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Danfoss Drives
Options Portfolio

Danfoss Drives VLT® Options

Fieldbus	FC 301	FC 302	FC 202	FC 102	FC 103
A					
VLT® PROFIBUS DP MCA 101	■	■	■	■	■
VLT® DeviceNet MCA 104	■	■	■	■	–
VLT® CANopen MCA 105	■	■	–	–	–
VLT® AK-LonWorks MCA 107	–	–	–	–	■
VLT® LonWorks MCA 108	–	–	–	■	■
VLT® BACnet MCA 109	–	–	–	■	–
VLT® PROFIBUS Converter MCA 113	–	■	–	–	–
VLT® PROFIBUS Converter MCA 114	–	■		–	
VLT® PROFINET MCA 120	■	■	■	■	■
VLT® EtherNet/IP MCA 121	■	■	■	■	–
VLT® Modbus TCP MCA 122	■	■	■	■	–
VLT® POWERLINK MCA 123	■	■	–	–	–
VLT® EtherCAT MCA 124	■	■	–	–	–
VLT® BACnet/IP MCA 125	–	–	–	■	–
VLT® DeviceNet Converter MCA 194	–	■	–	–	–

Danfoss Drives VLT ® Options

Functional extensions	FC 301	FC 302	FC 202	FC 102	FC 103
B					
VLT® General Purpose I/O MCB 101	■	■	■	■	■
VLT® Encoder Input MCB 102	■	■	–	–	–
VLT® Resolver Input MCB 103	■	■	–	–	–
VLT® Relay Card MCB 105	■	■	■	■	■
VLT® Safe PLC I/O MCB 108	A1 encl only	■	–	–	–
VLT® Analog I/O MCB 109	–	–	■	■	■
VLT® PTC Thermistor Card MCB 112	–	■	■	■	–
VLT® Sensor Input MCB 114	■	■	■	■	–
VLT® Safety Option MCB 150 series	–	■	–	–	–
VLT® Extended Cascade Controller MCO 101	–	–	■	–	–

Programmable controller, relay card & power supply	FC 301	FC 302	FC 202	FC 102	FC 103
C					
VLT® Advanced Cascade Controller MCO 102	–	–	■	–	–
VLT® Extended Relay Card MCB 113	■	■	■	■	■
VLT® Motion Control MCO 305	■	■	–	–	–
VLT® Synchronizing Controller MCO 350	■	■	–	–	–
VLT® Positioning Controller MCO 351	■	■	–	–	–
VLT® 24 V DC Supply MCB 107	■	■	■	■	■

Power options	FC 301	FC 302	FC 202	FC 102	FC 103
D					
VLT® Advanced Harmonic Filter AHF 005 & AHF 010	■	■	■	■	■
VLT® Sine-wave Filter MCC 101	■	■	■	■	■
VLT® dU/dt Filter MCC 102	■	■	■	■	■
VLT® Common Mode Filter MCC 105	■	■	■	■	■
VLT® Brake Resistor MCE 101	■	■	■	■	–
VLT® Line Reactor MCC 103	■	■	■	■	–

Danfoss Drives VACON® Options

I/O Option Boards	NX_ family	VACON® 100 family	VACON® 20 family
OPT-A series	■	–	–
OPT-B series	■	■	■
OPT-F series	–	■	–

Feedback/ Encoder	NX_ family	VACON® 100 family	VACON® 20 family
OPT-A series	■	–	–
OPT-B series	■	–	–

Fieldbus/ Communication	NX_ family	VACON® 100 family	VACON® 20 family
OPT-C series	■	(■)	–
OPT-E series	(■)	■	■

Adapter	NX_ family	VACON® 100 family	VACON® 20 family
OPT-D series	■	–	–

Functional safety	NX_ family	VACON® 100 family	VACON® 20 family
OPT-AF	■	–	–
OPT-BJ	–	■	–

NXC options	NX_ family	VACON® 100 family	VACON® 20 family
A, C, D, I, M, O, P and T group	(■)	–	–
OPT-E series	(■)	–	–

Heat exchangers	NX_ family	VACON® 100 family	VACON® 20 family
Heat exchangers	(■)	–	–

Some exceptions apply

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VLT® Fieldbus Options

VLT® PROFIBUS DP MCA 101

Operating the AC drive via a fieldbus enables you to reduce the cost of your system, communicate faster and more efficiently, and benefit from an easier user interface.

VLT® PROFIBUS DP MCA 101 provides

- Wide compatibility, a high level of availability, support for all major PLC vendors, and compatibility with future versions
- Fast, efficient communication, transparent installation, advanced diagnosis and parameterization and auto-configuration of process data via GSD-file
- Acyclic parameterization using PROFIBUS DP-V1, PROFIdrive or Danfoss FC profile state machines, PROFIBUS DP-V1, Master Class 1 and 2

Ordering number
130B1100 standard
130B1200 coated (Class 3C3/IEC 60721-3-3)

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VLT® DeviceNet MCA 104

VLT® DeviceNet MCA 104 offers robust, efficient data handling thanks to advanced Producer/Consumer technology.

- Support of ODVA's AC drive profile supported via I/O instance 20/70 and 21/71 secures compatibility to existing systems
- Benefit also from ODVA's strong conformance testing policies, which ensure that products are interoperable

Ordering number
130B1102 standard
130B1202 coated (Class 3C3/IEC 60721-3-3)

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VLT® CANopen MCA 105

High flexibility and low cost are two of the "cornerstones" for CANopen.

The VLT® CANopen MCA 105 option for the VLT® AutomationDrive is fully equipped with both high-priority access to control and status of the drive (PDO Communication) and access to all parameters through acyclic data (SDO Communication).

For interoperability the option has implemented the DSP402 AC drive Profile. This all guarantees standardized handling, interoperability and low cost.

Ordering number
130B1103 standard
130B1205 coated (Class 3C3/IEC 60721-3-3)

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VLT® AK-LonWorks MCA 107

VLT® AK-LonWorks MCA 107 is a complete electronic refrigeration and control system for monitoring and controlling refrigeration plants.

Connecting this drive to a Danfoss ADAP-KOOL® Lon network is really simple. After entering a network address, press a service pin to start the automatic configuration procedure.

Ordering number
130B1169 standard
130B1269 coated (Class 3C3/IEC 60721-3-3)

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VLT® LonWorks MCA 108

LonWorks is a fieldbus system developed for building automation. It enables communication between individual units in the same system (peer-to-peer) and thus supports decentralizing of control.

- No need for main station (master-follower)
- Units receive signals directly
- Supports Echelon free-topology interface (flexible cabling and installation)
- Supports embedded I/O and I/O options (easy implementation of de-central I/O)
- Sensor signals can quickly be moved to another controller via bus cables
- Certified as compliant with LonMark ver. 3.4 specifications

Ordering number
130B1106 standard
130B1206 coated (Class 3C3/IEC 60721-3-3)

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VLT® BACnet MCA 109

The BACnet protocol is an international protocol that efficiently integrates all parts of building automation equipment from the actuator level to the building management system.

Via the BACnet option it is possible to read all analog and digital inputs and control all analog and digital outputs of the VLT® HVAC Drive.

All inputs and outputs can be operated independently of the functions of the drive, and thus work as remote I/O:

- COV (Change of Value)
- Synchronization of RTC from BACnet
- Read/write Property Multiple
- Alarm/Warning handling

Ordering number
130B1144 standard
130B1244 coated (Class 3C3/IEC 60721-3-3)

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VLT® PROFIBUS Converter MCA 113

The VLT® PROFIBUS Converter MCA 113 is a special version of the PROFIBUS options that emulates the VLT® 3000 commands in the VLT® AutomationDrive.

The VLT® 3000 can be replaced by the VLT® AutomationDrive, or an existing system can be expanded without costly change of the PLC program.

For upgrade to a different fieldbus, the installed converter is easily removed and replaced with a new option. This secures the investment without losing flexibility.

Ordering number
NA standard
130B1245 coated (Class 3C3/IEC 60721-3-3)

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VLT® PROFIBUS Converter MCA 114

The VLT® PROFIBUS Converter MCA 114 is a special version of the PROFIBUS options that emulates the VLT® 5000 commands in the VLT® AutomationDrive.

The VLT® 5000 can be replaced by the VLT® AutomationDrive, or an existing system can be expanded without costly change of the PLC program.

For upgrade to a different fieldbus, the installed converter is easily removed and replaced with a new option. This secures the investment without losing flexibility. The option supports DPV1.

Ordering number
NA standard
130B1246 coated (Class 3C3/IEC 60721-3-3)

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VLT® PROFINET MCA 120

VLT® PROFINET MCA 120 uniquely combines the highest performance with the highest degree of openness. The option is designed so that many of the features from the VLT® PROFIBUS MCA 101 can be reused, minimizing user effort to migrate PROFINET, and securing the investment in a PLC program.

- Same PPO types as the MCA 101 PROFIBUS for easy migration to PROFINET
- Built-in web server for remote diagnosis and reading out of basic drive parameters
- Support of MRP
- Support of DP-V1 Diagnostic allows easy, fast and standardized handling of warning and fault information into the PLC, improving bandwidth in the system
- Support of PROFISAFE when combined with MCB 152
- Implementation in accordance with Conformance Class B

Ordering number
130B1135 standard
130B1235 coated (Class 3C3/IEC 60721-3-3)

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VLT® EtherNet/IP MCA 121

Ordering number
130B1119 standard
130B1219 coated
(Class 3C3/IEC 60721-3-3)

Ethernet is the future standard for communication at the factory floor.
The VLT® EtherNet/IP MCA 121 is based on the newest technology available for industrial use and handles even the most demanding requirements. EtherNet/IP™ extends commercial off-the-shelf Ethernet to the Common Industrial Protocol (CIP™) – the same upper-layer protocol and object model found in DeviceNet.

The VLT® MCA 121 offers advanced features such as:

- Built-in high performance switch enabling line-topology, and eliminating the need for external switches
- DLR Ring (from October 2015)
- Advanced switch and diagnosis functions
- Built-in web server
- E-mail client for service notification
- Unicast and Multicast communication

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VLT® Modbus TCP MCA 122

Modbus TCP is the first industrial Ethernet-based protocol for automation.
The VLT® Modbus TCP MCA 122 connects to Modbus TCP-based networks. It is able to handle connection intervals down to 5 ms in both directions, positioning it among the fastest performing Modbus TCP devices in the market. For master redundancy it features hot swapping between two masters.

Other features:

- Built-in web-server for remote diagnosis and reading out basic drive parameters
- Email notification can be configured, to send an email message to one or more recipients, when certain alarms or warnings occur, or are cleared
- Dual Master PLC connection for redundancy

Ordering number
130B1196 standard
130B1296 coated (Class 3C3/IEC 60721-3-3)

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VLT® POWERLINK MCA 123

VLT® POWERLINK MCA 123 represents the second generation of fieldbus. The high bit rate of industrial Ethernet can now be used to make the full power of IT technologies used in the automation world available for the factory world.

POWERLINK does not only provide high performance real-time and time synchronization features. Due to its CANopen-based communication models, network management and device description model, it offers much more than just a fast communication network.

The perfect solution for:
- Dynamic motion control applications
- Material handling
- Synchronization and positioning applications

Ordering number
130B1489 standard
130B1490 coated (Class 3C3/IEC 60721-3-3)

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VLT® EtherCAT MCA 124

The VLT® EtherCAT MCA 124 offers connectivity to EtherCAT® based networks via the EtherCAT Protocol.

The option handles the EtherCAT line communication in full speed, and connection towards the drive with an interval down to 4 ms in both directions. This allows the MCA 124 to participate in networks ranging from low performance up to servo applications.

- EoE Ethernet over EtherCAT support
- HTTP (Hypertext Transfer Protocol) for diagnosis via built-in web server
- CoE (CAN Over Ethernet) for access to drive parameters
- SMTP (Simple Mail Transfer Protocol) for e-mail notification
- TCP/IP for easy access to drive configuration data from MCT 10

Ordering number
130B5546 standard
130B5646 coated
(Class 3C3/IEC 60721-3-3)

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VLT® BACnet/IP MCA 125

Ordering number
134B1586 coated
(Class 3C3/IEC 60721-3-3)

The VLT® BACnet/IP MCA 125 option optimizes the use of VLT® HVAC Drive together with building management systems (BMS) using the BACnet/IP protocol or running BACnet on Ethernet. The option has two Ethernet connectors, enabling daisy-chain configuration with no need for external switches. The VLT® BACnet/IP MCA 125 makes it easy to control or monitor points required in typical HVAC applications, and reduces overall cost of ownership.

Besides standard functionality, the option provides:

- COV, Change Of Value
- Read/WritePropertyMultiple
- Alarm/Warning notifications
- PID Loop object
- Segmented data transfer
- Trending

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VLT® DeviceNet Converter MCA 194

The VLT® DeviceNet Converter MCA 194 emulates VLT® 5000 commands in the VLT® AutomationDrive.

This means that a VLT® 5000 drive can be replaced by the VLT® AutomationDrive, or a system can be expanded, without costly change of the PLC program.

For a later upgrade to a different fieldbus, the installed converter can easily be removed and replaced with a different option. This secures the investment without losing flexibility. The option emulates I/O instances and explicit messages of a VLT® 5000.

Ordering number
NA standard
130B5601 coated (Class 3C3/IEC 60721-3-3)

EtherNet/IP™ and DeviceNet™ are trademarks of ODVA, Inc.

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VLT® Functional Extensions

VLT® General Purpose I/O MCB 101

This I/O option offers an extended number of control inputs and outputs:

- 3 digital inputs 0-24 V:
  Logic '0' < 5 V; Logic '1' > 10V
- 2 analog inputs 0-10 V:
  Resolution 10 bit plus sign
- 2 digital outputs NPN/PNP push pull
- 1 analog output 0/4-20 mA
- Spring-loaded connection

Ordering number
130B1125 standard
130B1212 coated (Class 3C3/IEC 60721-3-3)

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VLT® Encoder Input MCB 102

This option offers the possibility to connect various types of incremental and absolute encoders. The connected encoder can be used for closed loop speed control as well as closed loop flux motor control.

The following encoder types are supported:

- 5V TTL (RS 422)
- 1VPP SinCos
- SSI
- Hiperface
- EnDat

Ordering number
130B1115 standard
130B1203 coated (Class 3C3/IEC 60721-3-3)

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VLT® Resolver Input MCB 103

This option enables connection of a resolver to provide speed feedback from the motor.

- Primary voltage.....2 – 8 Vrms
- Primary frequency .....2.0 – 15 kHz
- Primary current max.....50 mA rms
- Secondary input voltage.....4 Vrms
- Spring-loaded connection

Ordering number
130B1127 standard
130B1227 coated (Class 3C3/IEC 60721-3-3)

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VLT® Relay Card MCB 105

Makes it possible to extend relay functions with 3 additional relay outputs.

- Max switch rate at rated load/min. load 6 min-1/20 sec-1
- Protects control cable connection
- Spring-loaded control wire connection

Max. terminal load:

- AC-1 Resistive load.....240 V AC 2 A
- AC-15 Inductive load @cos phi 0.4 ..... 240 V AC 0.2 A
- DC-1 Resistive load..... 24 V DC 1 A
- DC-13 Inductive load @cos phi 0.4 ..... 24 V DC 0.1 A

Min. terminal load:

- DC 5 V.....10 mA

Ordering number
130B1110 standard
130B1210 coated (Class 3C3/IEC 60721-3-3)

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VLT® Safe PLC I/O MCB 108

The VLT® AutomationDrive FC 302 provides a safety input based on a single-pole 24 V DC input.

- For the majority of applications, this input enables the user to implement safety in a cost-effective way. For applications that work with more advanced products like Safety PLC and light curtains, the Safe PLC interface enables the connection of a two-wire safety link
- The Safe PLC Interface allows the Safe PLC to interrupt on the plus or the minus link without interfering the sense signal of the Safe PLC

Ordering number
130B1120 standard
130B1220 coated (Class 3C3/IEC 60721-3-3)

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VLT® Analog I/O MCB 109

This analog input/output option is easily fitted in the AC drive for upgrading to advanced performance and control using the additional I/O. This option also upgrades the AC drive with a battery back-up supply for the AC drive built-in clock. This provides stable use of all AC drive clock functions as timed actions.

- 3 analog inputs, each configurable as both voltage and temperature input
- Connection of 0-10 V analog signals as well as PT1000 and NI1000 temperature inputs
- 3 analog outputs each configurable as 0-10 V outputs
- Back-up supply for the standard clock function in the AC drive

Ordering number
130B1143 standard
130B1243 coated (Class 3C3/IEC 60721-3-3)

The back-up battery typically lasts for 10 years, depending on environment.

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VLT® PTC Thermistor Card MCB 112

The VLT® PTC Thermistor Card MCB 112 enables improved surveillance of the motor condition compared to the built-in ETR function and thermistor terminal.

- Protects the motor from overheating
- ATEX-approved for use with Ex d and Ex e and Ex n motors
- Uses Safe Stop function, which is approved in accordance with SIL 2 IEC 61508

Ordering number
NA standard
130B1137 coated (Class 3C3/IEC 60721-3-3)

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VLT® Sensor Input MCB 114

This option protects the motor from being overheated by monitoring the temperature of bearings and windings in the motor.

- Protects the motor from overheating
- Three self-detecting sensor inputs for 2 or 3 wire PT100/PT1000 sensors
- One additional analog input 4-20 mA

Ordering number
130B1172 standard
130B1272 coated (Class 3C3/IEC 60721-3-3)

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VLT® Safety Option MCB 150 and MCB 151

The VLT ® Safety Options MCB 150 and MCB 151 expand the Safe Torque Off (STO) function, which is integrated in a standard VLT ® AutomationDrive. The Safe Stop 1 (SS1) function performs a controlled stop before removing torque. The Safely-Limited Speed (SLS) function monitors whether a specified speed is exceeded.

The functions can be used up to PL d according to ISO 13849-1 and SIL 2 according to IEC 61508.

Additional standards-compliant safety functions:

- Replacement of external safety equipment
- Reduced space requirements
- 2 safe programmable inputs
- 1 safe output (for T37)
- Easier machine certification
- Drive can be powered continuously
- Safe LCP Copy
- Dynamic commissioning report
- TTL (MCB 150), sensorless operation (MCB 151 with MCB 159) or HTL (MCB 151) encoder as speed feedback

Ordering number
130B3280 MCB 150, 130B3290 MCB 151

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VLT® Safety Option MCB 152

The VLT ® Safety Option MCB 152 enables activation of Safe Torque Off (STO) via the PROFIsafe fieldbus in combination with VLT ® PROFINET MCA 120 fieldbus option. It improves flexibility by connecting safety devices within a plant.

The safety functions of the MCB 152 are implemented according to EN IEC 61800-5-2. The MCB 152 supports PROFIsafe functionality to activate integrated safety functions of the VLT AutomationDrive from any PROFIsafe host, up to Safety Integrity Level SIL 2 according to EN IEC 61508 and EN IEC 62061, Performance Level PL d, Category 3 according to EN ISO 13849-1.

- PROFIsafe device (in combination with MCA 120)
- Replacement of external safety equipment
- 2 safe programmable inputs
- Safe LCP Copy
- Dynamic commissioning report

Ordering number
130B9860 coated (Class 3C3/IEC 60721-3-3)

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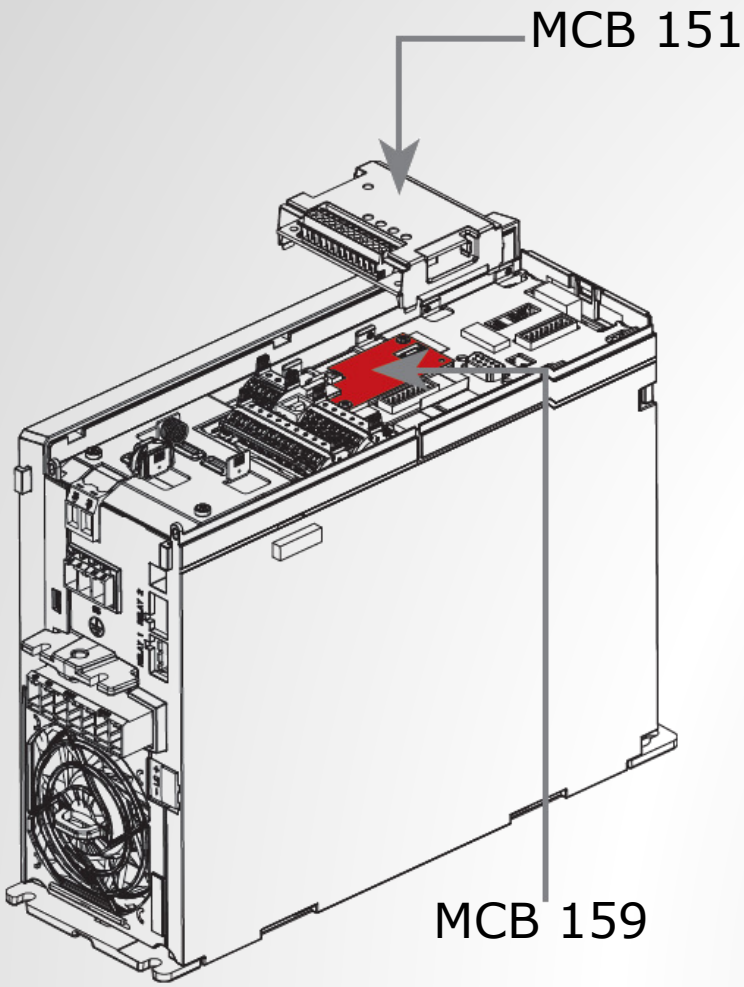
VLT® Sensorless Safety MCB 159



The VLT® Safety Option MCB 151 extended with the VLT® Sensorless Safety MCB 159 option provides safe sensorless speed functions (SS1/SLS/SMS) for VLT® AutomationDrive FC 302.

With the MCB 159 option, an external sensor is no longer required for safe speed monitoring.

Select VLT® Sensorless Safety MCB 159 as a C1 option in the configurator when ordering a new drive.

MCB 159 is not available for retrofit.

MCB 159 is only available as an extension to MCB 151.

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VLT® Programmable Controllers, Relay Card & Power Supply

VLT® Extended Cascade Controller MCO 101

The MCO 101 is easily fitted and upgrades the built-in cascade controller to operate more pumps and more advanced pump control in master/follower mode.

- Up to 6 pumps in standard cascade set-up
- Up to 5 pumps in master/follower set-up
- Technical specifications:
  See VLT® Relay Option MCB 105

Ordering number
130B1118 standard
130B1218 coated (Class 3C3/IEC 60721-3-3)

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VLT® Advanced Cascade Controller MCO 102

Easy to fit, the VLT® Advanced Cascade Controller MCO 102 upgrades the built-in cascade controller to operate up to 8 pumps and more advanced pump control in master/follower mode.

MCO 102 supports the combination of multiple variable speed and fixed speed pumps, as well as configurations with pumps of differing capacity (mixed pump control).

The additional 7 digital inputs and the 24 V DC connection to the drive enable flexible adaptation to the application. The same cascade-controller hardware is compatible with for the entire power range up to 2 MW.

Ordering number
130B1154 standard
130B1254 coated (Class 3C3/IEC 60721-3-3)

- Up to 8 pumps in standard cascade set-up
- Up to 8 pumps in master/follower set-up

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VLT® Extended Relay Card MCB 113

The VLT® Extended Relay Card MCB 113 adds inputs/outputs for increased flexibility.

- 7 digital inputs
- 2 analog outputs
- 4 SPDT relays
- Meets NAMUR recommendations
- Galvanic isolation capability

Ordering number
130B1164 standard
130B1264 coated (Class 3C3/IEC 60721-3-3)

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VLT® Motion Control Option MCO 305

An integrated programmable motion controller adding extra functionality for VLT® AutomationDrive FC 301 and FC 302.
VLT ® Motion Control Option MCO 305 offers easy-to-use motion functions combined with programmability - an ideal solution for positioning and synchronizing applications.

- Synchronization (electronic shaft), positioning and electronic cam control
- 2 separate interfaces supporting both incremental and absolute encoders
- 1 encoder output (virtual master function)
- 10 digital inputs
- 8 digital outputs
- Support of CANopen motion bus, encoders and I/O modules
- Sends and receives data via fieldbus interface (requires fieldbus option)
- PC software tools for debugging and commissioning: Program and Cam editor
- Structured programming language with both cyclic and event-driven execution

Ordering number
130B1134 standard
130B1234 coated (Class 3C3/IEC 60721-3-3)

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VLT® Synchronizing Controller MCO 350

The VLT® Synchronizing Controller MCO 350 for VLT ® AutomationDrive expands the functional properties of the AC drive in synchronizing applications, and replaces traditional mechanical solutions.

- Speed synchronizing
- Position (angle) synchronizing with or without marker correction
- On-line adjustable gear ratio
- On-line adjustable position (angle) offset
- Encoder output with virtual master function for synchronization of multiple followers
- Control via I/Os or fieldbus
- Home function
- Configuration as well as read-out of status and data via the Local Control Panel of the drive.

Ordering number
130B1152 standard
130B1252 coated (Class 3C3/IEC 60721-3-3)

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VLT® Positioning Controller MCO 351

The VLT® Positioning Controller MCO 351 offers a host of user-friendly benefits for positioning applications in many industries. Features:

- Relative positioning
- Absolute positioning
- Touch-probe positioning
- End-limit handling (software and hardware)
- Control via I/Os or fieldbus
- Mechanical brake handling (programmable hold delay)
- Error handling
- Jog speed/manual operation
- Marker related positioning
- Home function
- Configuration as well as read-out of status and data via the Local Control Panel of the drive

Ordering number
130B1153 standard
130B1253 coated (Class 3C3/IEC 60721-3-3)

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VLT® 24 V DC Supply MCB 107

Connect an external DC supply to keep the control section and any installed option alive during power failure.

This enables full operation of the LCP (including the parameter setting) and all installed options without connection to mains.

- Input voltage range……24 V DC +/- 15% (max. 37 V for 10 sec.)
- Max. input current ……2.2 A
- Max. cable length ……75 m
- Input capacitance load ……< 10 uF
- Power-up delay ……< 0.6 s

Ordering number
130B1108 standard
130B1208 coated (Class 3C3/IEC 60721-3-3)

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VLT® Power Options

VLT® Advanced Harmonic Filter AHF 005 and AHF 010

Optimized harmonic performance for VLT® drives rated up to 250 kW

Power range
380 – 415 V AC (50 and 60 Hz)
440 – 480 V AC (60 Hz)
600 V AC (60 Hz)
500 – 690 V AC (50 Hz)

Enclosure ratings
IP20*

* *An IP21/NEMA 1 upgrade kit is available for the IP20 unit. Order separately.*

Perfect match
for industrial automation, highly-dynamic applications and safety installations.

A patented technique reduces THD levels in the mains network to less than

5-10%

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VLT® Advanced Harmonic Filter AHF 005 and AHF 010

Optimized harmonic performance for VLT® drives rated up to 250 kW

Feature	Benefit
Reliable	**Maximum uptime**
– 100% factory tested – Based on proven and tested filter concept	– Low failure rate
Energy saving	**Lower operation costs**
– High efficiency – Electrically matched to the individual VLT® drives	– Low running expenses
Design	**Compact and aesthetic enclosure**
– Innovative coil design – Side-by-side mounting – Optimized for mounting in panels	– Smaller footprint – Less wall space needed
– Easy commissioning	– Low commissioning costs
– Enclosure size and colour matches	– Danfoss look and feel

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VLT® Sine-wave Filter MCC 101

Reduces the motor insulation stress and bearing currents

Line voltage and filter current
3 x 200 – 500 V, 2.5 – 800 A
3 x 525 – 690 V, 4.5 – 660 A

Enclosure ratings

- IP00 and IP20 wall-mounted enclosure up to 75 A (500 V)/45 A (690 V)
- IP23 floor-standing enclosure from 115 A (500 V)/76 A (690 V)
- IP54 both wall-mounted and floor mounted enclosures up to 34 A (500 V)/22 A (690 V)

Position the VLT® Sine-wave Filter between the AC drive and the motor to provide a sinusoidal phase-to-phase motor voltage. The filter reduces motor insulation stress, acoustic noise from the motor, and bearing currents.

- Reduces motor insulation stress
- Reduces acoustic noise from the motor
- Reduces bearing currents (esp. large motors)
- Reduces losses in the motor
- Prolongs service lifetime
- VLT® FC series family look

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VLT® dU/dt Filter MCC 102

Reduces the dU/dt values on the motor terminal phase-to-phase voltage

Line voltage and filter current
3 x 200 – 690 V (up to 880 A)

Enclosure ratings
IP00 and IP20*/IP23 enclosure
in the entire power range.
IP54 enclosure available up to 177 A

**An IP 21/NEMA 1 upgrade kit is available for the IP20 unit.*

VLT® dU/dt filters are placed between the AC drive and the motor to eliminate very fast voltage changes.

The motor terminal phase-to-phase voltage is still pulse shaped but its dU/dt values are reduced.

- These filters reduce stress on the motor's insulation and are recommended in applications with older motors, aggressive environments or frequent braking which cause increased DC link voltage.
- VLT® FC series family look

> Return to VLT® overview

VLT® Common Mode Filter MCC 105

Reduces electromagnetic interference

Line voltage range
380 – 415 V AC (50 and 60 Hz)
440 – 480 V AC (60 Hz)
600 V AC (60 Hz)
500 – 690 V AC (50 Hz)

Common mode filters are placed between the AC drive and the motor.

They are nano-crystalline cores that mitigate high frequency noise in the motor cable (shielded or unshielded) and reduce bearing currents in the motor.

- Extend motor bearing lifetime
- Can be combined with dU/dt and sine-wave filters
- Reduce radiated emissions from the motor cable
- Easy to install – no adjustments necessary
- Oval shaped – allows mounting inside the AC drive enclosure or motor terminal box

> Return to VLT® overview

VLT® Brake Resistor MCE 101

Dissipates energy generated during braking

Precision electrical match to each individual VLT® drive power size for

FC 102, FC 202, FC 301 and FC 302

Enclosure ratings
IP20, IP21, IP54, and IP65

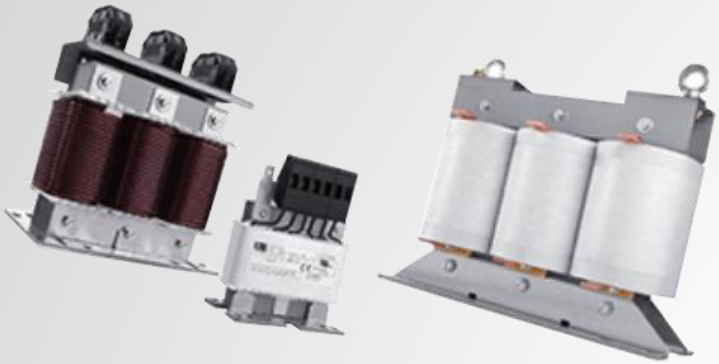
Energy generated during braking is absorbed by the resistors, protecting electrical components from heating up. Danfoss brake resistors are optimized for the VLT® FC-series and general versions for horizontal and vertical motion are available.

- Built-in thermo switch
- Versions for vertical and horizontal mounting
- UL-recognized – a selection of the vertically mounted units is UL-recognized

> Return to VLT® overview

VLT® Line Reactor MCC 103

Ensures current balance in load-sharing applications



The VLT ® Line Reactor MCC 103 range ensures balanced current sharing in load-sharing applications, where the DC-side of the rectifier of multiple drives is connected together.

For applications using load sharing, the MCC 103 is UL-recognized.

When planning load sharing applications, pay special attention to different enclosure type combinations and inrush concepts.

For technical advice regarding load-sharing applications, contact Danfoss application support.

Compatible with

- VLT ® AutomationDrive, VLT ® AQUA Drive and VLT® HVAC Drive
- 50 Hz or 60 Hz mains supply

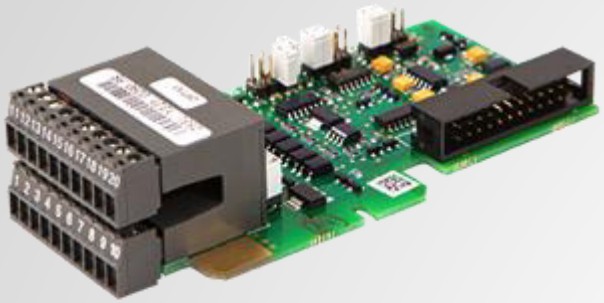
> Return to VLT® overview

ENGINEERING
TOMORROW

VACON® I/O Options - OPT-A series

NX_ family - I/O option boards

OPT-A1



This I/O option board for the NXS and NXP products provides a variety of input and output signals for controlling the drive:

- 6 digital inputs, 24 V DC
- 1 open-collector digital output
- 2 analog inputs (0...10 V or -10…+10 V or 0…20 mA)
- 1 analog output (0…10 V or 0…20 mA)
- +10 V DC reference
- +24 V DC external supply or voltage output

- Slot: A

Ordering number
OPT-A1 uncoated
OPT-A1-V coated

> Return to VACON® overview

OPT-A2

This I/O option board for the NXS and NXP products provides two relay output signals:

- 2 pcs NO/NC relay outputs
- Slot: B

Ordering number
OPT-A2 uncoated
OPT-A2-V coated

> Return to VACON® overview

OPT-A3

This I/O option board for the NXS and NXP products provides 2 relay output signals and a thermistor input for overtemperature protection:

- 1 NO/NC relay output
- 1 NO relay output
- 1 PTC thermistor input

- Slot: B

Ordering number
OPT-A3-V coated

> Return to VACON® overview

OPT-A4 TTL Encoder

Use this feedback option board to connect NXP products to TTL and TTL(R) type pulse/incremental encoders conforming to the RS422 specification.

- Differential A+, A-, B+, B-, Z+ and Z- signals
- 1 qualifier input, used to trace the Z-pulse
- 1 fast digital input, used to trace very short pulses
- Selectable encoder voltage supply +5/+15/+24 V

- Slot: C

Ordering number
OPT-A4-V coated

> Return to VACON® overview

OPT-A5 HTL Encoder

Use this feedback option board to connect NXP products to HTL type pulse/incremental encoders.

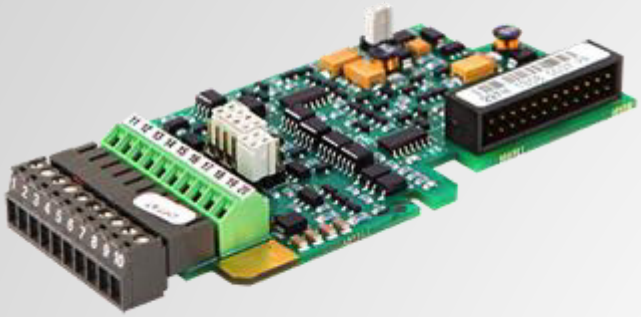
- Galvanically isolated differential A+, A-, B+, B-, Z+ and Z- signals
  - 150kHz max input frequency
- 1 qualifier input, used to trace the Z-pulse
- 1 fast digital input, used to trace very short pulses
- Selectable encoder voltage supply +15/+24 V

- Slot: C

Ordering number
OPT-A5-V coated

> Return to VACON® overview

OPT-A7 HTL Encoder



Use this feedback option board to connect 2 HTL type pulse/incremental encoders to an NXP product.

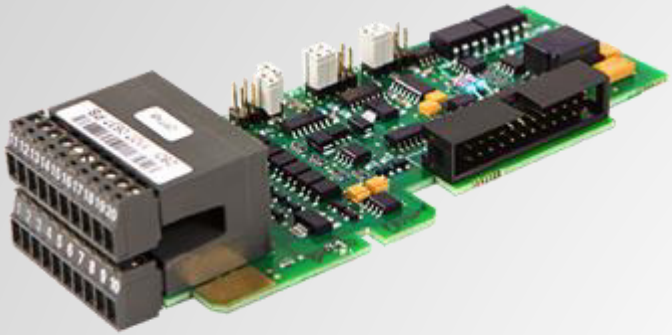
- Differential A+, A-, B+, B-, Z+ and Z- signals
- 1 qualifier input, used to trace the Z-pulse
- 1 fast digital input, used to trace very short pulses
- Selectable encoder voltage supply +15/+24 V

- Slot: C

Ordering number
OPT-A7 uncoated
OPT-A7-V coated

> Return to VACON® overview

OPT-A8



This I/O option board for the NXS and NXP products provides a variety of input and output signals for controlling the drive. It is equivalent to OPT-A1 except that analog inputs and outputs are galvanically isolated in OPT-A8.

- 6 digital inputs, 24 V DC
- 1 open-collector digital output
- 2 analog inputs (0...10V or -10…+10V or 0…20 mA)
- 1 analog output (0…10V or 0…20 mA)
- +10 V DC reference
- +24 V DC external supply or voltage output

- Slot: A

Ordering number
OPT-A8 uncoated
OPT-A8-V coated

> Return to VACON® overview

OPT-A9

This I/O option board for the NXS and NXP products provides a variety of input and output signals for controlling the drive. It is equivalent to OPT-A1 except that in OPT-A9 the connectors have a cross-section of 2.5 mm^2.

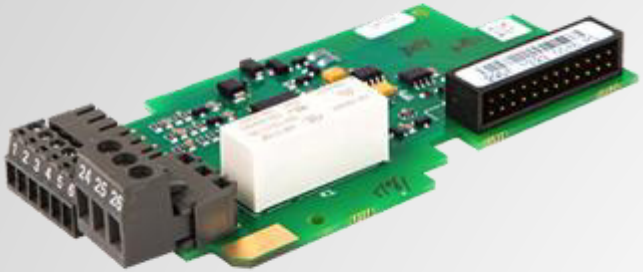
- 6 digital inputs, 24 V DC
- 1 open-collector digital output
- 2 analog inputs (0...10V or -10…+10V or 0…20 mA)
- 1 analog output (0…10V or 0…20 mA)
- +10 V DC reference
- +24 V DC external supply or voltage output

- Slot: A

Ordering number
OPT-A9 uncoated
OPT-A9-V coated

> Return to VACON® overview

OPT-AA



This I/O option board for the NXL product provides a variety of input and output signals for controlling the drive.

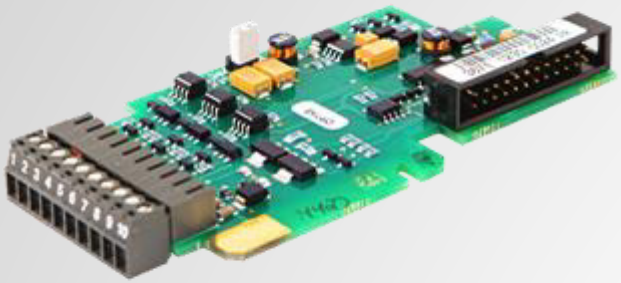
- 3 digital inputs, 24 V DC
- 1 open-collector digital output
- 1 NO relay output
- +24 V DC external supply or voltage output

- Slot: E

Ordering number
OPT-AA uncoated
OPT-AA-V coated

> Return to VACON® overview

OPT-AE



Use this feedback option board to connect HTL-type pulse/incremental encoders to NXP products.

The option board also outputs an Encoder Direction Signal and an Encoder Pulse Output Signal, which is produced by dividing the input pulses from the encoder.

- Differential A+, A-, B+, B-, Z+ and Z- signals
- 1 digital output for encoder direction
- 1 digital output for encoder output, a programmable divider
- Selectable encoder voltage supply +15/+24 V

- Slot: C

Ordering number
OPT-AE uncoated
OPT-AE-V coated

> Return to VACON® overview

OPT-AF Safe Torque Off

This option board provides the NXP product with the Safe Torque Off (STO) safety function. The option board also features an ATEX thermistor input for protection against motor overtemperature, where the motor is located in an ATEX environment. 2 relay outputs are also available in the option board.

- Safe Torque Off (STO) up to SIL2, PL d, Cat. 3 using 2 independent digital input channels
- ATEX thermistor input
- 1 NO relay output
- 1 NO/NC relay output

- Slot: B

Ordering number
OPT-AF-V coated

> Return to VACON® overview

OPT-AI

This I/O option board for the NXL product provides a variety of input and output signals for controlling the drive.

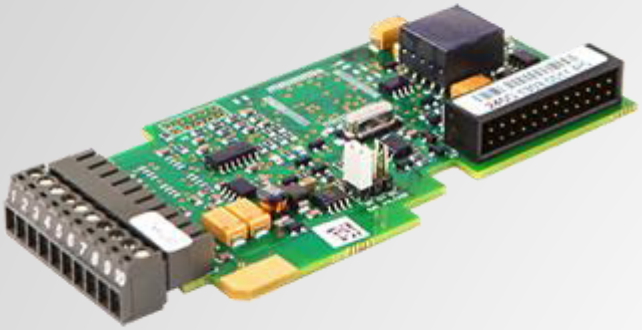
- 3 digital inputs, 24 V DC
- 1 PTC thermistor input
- 1 NO relay output
- +24 V DC external supply or voltage output

- Slot: E

Ordering number
OPT-AI uncoated
OPT-AI-V coated

> Return to VACON® overview

OPT-AK Sin/Cos Encoder



Use this feedback option board to connect sine/cosine type incremental encoders to an NXP product.

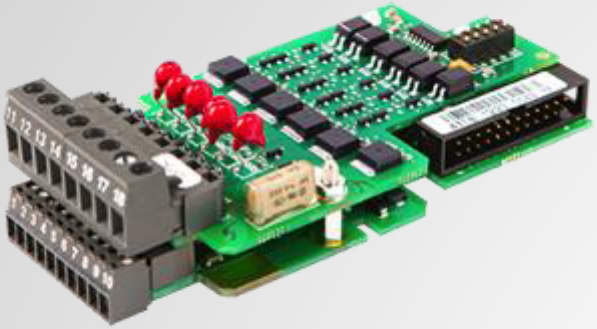
- Differential SIN+, SIN-, COS+, COS-, R+ and R- signals (1 volt peak-to-peak)
- Selectable encoder voltage supply +5/+15/+24V

- Slot: C

Ordering number
OPT-AK-V coated

> Return to VACON® overview

OPT-AL



This I/O option board for the NXS and NXP products provides a variety of input and output signals for controlling the drive.

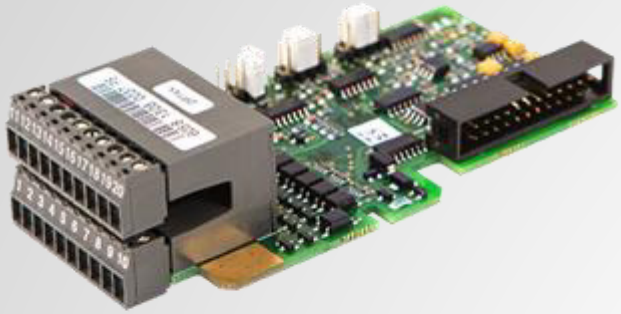
- 6 digital inputs, 42…240 V AC
- 1 open-collector digital output
- 1 analog input 0…10V
- 1 analog input -10…+10V
- 1 analog output 0…10V
- 1 analog output 0…20 mA
- +15 V DC voltage output
- +24 V DC external supply or voltage output

- Slot: A

Ordering number
OPT-AL-V coated

> Return to VACON® overview

OPT-AN



This I/O option board for the NXP product provides a variety of input and output signals for controlling the drive.

- 6 galvanically isolated digital inputs, 24 V DC
- 2 analog inputs (0...10V or -10…+10V or 0…20 mA)
- 2 analog outputs (0...10V or -10…+10V or 0…20 mA)
- +10 V DC and -10 V DC reference
- +24 V DC external supply or voltage output

- Slot: A

Ordering number
OPT-AN-V coated

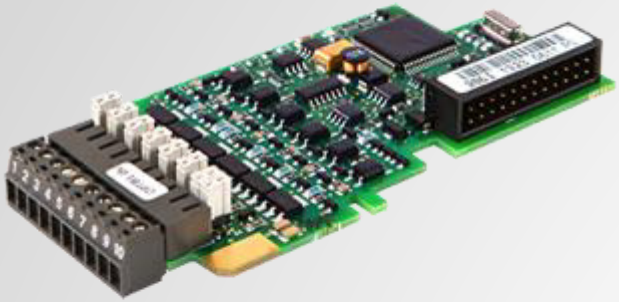
> Return to VACON® overview

ENGINEERING
TOMORROW

VACON® I/O Options - OPT-B series

VACON® 100, VACON® 20 and NX_ families - I/O option boards

OPT-B1



This I/O option board provides additional digital input and/or digital output signals to VACON® AC drives. The option board can be used in NX_ products and also in the VACON® 100 and VACON® 20 product series.

- 6 configurable digital input/output signals
  - 0…24 V DC when configured as input
  - Open-collector when configured as output
  - Signal type is selected using jumpers
- +24 V DC voltage output

- Slots NXS/NXP: BCDE
- Slots NXL: E
- Slots VACON® 100: CDE
- Slots VACON® 20: E

Ordering number
OPT-B1 uncoated
OPT-B1-V coated

> Return to VACON® overview

OPT-B2

This I/O option board provides additional relay output signals and a thermistor input to VACON® AC drives. The option board can be used in NX_ products and also in VACON® 100 and VACON® 20 product series.

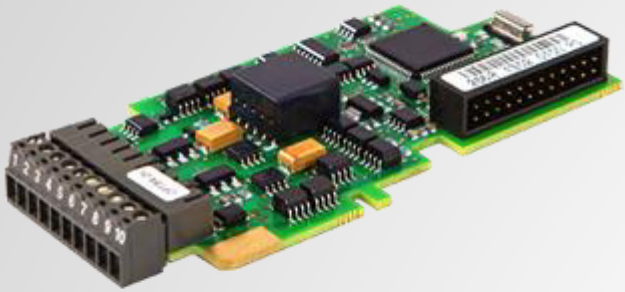
- 1 NO relay output
- 1 NO/NC relay output
- 1 PTC thermistor input

- Slots NXS/NXP: BCDE
- Slots NXL: E
- Slots VACON® 100: CDE
- Slots VACON® 20: E

Ordering number
OPT-B2-V coated

> Return to VACON® overview

OPT-B4



This I/O option board provides one analog input and two analog output signals to VACON® AC drives. The option board can be used in NX_ products and also in VACON® 100 and VACON® 20 product series.

- 1 galvanically isolated analog input (0…20 mA)
- 2 galvanically isolated analog outputs (0…20 mA)
- +24 V DC voltage output

- Slots NXS/NXP: BCDE
- Slots NXL: E
- Slots VACON® 100: CDE
- Slots VACON® 20: E

Ordering number
OPT-B4-V coated

> Return to VACON® overview

OPT-B5

This I/O option board provides three additional relay output signals to VACON® AC drives. The option board can be used in NX_ products and also in VACON® 100 and VACON® 20 product series.

- 3 NO relay outputs

- Slots NXS/NXP: BCDE
- Slots NXL: E
- Slots VACON® 100: CDE
- Slots VACON® 20: E

Ordering number
OPT-B5-V coated

> Return to VACON® overview

OPT-B8 PT100 Measurement

This I/O option board provides three temperature measurement channels to VACON® NXS and NXP drives.

- 2 PT100 sensor inputs (3-wire)
- Measurement channel #3 allows 1-3 sensors in series
- -30…+200°C measurement range

- For new installations, option OPT-BH is recommended

- Slots NXS/NXP:BCDE

Ordering number
OPT-B8-V coated

> Return to VACON® overview

OPT-B9

This I/O option board provides five high-voltage digital inputs and one relay output to VACON® AC drives. The option board can be used in VACON® NX_ products and also in VACON® 100 and VACON® 20 product series.

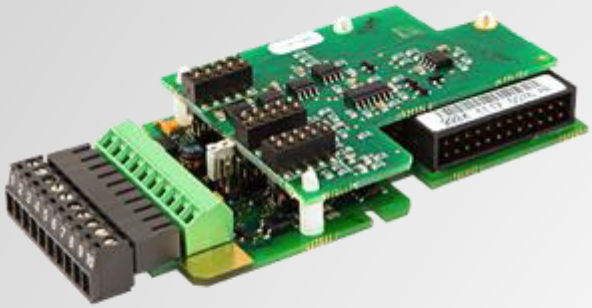
- 5 digital inputs, 42…240 V AC
- 1 NO relay output

- Slots NXS/NXP: BCDE
- Slots NXL: E
- Slots VACON® 100: CDE
- Slots VACON® 20: E

Ordering number
OPT-B9 uncoated
OPT-B9-V coated

> Return to VACON® overview

OPT-BB Endat 2



Use this option board to enable speed feedback to an NXP drive from an EnDat 2 encoder. Use the EnDat interface to read the absolute position of the shaft. The option board outputs a simulated pulse encoder signal according to RS422 specification.

Closed-loop control of the motor requires that sin/cos signals are available.

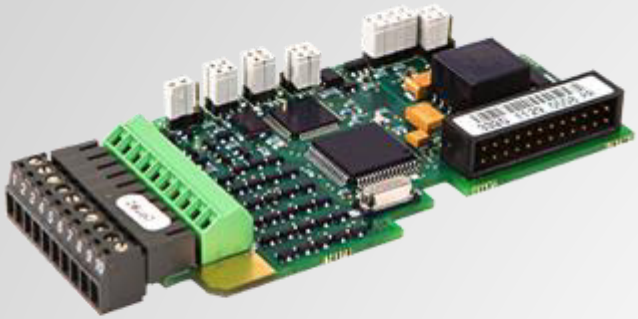
- Absolute encoder with Endat 2 protocol
- Differential DATA, CLOCK, and sin/cos (1 Vpp) input
- Selectable encoder voltage supply +5/+12/+15 V
- 2 Fast digital inputs for tracing short pulses
- Output A+, A-, B+ and B- incremental signals according to RS422 specification

- Slot: C

Ordering number
OPT-BB uncoated
OPT-BB-V coated

> Return to VACON® overview

OPT-BC Resolver



Use this option board to enable speed feedback to an NXP drive from a resolver. The board provides a simulated pulse encoder output.

- Configurable excitation signal frequency, 2-20 kHz
- Differential sin/cos feedback signals
- Differential HTL freeze input for marking position data
- Differential HTL encoder input (A, B and Z signals)
- Differential HTL simulated encoder output (A, B and Z signals)

- Slot: C

Ordering number
OPT-BC uncoated
OPT-BC-V coated

> Return to VACON® overview

OPT-BE EnDat 2.1 and SSI

Use this option board to enable speed feedback to an NXP product from an EnDat 2.1 encoder. Use the EnDat or SSI interface to read the absolute position of the shaft.

Closed loop control of the motor requires that sin/cos signals are available.

- EnDat 2.1 and SSI protocol support
- DATA+, DATA-, CLOCK+ and CLOCK- differential signals
- Differential SIN+, SIN-, COS+ and COS- signals (1 volt peak-to-peak)
  - 350kHz maximum input frequency
- Selectable encoder voltage supply +5/+12/+15 V

- Slot: C

Ordering number
OPT-BE-V coated

> Return to VACON® overview

OPT-BF

This I/O option board provides additional output signals to VACON® AC drives. The option board can be used in VACON® 100 and VACON® 20 product series.

- 1 open-collector digital output
- 1 analog output (0…10V or 0…20 mA)
- 1 NO relay output

- Slots VACON® 100: CDE
- Slots VACON® 20: E

Ordering number
OPT-BF-V coated

> Return to VACON® overview

OPT-BH Temperature Measurement

This I/O option board provides three temperature measurement channels to VACON® AC drives. The option board can be used in NXS, NXP and in VACON® 100 products.

- 3 temperature measurement channels
- PT100, PT1000, Ni1000, KTY84 sensor support
- -50…+200°C measurement range
- All measurement channels support 1…3 PT100 sensors in series

- Slots NXS/P: BCDE
- Slots VACON® 100: CDE

Ordering number
OPT-BH-V coated

> Return to VACON® overview

OPT-BJ Safe Torque Off

This option board provides the VACON® 100 product with the Safe Torque Off (STO) safety function. The option board also features an ATEX thermistor input for protection against motor overtemperature, where the motor is located in an ATEX environment. One relay output is also available for indicating STO function.

- Safe Torque Off (STO) up to SIL3
  using two independent digital input channels
- ATEX thermistor input
- One relay output for STO function
- Slot: E

Ordering number
OPT-BJ-V coated

> Return to VACON® overview

OPT-BK AS-i Bus

This option board provides VACON® AC drives with an AS-i bus interface.

- Slots VACON® 100: CDE
- Slots VACON® 20X: E

Ordering number
OPT-BK-V coated

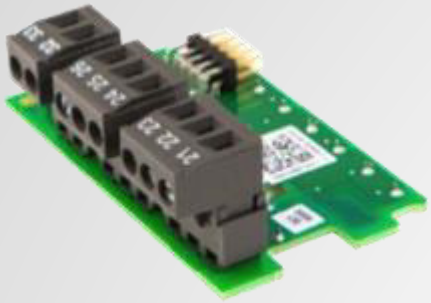
> Return to VACON® overview

ENGINEERING
TOMORROW

VACON® I/O Options - OPT-F series

VACON® 100 family - I/O option boards

OPT-F1



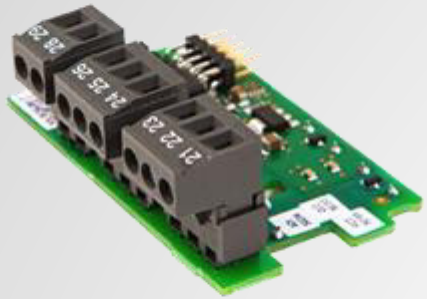
This I/O option board provides relay outputs to the VACON® 100 HVAC products using old control cards.

- Compatible with 70CVB01015 and 70CVB01418 control cards
- 2 NO/NC relay outputs
- 1 NO relay output

Ordering number
OPT-F1-V coated

> Return to VACON® overview

OPT-F2



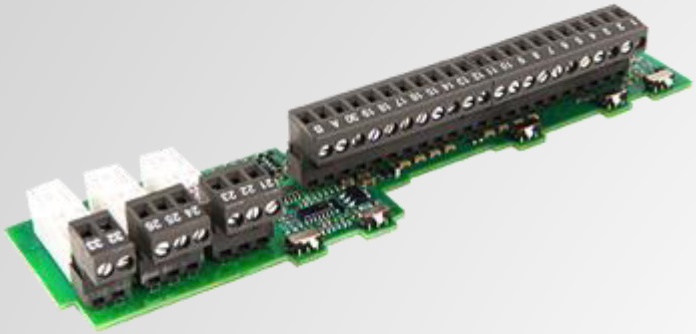
This I/O option board provides relay outputs and a thermistor input to the VACON® 100 HVAC products using old control cards.

- Compatible with 70CVB01015 and 70CVB01418 control cards
- 2 NO/NC relay outputs
- 1 PTC thermistor input

Ordering number
OPT-F2-V coated

> Return to VACON® overview

OPT-F3



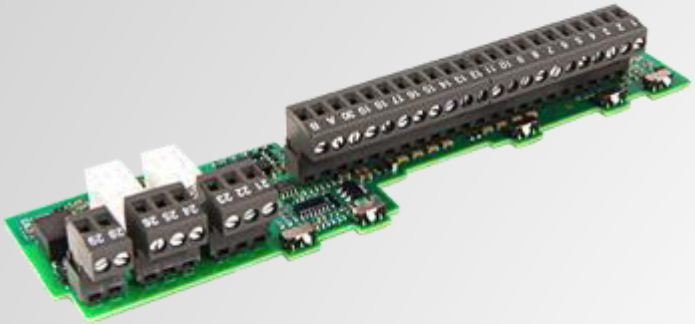
This I/O option board provides a variety of input/output signals and an RS485 interface to the VACON® 100 and VACON® 100 FLOW products. Also VACON® 100 HVAC products with new control board support this I/O board.

- Compatible with 70CVB01582 control card
- 6 pcs 0…24V digital inputs
- 2 analog inputs (0…10V or 0…20 mA)
- 1 analog output (0…10V or 0…20 mA)
- 2 NO/NC relay outputs
- 1 NO relay output
- +10 V DC output reference voltage
- +24 V DC external supply or voltage output
- RS485 interface for fieldbus

Ordering number
OPT-F3-V coated

> Return to VACON® overview

OPT-F4



This I/O option board provides a variety of input/output signals and an RS485 interface to the VACON® 100 INDUSTRIAL and VACON® 100 FLOW products. VACON® 100 HVAC products with new control board also support this I/O board.

- Compatible with 70CVB01582 control card
- 6 digital inputs, 0…24 V
- 2 analog inputs (0…10 V or 0…20 mA)
- 1 analog output (0…10 V or 0…20 mA)
- 2 NO/NC relay outputs
- 1 PTC thermistor input
- +10 V DC output reference voltage
- +24 V DC external supply or voltage output
- RS485 interface for fieldbus

Ordering number
OPT-F4-V coated

> Return to VACON® overview

ENGINEERING
TOMORROW

VACON® Fieldbus Options - OPT-C series

VACON® 100, VACON® 20 and NX_ families - fieldbus option boards

OPT-C2 Multiprotocol RS485

This option board provides a multiprotocol RS485 interface to NX_ products. The option board is identical to OPT-C8 apart from the fieldbus connector.

- Modbus RTU protocol support
- Metasys N2 protocol support
- Termination resistor can be activated with jumper
- 5-pin connector plug

Slots NXS/NXP: DE

Slots NXL: DE

Ordering number
OPT-C2 uncoated
OPT-C2-V coated

> Return to VACON® overview

OPT-C3 PROFIBUS DP

This option board provides a PROFIBUS DP-V0 interface to NX_ products. The option board is identical to OPT-C5 apart from the fieldbus connector.

- PROFIBUS DP-V0 protocol support
- Vacon profile and PROFIdrive-like profile
- Termination resistor can be activated with jumper
- 5-pin connector plug

Slots NXS/NXP: DE

Slots NXL: DE

Ordering number
OPT-C3-V coated

> Return to VACON® overview

OPT-C4 LonWorks

This option board provides a LonWorks interface to VACON® NX_ and VACON® 100 products.

- LonWorks protocol
- 3-pin plug connector

Slots NXS/NXP: DE

Slots NXL: DE

Slots VACON® 100: DE

Ordering number
OPT-C4-V coated

> Return to VACON® overview

OPT-C5 PROFIBUS DP

This option board provides a PROFIBUS DP-V0 interface to VACON® NX_ products. The option board is identical to OPT-C3 apart from the fieldbus connector.

- PROFIBUS DP-V0 protocol support
- VACON® profile and PROFIdrive-like profile
- Termination resistor can be activated with jumper
- Sub-D9 connector

Slots NXS/NXP: DE

Ordering number
OPT-C5-V coated

> Return to VACON® overview

OPT-C6 CANopen

This option board provides a CANopen interface to NX_ products.

- CANopen protocol support
- VACON® profile and CiA 402-like profile
- 5-pin plug connector

Slots NXS/NXP: DE

Slots NXL: DE

Ordering number
OPT-C6 uncoated
OPT-C6-V coated

> Return to VACON® overview

OPT-C7 DeviceNet

This option board provides a DeviceNet™ interface to VACON® NX_ products.

- DeviceNet protocol support
- VACON® profile and CIP AC Drive-like profile
- 5-pin plug connector

Slots NXS/NXP: DE

Slots NXL: DE

EtherNet/IP™ and DeviceNet™ are trademarks of ODVA, Inc.

Ordering number
OPT-C7-V coated

> Return to VACON® overview

OPT-C8 Multiprotocol RS485

This option board provides a multiprotocol RS-485 interface to VACON® NX_ products. The option board is identical to OPT-C2 apart from the fieldbus connector.

- Modbus RTU protocol support
- Metasys N2 protocol support
- Termination resistor can be activated with jumper
- Sub-D9 connector

Slots NXS/NXP: DE

Slots NXL: DE

Ordering number
OPT-C8 uncoated
OPT-C8-V coated

> Return to VACON® overview

OPT-CG Selma 2

This option board provides ABB Selma 2 protocol interface to VACON® NXP products.

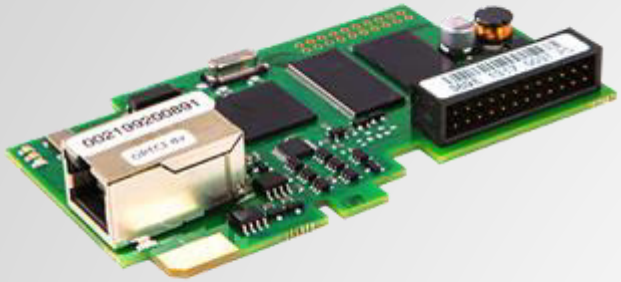
- Selma 2 protocol
- 4-pin plug connector

Slots NXP: DE

Ordering number
OPT-CG-V coated

> Return to VACON® overview

OPT-CI Modbus TCP



This option board provides Modbus TCP interface to VACON® NX_ products.

- Modbus TCP protocol
- 1x RJ45 connector

Slots NXS/NXP: DE

Slots NXL: DE

Ordering number
OPT-CI-V coated

> Return to VACON® overview

OPT-CJ BACnet MS/TP

This option board provides BACnet MS/TP interface to VACON® NX_ products.

- BACnet MS/TP (RS485-based) protocol
- 5-pin plug connector

Slots NXS/NXP: DE

Slots NXL: DE

Ordering number
OPT-CJ-V coated

> Return to VACON® overview

OPT-CP PROFINET

This option board provides a PROFINET interface to VACON® NX_ products.

- PROFINET protocol
- VACON® profile and PROFIdrive-like profile
- 1x RJ45 connector

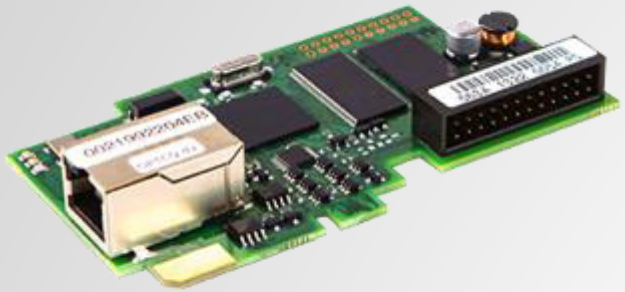
Slots NXS/NXP: DE

Slots NXL: DE

Ordering number
OPT-CP-V coated

> Return to VACON® overview

OPT-CQ EtherNet/IP



This option board provides EtherNet/IP interface to VACON® NX_ products.

- EtherNet/IP protocol
- VACON® profile and CIP AC Drive-like profile
- 1x RJ45 connector

Slots NXS/NXP: DE

Slots NXL: DE

Ordering number
OPT-CQ-V coated

> Return to VACON® overview

ENGINEERING
TOMORROW

VACON® Fieldbus Options - OPT-E series

VACON® 100, VACON® 20 and NX_ families - fieldbus option boards

OPT-E3 PROFIBUS DP

This option board provides a PROFIBUS DP-V1 interface to VACON® 100 and VACON® 20 product families. The option board is identical to OPT-E5 apart from the fieldbus connector.

- PROFIBUS DP-V1 protocol support
- VACON® profile and PROFIdrive-like profile
- 5-pin plug connector

- Slots VACON® 100: DE
- Slots VACON® 20: E

Ordering number
OPT-E3-V coated

> Return to VACON® overview

OPT-E5 PROFIBUS DP

This option board provides PROFIBUS DP-V1 interface to VACON® 100 and VACON® 20 product families. The option board is identical to OPT-E3 apart from the fieldbus connector.

- PROFIBUS DP-V1 protocol support
- VACON® profile and PROFIdrive-like profile
- Sub-D9 connector

- Slots VACON® 100: DE
- Slots VACON® 20: E

Ordering number
OPT-E5-V coated

> Return to VACON® overview

OPT-E6 CANopen

This option board provides CANopen interface to VACON® 100 and VACON® 20 product families.

- CANopen protocol support
- VACON® profile and CiA 402-like profile
- 5-pin plug connector

- Slots VACON® 100: DE
- Slots VACON® 20: E

Ordering number
OPT-E6-V coated

> Return to VACON® overview

OPT-E7 DeviceNet

This option board provides DeviceNet interface to VACON® 100 and VACON® 20 product families.

- DeviceNet protocol support
- VACON® profile and CIP AC Drive-like profile
- 5-pin plug connector

- Slots VACON® 100: DE
- Slots VACON® 20: E

EtherNet/IP™ and DeviceNet™ are trademarks of ODVA, Inc.

Ordering number
OPT-E7-V coated

> Return to VACON® overview

OPT-E9 Dual-Port Ethernet

This option board provides multiprotocol Ethernet interface to VACON® NXS, NXP, VACON® 100 and VACON® 20 product families.

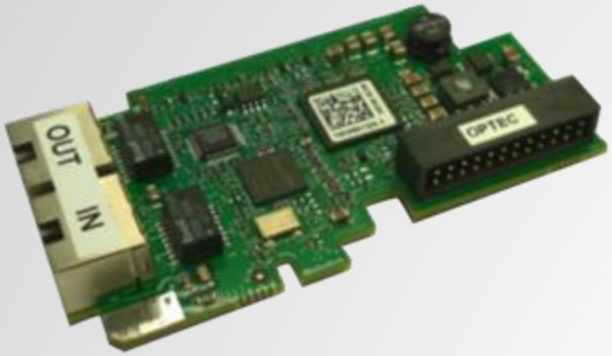
- Modbus TCP and PROFINET protocol support
- Future EtherNet/IP protocol support
- 2x RJ45 connectors with built-in switch
- RSTP protocol support currently

- Slots NXS/NXP: DE
- Slots VACON® 100: DE
- Slots VACON® 20: E

Ordering number
OPT-E9-V coated

> Return to VACON® overview

OPT-EC EtherCAT



This option board provides EtherCAT ® interface to VACON® NXP, VACON® 100 and VACON® 20 product families.

- EtherCAT protocol support
- Based on BECKHOFF ASIC
- VACON® profile and CiA 402-like profile
- 2x RJ45 connectors (EtherCAT supports line topology)

- Slots NXP: DE
- Slots VACON® 100: DE
- Slots VACON® 20: E

Limited availability

Ordering number
OPT-EC-V (coated)

> Return to VACON® overview

ENGINEERING
TOMORROW

VACON® Adapter Options - OPT-D series

NX_ family - adapter option boards

OPT-D1 SystemBus Adapter

This adapter option board allows VACON® NXP drives to be connected via fiber-optic cables. The link can be used for drive-to-drive communication or for parallelling of drives to achieve higher power.

- 2x fiber-optic pairs
- Slots NXP: DE

Ordering number
OPT-D1 uncoated
OPT-D1-V coated

> Return to VACON® overview

OPT-D2 SystemBus & CAN Adapter

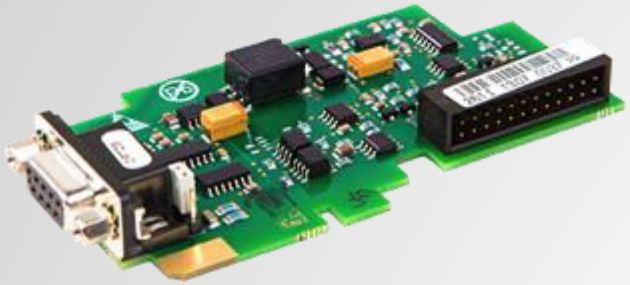
This adapter option board enables connection of VACON® NXP drives via fiber-optic cables. Use the link for drive-to-drive communication or for parallelling of drives to achieve higher power. The board also includes a CAN interface for monitoring of multiple drives, for customized CAN communication or for I/O expansion.

- 1 fiber-optic pair
- Galvanically isolated CAN interface (3-pin plug connector)
  - IEC 61131 application CAN
  - MonitorBus
- Slots NXP: DE

Ordering number
OPT-D2-V coated

> Return to VACON® overview

OPT-D3 RS232 Adapter



This adapter option board enables connection of VACON® NXS and NXP drives to a PC via RS232 link.

- Galvanically-isolated RS232 interface
- D9 connector

- Slots NXS/NXP: DE

Ordering number
OPT-D3 uncoated
OPT-D3-V coated

> Return to VACON® overview

OPT-D6 CAN Adapter

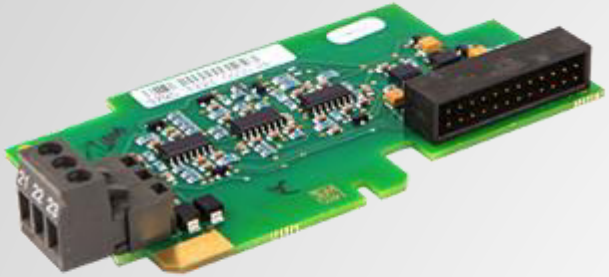
This adapter option board supplies a CAN interface to the IEC 61131 application of VACON® NXP drives. Use the CAN interface for monitoring of multiple drives, for customized CAN communication or for I/O expansion.

- Galvanically-isolated CAN interface (3-pin plug connector)
  - IEC 61131 application CAN
  - MonitorBus
- Slots NXP: DE

Ordering number
OPT-D6-V coated

> Return to VACON® overview

OPT-D7 Line Voltage Measurement



This adapter option board provides VACON® NXP drives with an interface for measuring mains/line voltage. The board includes a transformer to reduce the line voltage to a measurable amplitude. The board is used in applications such as AFE, renewable energy or micro-grid.

- Line voltage and frequency measurement
- External voltage transformer 1:60
- 380…690 V AC input voltage

- Slots NXP: C

Ordering number
OPT-D7 uncoated
OPT-D7-V coated

> Return to VACON® overview

ENGINEERING
TOMORROW

VACON® NXC+ Options

For VACON ® NXC Enclosed High Performance Single Drive

VACON NXC +OPTIONS

I and C-Group

INPUT DEVICES (I-Group)			
+IFD	Fuse Switch	With aR fuses	
+ICB	Input Circuit Breaker (+AMO)	MCCB (Motor operated)	
+IFU	Input Fuse and Base	With aR fuses	
+ICO	Input Contactor		
+ILS	Input Load Break Switch		

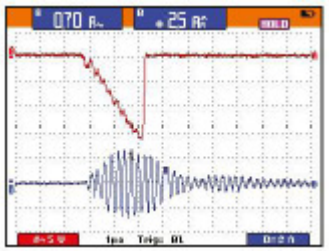
CABLING (C-Group)			
+CIT	Input Supply Cables from TOP		
+COT	Output Motor Cables TOP		

> Return to VACON® overview

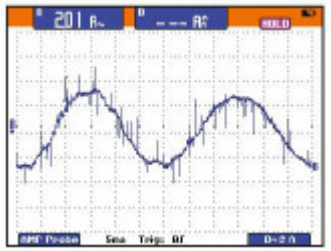
VACON NXC +OPTIONS

O-Group

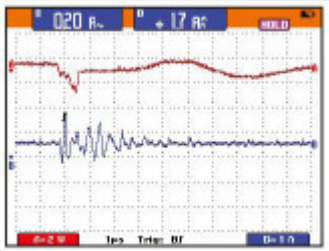
OUTPUT FILTER OPTIONS (O-Group)			
+OCM	Common-Mode Chokes	Ferrite	
+OCH	Common-Mode Chokes	Nanoperm®	
+ODU	dU/dt Filter		
+OSI	Sine-wave Filter		



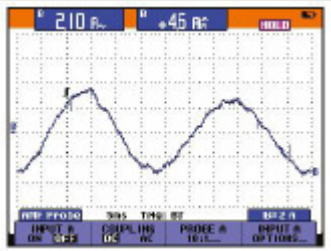
Shaft voltage and bearing current without +OCH



Grounding current without +OCH



Shaft voltage and bearing current with **+OCH**



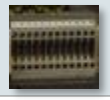
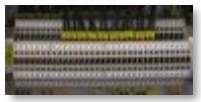
Grounding current without **+OCH**

The +OCH can be combined with other output filters.
Especially in combination with dU/dt filters they offer a low cost solution for protection of both motor bearings and insulation

> Return to VACON® overview

VACON NXC +OPTIONS

T-Group

CONTROL TERMINAL OPTIONS (T-Group)			
+TIO	Terminal I/O	35 terminals	
+TID	Terminal I/O Double	70 terminals	
+TUP	Terminals for external 230 V AC control voltage	12 terminals	

> Return to VACON® overview

VACON NXC +OPTIONS

P-Group

PROTECTIVE DEVICES OPTIONS (P-Group)			
+PTR	Thermistor Relay		
+PES	Emergency Stop (Cat 0)		
+PED	Emergency Stop Circuit (Cat 1)		
+PAP	Arc Protection		
+PIF	Insulation Fault Sensor		

> Return to VACON® overview

VACON NXC +OPTIONS

D-Group

DOOR MOUNTED OPTIONS (D-Group)			
+DLV	Pilot Lights	CONTROL VOLTAGE	
+DLD		READY	
+DLF		FAULT	
+DLR		RUN	
+DCO	Operation Switch Contactor	0-1-START	
+DRO	Operation Switch Local/remote	REMOTE CONTROL	
+DEP	Emergency Push-button	STOP	
+DRP	Reset Push-button	RESET	
+DAM	Analog Meter		
+DAR	Potentiometer		
+DCM	Analog Current Meter with Current Transformer	Ampere	
+DVM	Analog Voltage meter with Selector switch	Voltage	

> Return to VACON® overview

VACON NXC +OPTIONS

A-Group

AUXILIARY EQUIPMENT (A-Group)			
+AMF	Motor Fan Control (forced cooling)		
+AMH	Motor Heater Feeder		
+AMB	Mechanical Brake Motor Control		
+AMO	Motor Operator for +ICB (MCCB)		
+ACH	Enclosure Heater	50 W	
+ACL	Enclosure Light		
+ACR	Control Relay		
+AAI	Analog Signal Isolator		
+AAA	Auxiliary Contact (Control Voltage Devices)		
+AAC	Auxiliary Contact (Input Device)		
+ATx	Auxiliary Voltage Transformer +AT**1**, +AT**2**, +AT**3**, +AT**4**	200, 750, 2500, 4000 VA	
+ADC	Power Supply	24 V DC 2.5 A	
+ACS	AC Customer Socket	230 V AC	

> Return to VACON® overview

VACON NXC +OPTIONS

G-Group

GENERAL OPTIONS (G-Group)			
+G40	TS8 Empty Enclosure	400 mm	
+G60	TS8 Empty Enclosure	600 mm	
+G80	TS8 Empty Enclosure	800 mm	
+GPL	Base Plinth	100 mm	
+GPH	Base Plinth	200 mm	
+FAT	Factory Acceptance Test		
+MAR	Marine Construction	Hardware	
+SWP	Seaworthy Packing		

> Return to VACON® overview

ENGINEERING
TOMORROW

VACON® Heat Exchangers

For NXW Liquid Cooled Drives

Liquid to Liquid Heat Exchanger, 40 kW

- 40 kW cooling capacity
- 1-pump model
- Several variations:
  - HXL-M-040-N-P: IP00, PVC piping,
  - HXL-M-040-N-S: IP00, stainless steel piping
  - HXL-V-040-N-P: IP54 Veda cabinet, PVC piping
  - HXL-V-040-N-S: IP54 Veda cabinet, stainless steel piping
  - HXL-R-040-N-P: IP54 Rittal cabinet, PVC piping
  - HXL-R-040-N-S: IP54 Rittal cabinet, stainless steel piping

	HXL-M/V/R-040-N-P
Cooling power	0...40 kW
Mains supply	380...440 V AC
Flow	40...120 l/min

> Return to VACON® overview

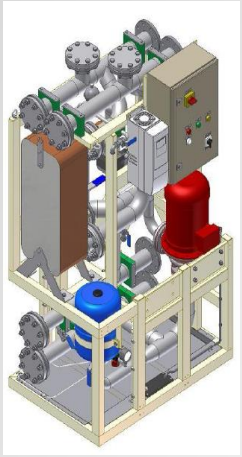
Liquid to Liquid Heat Exchanger, 120 kW

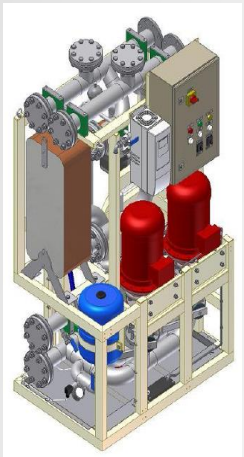
- 120 kW cooling capacity
- 1-pump models
- 2-pump models for marine applications
- Several variations, available in IP54 Rittal and Veda cabinets:
  - HXL-M-040-N-P: IP00, PVC piping, 1-pump
  - HXL-M-040-N-S: IP00, stainless steel piping, 1-pump
  - HXM-M-040-N-P: IP00, PVC piping, 2-pumps
  - HXM-M-040-N-S: IP00, stainless steel piping, 2-pumps

	HXL/M-M/V/R-120-N-P
Cooling power	0...120 kW
Mains supply	380...440 V AC
Flow	120...360 l/min

> Return to VACON® overview

Liquid to Liquid Heat Exchanger, 300 kW





- 300 kW cooling capacity
- All models with stainless steel piping
- 1-pump models
- 2-pump models for marine applications
- Several variations:
  - HXL-M-300-N-S: IP00, 1-pump
  - HXM-M-300-N-S: IP00, 2-pumps
  - HXL-R-300-N-S: IP54 Rittal cabinet, 1-pump
  - HXM-R-300-N-S: IP54 Rittal cabinet, 2-pumps

	HXL/M-M/R-300-N-P
Cooling power	0...300 kW
Mains supply	380...440 V AC
Flow	360...900 l/min

> Return to VACON® overview

Liquid to Air Heat Exchangers, Water Chillers

- Liquid to Air heat exchangers with cooling compressor
- Manufactured by Lauda Ultracool
- IP54 cabinet
- Mains supply
  - 400-440 V AC/50 Hz or
  - 440-480 V AC/60 Hz
- Several models for different cooling capacity and coolant flow

PRODUCT CODE	kW (P@35°C / P@45°C)	Q (l/min)
UC-0030SP	3.8 / 3.3	20
UC-0080SP	13.7 / 11.2	40
UC-0140SP	22.1 / 18.3	80
UC-0240SP	41.8 / 34.2	120
UC-0400SP	48.6 / -	120
UC-0800SP	97.2 / -	240
UC-0500SP-E	- / 43	120
UC-1000SP-E	- / 86	240

> Return to VACON® overview