VLT® | VACON®

ENGINEERING TOMORROW

Danfoss

Product Overview

iDrives

INTELLIGENT DRIVE SOLUTIONS

www.idrives.net

iDrives
INTELLIGENT DRIVE SOLUTIONS

Welcome

General Manager Bjarke Byllemos, National Sales Manager Aslam Raza and Business Development Manager Ian Cartwright bring proven track records and a professional approach to the North, South and Pacific Island Markets. Combining their 75+ years' experience, the iDrives team offers unequalled factory trained experience from an innovative, market leading global manufacturer with full applications and service support.

iDrives is focussed on providing intelligent drive solutions and passionate about growing the Danfoss brand by helping customers maximise their opportunities and productivity.

The iDrives management and team look forward to combining their customer and application understanding with variable speed drive, soft starter, active and passive filter solutions, sales and service support to meet customer needs.

iDrives Management Team

Ian Cartwright, (left), Aslam Raza (centre) and Bjarke Byllemos (right)

www.idrives.net

iDrives
INTELLIGENT DRIVE SOLUTIONS

Contents

True system independence

System independence

When it comes to optimizing system efficiency to meet your needs exactly, the right components are vital. Whether it's a particular vendor, certain motor technology or a standardized way to communicate, Danfoss Drives can provide the right AC drive to meet your specific needs.

You'll always get the most flexible VLT® or VACON® drive adapted to:

- Meet the unique requirements of your applications
- Operate at peak performance
- Optimize efficiency

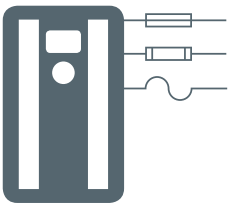
When you have the freedom to select the optimal components for your system, a potential energy saving of up to 60% is possible.

Motor independence

With increasingly stringent demands on motor efficiency, traditional induction motors cannot always comply. New motor technologies therefore continue to emerge, extending both full-load and part-load efficiency. The unique requirements of these newer motor technologies – such as permanent magnet (PM) motors and synchronous reluctance (SynRM) motors – also demand special motor control algorithms within the AC drive. Both VLT® and VACON® drives have the built-in capabilities to control whatever motor technology your application requires, at optimum efficiency. The required performance of your system is always available exactly when you need it.

Fieldbus independence

One other important aspect of anysystem is the ability to efficiently communicate over standard interfaces such as PROFINET or EtherNet/IP in industrial applications or BACnet/IP in building automation applications. Regardless of your application or your preferred communication protocol, both VLT® and VACON® drives have an extremely wide variety of communication protocols to select from. In this way you can ensure that the AC drive integrates seamlessly into your chosen system. The control system attains optimal efficiency while also reducing costs related to training, commissioning and maintenance.



Free-standing and wall-mounted drives

No need to compromise
Can't make space for a cabinet? Now there is no need. VLT® drives are so robust that you can mount them virtually anywhere, even right beside the motor. Free-standing and wall-mounted drives are equipped for the toughest of environments. So they suit your heavy-duty application, no matter whether the requirement is resistance to the industrial environment, clean power supply, or stable grid compliance with EMC and harmonic mitigation. More features which save on compromise:

- Enclosure types rated up to IP54/NEMA 3R
- Full EMC compliance according to international standards
- Ruggedized and coated PCBs
- High temperature resistance, operating up to 50 °C without derating
- Motor cable lengths up to 150 m as standard, with uncompromised performance
- Integrated components save the need for extra externally-mounted equipment

Cabinet drives

Win time
VLT® drives are designed with the installer and operator in mind to save time on installation, commissioning and maintenance.

VLT® High Power Drives are designed for full access from the front. Just open the cabinet door and all components can be reached without removing the, drive even when mounted side by side. More time-saving features:

- An intuitive user interface with an award-winning Local Control Panel (LCP) that streamlines start-up and operating procedures
- The full power range utilizes a common control platform for consistent interface and predictable operation
- Robust design and advanced controls make VLT® drives virtually maintenance free

Drive modules

Win space
The compact design of VLT® drives – and high-power VLT® drives in particular – makes them easy to fit even in small spaces.

Integrated filters, options and accessories provide additional capabilities and protection without increasing the enclosure size. More space-saving features:

- Built-in DC link reactors for harmonic suppression eliminate the need for higher loss external AC line reactors
- Optional built-in RFI filters are available throughout the power range
- Optional input fuses and loadshare terminals are available within standard enclosures
- In addition to the many valuable features that VLT® drives offer as standard, there are numerous other control, monitoring and power options available in pre-engineered factory configurations

c UL us CE TS16949

Manufactured to the highest quality standards VLT® series drives are UL listed and made in ISO 9001-2000 certified facilities.

Engineered for **cost savings** via **intelligent heat management**, compactness and **protection**

All Danfoss VLT® drives follow the same design principle for fast, flexible and fault-free installation and efficient cooling.

VLT® High Power Drives are available in a broad range of enclosure sizes and protection ratings from IP20 to IP54 to enable easy installation in all environments: mounted in panels, switch rooms or as stand-alone units in the production area.

Cost saving heat management

In VLT® High Power Drives there is total separation between the backchannel cooling air and the internal electronics. This separation greatly reduces the airflow over the sensitive electronics, minimizing the exposure to contaminants. At the same time it removes heat efficiently which helps to prolong product life, increase the overall availability of the system and reduce faults related to high temperatures.

For example, by exhausting heat directly outside, it is possible to reduce the size of the cooling system in the panel or switch room. This can be achieved with Danfoss' extremely efficient backchannel cooling concept, allowing heat to be vented outside the control room.

In daily use the benefits are equally clear as the energy consumption related to cooling can be reduced significantly. This means that designers can reduce the size of the air conditioning system, or even eliminate it entirely.

Coated circuit boards

The VLT® High Power Drive conforms as standard to class 3C3 (IEC 60721-3-3) to ensure long lifetime even in harsh environments.

Ruggedized for extra protection

The VLT® High Power Drive in a D enclosure is available in a 'ruggedized' version that ensures the components remain firmly in place in environments characterized by high degrees of vibration, such as Marine and mobile equipment.

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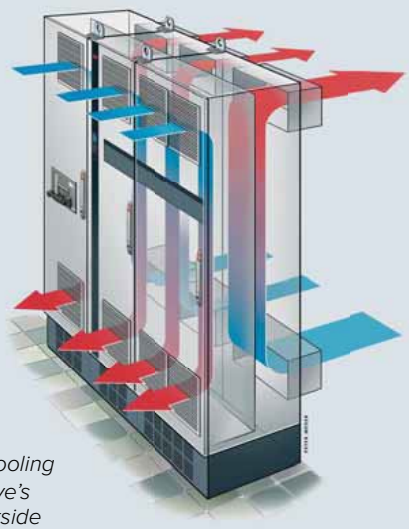
Back-channel cooling gives up to **90%** **reduction** in investment for air cooling systems



Minimal airflow over electronics
Complete separation between back-channel cooling air and the internal electronics ensures efficient cooling.

Back-channel cooling
By directing air through a rear cooling channel up to 80-90% of the drive's heat loss is removed directly outside the installation room.

Danfoss has the world's largest installed base of variable speed drives comprising VLT® and VACON® AC drives, and can draw on decades of passion and experience within a wide range of industries.

The Danfoss journey began on 1 September, 1933, when Mads Clausen founded Danfoss in his parents' farmhouse in Nordborg, Denmark. In 1968 Danfoss was the first company to mass-produce AC drives. Since then, Danfoss has been a leader in drives technology and digital solutions that enable customers to thrive in a world that is rapidly changing.

Danfoss recognises and address the megatrends affecting the world today. Innovating technology that tackles climate change, helps cope with rapid urbanization and provides successful and sustained water and wastewater management are high on their agenda.

Danfoss are passionate about helping you get the most out of your applications by providing efficient lifecycle services. With centres of excellence in key regions, sales companies and service centres in more than 50 countries, Danfoss ensure the distance to products and support is minimal.

Danfoss Drives entered the New Zealand market in 1993. Since then Danfoss Drives has grown a large installed base nationwide, across multiple industries and in many significant projects. In New Zealand Danfoss has established a strong reputation for quality, service and application knowledge through its partners.

As New Zealand's premier Danfoss Drive supplier, iDrives delivers intelligent drive solutions across New Zealand. We are focused on providing intelligent drive solutions and passionate about growing the Danfoss brand by helping customers maximise their opportunities and productivity.

Read more on Danfoss history.

VLT®

VLT® drives position you at the **forefront** of the energy-efficiency race.

Outmaneuvering other precision drives, they excel, with remarkable fit, functionality and diverse connectivity. VLT® drives play a key role in the rapid urbanization through an uninterrupted cold chain, fresh food supply, building comfort, clean water and environmental protection. Benefit from the universally-compatible VLT® effectiveness where ease of use unites seamlessly with high precision, synchronization and speed. You achieve servo-like performance with rationalized elegance, free of complexity.

Secure long-term economic benefits with documented low system-lifetime cost. VLT® drives consistently deliver, whether in Food and Beverage, Water and Wastewater, HVAC, Refrigeration, Material Handling, or Textile applications. The steadfast longevity of VLT® drives is directly attributable to world-class quality assurance placing VLT® drives right at the sharp end. The sharp end of global resource management and factory automation.

Software

Danfoss ecoSmart™

Now it's easy to determine IE and IES classes according to EN 50598-2, for VLT® and VACON® drives alone and in combination with a motor. Danfoss ecoSmartTM uses nameplate data to perform the efficiency calculations, and produces a pdf report for documentation.

View the Danfoss ecoSmart™ online tool

Danfoss HCS

Danfoss HCS is a professional harmonics simulation tool which is web-based. It provides harmonic analysis of systems using VLT® and VACON® products. This tool uses a scientific simulation platform with an advanced simulation model. It uses more system parameters than the other harmonics simulation tools offered by Danfoss Drives, and therefore delivers more accurate results. Danfoss HCS presents the results of the simulation in table or graphical form.

VLT® Software

VLT® Motion Control Tool MCT 10

VLT® Motion Control Tool MCT 10 is a windows-based engineering tool with a clearly structured interface that provides an instant overview of all the AC drives in a system of any size. The software runs under Windows and enables data exchange over a traditional RS485 interface, fieldbus (PROFIBUS, Ethernet, or other) or via USB.
Parameter configuration is possible both online on a connected drive and offline in the tool itself. Additional documentation, such as electrical diagrams or operating manuals, can be embedded in VLT® Motion Control Tool MCT 10. This reduces the risk of incorrect configuration while offering fast access to troubleshooting.

VLT® Energy Box

Calculate the energy consumption of HVAC applications controlled by VLT® drives and compare this with alternative - and less energyefficient - methods of air flow control.
Using VLT® Energy Box it is easy to evaluate and document the savings achieved by using a VLT® HVAC Drive by comparison with other types of capacity control systems - for new installations as well as retrofit situations.

VLT® Motion Control Tool MCT 31

The MCT 31 harmonic simulation tool is a stand-alone program for Windows and useful in the planning phase. It is easy to use, includes a database of VLT® drives products, and provides a fast overview of the expected general system performance. It can also propose a cost-effective harmonics mitigation strategy based on the Danfoss product range.

VACON® Software

VACON® Live

Commissioning, maintenance, parameterization and monitoring of multiple drives.
Supported drives: VACON® 10, VACON® 20, VACON® 20 X, VACON® 100 X, VACON® 100 family

VACON® Loader

Updating AC drive firmware and installing application software.
Supported drives: VACON® 10, VACON® 20, VACON® 20 X, VACON® 100 X, VACON® 100 family

VACON® NCDrive

Commissioning, maintenance, parameterization and monitoring of drives.
Supported drives: VACON® NXP, VACON® NXS, VACON® NXL

VACON® NCLoad

Updating AC drive firmware and installing application software.
Supported drives: VACON® NXL, VACON® NXS, VACON® NXP

VACON® Customizer

To freely customize the operation of an AC drive.
Supported drives: VACON® 100 INDUSTRIAL, VACON® 100 FLOW, VACON® 100 X

VACON® Programming

An AC drive application programming tool to optimize drive behavior.
Supported drives: VACON® 20, VACON® 20 X, VACON® 100 family, VACON® 100 X, VACON® NXS, VACON® NXP

VACON® Key

Manage and handle VACON® NXP Grid Converter licenses.
Supported drives: VACON® NXP Grid Converter

VACON® Layout

Configure and obtain documentation
Supported drives: VACON® NXP System Drive

VACON® Documentation Wizard

Diagrams and drawings
Supported drives: VACON® NXC

VACON® Harmonics

Simulate the expected harmonics of an AC drive or group of drives. Supported drives: VACON® NXS, VACON® NXP, VACON® 10, VACON® 20, VACON® 20 X, VACON® 100 family

VACON® Save

Calculate energy savings when using an AC drive with pumps, fans and compressors.

Low power drives

VLT® Micro Drive FC 51

The smallest AC drives in the VLT® series are particularly suitable for side-by-side mounting with a high integration density. The typical features of Danfoss drives are still retained.

Compact
VLT® Micro Drive is up to 40 percent smaller than other AC drives with comparable power and built-in features.

Protection for electronics
To ensure a long service life, the cooling air does not flow directly over the power electronics.

Power range

1 x 200-240 V ..... 0.18-2.2 kW
3 x 200-240 V ..... 0.25-3.7 kW
3 x 380-480 V ..... 0.37-22 kW

Fieldbus
- Modbus

Enclosure
- IP20
- IP21/Type 1

View FC 51 on the Danfoss website

Low power drives

VLT® Midi Drive FC 280

The VLT® Midi Drive FC 280 delivers flexible and efficient motor control for use in a wide variety of automation and machine building applications.

Flexible. Communicative.
The VLT® Midi Drive FC 280 is strong on control performance, functional safety, and flexible fieldbus communication. Integrated functionality such as DC choke, RFI filter, Safe Torque Off (STO), and brake chopper saves you from finding space and budget to install extra components.

Easy retrofit
VLT Midi Drive is prepared for compatibility with the VLT® 2800.Its exterior dimensions, cable plugs, cable lengths, and set-up software tools enable easy retrofit in established plant or machinery concepts.

Easy to use
A USB port provides easy PC connectivity. The VLT® Memory Module MCM 102 option facilitates fast implementation of factory settings, transfer of settings, and easy commissioning.

Power range

1 x 200-240 V ..... 0.37-2.2 kW
3 x 200-240 V ..... 0.37-3.7 kW
3 x 380-480 V ..... 0.37-22 kW

Fieldbus
- Modbus
- PROFIBUS DP V1
- PROFINET
- CANopen
- Ethernet/IP

Enclosure
- IP20
- IP21/Type 1

View FC 280 on the Danfoss website

High performance drives

VLT® AutomationDrive FC 302

The VLT® AutomationDrive FC 302 is a modular drive designed to comply with all modern automation application requirements with easy configuration and
a broad power range.

Safety where it matters
The VLT® AutomationDrive FC 302 features Safe Torque Off as standard. Easily configurable options are available: SS1, SLS, SMS and SSM.

Integrated Motion Controller
The Integrated Motion Controller software enables the VLT® AutomationDrive FC 302 to run induction and PM motors in positioning and synchronization applications, both with and without encoders.

Harmonic mitigation
Advanced active filter variants reduce harmonics to below 3% at best, and 12-pulse drives provide robust cost-effective harmonics reduction in supply applications.

Power range

3 x 200-240 V ..... 0.25-37 kW
3 x 380-500 V ..... 0.37-1100 kW
3 x 525-600 V ..... 0.75-75 kW
3 x 525-690 V ..... 1.1-1400 kW

Power range - Low harmonic drive

3 x 380-480 V ..... 132-710 kW

Power range - 12-pulse drive

3 x 380-500 V ..... 250-1000 kW
3 x 525-690 V ..... 250-1400 kW

Fieldbus

- Modbus
- DeviceNet
- CANopen
- PROFIBUS DP V1
- Modbus TCP
- Ethernet/IP
- EtherCAT
- PROFINET
- Powerlink

Enclosure

- IP20
- IP21/Type 1
- IP54/Type 12
- IP66/Type 4X

View FC302 on the Danfoss website

High performance drives

VLT® AQUA Drive FC 202

The VLT® AQUA Drive FC 202 drives and controls all types of pumps. In addition to the widely used centrifugal pumps (quadratic load torque), the VLT® AQUA Drive FC 202 is ideal for displacement pumps or eccentric screw pumps (constant load torque).

Focusing on water and pumps
Dedicated functions such as burst pipe monitoring, dry-running protection and flow compensation secure and empower your pumping application independent of the motor technology.

Cascade controller as standard
The cascade controller connects or disconnects pumps as necessary and according to specified limits. It also enables master/follower operation. Extended functionality is available via an option.

Power range

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

Power range - Low harmonic drive

3 x 380-480 V ..... 132-710 kW

Power range - 12-pulse drive

3 x 380-500 V ..... 250-1000 kW
3 x 525-690 V ..... 250-1400 kW

Fieldbus

- Modbus
- DeviceNet
- PROFIBUS DP V1
- Modbus TCP
- Ethernet/IP
- PROFINET

Enclosure

- IP20
- IP21/Type 1
- IP54/Type 12
- IP66/Type 4X

View FC202 on the Danfoss website

Soft starters

VLT® Compact Starter MCD 201 and 202

While the basic and the starting torque VLT Compact starter MCD 201 version is only used for motor starting, the extended VLT Compact Starter MCD 202 version offers additional motor protection functions. These include, for exampe, current limitation during motor starting.

Built-in bypass

After the motor is started, the MCD 201 and MCD 202 automatically connect the motor to the mains supply via the built-in bypass relay. This minimizes losses during operation under full load.

Technical data

Input ..... 3 x 200-575 V
Control voltage ..... 24V AC or DC/110-440 V AC
Power ..... 7.5 kW-110kW (200 A)

Fieldbus

- Modbus
- DeviceNet
- PROFIBUS DP V1
- Ethernet/IP

Enclosure

- IP20

View MCD 201 and 202 on the Danfoss website

Soft starters

VLT® Soft Starter MCD 500

The VLT® Soft Starter MCD 500 is the comprehensive solution for soft starting and stopping three-phase asynchronous motors. Integrated current transducers measure the motor current and provide important data for optimal start and stop ramps. A built-in bypass is available up to 961 A.

Fast commissioning
The four-line graphic display (choice of eight languages) and quick menu ensures easy and reliable configuration and read-out.

Load-oriented start
Adaptive Acceleration Control (AAC), adjusted to the respective load, ensure the best possible start and stop ramps in order to avoid water hammering.

Comprehensive protection
Phase error detection, thyristor monitoring and bypass contact overload are just a few integrated monitoring functions.

VLT Soft Starter MCD 600

The VLT Soft Starter MCD 600 combines the latest in advanced controls and protections with an increased level of intelligence for superior performance in fixed-speed applications

Flexibility
The MCD 600 is more flexible than ever to install, thanks to a wide variety of Ethernet and serial-based communication option cards, application-dedicated smart cards and support for eight languages.

Integral Bypass
The integrated bypass ensures both extremely high efficiency and harmonicfree operation at full speed, reducing energy consumed and required cooling capacity.

Ease of Use
Ease of use is also greatly increased with new capabilities, such as the pump-clean function, PowerThrough operation, and calendar or run time based scheduling. Furthermore, enhanced protection ensures more uptime.

Technical data

Input ..... 3 x 200-690 V
Control voltage ..... 24 V DC or 110-240 V AC
Power ..... 7.5-850 /2400* (1600A) kW
*Inside delta connection

Fieldbus
- Modbus
- DeviceNet
- PROFIBUS DP V1
- Ethernet/IP

Enclosure
- IP00
- IP20

View MCD 500 on the Danfoss website
View MCD 600 on the Danfoss website


Highest
harmonic
performance
at lowest operating
expenses in its
power range
30%
cost reduction in
1st year compared
with traditional drive
systems

In 2002 VACON drives entered New Zealand and soon established itself as the market leader in the HVAC market, securing numerous high profile projects and growing a large installed base.

In 2014 VACON became part of the Danfoss Group, leveraging the best of both companies to provide customers an even more competitive, innovative and attractive offering of AC drives as Danfoss Drives.

Combine **innovation** and high durability for the **sustainable** industries of **tomorrow**.

For long lifetime, top performance, and full-throttle process throughput, equip your demanding process industries and marine applications with VACON® single or system drives.

Reduce emissions and increase fuel efficiency through trailblazing innovation in hybridization trends. Manage heat intelligently, and win focus, with functionalities dedicated to your industry alone. Connect rapidly and program with exceptional flexibility.

All these abilities mean VACON® drives form the robust foundation for optimization in harsh environments. Whether in Marine and Offshore, Oil and Gas, Metals, Mining and Minerals, Pulp and Paper, Renewable Energy, or other heavy-duty industries, the VACON® drives meet the challenge. Tune total operational cost and cut capital expenditure thanks to compact size and lower airconditioning load. Of course, uncompromising reliability is a constant.

The exceptional VACON® range is **continuously advancing**, with rigorous application-optimized **innovation**, ready to be put to work. **Hard work.**

Low power drives

VACON® 20

VACON® 20 comes with compactness and programming functionality that makes it one of the most easilyadaptable drives available for OEM applications.

Saves machine costs
The VACON® 20 has a built-in PLC functionality according to IEC 61131-1 which brings cost savings to the user. For the OEM or machine builder it is easy to change the software logic of the drive to adapt to their own control needs.

High fieldbus connectivity
The VACON® 20 supports of a wide variety of fieldbus connections. Enables effective machine integration, eliminating the need for external fieldbus gateways and parallel I/O connections.

Configure without mains power
With the optional copying module, parameter configurations can be copied into the VACON® 20 during the installation phase with no need for mains power - saving both time and effort.

Power range

1 x 115 V	0.25-1.1 kW
1 x 208-240 V	0.25-2.2 kW
3 x 208-240 V	0.25-11 kW
3 x 380-480 V	0.37-18.5 kW

VACON® 20 Cold Plate

For flexibility in cooling, with focus on customer-specific cooling solutions, the VACON® 20 Cold Plate is the perfect AC drive for OEMs with special cooling requirements.

Cooling flexibility
Cold plate cooling allows the drive to be used in the best possible cooling configurations, such as passive heat sinks, liquid-based cooling or any other cold surface onto which the AC drive can be mounted. Goes into sealed enclosures VACON® 20 Cold Plate operates at up to 70°C ambient temperatures without derating, and is installable at low depth due to its flat form factor. For the user, this means the greatest possible flexibility - and the ability to install the drive into sealed enclosures.

VACON 20 benefits
The VACON® 20 Cold Plate contains same user interfaces and options as in the other VACON® 20 products, including built-in support for IEC 61131-1 PLC programming.

Power range

1 x 208-240 V	0.75-1.5 kW
3 x 208-240 V	0.75-4.0 kW
3 x 380-480 V	0.75-7.5 kW

Fieldbus
- Modbus
- DeviceNet
- PROFIBUS DP V1
- CANopen
- EtherCAT
- Modbus TCP
- Ethernet/IP
- PROFINET

Vacon 20 Enclosure
- IP20
- IP21/Type 1

Vacon 20 Cold Plate Enclosure
- IP00

View Vacon 20 on the Danfoss website

View Vacon 20 Coldplate on the Danfoss website

Wall Mounted drive
IP21/Type1
IP54/Type12

Enclosed drive
IP21/Type1
IP54/Type12

Low power drives

VACON® 100 Flow

Delivering all the benefits of the VACON® 100 family of drives, the VACON® 100 FLOW offers dedicated functionality. It improves flow control and saves energy in industrial pump and fan applications in power sizes up to 800 kW.

Modules and enclosed drives
All power sizes are available as drive modules. The free-standing enclosed drive version for higher power sizes contains a wide range of configurable options and an innovative control compartment for safe access, without opening the cabinet door

Dedicated industrial flow control
The VACON® 100 FLOW provides specific flow control functions to enhance pump and fan performance and protect pipes and equipment, ensuring reliable operation.

Runs high-efficiency motors
Select the most efficient motor for your task, with the ability to run the new high-efficiency motor technologies, such as permanent magnet and synchronous reluctance motors, for improved system efficiency.

Power range

3 x 208-240 V ..... 0.55-90 kW
3 x 380-500 V ..... 1.1-630 kW
3 x 525-690 V ..... 5.5-800 kW

Fieldbus

- Modbus
- Metasys N2
- BACnet (MSTP)
- Modbus TCP
- BACnet/IP
- DeviceNet
- PROFIBUS DP V1
- CANopen
- LON works
- EtherCAT
- Modbus TCP
- Ethernet/IP

Enclosure

- IP00
- IP21/Type 1
- IP54/Type 12

View Vacon 100 Flow on the Danfoss website

VACON® NXP Air Cooled

VACON® NXC Air Cooled Enclosed Drives

VACON® NXP Liquid Cooled Drive

Full power range drives and dedicated drives

VACON® NXP Air Cooled

The VACON® NXP Air Cooled drive is designed for a broad range of demanding industrial applications, focusing on higher power sizes and system drives.

Top performance
VACON® NXP control flexibility delivers maximum motor control performance and dynamics, in both single-shaft machines and drive systems.

Configurable on all levels
Fully configurable I/O and fieldbuses cater for any connectivity need. Fast optical drive-to-drive communication gives you the flexibility of load sharing and paralleling of power units.

Extremely flexible
Adapt the drive to many diverse usage requirements by loading the VACON application software that best suits the needs. Built-in PLC functionality according to IEC61131-1 enables you to create new functionality in the drive to obtain cost savings and deeper machine integration.

Power range
3 x 208-240 V ..... 0.55-90 kW
3 x 380-500 V ..... 1.5-1200 kW
3 x 525-690 V ..... 2.0-2000 kW

View NXP Air Cooled on the Danfoss website

VACON® NXC Air Cooled Enclosed Drives

The VACON® NXC combines the VACON® NXP product range with a wide range of options in a single enclosed drive format.

Reliable operation
Based on a Rittal TS8 enclosure, the VACON® NXC enclosed drive is fully pre-designed and factory tested in order to ensure reliable and trouble-free operation.

Easy to work with
Access to the control equipment is easy and safe, due to the dedicated control compartment located at the front part of the enclosed drive. It is also internally protected against unintentional touch to increase user safety.

Easy to configure
When ordering, choose between a wide range of cabinet-installed options. Both 6 and 12-pulse versions are available.

Power range
3 x 380-500 V ..... 132-1200 kW
3 x 525-690 V ..... 110-2000 kW

Power range - AFE supply
500 V ..... 132-1500 kW
690 V ..... 110-2000 kW

Power range - Low harmonic, Active Filter supplies
500 V ..... 132-560 kW
690 V ..... 110-800 kW

View NXP Air Cooled Enclosed Drives on the Danfoss website

VACON® NXP Liquid Cooled Drive

This dedicated liquid-cooled drive is well-suited to applications where air quality is critical, space is limited, and efficient heat transfer is required.

Compact
No need for air ducts or large fans, combined with a more compact size, means you achieve a high power density in your installation - and virtually silent operation.

Uptime and cost savings
Save on both investment and operating costs when removing heat using the liquid medium. Achieve maximum uptime, with robust operation even in demanding conditions and with only minimal air filtering in dusty conditions.

Highest control flexibility
The drive utilizes the full VACON® NXP family control functionality to achieve modularity and scalability in a wide range of AC drive applications.

Power range
3 x 380-500 V ..... 132-4100 kW
3 x 525-690 V ..... 110-5300 kW

View NXP Liquid Cooled on the Danfoss website

VACON® NXP Liquid Cooled Enclosed Drive

VACON® NXP System Drive

System drives

VACON® NXP Liquid Cooled Enclosed Drive

The VACON® NXP Liquid Cooled Enclosed Drive offers all the benefits of VACON® NXP Liquid Cooled drives for high power applications in a compact IP54 rated enclosed drive package.

Predesigned is easy
Being predesigned and engineered, these drives are ready to go as soon as you receive them. Simply connect to the cooling system and the power and motor supplies.

Active Front End for clean supply
Drives with active front end minimize harmonic disturbance to the grid, enable regenerative braking and reduce the scale of infrastructure required, such as transformers and generators.

Fast serviceability
Fast access to the modules using pull-out rails saves time and money in service and maintenance situations.

Power range
3 x 525-690 V ..... 800-1550 kW

View NXP Liquid Cooled Enclosed Drives on the Danfoss website

VACON® NXP System Drive

By combining common DC bus components the VACON® NXP System Drive provides you a drive configured and assembled to meet your needs - regardless of whether you need to control one or several motors.

Simplicity in projects
Using pre-designed enclosed drive sections for all main system parts, it enables a short engineering and configuration time for any drive system. Every project design is fully documented for the specific configuration.

Reliability is key
The verified and tested solutions that combine VACON® AC Drives, DC bus components and options result in verified and tested reliability.

Easy serviceability
A pullout system allows quick replacement of drives modules in service situations. Safety is a priority with internal touch protection and high power busbar sections in separate compartments.

Current ratings (main busbars)
3 x 380-500 V .....630-5000 A
3 x 525-690 V .....630-5000 A

View NXP System Drive on the Danfoss website

VACON® 20 X

VACON® 100 X

Decentral drives

VACON® 20 X

The VACON® 20 X decentral drive offers all the benefits of decentralized solutions up to 7.5 kW.

Robust and resistant
Due to the IP 66 enclosure and the high vibration resistance the drive is suitable for tough environments. The Gore® vent membrane ensures reliability even when wet.

Easy to integrate
A one-plug I/O connection and access to all main fieldbus protocols ensures easy integration for machine builders. Built-in IEC61131-1 programmability opens up for customized software modification, to meet the needs of most applications.

Power range
1 x 208-240 V ..... 0.75-1.5 kW
3 x 208-240 V ..... 0.75-4.0 kW
3 x 380-480 V ..... 0.75-7.5 kW

View VACON 20X on the Danfoss website

VACON® 100 X

Robust enclosure and high functionality is provided by the VACON® 100X for indoor and outdoor applications. No extra enclosure - even outdoors The drive withstands high-pressure water, high vibration levels, heat and dirt. The Gore® vent membrane and IP66 enclosure give you the freedom of indoor and outdoor use.

A really cool drive
An optional space heater is available for cold environments.

Wide power range
With power range extending up to 37 kW, this drive makes the benefits of decentralized solutions available for a wide range of applications.

Power range
3 x 208-240 V ..... 1.1-15 kW
3 x 380-500 V ..... 1.1-37 kW

View VACON 100X on the Danfoss website

Fieldbus
- Modbus
- Metasys N2
- BACnet (MSTP)
- Modbus TCP
- BACnet/IP
- DeviceNet
- PROFIBUS DP V1
- CANopen
- LON works
- EtherCAT
- Modbus TCP
- Ethernet/IP

Enclosure
- IP166

Up to

68%

smaller footprint

provides ease of installation and lower material costs.

DrivePro® Life Cycle services
Delivering a customized service experience!

We understand that every application is different. Having the ability to build a customized service package to suit your specific needs is essential.

DrivePro® Life Cycle Services is a collection of tailormade products designed around you. Each one engineered to support your business through the different stages of your AC drive's life cycle.

From optimized spare-part packages to condition-monitoring solutions, our products can be customized to help you achieve your business goals.

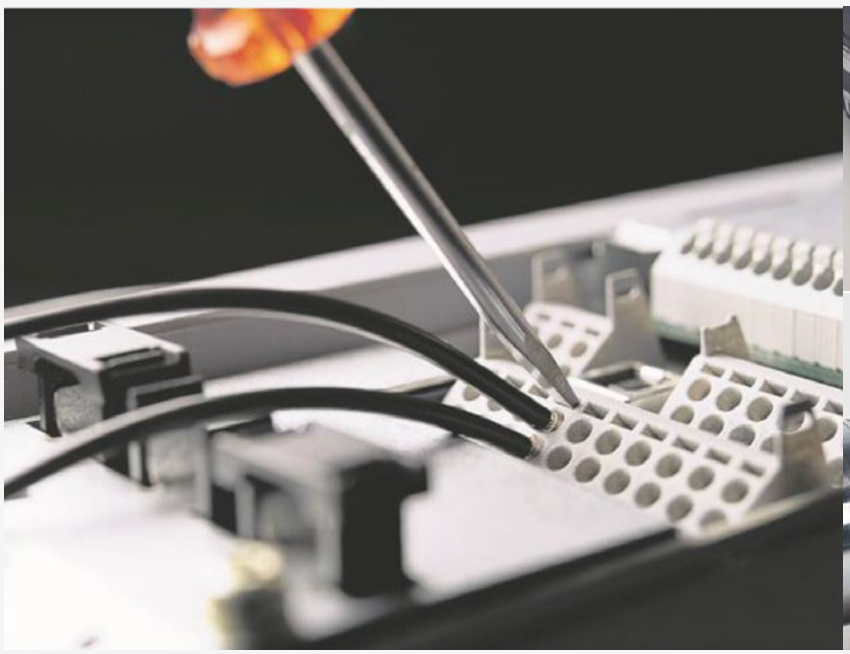
With the help of these products, we add value to your application by ensuring you get the most out of your AC drive.

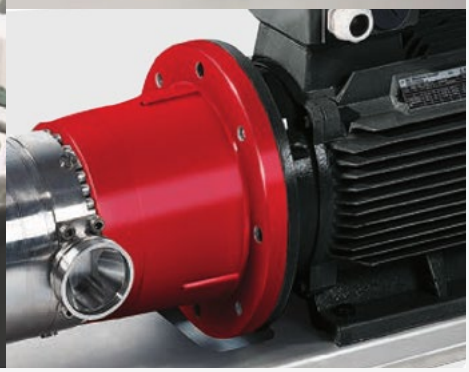
When you deal with us, we also offer you access to training, as well as the application knowledge to help you in planning and preparation. Our experts are at your service.

Authorised DrivePro® Service Partner

National Support. There when you need it the most.

- Dedicated Service Personnel
- Factory Trained Technicians
- NZ Electrical Registration
- Spare parts on hand
- Loan Drives
- Rapid Repsonse





DrivePro® Life Cycle Services

Get the most out of your systems, with the help of DrivePro® services for Danfoss VLT® and VACON® drives. You get services that go beyond simple troubleshooting, maintenance, repairs and replacements. They also proactively improve productivity, performance and uptime.

Danfoss Drives' comprehensive portfolio of services spans the entire lifecycle of your drives.

DrivePro® services are delivered by experts. They are customized to your requirements, whenever and wherever you need them.

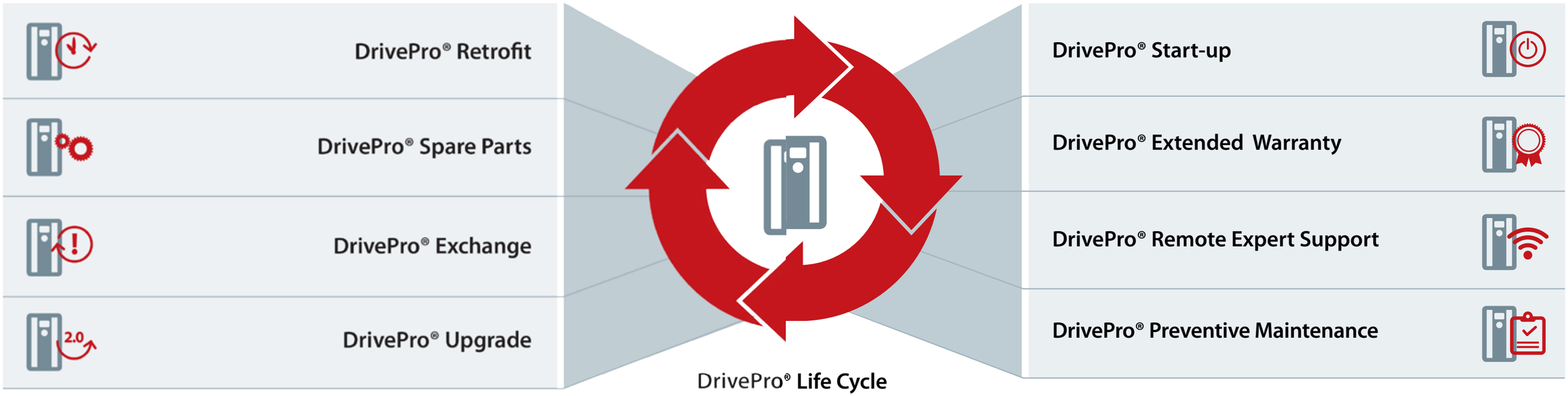
What DrivePro® services can do for your operations:

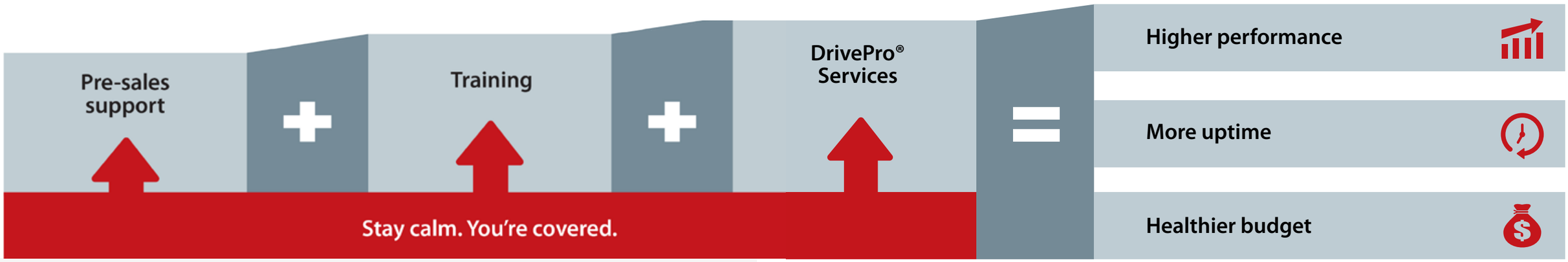
Add value: DrivePro® services add value to your processes and business. You win efficiency, predictability and peace of mind.

Deliver know-how: DrivePro® experts understand the special characteristics, needs and requirements of your AC drives applications, your industry, and your business.

Keep you at the forefront: DrivePro® services ensure you have access to all the latest innovations in the form of upgrades or exchanges. Because we understand your application needs, we are confident in making recommendations for the future.

When you deal with us, we also offer you access to training, as well as the application knowledge to help you in planning and preparation. Our experts are at your service.





Merus Power designs and manufactures **world-leading clean technology** to **improve** power quality, energy efficiency, operational and environmental performance.

Their dynamic compensation solutions – active harmonic filters, STATCOMs, SVCs, energy storages and UPQs – effectively solve your power quality problems in real time.

Merus Power has successfully solved customers' power quality challenges from a wide range of application areas. Their solutions have been used to mitigate harmonic distortions, control voltage variations, improve power factor, perform load balancing and power protection. By improving power quality, Merus customers have benefited in terms of energy savings, higher productivity and process reliability, longer machinery lifetime and compliance with the grid codes.

Now Merus is solving power quality challenges in New Zealand in partnership with iDrives.

IMPORTANCE
of good power quality

Power quality can affect the overall company performance, which is a fact easily overlooked by the management. Merus active harmonic filters provide a quick return on your investment. The quick and effective response of Merus active harmonic filters to power system variations enables higher process reliability, longer equipment life, reduced energy losses and better productivity. It also makes it easy to comply with global power quality standards and demanding grid codes.

Rise of non-linear and other challenging loads in modern electrical networks present unique power quality challenges. Sensitive operations, challenging loads and isolated or weaker grids demand stricter grid codes and power quality standards to safeguard the reliability of an electrical system for smooth industrial and commercial processes. Harmonics distortions, voltage variations, poor power factor and load unbalance are among the key elements that not only test the reliability of modern electrical systems but also induce overall greater system losses.

CUSTOMER BENEFITS

- **Energy savings**
- **Higher productivity**
- **Reliable plant operation at reduced maintenance costs**
- **Longer lifetime of electrical and process equipment**
- **Additional capacity in existing electrical network**
- **Compliance with IEEE 519, G5/4, IEC 61000 3-2, 3-4 or any other power quality standards and recommendations**
- **Quick return on investment**

FUNCTIONS
of Merus Active Power Quality Filters

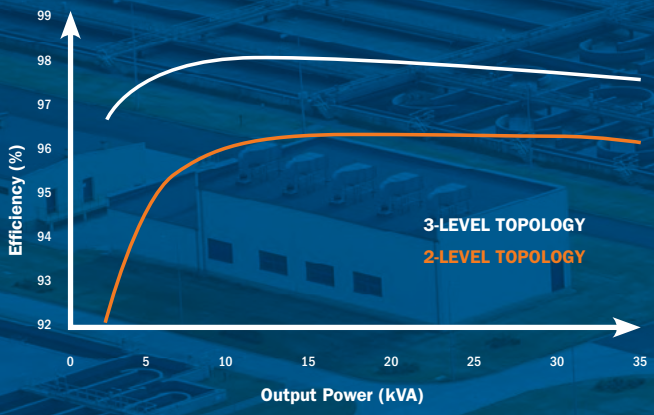
Along with effectively cancelling harmonic distortions, Merus active harmonic filters are capable of solving several other power quality challenges. The selective operation mode allows tailoring of the functionality of Merus active harmonic filter to meet the required performance level. Merus active harmonic filters are easily configurable through the HMI to improve the power factor by injecting fundamental reactive power. Unlike conventional technologies, real time response ensures that reactive power is fed efficiently to the fast fluctuating loads such as welding machines and cranes, among others. It guarantees the mitigation of voltage variations and flicker. Load unbalancing in a 3-phase system, such as spot welding, can also be addressed with the help of Merus active harmonic filters.

KEY FUNCTIONS

- **Active harmonic filtering**
- **Power factor correction**
- **Voltage variation control and flicker mitigation**
- **Load balancing in three-phase systems**

3-LEVEL TOPOLOGY

Merus A2-series active harmonic filters are built on modern 3-level topology which brings several benefits compared to other active filters built on the conventional 2-level topology. In 3-level topology, the switching frequency and voltage stress are distributed among the two IGBTs. Reduced stress extends the lifetime of the power electronics. The efficiency and lower losses achieved with 3-level topology are excellent. These make the overall cost of ownership much lower compared to conventional solutions.



APPLICATIONS

In Industries

In the manufacturing plants, the Variable Frequency Drives (VFDs) have extensively been used for the motor control purposes to save energy. However, they are one of the major sources of harmonic distortions in the network. Merus A2-series active harmonic filters can effectively cancel the harmonic distortions created by variable speed drives in industrial applications. Merus A2-series active harmonic filters bring power quality benefits to variety of industries including the following:

- **Paper industry**
- **Food & beverage industry**
- **Automotive industry**
- **Oil & gas industry**
- **Chemical industry**
- **Pharmaceutical industry**
- **Textile & clothing industry**
- **Steel industry**
- **Cement industry**
- **Microelectronic manufacturers**
- **Other industrial processes with AC or DC drives**

COMMERCIAL BUILDINGS

Modern commercial buildings use equipment built with Switch Mode Power Supplies (SMPS) and Uninterrupted Power Supply (UPS) systems which are sources of harmonic distortions.

In commercial buildings, single-phase loads cause triplen harmonics which are accumulated in the neutral wire. A2-series active harmonic filters are available in 4W so not only do they cancel harmonics in 3 phases but also in neutral.

- **Financial institutions**
- **Data centers**
- **Scientific laboratories**
- **Hospitals**
- **Telecommunication centers**
- **Airports**
- **Remote radar locations**
- **Amusement parks**
- **Shopping centers**
- **Ski resorts**
- **Residential buildings**

INFRASTRUCTURE

Fans, pumps, compressors and other heavy loads in modern infrastructure are often fed with variable speed drives to control the motors to save energy. Harmonic distortions are significantly high in the presence of variable speed drives and are often exceeding the limits defined in global power quality standards and recommendations. Merus A2-series active harmonic filters can effectively bring the harmonic distortions to the desired limits and help comply with the standards.

- **Water and waste water treatment plants**
- **District cooling plants**
- **Tunnels**
- **Metro stations**
- **Traction**
- **Wind & Solar farms**

VOLTAGE VARIATIONS CONTROL CAUSED BY DYNAMIC LOADS

Dynamic loads such as welding machines and cranes, demand real time reactive power compensation to avoid voltage destabilization. Conventional power factor correction solutions are unable to answer to this demand in real-time.

Merus A2-series active harmonic filters are versatile solutions capable of providing several functionalities. They can inject fundamental reactive power in the network in real time, ensuring stable voltage. They can also be used to remove voltage unbalance in the network.

- **Welding machines**
- **Cranes**
- **Crushers**
- **Winders**
- **Shredders**
- **Lifts**
- **Other dynamic loads**

TECHNICAL SPECIFICATIONS

Merus A2-Series Active Power Quality Filters

MODEL	A2-50	A2-60	A2-75	A2-100	A2-120	A2-150	A2-200
Rating of individual units	**50 A**	**60 A**	**75 A**	**100 A**	**120 A**	**150 A**	**200 A**
Rating at 400V	**35Kvar**	**42Kvar**	**52Kvar**	**69Kvar**	**83Kvar**	**104Kvar**	**139Kvar**
Nominal voltage	200V – 480V (Auto voltage sensing)						
Harmonic performance	up to 50th harmonic – compliance with IEEE 519 and G5/4t						
Rated frequency	50Hz or 60Hz (Auto frequency sensing)						
Operating modes	All harmonics/All harmonics but not fundamental/Selective harmonics						
Response time	< 100 microseconds / 1 Network cycle (selective mode)						
Parallel units	Unlimited scalability, parallel operation of any rating combinations up to 7 units per one HMI is possible						
Switching frequency	20kHz						
Controller	Real time digital control with FFT						
Load balancing capacity	100% * IN of active filter						
Neutral wire current	150A	180A	225A	300A	360A	450A	600A
3-Wire/4-Wire	3W & 4W	3W & 4W	3W & 4W	3W & 4W	3W & 4W	3W & 4W	3W & 4W
Human-machine interface (HMI)	7” easy to use touch screen interface						
HMI languages	8 languages including English-German-Spanish-Chinese-Russian. Others on request.						
Monitoring	On-site and remote monitoring possibilities						
Reporting	Reports data of power quality events from the last 30 days.						
Communication	Ethernet, ModBus (TCP)						
Cooling media	Air						
Protection degree	IP 20 (for the module), (Up to IP54 depending on the enclosure)						
Ambient temperature	40°C, without derating						
Humidity	For operation maximum 85% RH; non-condensing. For storage & transportation (95%)						
Power losses	< 2,3 %						
Dimension (HxWxD)	850x500x225	850x500x225	850x500x225	850x500x225	850x500x225	1150x500x225	1150x500x225
Weight	70kg	70kg	70kg	70kg	70kg	110kg	110kg
Cable entry	Top or Bottom	Top or Bottom	Top or Bottom	Top or Bottom	Top or Bottom	Top or Bottom	Top or Bottom
Noise	60dB	60dB	64dB	64dB	65dB	66dB	67 dB
Current transformers	3 pieces, secondary 5A or 1A, class 1 or better						
*300 mm free space below and above required for air ventilation.							

Merus M-series active filters are available in 690V and 960V nominal voltage levels.

iDrives
INTELLIGENT DRIVE SOLUTIONS

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