ENGINEERING
TOMORROW

Danfoss Drives
Business Segment Water/Wastewater

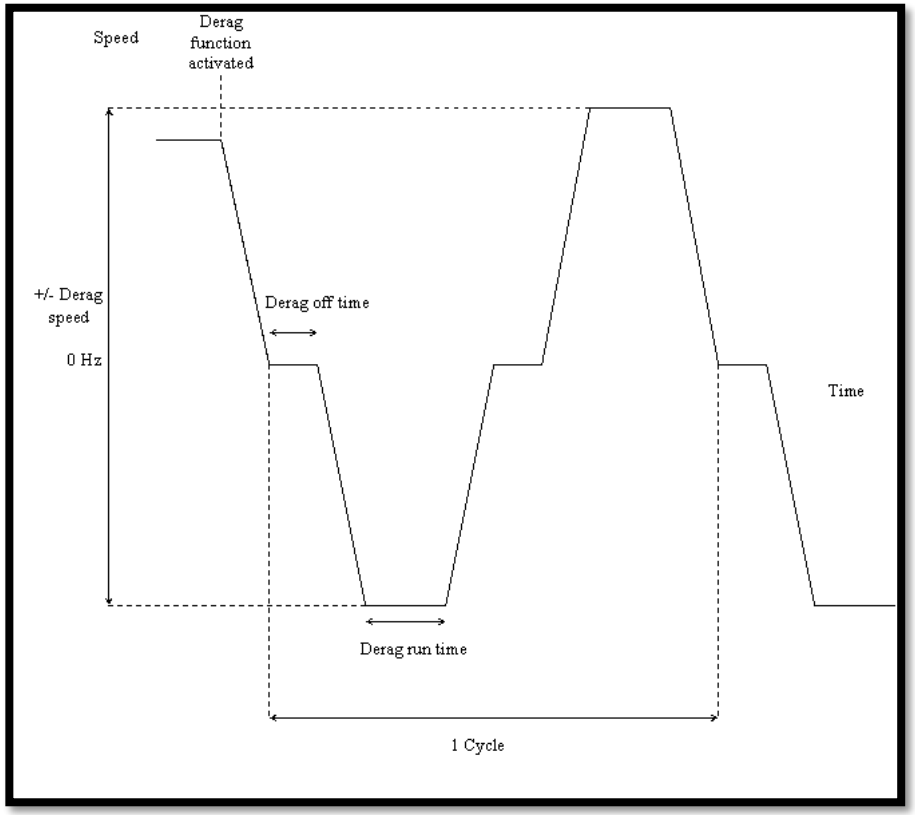
Deragging

VLT® AQUA Drive

The ultimate solution for Water, Wastewater & Irrigation

Deragging: Purpose of the new feature

- **Preventive** and **reactive** pump feature
- Main application area: Wastewater, e.g. lifting pumps and pressure boosting pumps in the sewage system
- Triggers for preventive and reactive Deragging available
- Frees pumps of debris and other solids
- Prevents clogged impellers



What ”Deragging” does

- Running the pump in both direction
  for a number of cycles
- Configurable:
  + Number of cycles
  + Run time
  + Speed
  + Delay

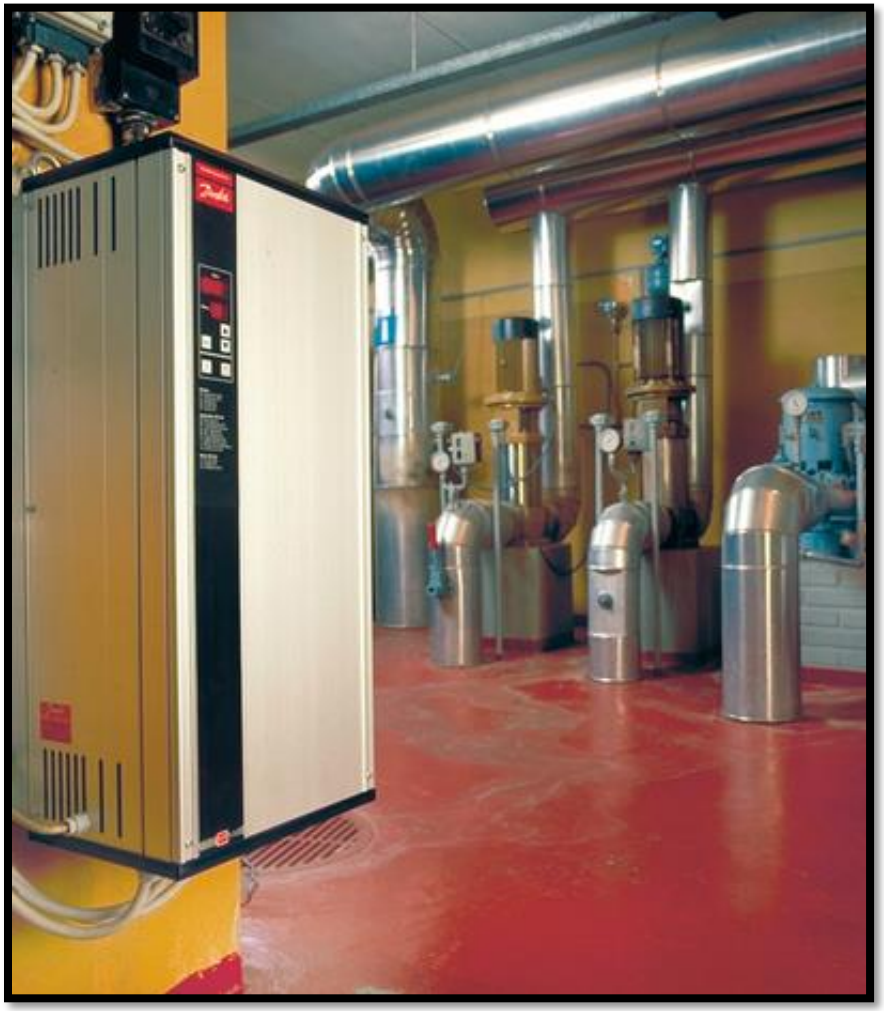
Important:
Deragging must not be enabled, if the pump cannot be operated in both directions.

Deragging: Benefits and values

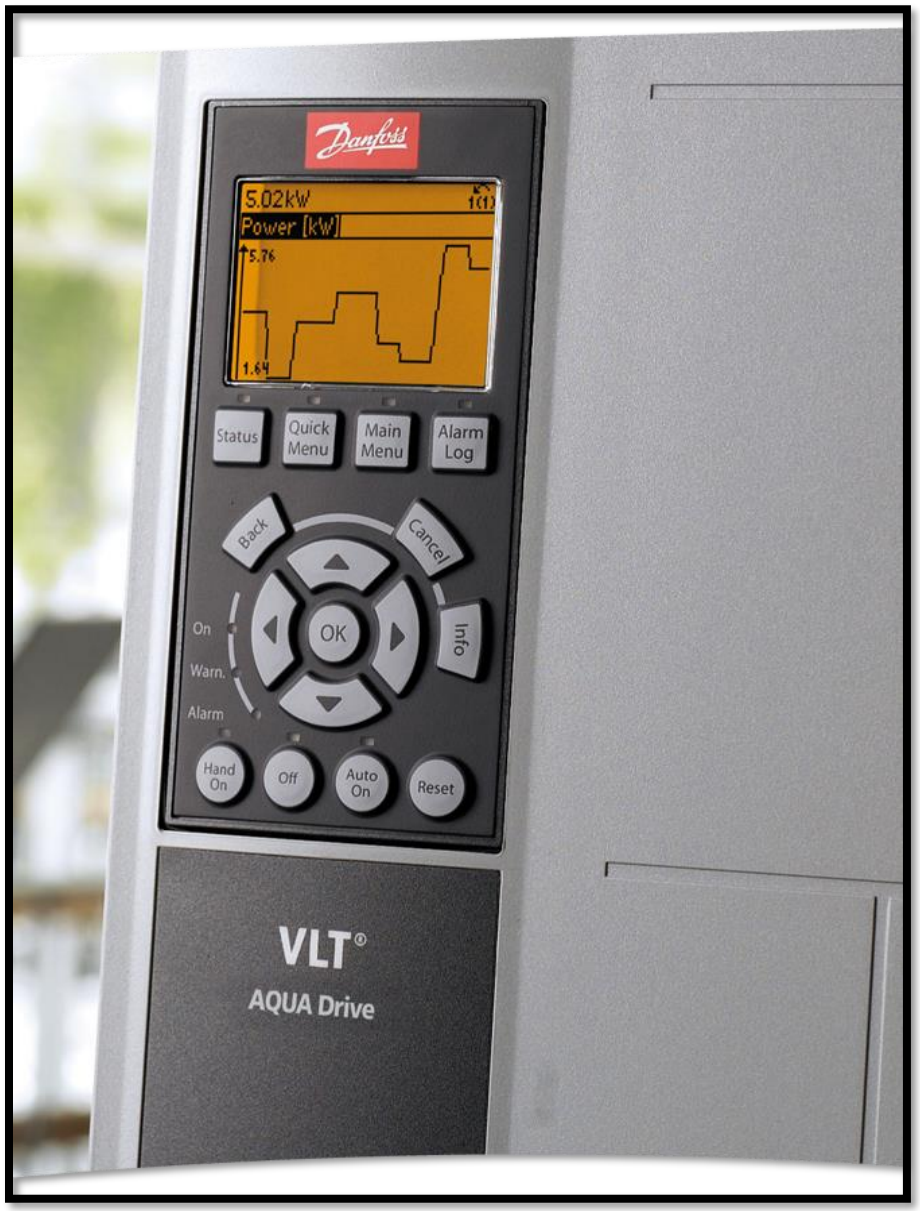
The Deragging feature …

- ✓ requires no external equipment,
- ✓ can be used as preventive measure,
- ✓ is easy to configure,
- ✓ reduces the downtime,
- ✓ prolongs the lifetime,
- ✓ reduces the number of callouts for maintenance and repairs caused by blockages of pumps,
- ✓ needs no extra-programming (SLC),
- ✓ saves energy

How Deragging can be triggered



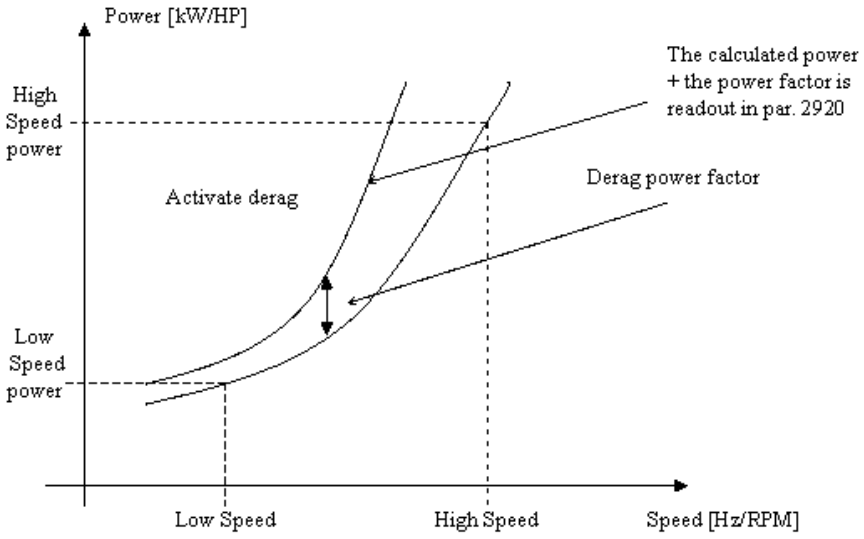
- Start command
- Stop command
- Digital input
- Time based action
- Drive action (SLC)
- Based on monitored power



How to configure

Name	Range	Default	Info
Derag Cycles	0-10 (0 reads Off)	0 (Off)	The number of cycles the drive will derag.
Derag at Start/Stop	[0] Off [1] Start [2] Stop [3] Start+Stop	[0] Off	Derag function when starting and/or stopping the drive.
Deragging Run Time	0 – 60 min	0 min	The time that the drive will dwell at the derag speed.
Derag Speed [RPM]	P411 to P413	P411	The speed at which the drive will derag in RPM.
Derag Speed [Hz]	P412 to P414	P412	The speed at which the drive will derag in hertz.
Derag Off Delay	1 - 600 sec	10 sec	The time that the drive will remain off before starting another derag pulse. Allows contents of the pump to settle.

How to configure



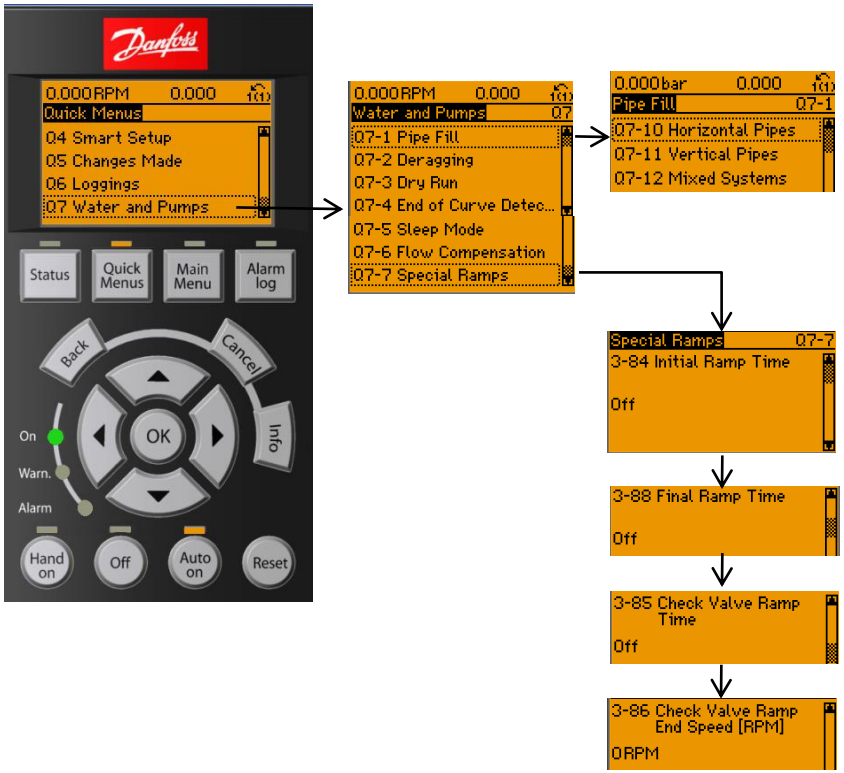
Name	Range	Default	Info
Derag Power			Readout of calculated derag power at actual speed.
Derag Power Factor	1 - 400%	200%	Set a correction if Derag Detection reacts on too low a power value.
Derag Power Delay	1 s-10 min; 10:01 is "Off"	"Off"	The time that the drive must remain on reference and a high power condition for a derag to occur.
Low Speed	P411 – P2928	0	Set output speed used for registration of derag power at low speed in RPM.
Low Speed Power	0 to Max	Max	Set derag power at low speed in kW.
High Speed	P2924 - P413	0	Set output speed used for registration of derag power at high speed in RPM.
High Speed Power	0 to Max	Max	Set derag power at high speed in kilowatts.
Derag On Ref Bandwidth	1 to 100%	5%	Set the percentage of motor speed high limit to accommodate system pressure fluctuation.
Power Derag Limit	0-10	3	The number of times the power monitor can trigger consecutive derags before a fault is reported.
Consecutive Derag Interval	Size dep.	Size dep.	The time for an additional power derag to be considered "consecutive".

Status notifications

Source: www.pompkennis.nl

- A status in the LCP indicates that the derag function is active (Auto Remote Derag)
- A bit in the extended status word indicates that a Deragging event is ongoing
- An output function for the digital outputs and relays is available.

Quick Menu: ”Water & Pumps”



- Quick access to the most common water and pump features of the VLT® AQUA Drive
  - Pipe Fill Mode for horizontal, vertical and mixed pipe systems
  - Deragging
  - Dry Run Detection
  - End of Curve Detection
  - Sleep Mode
  - Flow Compensation
  - Special Ramps
    Initial/Final Ramp, Check Valve Ramp

✓ Improved user-friendliness
✓ Safes significantly time for adapting the drive to the needs of the application

Pumpstation (Netherlands)

Application

Pumps of the station were clogged or blocked 4-5 times per month (e.g. by towels).
Troubleshooting took 2-3 hours per incidence.
Travel time has been about 1.5 hours.

Solution

- Reactive Deragging
  triggered by power consumption

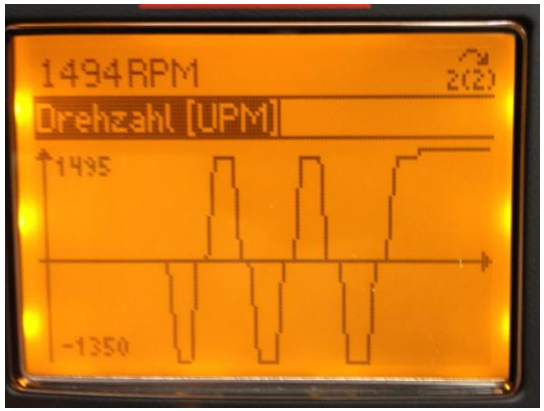
Customer Value

- ✓ No incidents anymore
- ✓ Solution without additional equipment

Annual savings

4.5/month * 12 months * 4 hours * 50 EUR/hour

= 10 800 EUR



Wastewater treatment plant (Germany)

Application

1-2 times/week problems with pump starts of the incoming pumping station due to sedimentation of debris. Troubleshooting took about 1.5 hours for each incidence.

Solution

- Preventive Deragging at every start of the pump

Customer Value

- ✓ No incidents anymore
- ✓ Solution without additional equipment

Annual savings

1.5/week * 52 weeks * 1.5 hours * 50 EUR/hour

= 5 850 EUR

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