potted in plastic and protected against:

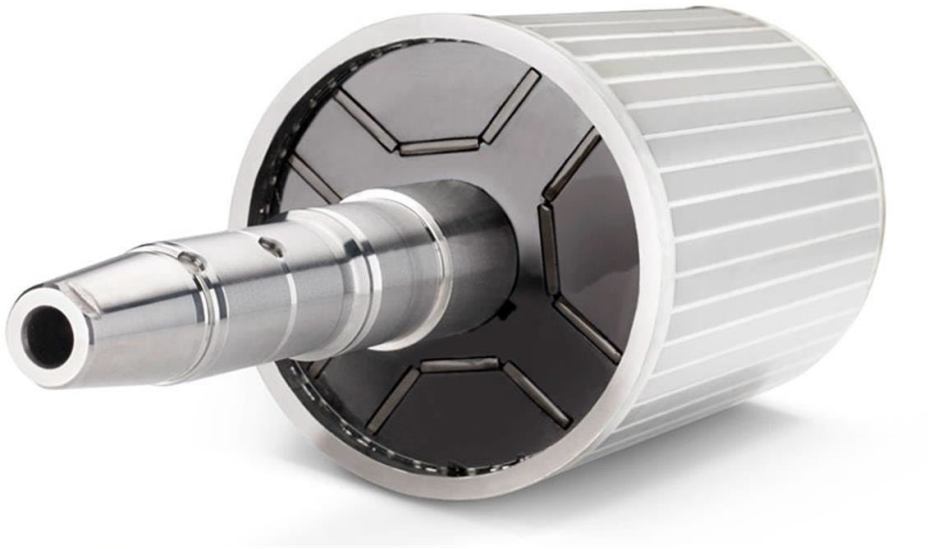
- ✓ Vibration
- ✓ Heat
- ✓ Humidity
- ✓ Dust
- ✓ Dirt
- ✓ Extreme temperature variations

If heat detected in motor the motor automatically reduces its power to protect the pump

State of the Art Synchronous Motor

- ✓ Concentrated winding stator design
- ✓ Permanent magnet rotor
- ✓ Minimum IE4 efficiency
- ✓ Smaller foot-print
- ✓ Must have a VFD to run





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N Technology Hydraulic

Combination of high efficiency and self-cleaning

Self-cleaning = Sustained hydraulic efficiency

Guide pin and insert ring groove help eject stringy material found in modern wastewater

Typical ”Solids” in Modern Wastewater

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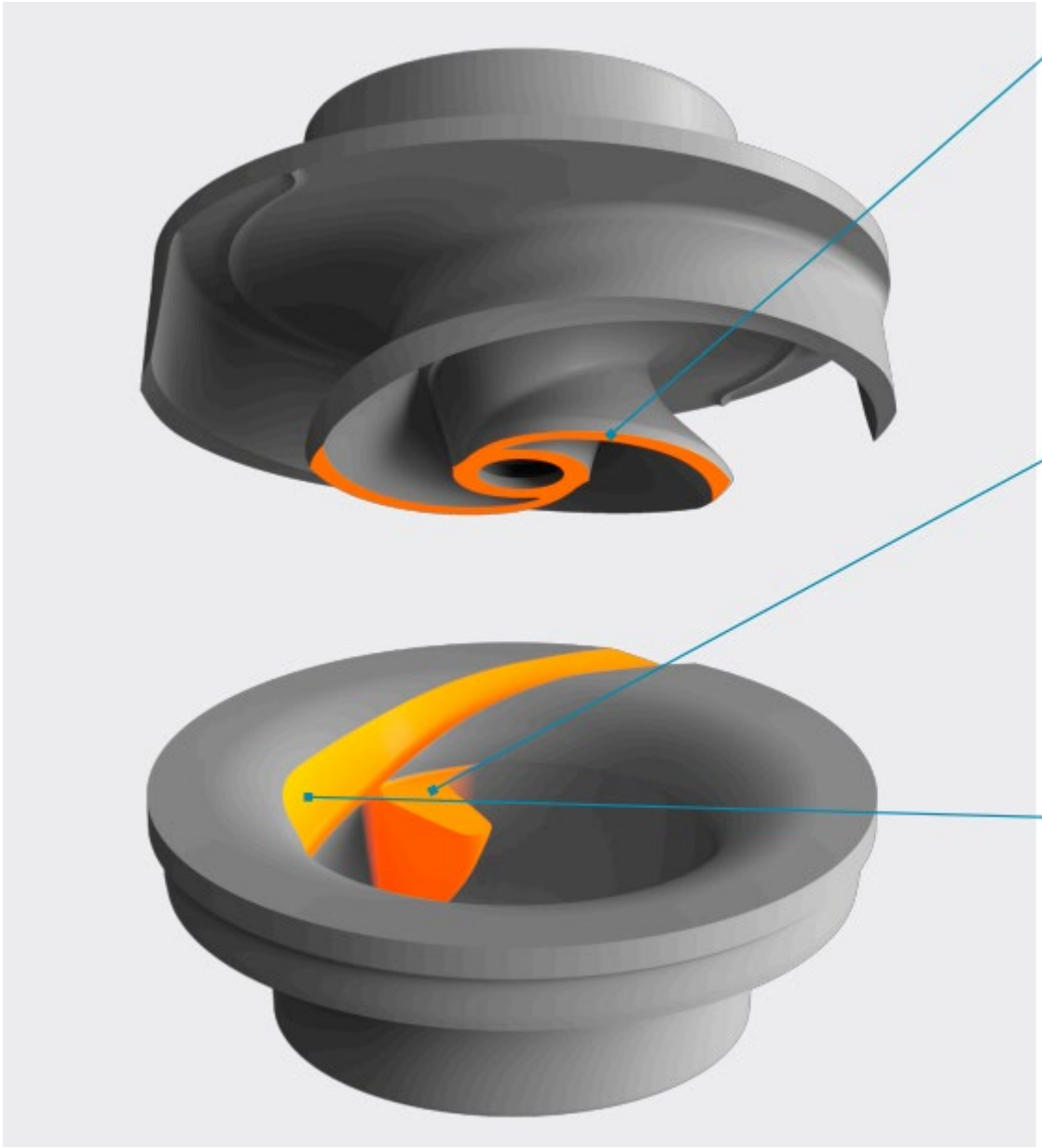


1. Backswept leading edges – ensures no sticking

When solids enter the pump, they are met by the N impeller. The optimized blade geometry, with its backswept leading edges, ensures that no material sticks to the impeller.

2. Integrated guide pin – clears the center

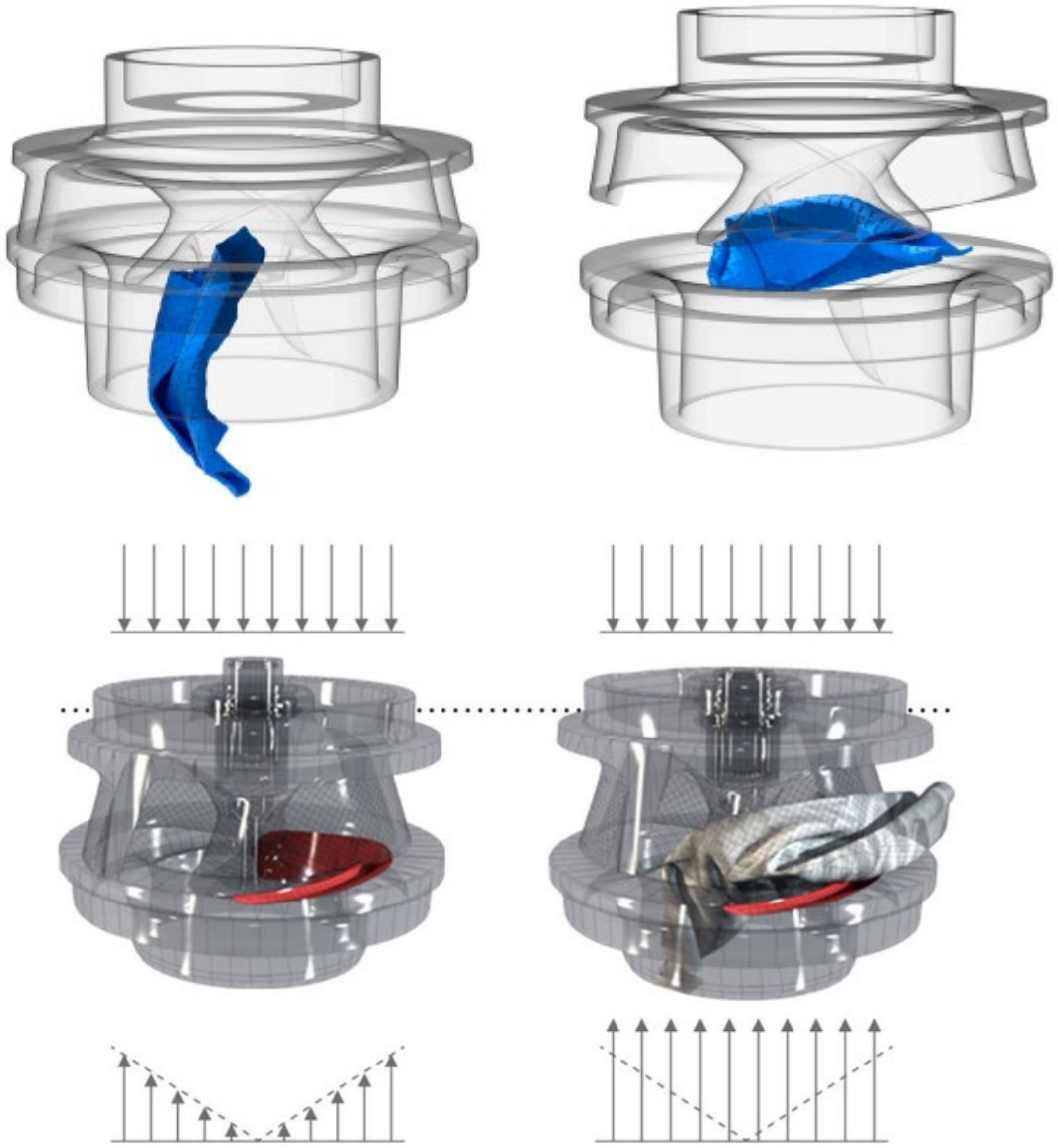
A guide pin inserted into the insert ring clears the center of the impeller by pushing solids along the leading edges towards the periphery of the impeller for removal.

3. Relief groove – facilitates transport

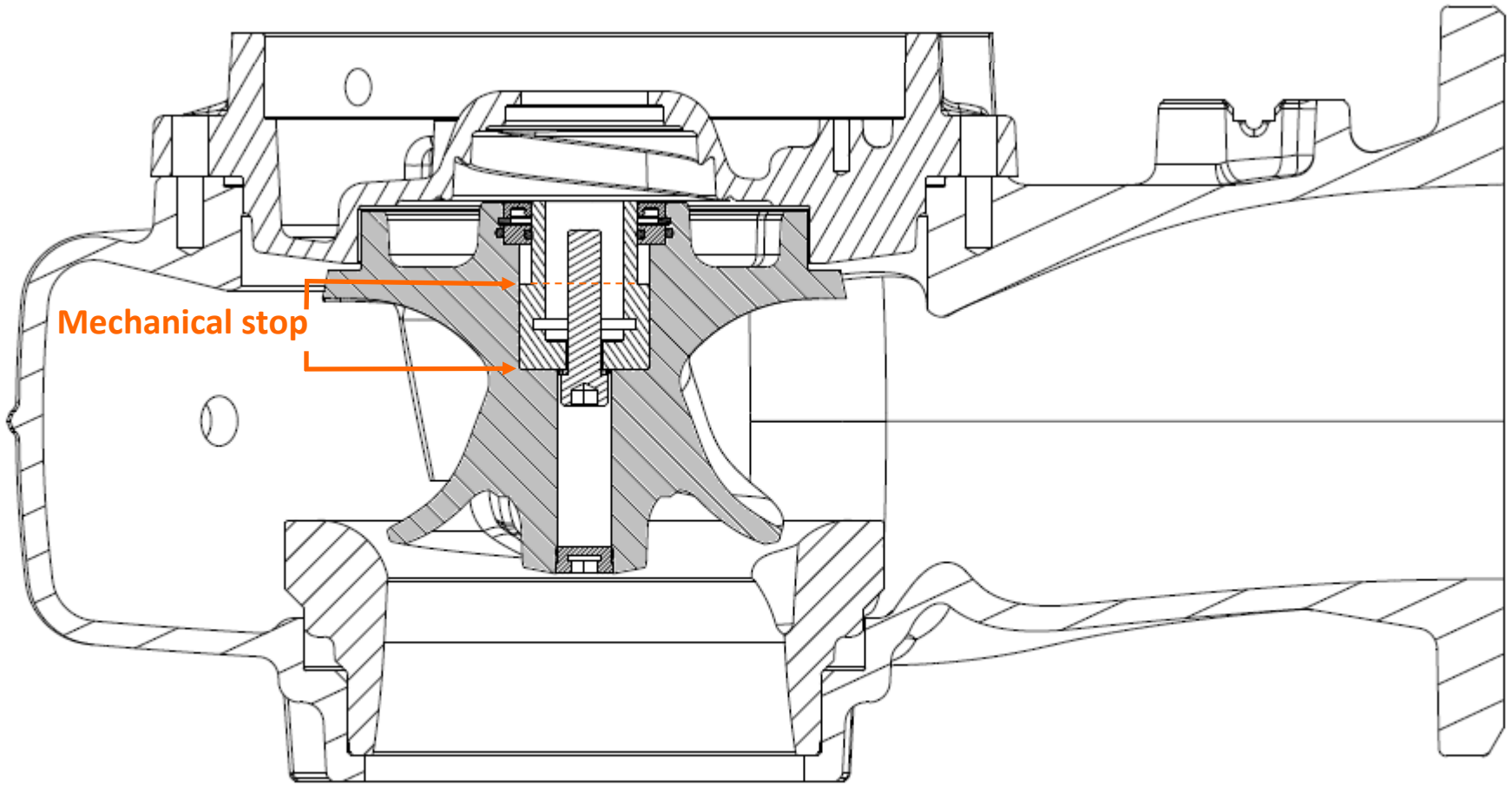
When solids reach the perimeter of the inlet, they are transported inside the relief groove, guided along the edge of the impeller vane, through the volute and out of the pump.

Impeller Moves up to Allow Objects to Pass

Adaptive N – lifts up for large objects
When larger objects enter the pump, the impeller lifts up due to the forces from these solid objects passing through. This avoids clogging and assures continuous, energy-efficient pumping.



Adaptive N: Cutaway



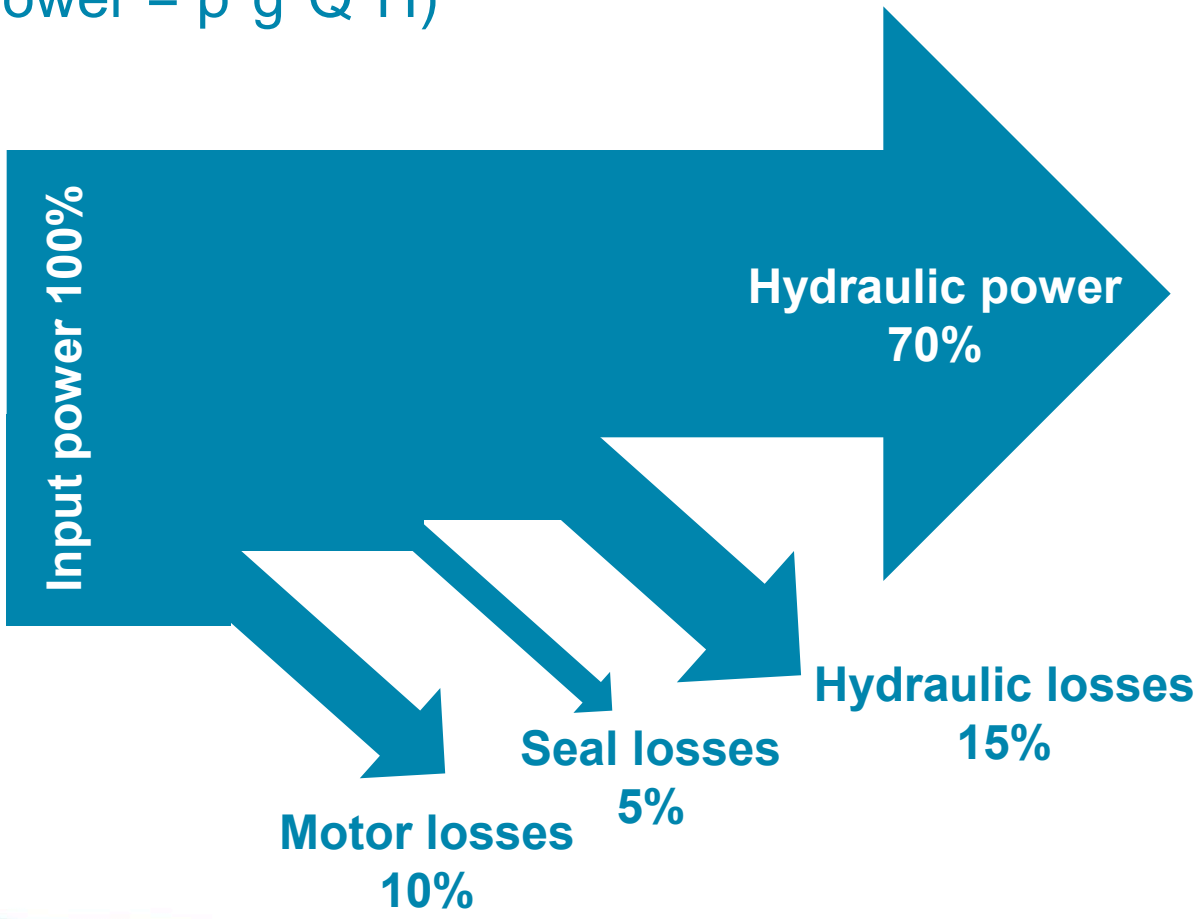
What is Efficiency?

Efficiency = Useful work done / Supplied energy

For pumps: Efficiency = Hydraulic power / Input power

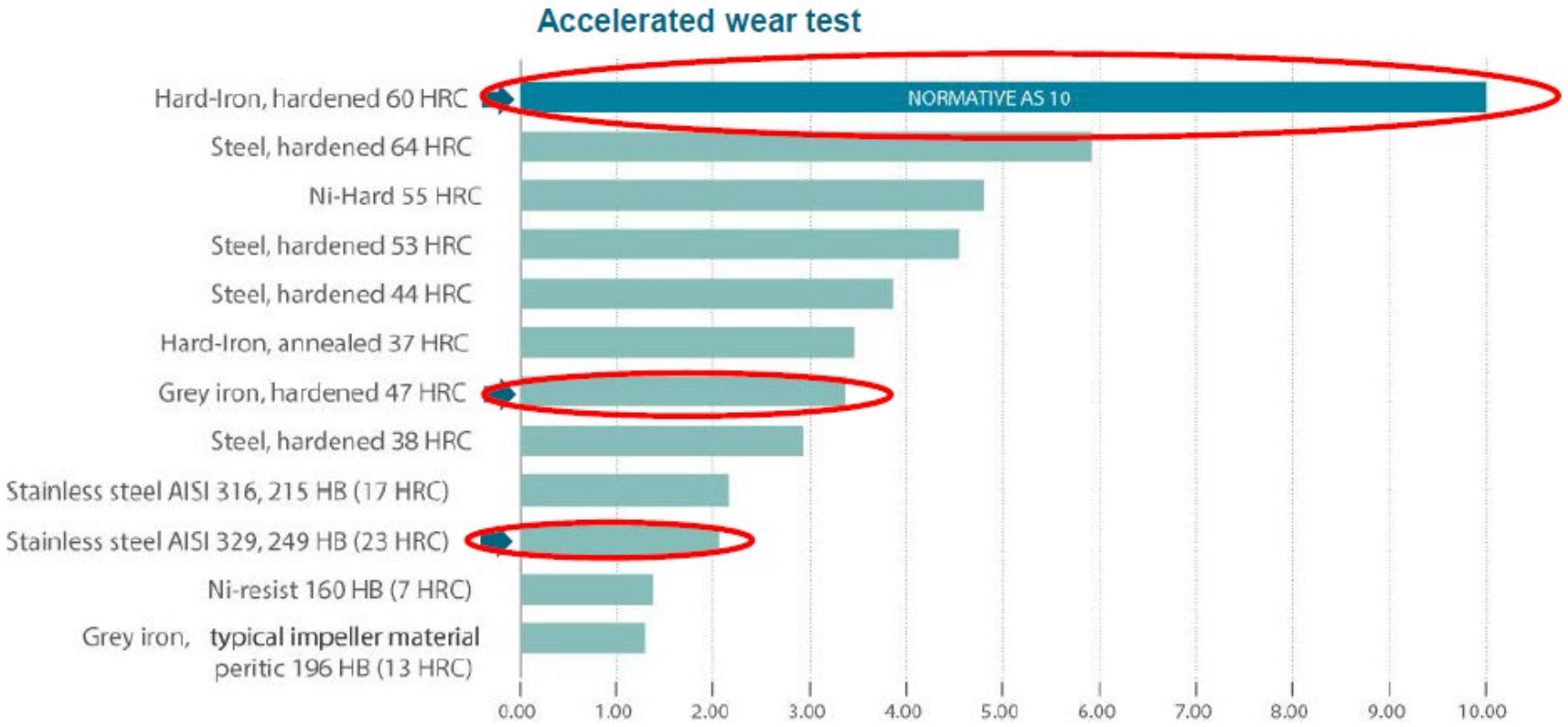
(Hydraulic power = ρ*g*Q*H)

Each Concertor option, 3” 4” and 6”, has one impeller size only. Therefore, the volute is 100% tailored to that one impeller size for hydraulic efficiency.

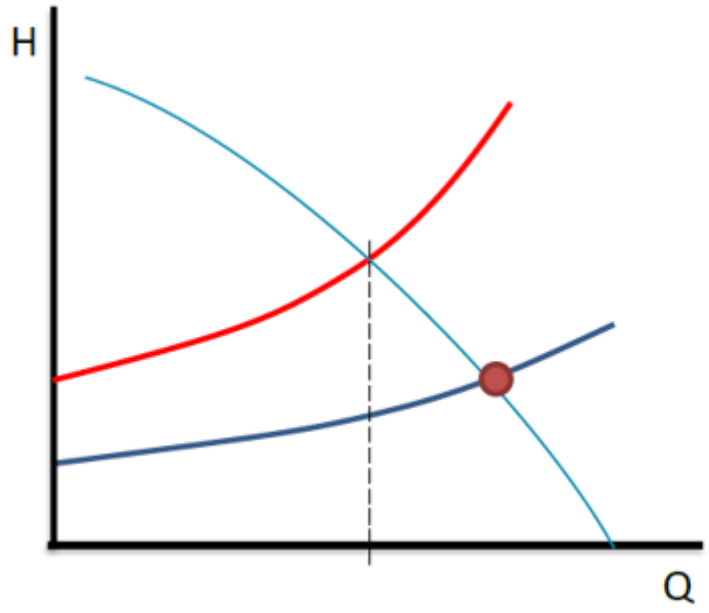


Hard Iron Impellers

- ✓ 25% chromium and 3% carbon in impeller and insert ring
- ✓ High resistance against wear and erosion-corrosion
- ✓ 3 times prolonged life-time, compared to hardened grey iron.



Some Customers Have Duty Point Uncertainty



What is specified?

What is experienced at start up?

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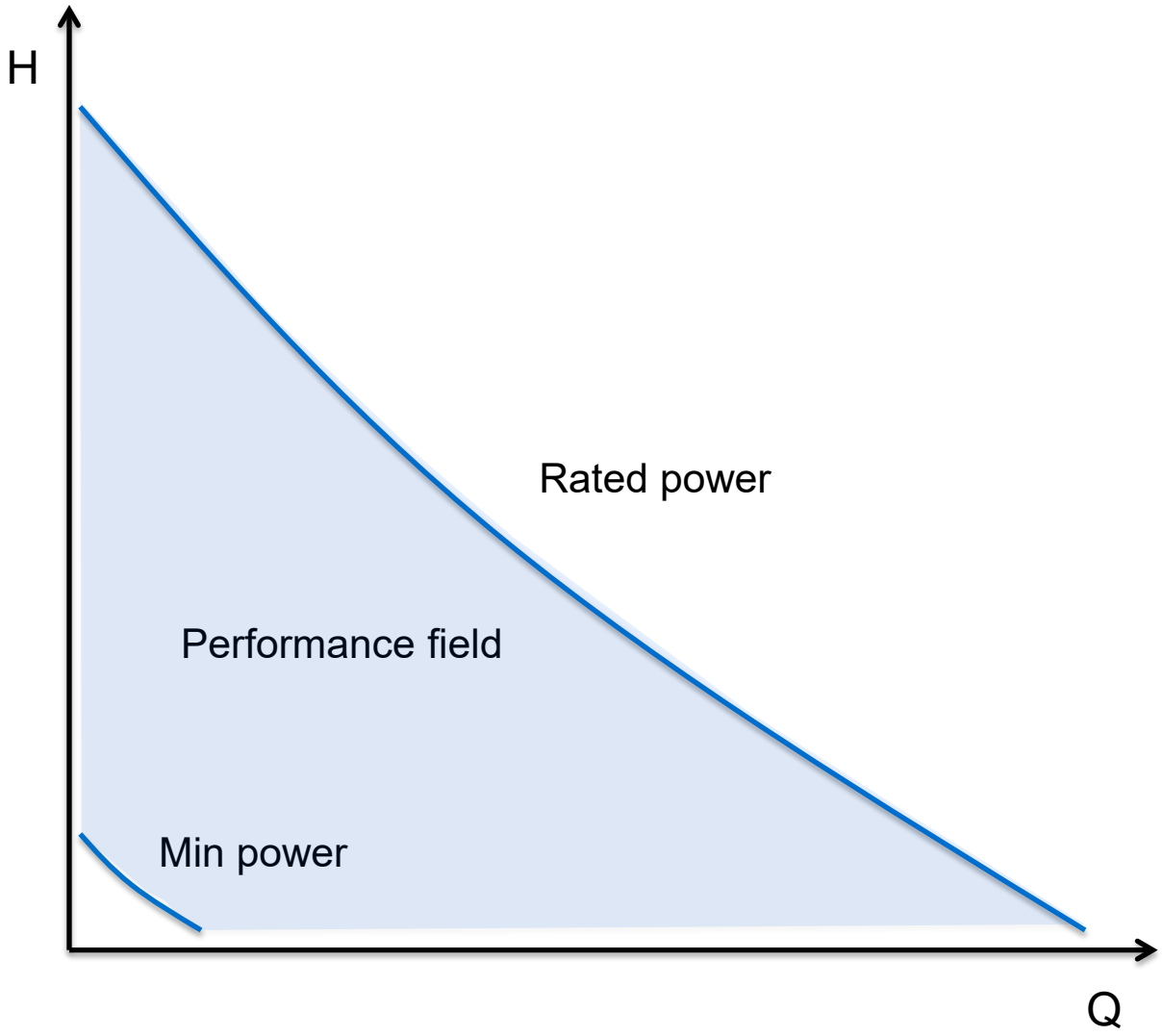
Concertor Operates in a Performance Field



Scalable System

Concertor N

Concertor DP

Concertor XPC

Concertor N – Pump only

- ✓ Clog detection and self-cleaning hydraulics
- ✓ Integrated pump overload protection
- ✓ Soft start
- ✓ Always correct rotation
- ✓ Performance adjustable with service tool
- ✓ Drop-in replacement for conventional pump

Concertor DP – Pump + Gateway

- ✓ No motor starter required
- ✓ Dynamic performance adjustment
- ✓ Soft stop
- ✓ Communications (4 DI, 4 DO, 1 AI, 1 AO)
- ✓ Historical data log and backup restore
- ✓ Performance adjust able from service tool, HMI or webserver
- ✓ Can connect our gateway to an end user controller / RTU / PLC

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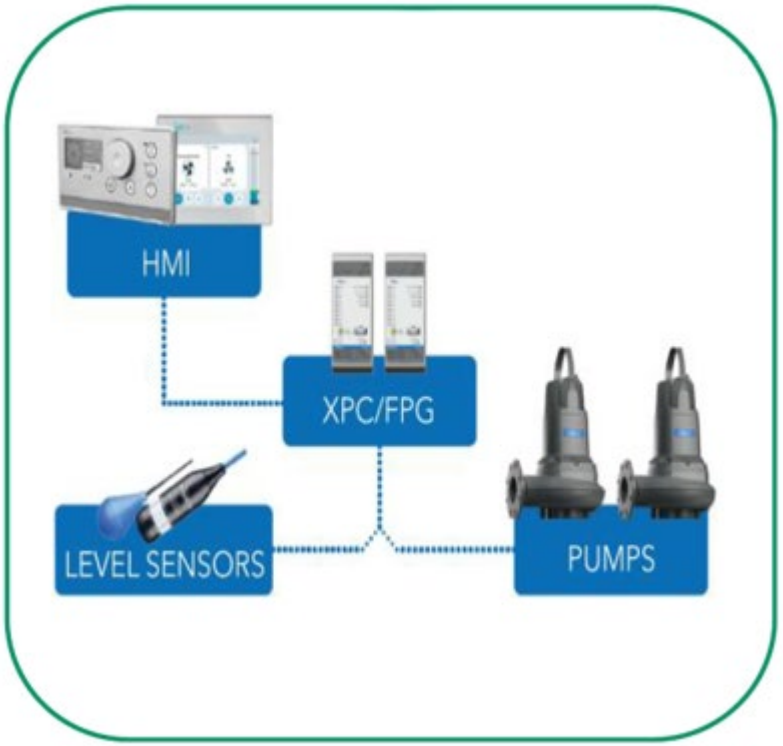
Concertor XPC – Advanced Station Controller

- ✓ Energy minimizer
- ✓ Flow calculation
- ✓ Sump cleaning
- ✓ Pipe Cleaning
- ✓ Configurable and expandable I/O
- ✓ Intuitive user interface
- ✓ Data logging



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Resulting Station Optimization Using Intelligent Pumping

Trouble-Free Pumping

CLOG-FREE PUMPING OPERATION AND CLEAN WET WELLS SAVE UP TO

80%

ON VACUUM **CLEANING COSTS**

THAT WAS THEN…

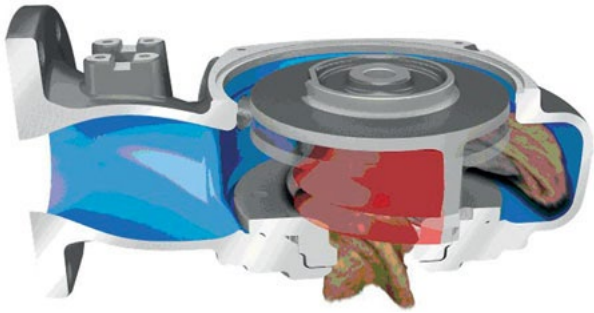
… THIS IS NOW

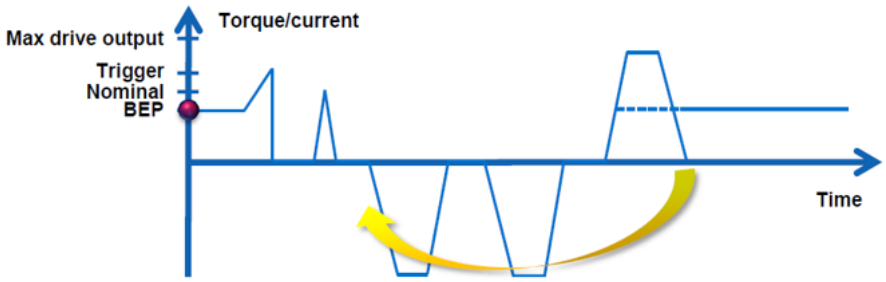
TROUBLE-FREE PUMPING

- Built-in sump and pipe cleaning
- Reduced unplanned maintenance
- Self-cleaning hydraulics
- Self-monitoring functionality
- Self-tuning to preserve key components
- Electronics placed in a stable, submerged environment

Clog Detection

- ✓ Rapid increase of current on clog event
- ✓ Current increase Initiates pump cleaning cycle
- ✓ Concertor allows max drive current output and starts backwards 2 times and forward 1 time.





Discharge Pipe Cleaning

- ✓ Multiple pumps are operated at maximum capacity to create higher discharge velocity, which re-suspends and transports sediment in the force main.

Clog Detection

Sump Cleaning

- ✓ Varying shutoff levels and periodic pump-downs
  Adjustable frequency – typically every 12th cycle
- ✓ Clean wet wells and diminished grease ring
- ✓ Can reduce vacuum cleaning costs by as much as 80%

Before installing Concertor

After two weeks with Concertor

Energy Savings / Efficient Power Management

ENERGY SAVINGS OF UP TO

70%

COMPARED TO **CONVENTIONAL PUMPING** SYSTEMS

- ✓ Soft start to reduce high starting current and maximum demand
- ✓ Power factor always between 0.9 to 0.95 to better utilize available power
- ✓ Average 46% energy savings
- ✓ Energy minimizer function automatically finds optimal duty point
- ✓ IE4 compliant permanent magnet motor
- ✓ Efficient power management
- ✓ Adaptive self-cleaning N-hydraulics

Reduced total investment

CONCERTOR CAN **REDUCE THE SIZE** OF CABINETS UP TO

50%

COMPARED TO **CONVENTIONAL** CABINETS

- ✓ Pre-engineered as total system
- ✓ Smaller and simplified panels
- ✓ Cooler, more reliable, and safer panels
- ✓ Built-in supervision and monitoring functions

Efficient asset management

INVENTORY CAN BE REDUCED BY UP TO

80%

DUE TO **CONCERTOR'S FLEXIBLE PERFORMANCE**

- ✓ Adjustable performance fields
- ✓ Easier product selection
- ✓ Reduced inventory, lead time, and spares
- ✓ Information for improved asset management

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Questions?

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