The Drive & Control Company

Rexroth Bosch Group

Product catalogue Hägglunds DUe

Drive unit

Few components – many combinations

Our flexible drive units are part of Hägglunds direct drive system comprising drive unit, Hägglunds motor and control system.
Our drive units are easy to install and are fully function tested before delivery. With our proven, modularized solutions we give you maximized uptime and quick and easy maintenance. We can also offer you a quick delivery and high delivery performance.
Our monitoring and control system (Hägglunds Spider) brings excellent controllability to the drive system.
With a Hägglunds drive unit to match your motors, you have the same quality throughout the entire drive system.

Features

- Configurable system - many possible combinations to fulfill the customer demands.
- Short delivery times for the basic range of DUe
- Can be positioned close to the machine or in any convenient location.
- Small space required - vertical assembly.
- Very easy to install and maintain.
- Well proven technical solutions.
- Equipped with Hägglunds advanced control system.
- Sound insulated cabinet.

RE15325-01, 2013-12, **Bosch Rexroth Mellansel AB**

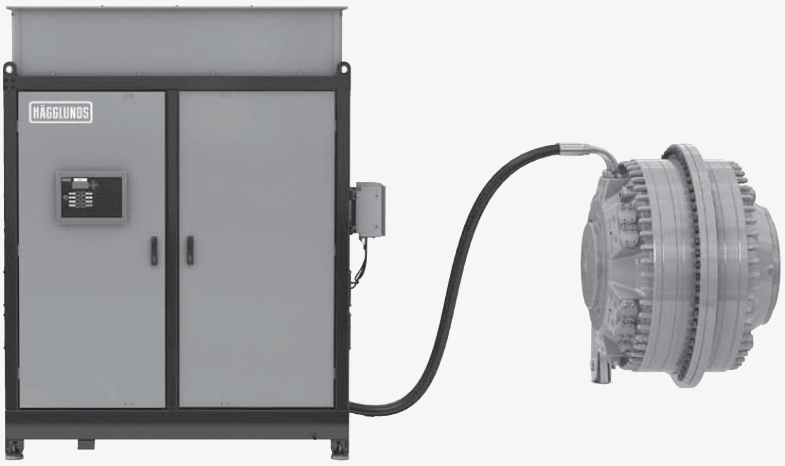
The drive to deliver

The Hägglunds direct drive systems from Bosch Rexroth stand for quality and reliability beyond the ordinary. But more than that, our solutions are a response to our customers' challenges, and their purpose is to deliver performance.
Our people will always work hard to ensure our drive systems are worthy of your trust. We put a great deal of effort into building relationships and sharing knowledge in order to deliver a service beyond the ordinary. Your needs are always the starting point for designing a Hägglunds drive systems.
We listen carefully in order to gain a deep understanding. Then we work quickly and responsively to achieve the right solution. It's all about performance, flexibility and reliability – delivered with simplicity.

Bosch Rexroth Mellansel AB, 2013-12, RE15325-01

The hydraulic direct drive system

From the bitter cold of Siberia to the blistering heat of Africa, Hägglunds direct drive systems withstand the challenges of any environment and any type of industry. The drive units can be supplied in a wide range of power levels and configurations and are function-tested before delivery.



A Hägglunds direct drive system consists of a motor, a drive unit and a control and monitoring system. The motor provides dependable power for any application and under the most demanding conditions. The driving force behind it is the drive unit, featuring fast-acting hydraulic pumps that bring total reliability to your drive system. The brains behind the brawn is the control and monitoring system.

Flexible and easy to install, it puts essential functionality and information at your fingertips. We also offer a broad range of valves that increase flexibility and add functionality to your drive system, as well as the accessories you need to complete the package. We give you high power under full control.

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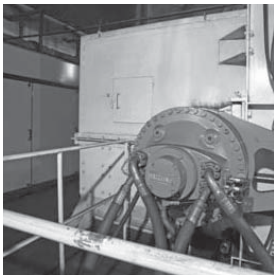
From challenge to performance






We realize that customers don't actually want to buy a product: they simply want the best solution to a challenge. So we start by listening carefully, then draw on our long experience to understand the nature of that challenge. More often than not some inventive thinking is required.

A different kind of strength
Demanding industries require tough and reliable products. But is that enough? We don't think so. Of course products are important, but they are not the whole story. We offer a different kind of strength, which comes from our focus on people. That's what makes our drives different.

The experience
Your business is our business and we live in your reality every day. Our focus is on trust, peace of mind and simplicity. You'll feel it in the way we listen, understand and support you every step of the way. In the quality of our systems. In our expertise and commitment to delivering a superior solution and in our promise to secure your performance.

Every product is part of something bigger - a solution created by people, for people and the purpose of that solution is to deliver performance. That's what we stand for. Achieving performance requires the right product in the right context, with the right support. It takes understanding, commitment and expertise.

The journey:

Bosch Rexroth Mellansel AB, 2013-12, RE15325-01

The power of certainty
We can provide you with everything that is necessary to optimize system performance and give you full peace of mind through a wide range of service options such as original Hägglunds spare parts, field service with our highly skilled service engineers, as well as repair and overhaul to the highest factory standard.

We provide the support you require for your specific needs and offer a range of customized maintenance agreements, called performance agreements. They are all designed for you to get the most out of your system solution by choosing from different levels of support and services that ensure maximum performance from your equipment.

A wide range of service options is available. Together with our representative you can tailor a performance agreement that suits your drive and is optimized to meet your challenges.

Support Performance

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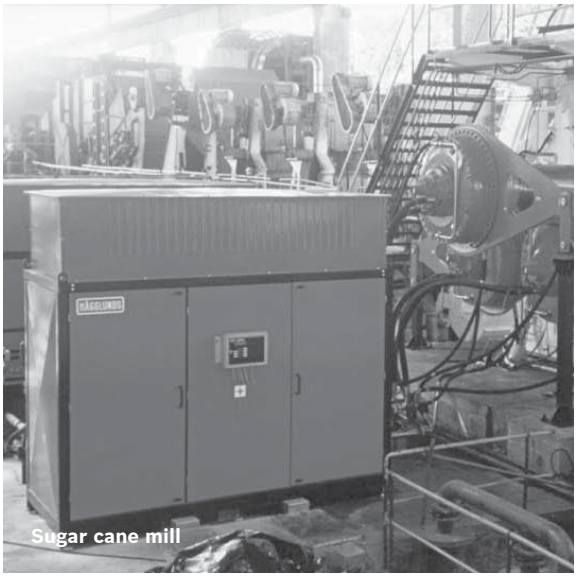
Application examples


Bucket wheel reclaimer


Sugar mill


Sugar cane mill


Low speed shredder

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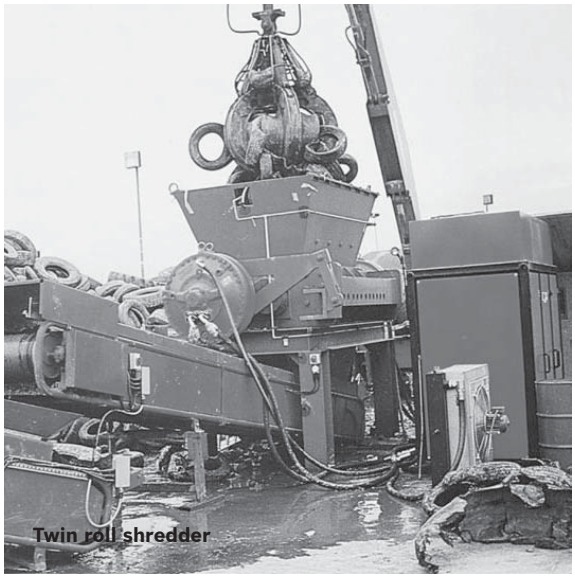
Drum displacement washers


Diving bell winch

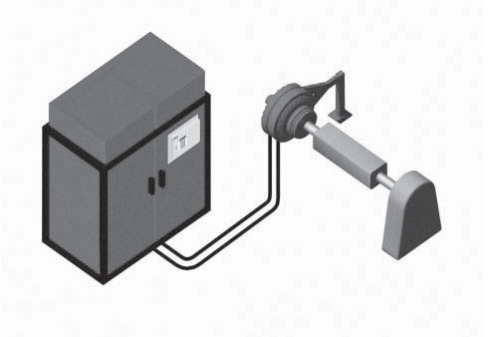

Twin roll shredder


Sugar mill

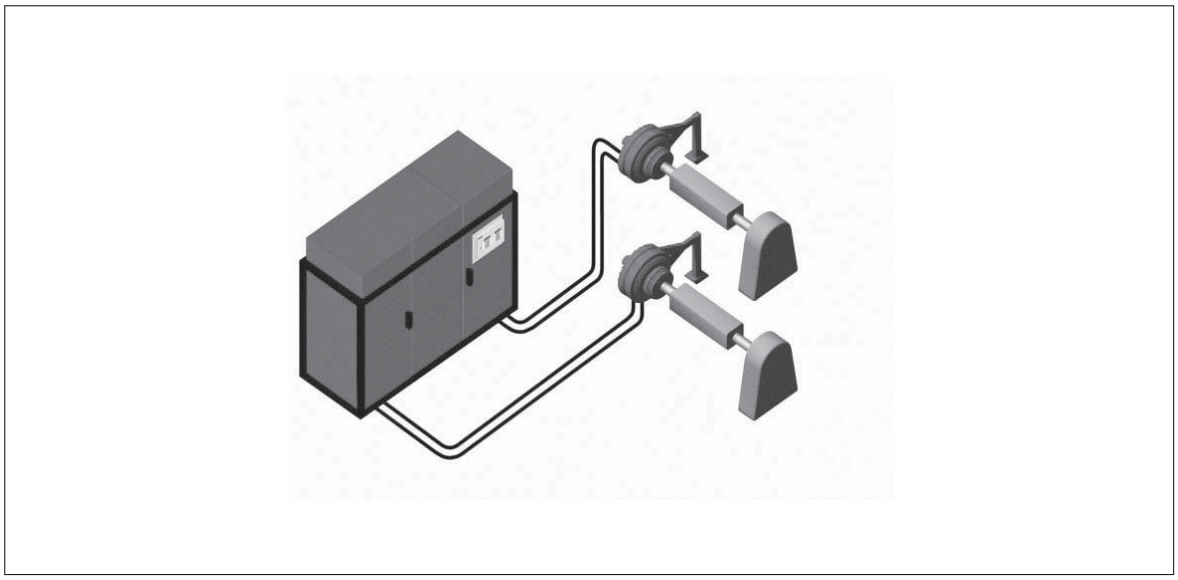
RE15325-01, 2013-12, **Bosch Rexroth Mellansel AB**

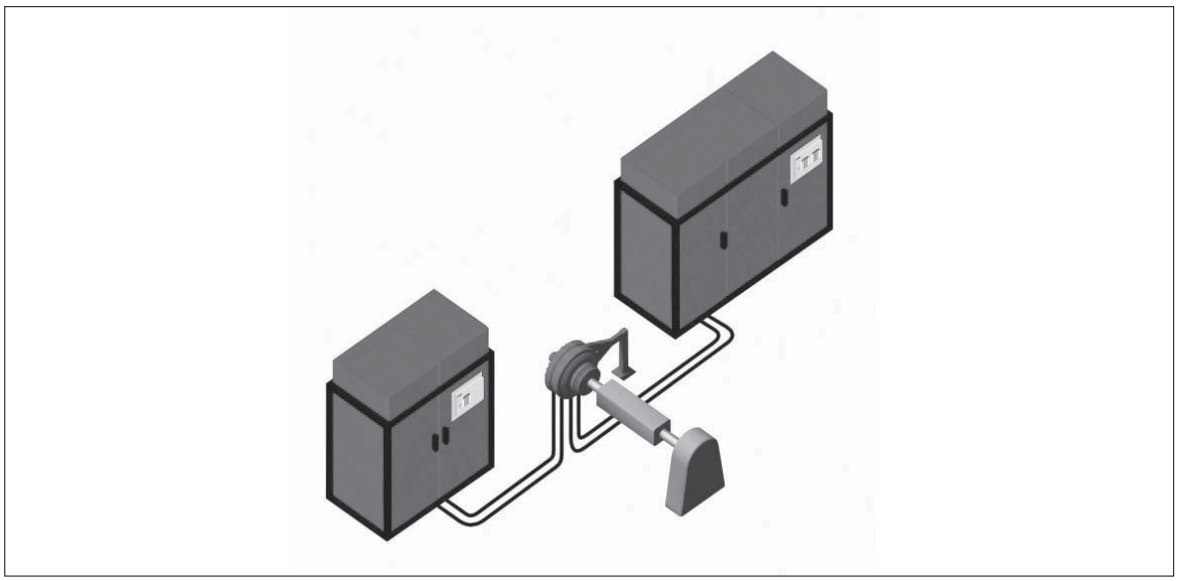
Choose the best solution for your application

- A direct drive system of few components, but many combinations and configurations, to provide any solution for the Hägglunds direct drives performance range. The perfect load sharing characteristics enables multi-pump and/or multi-motor combinations to suit the application.
- User friendly - pressure and flow and therefore torque, speed and hence power can be adjusted. It is easy to upgrade to suit changing production demands. This versatility can transform a machine into an intelligent high production unit. Features such as extremely fast pump compensators to give fast response and reduce stresses and strains on the machine, load sensing and power limiting enable functionality unavailable from other systems.
- The ability to split the drive from the drive unit enables freedom of application, the power unit can be positioned away from the machine without foundation requirements.
- Our control system, Hägglunds Spider, provides all the necessary start/stop logic, system health monitoring and machine control techniques. It is mounted, wired and fully programmed on the DUe unit prior to delivery.
- The unit is easy to install, it is fully function tested before delivery and takes a short time to commission. Installation can be undertaken usually during a normal shutdown period so no production losses are experienced.
- Customization is normal e.g. standby pump sets for critical areas, auxiliary circuits for cylinders and brakes. Provision for working in harsh environments such as dusty mining sites, on ship decks, explosive zone chemical plants and climates with wide temperature variations.



Bosch Rexroth Mellansel AB, 2013-12, RE15325-01





RE15325-01, 2013-12, **Bosch Rexroth Mellansel AB**

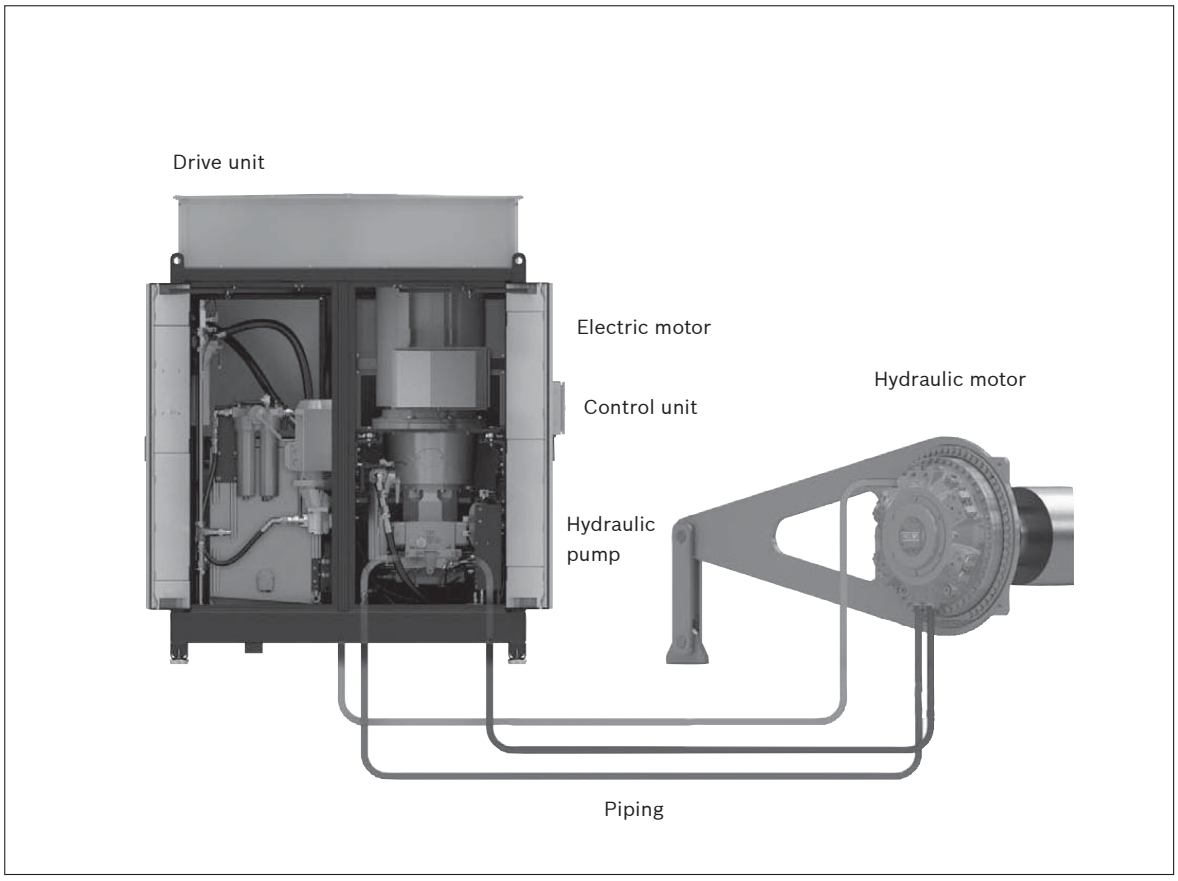
Functional description

A complete Hägglunds direct drive system from Bosch Rexroth comprises the drive unit with electric motor, pump and tank, the control system, the hydraulic motor and the piping system. The drive unit type DUe is described in this publication and uses a closed loop hydraulic system to provide a highly dynamic drive system.

All items except the piping and hydraulic motor are housed in a sound insulated cabinet. The swash plate pump is driven by an electric motor running efficiently at fixed speed.
The oil flow from the pump is determined by the swash-plate angle, which is controlled by a signal from the control system. Starting in an unloaded, neutral condition, the system ramps the flow up to the required direction and rate and pressure is determined by the load up to the limit set by the compensator. If pressure reaches compensator setting the pump will destroke, stopping the drive, so eliminating heat build up but maintaining the set pressure and therefore torque at the drive. The pump will stay in this condition until the system is unloaded whereupon the pump will immediately ramp up to the set flow rate or until the control is adjusted. The pump and the hydraulic motor are connected together by flexible hoses and piping if necessary.

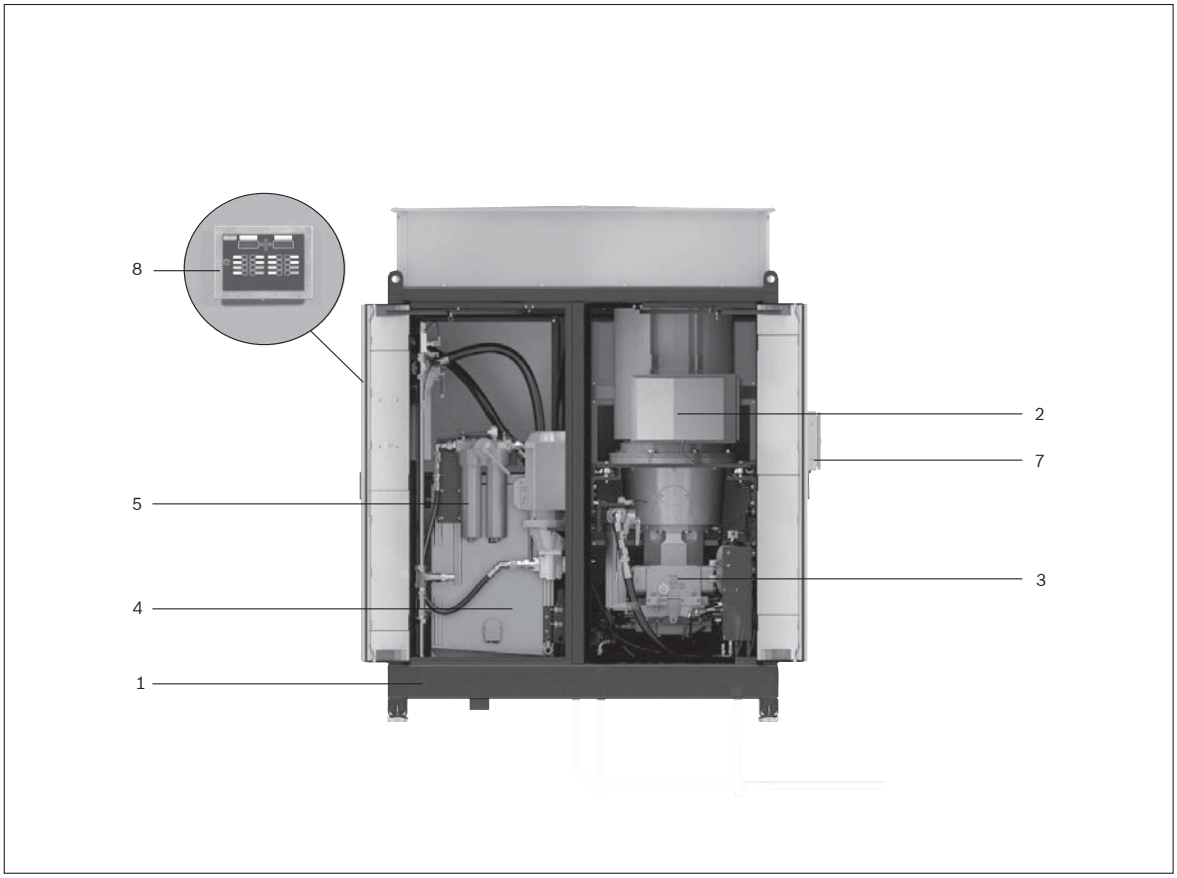
At the motor the oil is distributed through the valve plate to the pistons in the cylinder block 50% of them with high pressure and 50% with charge pressure. The oil pressure forces the piston assemblies radially outwards against the cam-ring. This produces a balanced and smooth rotation with extremely high torque which drives the machine. The speed of the motor is controlled by the flow of oil from the pump. Drive motor speed is therefore proportional to the swash plate angle of the pump. If the swash plate is controlled over-centre, the flow is reversed and the motor direction is reversed.
Both the hydraulic motor and the pump have a very low moment of inertia, which makes it possible to change speed and stop or reverse direction quickly.
A proportion of the return flow is used to provide oil conditioning by cooling and filtering. The oil in the motor and pump case which provides lubrication and local cooling is fed back to tank via an adequately sized drain line.

Bosch Rexroth Mellansel AB, 2013-12, RE15325-01



RE15325-01, 2013-12, **Bosch Rexroth Mellansel AB**

Main components



1. The free standing cabinet is built of a robust steel framework with sound insulated doors, panels and cover. It is surface treated to prevent corrosion and ageing in tough process industry environments. The solution is an open one, which simplifies accessibility during maintenance and service.

2. The electric motors that we use have high efficiency and are also extremely reliable. They are started without load and run optimally at fixed speed

3. The hydraulic pumps are of variable displacement axial piston type with very fast acting pressure compensator override. This virtually eliminates overloads and is a major factor in system reliability. All control valves are built in to keep pipe work to an absolute minimum. The electro-hydraulic stroker provides variable flow by smoothly controlling the swash plate

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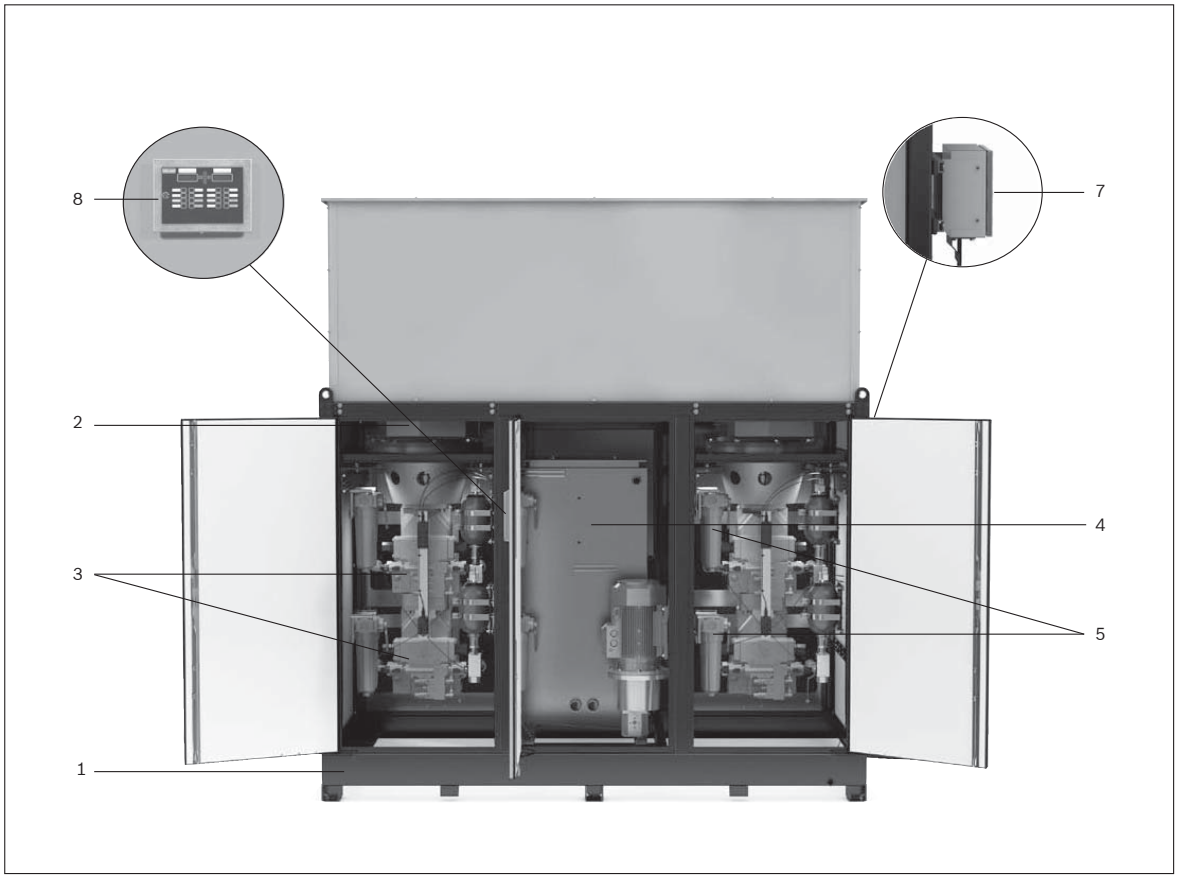

and thereby oil flow by pump displacement.

4. The tank is manufactured in stainless steel to prevent corrosion.

5. The oil filters are dimensioned for oils with high viscosity and a high degree of contamination separation. Duplex filters can be supplied as an option, allowing filter replacement during operation.

6. The oil cooler (mounted on the back side of the drive unit) is dimensioned to maintain the oil temperature in the hydraulic system at the correct level. In this way good lubrication characteristics are ensured and the service life of the oil and of the complete drive system will be long.
   To best suit your system and demands, either air oil or water oil cooling system can be chosen.

7. The Spider box is configurable for different types of applications, providing consistent start and stop sequences. The operation can be controlled by external signals or from the local control panel. Various operational parameters, such as speed, pressure, electric motor power and self-diagnostics, can be displayed on the local control panel or via external signals.

8. The Control Panel is used for local control of the drive unit. The control panel is normally mounted on the outside or inside of the drive unit door

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Combination options

Specified technical features

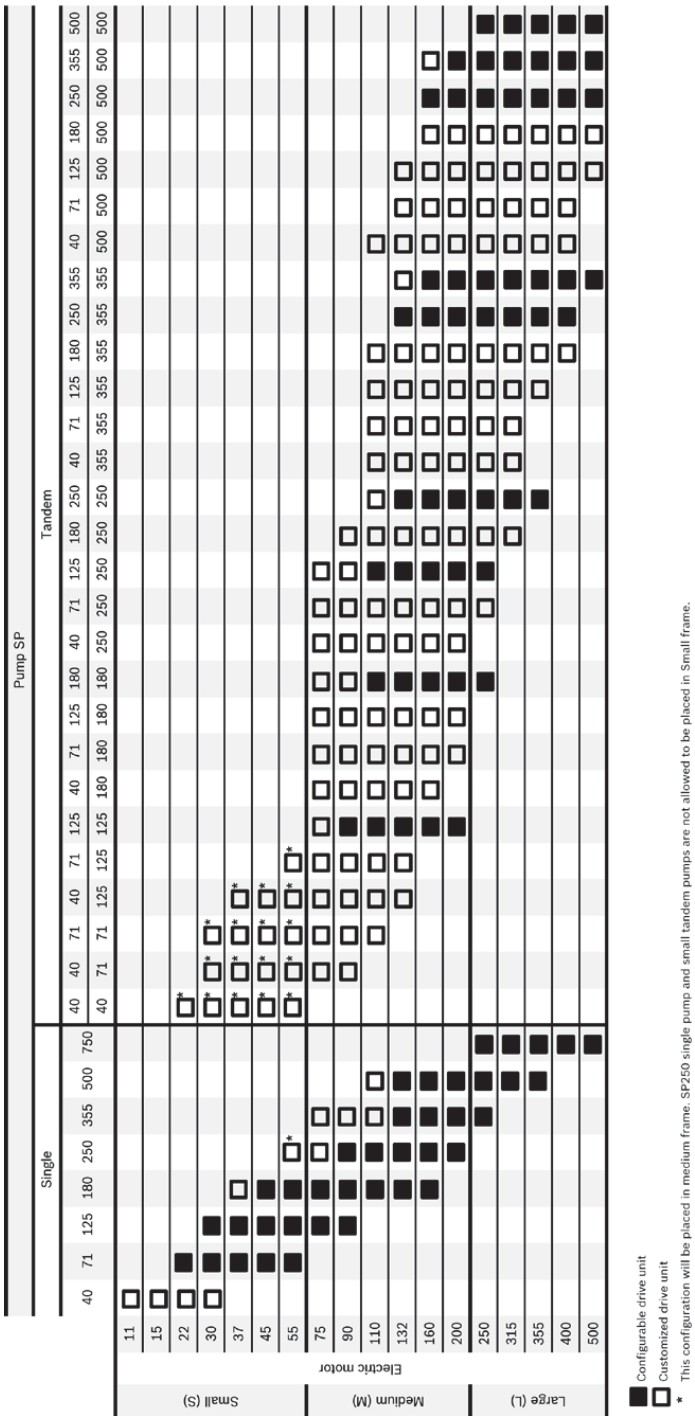
- Hägglunds Spider control system, special developed to suit the LHD system
- Axial piston pump with electrohydraulic control, also including: fast pressure compensator, charge pump and flushing valve
- Tandem pump mounting possibilities
- Totally enclosed IE2, IP55, squirrel cage, 4-pole electrical motor with thermistor protection
- Motor/pump set mounted on antivibration pads
- Charge pressure switch and high pressure transmitters
- Stainless steel oil tank with level gauge, level sensor, temperature sensor, breather, drain valve and suction line valve with switch
- 10 micron return and drain line single filters with visual & electrical indication
- Oil filling point with quick release connector
- Suitable Water cooler or Air blast cooler
- All internal pipe work and wiring included
- Oil dip pan can handle the entire tank volume
- Temperature range -20°C to +40°C for configurable drive unit and -40°C to +50°C for customized drive unit

Options for the DU

- Electric motor sealed off from the hydraulic parts
- Low noise option
- ATEX
- Anti-condensation heaters for electric motors
- Cabinet feet, with anti vibrating mount
- Duplex oil filters
- Oil heater
- Accumulator for shock loads and for refilling
- Prepared for flushing of hydraulic motor case
- Heavy duty epoxy paint system on frame with stainless steel panels and doors
- Optional electric motors, for example medium voltage
- Auxiliary hydraulic circuits, for example brakes, hot oil flushing/circulation for cold weather environments
- Fieldbus communication

Bosch Rexroth Mellansel AB, 2013-12, RE15325-01

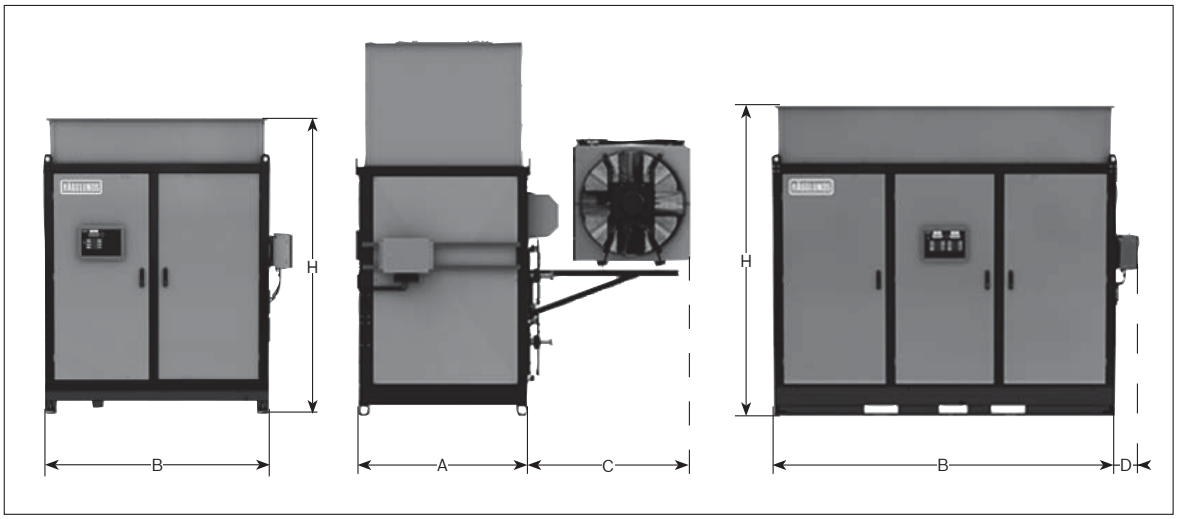
Combinations of pump and electric motor – Hägglunds DU drive unit



RE15325-01, 2013-12, **Bosch Rexroth Mellansel AB**

Technical data

Basic dimensions - Hägglunds DUe drive unit



Dim mm \ Type*		DUeS2	DUeS3	DUeM2	DUeM3	DUeL2	DUeL3
H ***		2220-2300	2220-2300	2520-3400	2520-3400	2820-3700	2820-3700
B		1820	2720	2000	3000	2190	3500
A		1225	1225	1500	1500	1500	1500
C****	Air-oil	1076	1429	1076	1639	1076	1076
	Water-oil	456	456	456	456	456	456
D**		250	250	250	250	250	250

*) Cabinet designations ending with a 2, represent a two-door cabinet. Cabinet designations ending with a 3, represent a three-door cabinet. Cabinet designations with an S, represent frame size small, M represent frame size medium and L represent frame size large.
**) The control unit (Spider) can be placed on either side of the cabinet.
***) The height of the top cover varies due to the different pump/motor combinations available.
****) Based on general size

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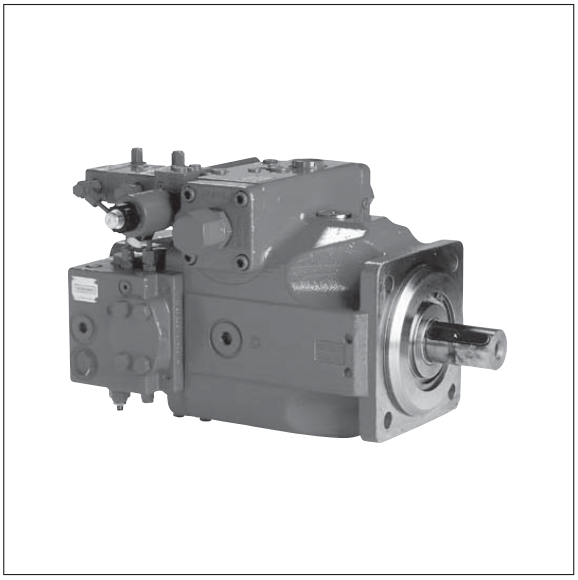
SP pump

The SP pump is designed specifically to Hägglunds specifications to provide a neatly packaged pump with integral boost pump, electro-hydraulic displacement stroker and fast compensator to reduce pressure spikes on tough drives. Maximum volume adjustment screws and a displacement indicator are included. A double shaft seal arrangement is provided to eliminate leakage. The SP has low noise characteristics and is designed to give long trouble free life in line with Hagglunds drives systems generally.
The SP provides a very wide range of pump displacements including the ability to use tandem pumps which on 250 size and above give a very compact solution using an internal gear pump for boost and servo pressures. 180 size and below are also available in tandem but using an external boost and servo pump. Tandem pumps enable one electric motor to load share two drives which can save space, improve efficiency and economy. The SP enables very good possibilities to optimize to the most efficient and appropriate drive selection.



Size				40	71	125	180	250	355	500	750
Displacement	Variable pump	V_{gmax}	cm3	40	71	125	180	250	355	500	750
	Auxiliary pump	V_{gH}	cm3	20	25	38	45	63	80	98	143
Max. power Dp=350 bar	(at n_E=1500rpm)		kW	35	62	109	158	219	311	438	656
Filling volume		J	L	2	2,5	5	4	10	8	14	19
Max. pressure cont.			bar	350	350	350	350	350	350	350	350
Max. pressure peak			bar	400	400	400	400	400	400	400	400

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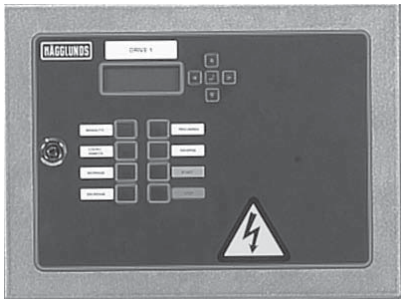
Hägglunds Spider control system

Hägglunds Spider is the control system for the Hägglunds DU drive unit. It can work as a stand-alone control system or be slaved under a factory system and contains drivers for pumps, monitoring of the hydraulic system and functionality for many applications. The configuration of Hägglunds Spider is very flexible and the system can be adopted for various applications needs.
The Spider box can be mounted on the right or the left hand side of the drive unit. It is the connection point for remote interface cabling e.g. to a customer DCS via discrete cabling or via Field bus.



Features:

- IP65 Stainless steel enclosure
- -20...+50°C (-40°C with optional heater)
- 90-264VAC or 24VDC supply
- 8 supported communication Field busses
- Independent or common control of 2 driven machine shafts
- Driver of 4 pumps
- Monitoring of analog and digital sensors
- Speed regulation
- Torque control
- Power limitation
- Usage monitoring
- Configurable for application specific functionalities

The control panel is used for local control of the drive unit. It is normally mounted on the drive unit door, connected via a cable to the Spider box. It can be remotely used via a 4-wire cable with a max cable length of 100m.
The control panel is available with one set of buttons and display for a single drive or with two sets of buttons and displays for two driven shafts.
Two display types are available:

- LCD with black characters on yellow background for European and Japanese texts.
- VFD with bright blue characters on black background for European and Chinese texts.

The front of the panel can be protected with a lockable transparent plastic window.

Bosch Rexroth Mellansel AB, 2013-12, RE15325-01

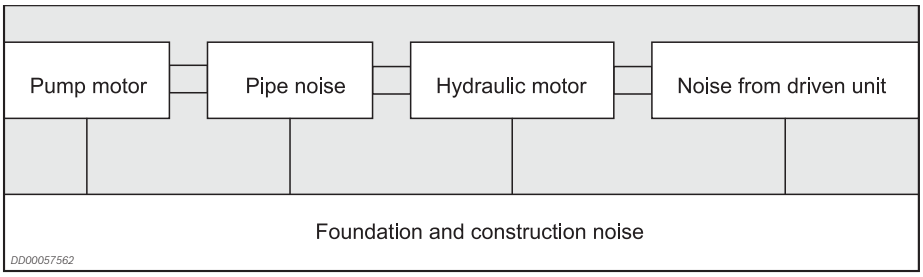
Sound

In a good work environment the sound levels are important. Environments where the sound levels are kept down, make a difference for operator health and well being. Hägglunds low speed hydraulic motors generate very low sound levels due to the low speed. The dominating sound sources in a hydraulic drive system are the power unit and the piping system. Hägglunds offers three options with regard to the power unit sound levels.
The sound can be of three basic kinds. Structured borne sound (from for instance a pump), air borne sound (for example from a cooling fan), and fluid borne sound (emitted by the pump or the motor as pulsation in the oil flow). Each of these has to be treated separately to manage the overall sound level and to specify the level, the combined effect must be considered.
The sound power being radiated by a machine is often of more concern than the sound pressure measured at a given distance from the machine. Sound values below are the average LPA surface sound pressure levels according to ISO standards 3746 and doesn't include piping.

Open unit, 90-95 dBA
Standard frame but no panels. Air cooled electric motors. Sound level around 90-95 dBA. For installation in pump rooms or where there are no specific demands regarding sound level or protection

Closed unit, 75-85 dBA
Standard frame, panels and doors. Air cooled electric motors. Typical sound level 75-85 dBA. For installation with moderate sound level demand and/or with reasons to have protect. (Standard)

Sound proof unit, 72-80 dBA
Standard frame, panels and doors. Pump set mountings and cabinet feet in rubber. Sound dampened air and hose outlet in cabinet. Air cooled electric motors.
Typical sound levels 72-80 dBA For installations with high sound level demand.



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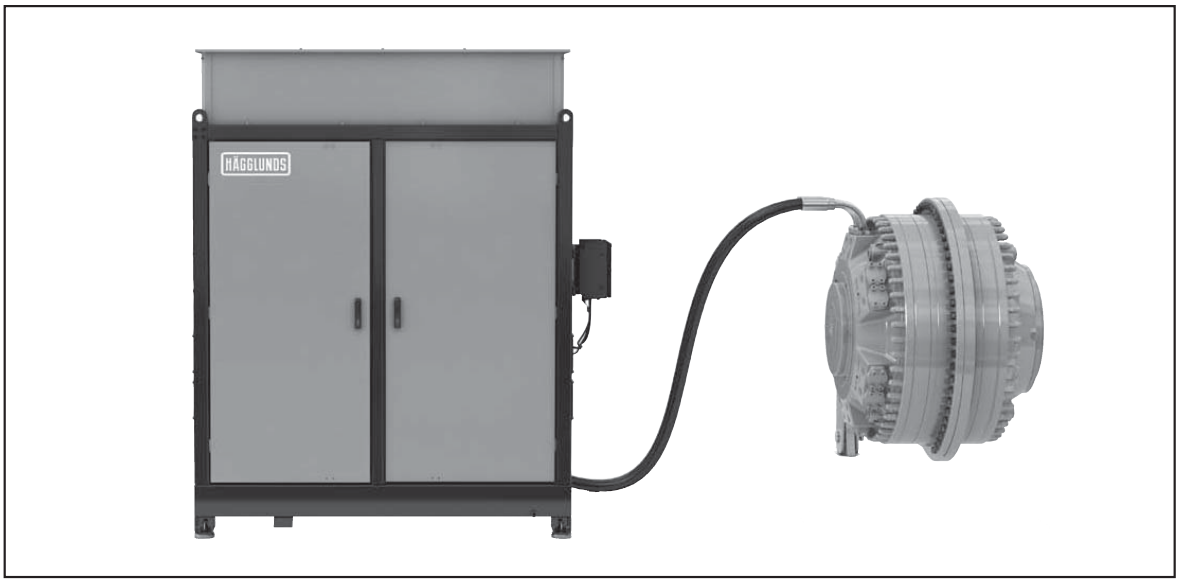
ATEX

The drive Unit has options for usage in explosive area according to the ATEX Directive 94/9/EC. The limit for the standard solution is for Gas area zone 2 and temperature class T4. Extended classification is possible on request within the Gas area.
The drive unit module-based assembly gives a high flexibility to adopt to customer function requirements despite the limitations set by the ATEX directive.
The Hägglunds standard control system can be used if assembled outside explosive zone and with the interface signals handled via energy limiting barriers.



Bosch Rexroth Mellansel AB, 2013-12, RE15325-01

Ordering code

01	02	03	04		05		06		07		08		09		10		11		12		13
DUE	**-**	**L**	**2**	**-**	**315**	**/**	**000**	**-**	**500**	**+**	**000**	**/**	**000**	**+**	**000**	**-**	**A**	**-**	**0380**	**/**	**50**

Drive unit

01	Drive unit European standard	**DUE**

02	Configurable drive unit	**-**
	Customized drive unit	**X**

Frame size

03	Small frame	**S**
	Medium frame	**M**
	Large frame	**L**

Number of doors

04	Two door unit	**2**
	Three door unit	**3**

Electric motor size

05 06	Electric power (kW) - Right hand side Electric power (kW) - Left hand side	**011** **015** **022** **030** **037** **045** **055** **075** **090** **110** **132** **160** **200** **250** **315** **355** **400** **500**

RE15325-01, 2013-12, **Bosch Rexroth Mellansel AB**

01	02	03	04		05		06		07		08		09		10		11		12		13
DUE	**-**	**L**	**2**	**-**	**315**	**/**	**000**	**-**	**500**	**+**	**000**	**/**	**000**	**+**	**000**	**-**	**A**	**-**	**0380**	**/**	**50**

Pump size SP pumps - top

07 09	Pump size (cc) SP pumps - top right hand side Pump size (cc) SP pumps - top left hand side	**040** **071** **125** **180** **250** **355** **500** **750**

Pump size SP pumps - bottom

08 10	Pump size (cc) SP pumps - bottom right hand side Pump size (cc) SP pumps - bottom left hand side	**040** **071** **125** **180** **250** **355** **500**

Cooler type

11	Air oil cooler	**A**
	Water oil cooler	**W**

Voltage (V)

12	Main voltage	

Frequency (Hz)

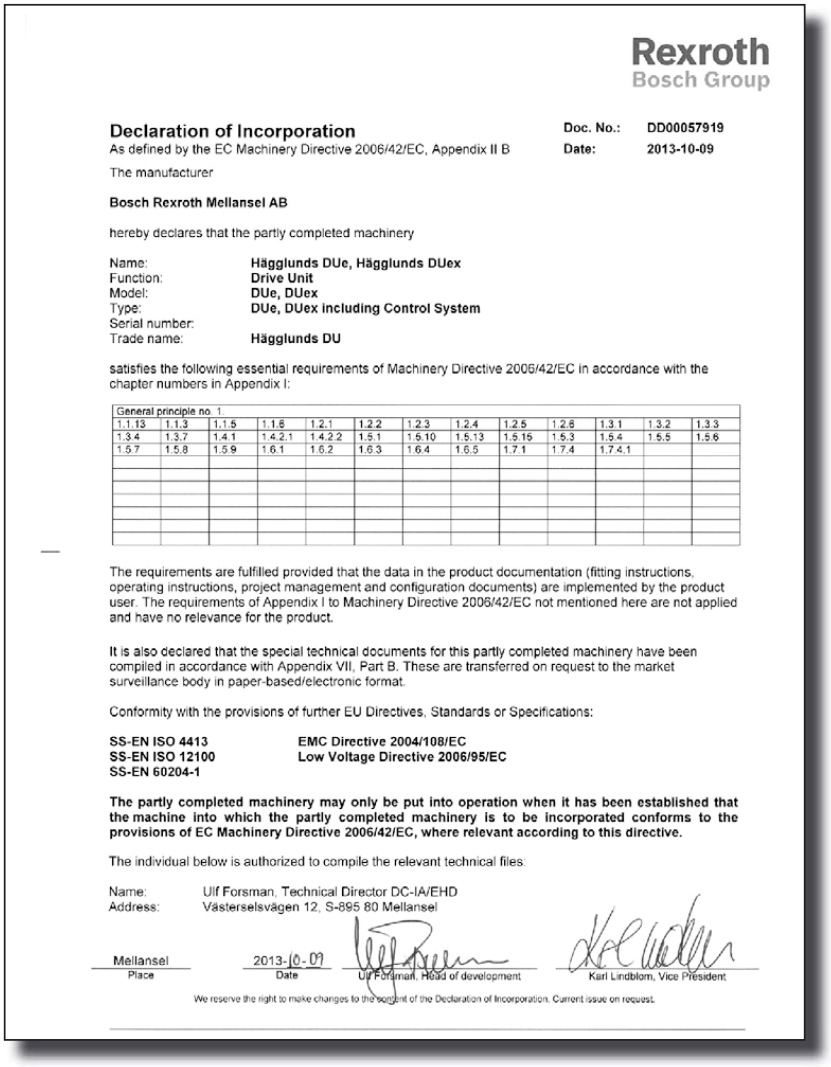
13		**50**
		60

Bosch Rexroth Mellansel AB, 2013-12, RE15325-01

Certificates

Declaration of incorporation

The Declaration of Incorporation is available on request for deliveries from Bosch Rexroth Mellansel AB.



Rexroth
Bosch Group

Declaration of Incorporation
As defined by the EC Machinery Directive 2006/42/EC, Appendix II B

Doc. No.: DD00057919
Date: 2013-10-09

The manufacturer

Bosch Rexroth Mellansel AB

hereby declares that the partly completed machinery

Name: **Hägglunds DUe, Hägglunds DUex**
Function: **Drive Unit**
Model: **DUe, DUex**
Type: **DUe, DUex including Control System**
Serial number:
Trade name: **Hägglunds DU**

satisfies the following essential requirements of Machinery Directive 2006/42/EC in accordance with the chapter numbers in Appendix I:

General principle no. 1:												
1.1.13	1.1.3	1.1.5	1.1.6	1.2.1	1.2.2	1.2.3	1.2.4	1.2.5	1.2.6	1.3.1	1.3.2	1.3.3
1.3.4	1.3.7	1.4.1	1.4.2.1	1.4.2.2	1.5.1	1.5.10	1.5.13	1.5.15	1.5.3	1.5.4	1.5.5	1.5.6
1.5.7	1.5.8	1.5.9	1.6.1	1.6.2	1.6.3	1.6.4	1.6.5	1.7.1	1.7.4	1.7.4.1		

The requirements are fulfilled provided that the data in the product documentation (fitting instructions, operating instructions, project management and configuration documents) are implemented by the product user. The requirements of Appendix I to Machinery Directive 2006/42/EC not mentioned here are not applied and have no relevance for the product.

It is also declared that the special technical documents for this partly completed machinery have been compiled in accordance with Appendix VII, Part B. These are transferred on request to the market surveillance body in paper-based/electronic format.

Conformity with the provisions of further EU Directives, Standards or Specifications:

SS-EN ISO 4413
SS-EN ISO 12100
SS-EN 60204-1
EMC Directive 2004/108/EC
Low Voltage Directive 2006/95/EC

The partly completed machinery may only be put into operation when it has been established that the machine into which the partly completed machinery is to be incorporated conforms to the provisions of EC Machinery Directive 2006/42/EC, where relevant according to this directive.

The individual below is authorized to compile the relevant technical files:

Name: Ulf Forsman, Technical Director DC-IA/EHD
Address: Västerselsvägen 12, S-895 80 Mellansel

Mellansel (Place) 2013-10-09 (Date) Ulf Forsman, Head of development — Karl Lindblom, Vice President

We reserve the right to make changes to the content of the Declaration of Incorporation. Current issue on request.

RE15325-01, 2013-12, **Bosch Rexroth Mellansel AB**

The Drive & Control Company

Rexroth Bosch Group

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