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ENGINEERING
TOMORROW

Selection Guide | VLT® OneGearDrive®

Powerful, efficient and hygienic
– all in only one frame size

40%
energy savings

compared to conventional systems by using VLT® OneGearDrive® together with VLT® AutomationDrive FC 302 or VLT® Decentral Drive FCD 302

www.danfossdrives.com

VLT®
THE REAL DRIVE

Energy efficient, flexible, reliable – VLT® OneGearDrive®

VLT® OneGearDrive® is a highly efficient permanent-magnet three-phase synchronous motor coupled to an optimized bevel gear box. As part of the Danfoss VLT® FlexConcept® the drive is an energy-efficient drive system that helps to optimize plant productivity and reduce energy costs. The VLT® FlexConcept® is comprised of the VLT® OneGearDrive®, combined with a VLT® Decentral Drive FCD 302 or VLT® AutomationDrive FC 302 frequency converter.

Cost reductions with drive control

The VLT® OneGearDrive® features a permanent magnet motor, which is a synchronous motor with rotor mounted permanent magnets. The drive can achieve up to 89% efficiency and high torque, already exceeding the IE4 Super Premium Efficiency class, in a compact motor frame.
With only one motor type and three available gear ratios, the motor concept covers all typical versions of conveyor drives commonly used in the food and beverage industry.

For conveyor drives in particular, this system dramatically simplifies project engineering, installation, commissioning and maintenance – regardless of whether the plant operator opts for a centralized or decentralized drive configuration.

Optimized components – fewer variants

The VLT® OneGearDrive® uses optimized bevel gearing, which is more efficient than commonly used worm gears. As a whole, the system can reach an efficiency level as high as 89%, yielding energy savings of up to 25% compared with conventional systems. The system components allow maximum flexibility with a minimum number of unit variations such as motors, gear unit sizes or frequency converters, all of which offer a uniform user interface concept and the same functionality. A reduced number of geared motor unit (GMU) variants across the plant also means smaller spare parts inventories and further cost reductions.

Flexible solutions – high efficiency

Electric drives play an important role in supporting food and beverage operations to optimize plant efficiency and reduce energy costs. The VLT® FlexConcept® takes this effort a crucial step further.

Savings in operations and maintenance

In the past, the various production areas: manufacture, filling, packaging, palletizing, and storage etc, required a variety of drive concepts. Dozens or even hundreds of drives are for example needed just to power the conveyors which interconnect the various production stages.

Previously, motors were not particularly efficient; there was a wide variety of transmissions and drives in use and maintenance costs were high. The consequences were, and still are, high energy costs and that large stocks of spare parts must be maintained to minimize down-time. Since then, the evolution of inverter drives has brought the inverter/cage motor combination to a high peak of performance, capable of matching that of even servo drives.

With the VLT® OneGearDrive® as part of the VLT® FlexConcept®, Danfoss has developed a flexible, standardized and efficient drive system that significantly reduces the number of drive variants, resulting in greatly reduced operating costs, substantial energy savings and carbon dioxide reductions.

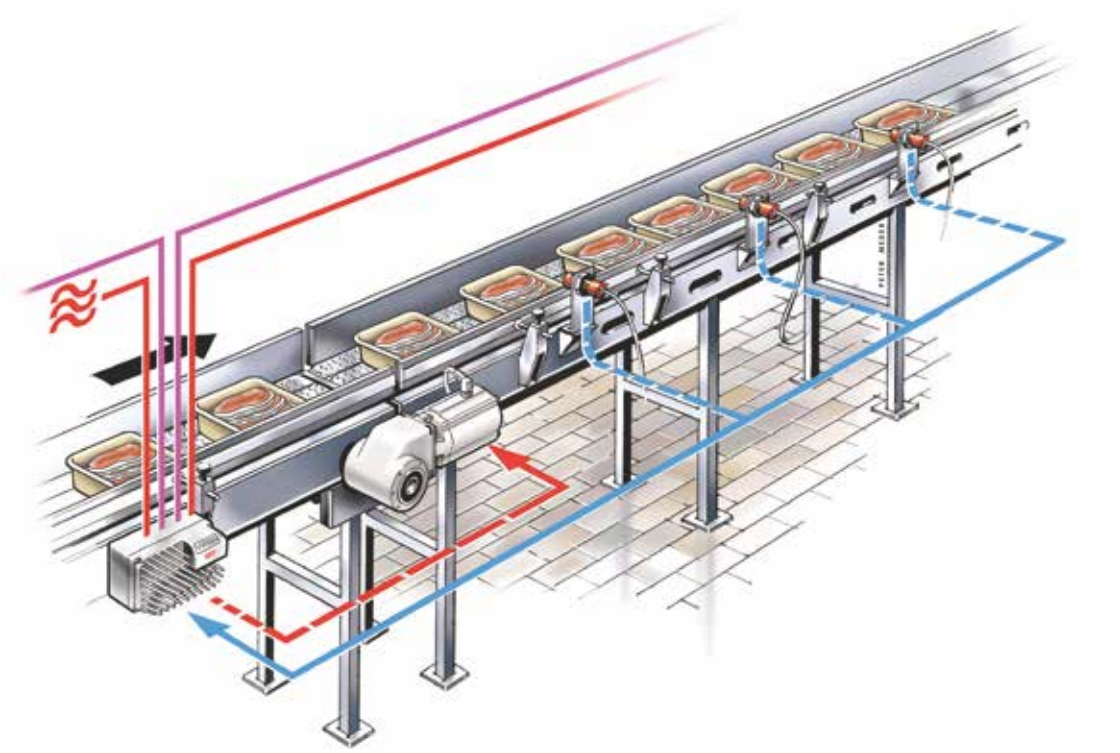
Hygienic design required

Especially in food and beverage production areas, but also in pharmaceutical and cosmetic manufacturing plants, hygiene compliance rules are extremely demanding. This is why Danfoss has designed the VLT® OneGearDrive® to comply with the rules of the "European Hygienic Engineering & Design Group" (EHEDG). EHEDG provides the specifications and guidelines for the comprehensive, proactive protection of food from contamination with bacteria, fungi and yeasts during processing.

In the VLT® OneGearDrive® Danfoss has utilized years of experience in process and mechanical engineering, as well as knowledge in microbiology, to create a competitive, cost efficient solution that can easily be integrated into any production setup.

This is a clear advantage compared to upgrading existing process equipment designs to meet hygienic requirements, which is often both expensive and unsuccessful.

Fewer variants – run a higher number of applications



VLT® OneGearDrive® – one gear size

Compared to traditional systems, the compact design of the VLT® OneGearDrive® makes it a strong choice that can provided benefits in transport and conveying systems as well as machines and equipment.

With only one motor type and three gear ratios available, the motor concept covers all typical conveyor drives. Furthermore, the restricted range of physical configurations of the OneGearDrive® simplifies the number of spare variants and makes it more cost efficient, easing engineering and installation thanks to uniform mechanical dimensions.

Flexible plant design

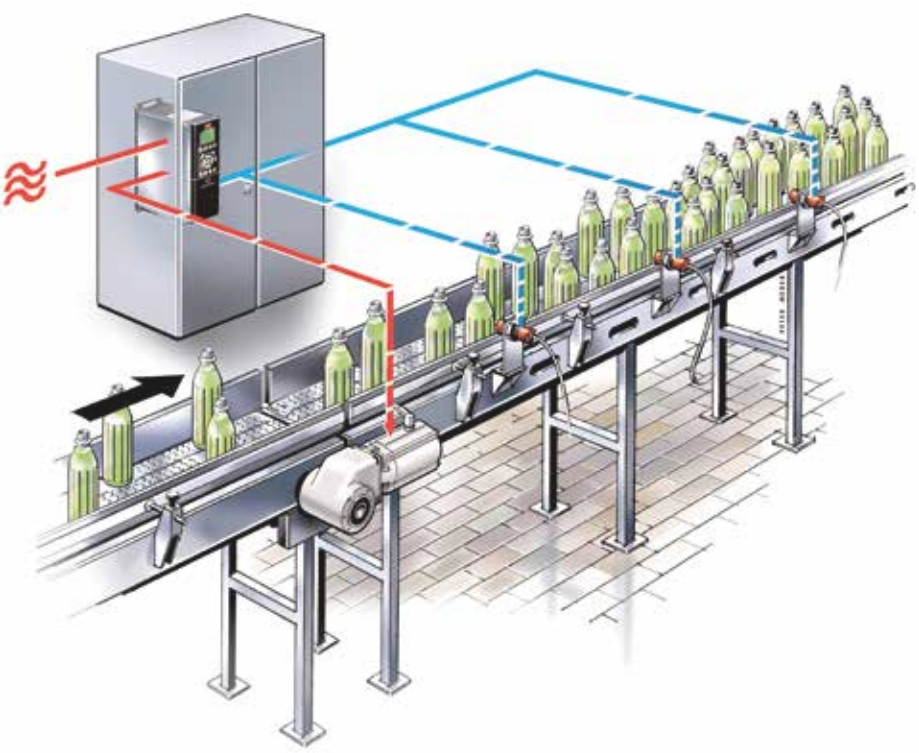
In combination with the VLT® AutomationDrive FC 302 or the VLT® Decentral Drive FCD 302 the VLT® OneGearDrive® is equally suited to central and decentral installations, giving the plant designer complete flexibility from the outset.

A maximum torque of approx. 400 Nm is obtained and three gear ratios (5.92, 14.13, 31.13) are available. With a cable length of 500 ft (screened) and 1,000 ft (unscreened) between frequency converter and VLT® OneGearDrive®, all conditions for conveyor drives in the food & beverage applications are fulfilled.

Up to

89%

system efficiency Utilizing PM Motor technology which exceeds IE4 Motor Super Premium Efficiency Class



Less expensive, fewer variants

Due to the PM motor there are lower losses, a smaller moment of inertia, a wide torque and speed range and a high short-term overload capability, enabling high maximum torque over a wide speed range. This gear motor is a drive which, considered over its lifetime, is less expensive than conventional geared motor units (GMUs).

Long service intervals

The VLT® OneGearDrive® runs 35,000 operating hours in partial operation between oil changes (by using food grade oil). This means long service intervals, low maintenance costs and effort, and low operating cost.

Dry, wet and wash- down aseptic areas

The VLT® OneGearDrive® comes in two versions, the VLT® OneGearDrive® Standard for use in dry and wet production areas while the VLT® OneGearDrive® Hygienic for use in aseptic areas heralds a new threshold in food hygiene and cleanability.

reddot design award
winner 2010

Awarded design
The design of the VLT® OneGearDrive® Hygienic also opens up totally new aesthetic and key stylistic elements in drive technology. The motor and gearbox together form a clean, simple entity and the product won the reddot design award 2010 for "high product quality, expressing innovation in form and function in an exemplary manner".

Hygienic design

Food safety
In food and beverage production areas where the product may come into direct contact with equipment and motors, the hygienic design of process equipment has a tremendous impact on diminishing the risks of contamination, which also means that the shelf life of products is improved. If the applied process equipment is of a poor hygienic design, it is difficult to clean it of micro-bacterial contamination.

New hygienic trends
EU regulations for the compliance of hygienic equipment to be used in the manufacturering of popular food and beverages are becoming increasingly tight. For example, in the beverage industry, still water, fruit juices and alcohol free beers are all highly reactive to external influences.

New packaging materials also raise the demands on the hygienic conditions. Plastic packaging for cosmetics, including PET bottles in the drinks industry, require new measures as they do not tolerate heat sterilization or cleaning that previously rendered glass containers aseptic.

Hygienic design
After years working with the food and beverage industry, Danfoss knows better than most the need for a robust, watertight construction that resists attack by acids or detergents, doesn't harbor bacteria and can be cleaned down quickly and easily, shortening the maintenance window.

EHEDG compliance
The VLT® OneGearDrive® Hygienic is the ideal choice for any application where hygiene is especially important. It complies with the requirements for best cleaning and hygienic design – with certification according to EHEDG (European Hygienic Engineering & Design Group).

Complete smooth surface
The VLT® OneGearDrive® Hygienic has a complete smooth, easy to clean surface without cooling fins and fan, without any pockets preventing bacteria growth and allowing detergents to drain off freely.

Because these drives do not have fans, they do not suck in airborne germs and blast them back into the surrounding air. The drive units are also available with totally encapsulated brakes.

High degrees of protection
The VLT® OneGearDrive® Hygienic is resistant to detergents and disinfectants (pH 2 ..14). Danfoss supplies the OneGearDrive® Hygienic with high IP 67 or IP 69K protection ratings as standard. A proven stainless steel plug-and-socket connector simplifies replacement during maintenance.

IPA certified
The VLT® OneGearDrive® Hygienic is certified as usable for clean rooms and aseptic filling by IPA (Fraunhofer institute) according to the dedicated "Air Cleanliness Classification" DIN EN ISO 14644-1.

The VLT® OneGearDrive® is designed to be integrated in the plant equipment and to withstand the same detergents and physical cleaning as the rest of the aseptic production equipment.

VLT® OneGearDrive®
Two versions are all you need

The VLT® OneGearDrive® is available in two versions; the VLT® OneGearDrive® Standard for use in dry and wet production areas, and the VLT® OneGearDrive® Hygienic, for use in wet areas, areas with high cleaning intensity including aseptic and cleanroom production areas.

Complete smooth surface Fan-free motor, No cooling fins
In both versions, completly smooth, easy to clean surface without cooling fins, prevents pockets of dirt from forming and allows detergents to drain off freely. The fan-free motor avoids the risk of air-borne germs and dirt particles being drawn in and then expelled back into the surrounding air.

High degrees of protection
IP 67 and IP 69K (OGD Hygienic) – allows unrestricted use in wash down areas. IP 65 and IP67 (OGD Standard) – high protection in wash down areas.

10 pole motor for continuous duty S1
High torque availability.

High efficiency bevel gear
High break-away torque and uniquely compact design.

Available hollow shaft diameters 1-1/4", 1-7/16", 1-1/2" and 30, 35 and 40 mm:
Allow flexible adaptation to customer standards.

H **Motor connection with CleanConnect® stainless steel connectors**
Allow safe connection in wet areas, fast replacement, and high cleanability. The proven stainless steel plug-and-socket connectors simplify replacement during maintenance. This allows the replacement to be performed by a mechanical service technician alone, without the assistance of an electrician as in the past.

S **Motor connections via terminal box with CageClamp® technology**
Fast, reliable connection lowering installation costs.

H oS **Stainless steel hollow shaft**
AISI 316 Ti, corrosion resistant.

H oS **Aseptic coating and food grade lubricants compliant with FDA and NSF requirements**
Allow reliable and direct use in product handling areas, with up to 35,000 hours between oil change.

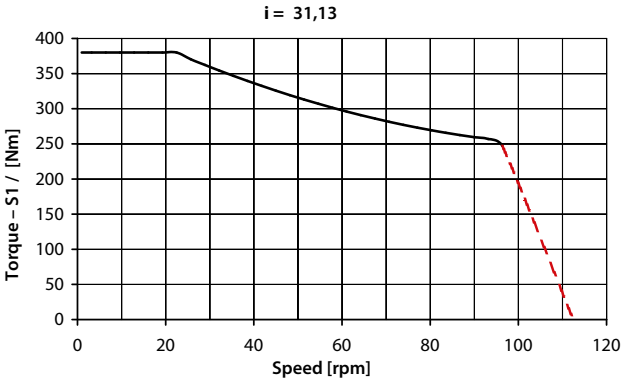
H oS **Certified aseptic coating**
Resistant to detergents and disinfectants (pH 2..14).

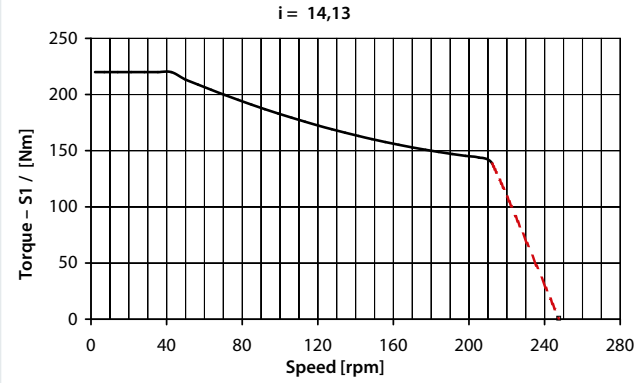
On customer request:
Antibac® antibacterial coating
Reduces cleaning time and costs – this unique coating kills 99.9% of germs by means of active silver ions.

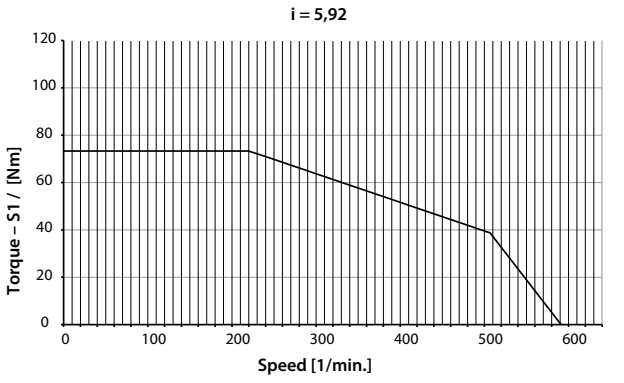
= standard for both versions
H = standard for VLT® OneGearDrive®Hygienic
S = standard for VLT® OneGearDrive® Standard
oH = optional for VLT® OneGearDrive® Hygienic
oS = optional for VLT® OneGearDrive® Standard

Two versions
The VLT® OneGearDrive® Standard with terminal box and to the left, the VLT® OneGearDrive® Hygienic with stainless steel connectors.

Speed/torque characteristics



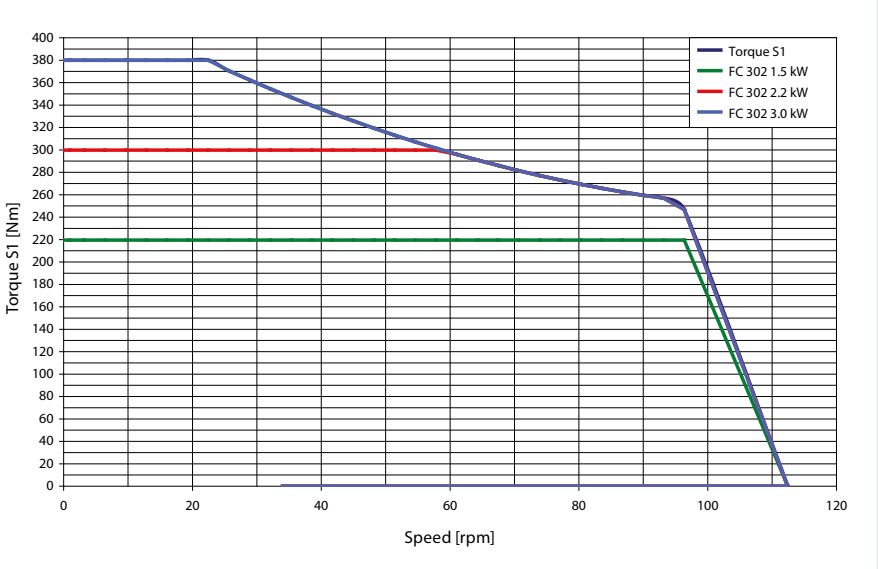




Max current 7.2 A
3 kW

Gear ratios:
i = 31.13
i = 14.13
i = 5.92

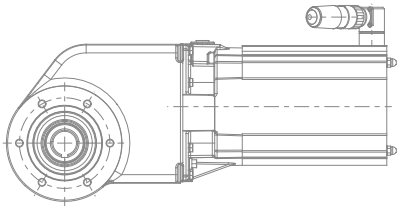
UL/CUL diagrams on request



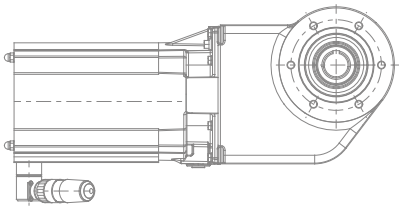
Example:
Speed/ torque characteristics
in combination with
VLT® AutomationDrive FC 302
or VLT® Decentral Drive FCD 302,
for gear ratio i = 31.13

For use at higher speeds, please check with our VLT® OneGearDrive® sales engineers

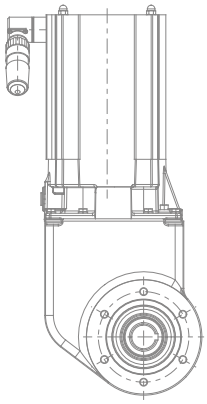
Installation positions



P1



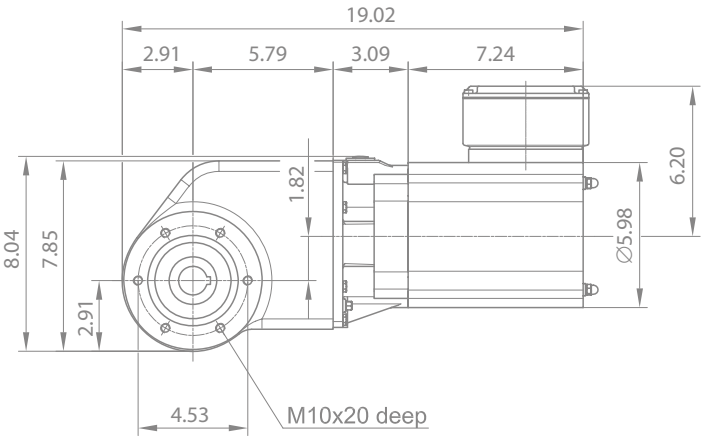
P2

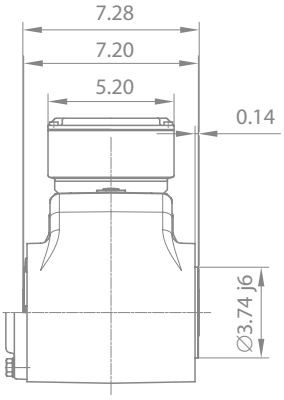


P3

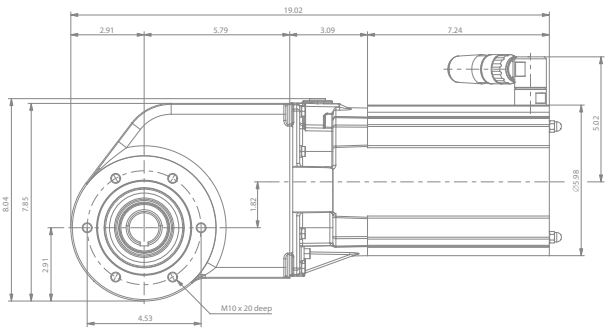
Dimensions

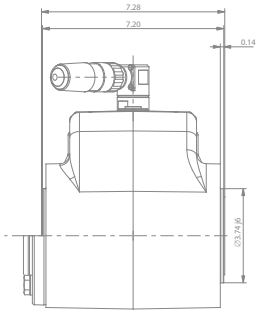
VLT® OneGearDrive® Standard





VLT® OneGearDrive® Hygienic





All measurements are in inch

Ordering type code for OneGearDrive®

Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37
Fixed	O	G	D		K	2						1				L	0	9	R	X			1				9	0	1	0							
Variants				S			0	5	K	9	2		3	0	1						T	B		P	2	S					H	1	B	X	X	X	X
				H			1	4	K	1	3		3	5	2						S	2		P	3	A					S	1	B	1	8	0	1
							3	1	K	1	3		4	0							S	3															
													I	1							S	4															
													I	2																							
													I	3																							

[01-03]	Product group
OGD	VLT® OneGearDrive®

[04]	Product variant
S	Standard
H	Hygienic

[05]	Gear type
K	Bevel gear

[06]	Size
2	400 Nm

[07-11]	Gear ratio
05K92	5.92
14K13	14.13
31K13	31.13

[12]	Output shaft design
1	Hollow shaft

[13-14]	Output shaft size
30	30 mm
35	35 mm
40	40 mm
I1	1 1/4 inch
I2	1 7/16 inch
I3	1 1/2 inch

[15]	Output shaft material
1	Mild steel *(OGD-S only)*
2	Stainless steel, AISI 316 Ti *(standard for OGD-H, option for OGD-S)*

[16-18]	Motor size
L09	1.5 – 3.0 kW

[21-22]	Motor connection
TB	With terminal box *(OGD-S only)*
S2	Motor with plug socket and motor connector, without cable *(OGD-H only)*
S3	Motor with plug socket and motor connector, with 5 m cable *(OGD-H only)*
S4	Motor with plug socket and motor connector, with 10 m cable *(OGD-H only)*

[23]	Connector position
1	Top

[24-25]	Installation position
P2	Horizontal, connections up or down *(P1 = P2, see page 9)*
P3	Vertical, motor up *(see page 9)*

[26]	Surface coating
A	Aseptic *(standard for OGD-H, option for OGD-S)*
S	Standard *(OGD-S only)*

[27-30]	RAL colour code
9010	Standard

[31-32]	Lubricants
H1	Food grade oil *(standard in OGD-H; option for OGD-S)*
S1	Standard *(OGD-S only)*

[33-36]	Brake
BXXX	Without brake
B180	180 V DC *(option OGD-S)*

[37]	UL/CUL
X	Without
1	UL/CUL

NOTE: *For availabillity of specific options and configurations please refer to drive configurator at http://driveconfig.danfoss.com*

Accessories

VLT® OneGearDrive® Hygienic	Ordering number
Motor connector without cable	178H1613
Motor connector with 5 m cable	178H1630
Motor connector with 10 m cable	178H1631
Torque arm stainless steel	178H5006
VLT® OneGearDrive® Standard	**Ordering number**
Torque arm stainless steel	178H5006

Features and benefits

Feature	Benefit
High system efficiency incl. frequency converter	– Save money and energy – up to 40% power savings compared to conventional systems
High-efficiency permanent magnet three-phase synchronous 10-pole motor with bevel gear drive	– Better than Super Premium Efficiency class IE4
Available hollow shaft diameters: 30, 35, 40 mm and 3 impartial shaft sizes	– Flexible adaption to customer standards
Completely smooth enclosure leaves no crevices or dirt traps	– Easy to clean – Safe production
Motor connection with Danfoss CleanConnect® stainless steel circular connector	– Safe connection in wet areas – Fast installation and replacement – High cleanability
Motor and brake connections via terminal box with CageClamp® technology	– Fast, reliable connection – Lower installation cost
Aseptic coating	– Resistant to detergents and disinfectants (pH 2..14)
Antibac® antibacterial coating (on request)	– Reduced cleaning time and costs
Gearbox without breather vents and use of food grade lubricants compliant with FDA and NSF requirements	– Up to 35,000 operating hours in partial load between oil change
High degrees of protection: – IP 67 and IP 69K (OGD- H) – IP 65 and IP 67 (OGD- S)	– Unrestricted use in washdown areas – High protection in washdown areas
Fan-free operation	– Less noise emission – No air-born germs and dirt particles to be drawn into the motor and then expelled back into the surrounding air
Only 3 gearbox ratios in one common design	– Up to 70% reduction in variants reduces spare part stock
Compatible with all Danfoss frequency converters FC/D 302 from 1.5-3 kW	– Free choice of central and decentral installations

VLT® OneGearDrive® Standard with brake

Specifications

VLT® OneGearDrive®	
Power rating	1.5 – 3.0 kW
Speed max.	3000 rpm
Frequency max.	250 Hz
Current max.	7.2 A
Torque	1.7 Nm/A
Voltage	120 V/1000 rpm
Weight	Approx. 28 kg

ENGINEERING
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What VLT® is all about

Danfoss VLT Drives is the world leader among dedicated drives providers – and still gaining market share.

Environmentally responsible

VLT® products are manufactured with respect for the safety and well-being of people and the environment.

All frequency converter factories are certified according to ISO 14001 and ISO 9001 standards.

All activities are planned and performed taking into account the individual employee, the work environment and the external environment. Production takes place with a minimum of noise, smoke or other pollution and environmentally safe disposal of the products is pre-prepared.

UN Global Compact

Danfoss has signed the UN Global Compact on social and environmental responsibility and our companies act responsibly towards local societies.

Impact on energy savings

One year's energy savings from our annual production of VLT® drives will save the energy equivalent to the energy production from a major power plant. Better process control at the same time improves product quality and reduces waste and wear on equipment.

Dedicated to drives

Dedication has been a key word since 1968, when Danfoss introduced the world's first mass produced variable speed drive for AC motors – and named it VLT®.

Twenty five hundred employees develop, manufacture, sell and service drives and soft starters in more than one hundred countries, focused only on drives and soft starters.

Intelligent and innovative

Developers at Danfoss VLT Drives have fully adopted modular principles in development as well as design, production and configuration.

Tomorrow's features are developed in parallel using dedicated technology platforms. This allows the development of all elements to take place in parallel, at the same time reducing time to market and ensuring that customers always enjoy the benefits of the latest features.

Rely on the experts

We take responsibility for every element of our products. The fact that we develop and produce our own features, hardware, software, power modules, printed circuit boards, and accessories is your guarantee of reliable products.

Local backup – globally

VLT® motor controllers are operating in applications all over the world and Danfoss VLT Drives' experts located in more than 100 countries are ready to support our customers with application advice and service wherever they may be.

Danfoss VLT Drives experts don't stop until the customer's drive challenges are solved.

Danfoss VLT Drives, 4401 N. Bell School Rd., Loves Park, IL 61111, Tel. +1 (815) 639-8600 (main),
Tel. +1 (800) 432-6367 (24 Hour Service for Drives), Fax +1 (815) 639-8000, www.danfossdrives.com, Email: salesinformation@danfoss.com

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- Quote per purchase volume in real time.
- Online documentation and datasheets of all products.
- Estimated delivery time enquiry in real time.
- Logistics systems for the shipment of materials almost anywhere in the world.
- Purchasing management, order record and tracking of shipments.

To access the product, click on the green button.

Product	Code	Reference	Product link
VLT® OneGearDrive Standard, 1.5 - 3.0 KW, 31.13, 30 mm, Stainless steel, Without CSA/UL, Vertical, motor up, 180V DC brake (400V AC), Terminal Box	134L0392		Buy on EAN
VLT® OneGearDrive Standard, 1.5 - 3.0 KW, 5.92, 30 mm, Mild steel, Without CSA/UL, Horiz., conn. up or down, Without brake, Terminal Box	134H7699		Buy on EAN
VLT® OneGearDrive Standard, 1.5 - 3.0 KW, 14.13, 30 mm, Mild steel, Without CSA/UL, Horiz., conn. up or down, Without brake, Terminal Box	134G4659		Buy on EAN
VLT® OneGearDrive Hygienic, 1.5 - 3.0 KW, 31.13, 40 mm, Stainless steel, Without CSA/UL, Vertical, motor up, Without brake, Motor+plug+conn, no cable	134F1326		Buy on EAN
VLT® OneGearDrive Standard, 1.5 - 3.0 KW, 31.13, 40 mm, Stainless steel, With CSA/UL, Vertical, motor up, 180V DC brake (400V AC), Terminal Box	134L0223		Buy on EAN
VLT® OneGearDrive Standard, 1.5 - 3.0 KW, 14.13, 30 mm, Mild steel, Without CSA/UL, Vertical, motor up, Without brake, Terminal Box	134G7004		Buy on EAN
VLT® OneGearDrive Standard, 1.5 - 3.0 KW, 31.13, 30 mm, Mild steel, Without CSA/UL, Horiz., conn. up or down, Without brake, Terminal Box	131Z4276		Buy on EAN
VLT® OneGearDrive Standard, 1.5 - 3.0 KW, 14.13, 30 mm, Mild steel, With CSA/UL, Horiz., conn. up or down, Without brake, Terminal Box	134H7811		Buy on EAN
VLT® OneGearDrive Standard, 1.5 - 3.0 KW, 31.13, 30 mm, Mild steel, Without CSA/UL, Vertical, motor up, Without brake, Terminal Box	134G3252		Buy on EAN
VLT® OneGearDrive Standard, 1.5 - 3.0 KW, 31.13, 35 mm, Mild steel, Without CSA/UL, Horiz., conn. up or down, Without brake, Terminal Box	134G6111		Buy on EAN