VLT® AQUA Drive Type FC 202

Key features, product benefits and value summary.

VLT® AQUA Drive is dedicated to water and wastewater applications. With a wide range of powerful standard and optional features, VLT® AQUA Drive provides the lowest overall cost of ownership for water and wastewater applications.

Power range:

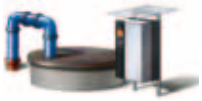
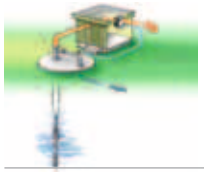
1 x 200 – 240 V AC: ..... 1.1 – 22 kW
1 x 380 – 480 V AC: ..... 7.5 – 37 kW
3 x 200 – 240 V AC: ..... 0.25 – 45 kW
3 x 380 – 480 V AC: ..... 0.37 – 1000 kW
3 x 525 – 600 V AC: ..... 0.75 – 90 kW
3 x 525 – 690 V AC: ..... 11 – 1400 kW

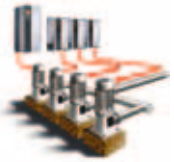
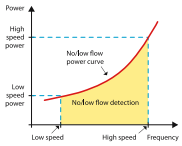
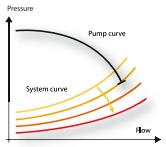
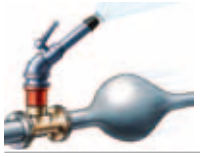
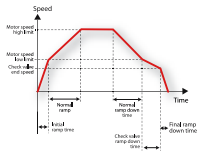
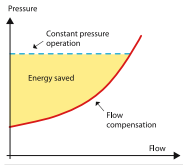
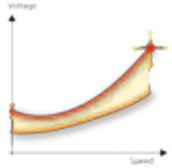
Perfect

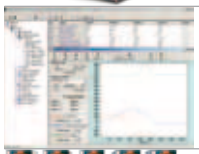
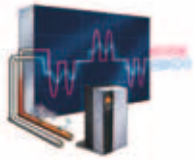
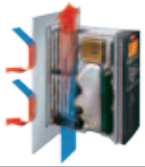
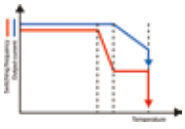
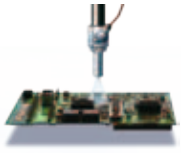
match for:

– Water supply
– Wastewater treatment
– District heating
– Irrigation

Feature	Benefit
Dedicated features	
Dry run detection	Protects the pump
Flow compensation function	Saves energy
2 step ramps (initial ramp)	Protects deep well pumps
Check valve ramp	Protects against water hammer and saves installed cost on soft close valves
Pipe fill mode	Eliminates water hammering
Built-in motor alternation feature	Duty-stand by operation, cost reduction
Sleep Mode	Saves energy
No/low flow detection	Protects the pump
End of pump-curve detection	Protects the pump, leakage detection
Pump cascade controller	Lower equipment cost
Back-channel cooling for frame D, E and F	Prolonged lifetime of electronics
Energy saving	**Less operation cost**
VLT® efficiency (98%)	Saves energy
Automatic Energy Optimisation (AEO)	Saves 3 – 8% energy
Sleep Mode function	Saves energy
Master/follower control	Saves up to 15% energy
Auto Tuning of Staging Speeds	Smoothens the staging and saves energy
Flow Compensation	Saves Energy by self-adjusting the set-point
Reliable	**Maximum uptime**
IP 20 – IP 66 enclosures	Outdoor mounting
All power sizes available in IP 54/55 enclosures	Broad usability in standard factory supplied enclosure
Password protection	Reliable operation
Mains disconnect switch	No need for external switch
Optional, built-in RFI suppression	No need for external modules
Built-in Smart Logic Controller	Often makes PLC omissible
One Wire safe stop	Safe operation/less wiring
Max. ambient temperature up to 50° C without derating	Reduced need for cooling
User-friendly	**Save initial and operation cost**
Award winning control panel (LCP)	Effective commissioning and operation
One drive type for the full power range	Less learning required
Intuitive user interface	Time saved
Integrated Real Time Clock	Lower equipment cost
Modular design	Enables fast installation of options
Auto tuning of PI-controllers	Time saved
Payback time indication	Less worries

	Feature	Function / benefit	Value
	Extension of high power range up to 1.4 MW	• Now possible to provide solution for high power applications (including MV using step up/step down transformers)	• One drive/supplier for all applications = less confusion & lower spares/inventory cost
	Full range of IP55/IP66 and NEMA Type 4X enclosure up to 90 kW	• Directly wall mounted in any environment	• No requirement for panels
	More compact IP55/IP66 and NEMA Type 4X enclosure (A4) for 0.37 – 4.0 kW	• 32% smaller than existing A5 enclosure • Tested outdoor installation • Easier installation • Continuous operation at 50° C	• No need for additional panel of outdoor installation • No need for additional cooling in hot environments
	0.37 – 7.5 kW units are now available in IP20 book style enclosures	• Less panel space required	• Smaller panels & lower panel cost
	1.1 – 22 kW single phase 200 – 240 V units available for remote locations	• Simple conversion from single phase to three phase without transformer	• Reduced installation cost
	Mains disconnect switch and fuses are available as factory option	• Local mains isolation now possible where required, without the need for separate isolator switch, fuses, enclosure & wiring	• Reduces total installation/-wiring cost & simplifies isolation process
	Local control panel now with graphical display plus “Info” & fault log buttons	• Simplifies set-up and status/fault diagnostics through graphical means, on board manual and fault data logger	• Lower set-up & fault diagnostic time/cost, plus increased drive availability
	New plug-in options now include I/O, Modbus TCP, Ethernet IP & connection of external 24 V dc supply etc.	• Increased interface flexibility + universal communication compatibility with enhanced security via back-up supply	• No external interface options/gateways required = lower system/-integration cost
	Smart Logic Controller is built-in as standard	• Now possible to incorporate control using basic sequential user-defined actions determined by user-defined events • Example: Automatic deragging of wastewater pumping stations	• Save on external PLC/relays, comparators, timers, panel space and wiring cost, etc.

	Feature	Function / benefit	Value
	3/2 pump cascade controller is standard (6 or 8 pump controller are plug-in options, including master/follower operation)	• Basic 3 pump standard cascade control or 2 pump cascade control with lead pump alternation is now possible as standard	• Save on external pump controller and wiring cost on basic 3/2 pump applications • Increased energy savings using master/follower functionality
	PI Controllers now include auto-tuning function	• Functions by introducing step-wise changes whilst operating at steady state & then monitoring the feedback to tune PI	• Save on set-up time/cost + potentially improve system performance and efficiency
	Low flow/dry run detection now includes automatic set-up option to generate no flow power curve	• When enabled automatically runs pump to ~50% & 85% speed, storing measured power with shut off valve closed	• Save set-up time/cost + potentially improve pump protection
	End of curve monitoring/broken pipe detection now available in closed loop mode	• Shuts system down if feedback signal is below setpoint for user- defined period, with output frequency at maximum	• Protects pump impeller from damage & potentially reduces piping damage & water loss
	Horizontal pipe fill mode is now available in addition to vertical pipe fill mode (closed loop)	• Now functions with fill speed for user-defined time on horizontal pipes, in addition to fill rate on vertical pipes	• Protects piping from mechanical shock /water hammer damage & water loss
	Check valve ramp & initial/final ramp down functions are now available	• Initial and final ramp secures cooling flow in pump and prevents over heating • Independent ramp for slow closing of check valve allows the use of standard check valves	• Protects check valve & thrust bearings from damage/reduces water hammer damage • Using a standard check valve in stead of special soft-close valve will save 60% on the valve cost or up to 16% of the drive cost
	Flow Compensation	• Programs the system curve • Closed loop PID decreases the speed depending on pressure • Flow compensation decreases the setpoint	• Energy saving can be up to 40%
	Automatic Energy Optimiser is available in constant torque mode as well as variable torque	• Ensures the motor is optimally magnetised at all speeds/loads, for maximum efficiency	• Improves system efficiency and reduces operating cost, in particular on lightly loaded motors
	Sleep mode	• Saves energy when pump is in standby	• Reduced energy cost

	Feature	Function / benefit	Value
	Real time clock is now incorporated as standard with user definable text	• It is possible to program 10 x time-based functions and 20 x preventative maintenance actions (Battery backup optional)	• Saves cost for external timers & controls & improves system reliability
	MCT10 now includes Wizard function for Cascade Controller	• Provides simple step by step graphic procedure to set-up cascade controller to match number of pumps, feedback etc.	• Save on set-up time / cost + improve system security with back-up of all settings
	Programming and monitoring via USB port	• Standard USB port for PC connectivity	• No cost for adaptors • Reduced time for setup
	Standard DC link coils or optional Low Harmonics Drive (LHD) and Advanced Harmonics Filters (AHF) for optimum harmonics mitigation	• Selectable active or passive harmonics mitigation • Optimised installation cost and performance	• Reduce transformer and cable cost
	Built-in RFI filters as standard and operation with long motor cables up to 300 m unscreened motor cable or 150 m screened cable	• Operation of deepwell pumps without output transformer • Central mounting in large plants • No problems with high frequency noise in the installation	• Reduced installation cost • Improved reliability of communications
	Back channel cooling on full product range • Panel through mount from 0.25 to 90 kW • Factory designed back channel cooling from 110 kW to 1.4 MW	• Reduced requirement for panel cooling • Control room air conditioning can be reduced	• 80% reduction of heating in panels
	High drive efficiency	• Reduced heat loss from drives in panels and motor control centres	• 20% lower heat loss than previous generation of VLT® drives
	High ambient temperature	• 50° C ambient temperature without derating the drive • Reduced risk of nuisance tripping	• Reduced cost for air conditioning in high temperature areas
	Corrosion resistant as standard in compliance with level 3C2 according to IEC 60721-3-3. Protection level 3C3 is factory option.	• Reduced risk of corrosion of boards and terminals	• Longer life time of drives

Danfoss VLT Drives, Ulsnaes 1, DK-6300 Graasten, Denmark, Tel. +45 74 88 22 22, Fax +45 74 65 25 80
www.danfoss.com/drives • E-mail: info@danfoss.com

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