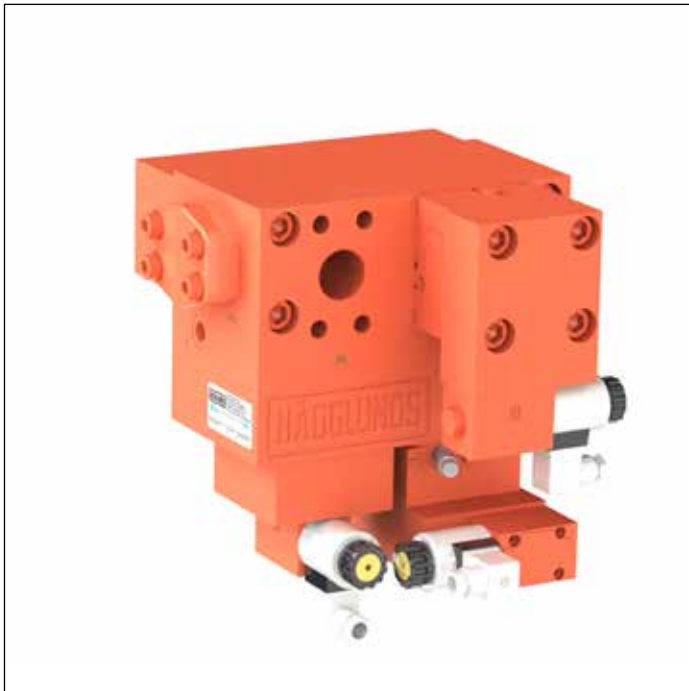


Quick stop valve Häggglunds VQCC 800



- ▶ Valid for Häggglunds CA, CB, CBm
- ▶ Maximum flow 800 lpm (208 gpm)
- ▶ Very fast response time <150 ms
- ▶ Max pressure 350 bar (5000 psi)
- ▶ Suitable for closed loop operation
- ▶ Used preferably together with Häggglunds QECC

Features

- ▶ Compact and robust design
- ▶ Mounted directly on Häggglunds motors
- ▶ Fulfills performance level D category 3 according to EN ISO 13849
- ▶ Low pressure loss

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1 Preface

1.1 Safety messages

This documentation includes safety messages placed before sequential operating procedures that may involve the risk of personal or property damage. The described precautionary measures must be observed.

Safety messages are structured as shown below:

SIGNAL WORD	
Type and source of risk	Consequences if disregarded
▶	Precautionary measures
▶	<listing>

Warning sign:	Draws attention to the risk
Signal word:	Identifies the hazard level
Type and source of risk:	Identifies the type and source of the hazard
Consequences:	Describes what occurs when the safety messages are not complied with
Precautions:	Indicates how the hazard can be avoided

The signal words have the following meaning:

Warning sign, signal word	Meaning
DANGER	Indicates a hazardous situation which, if not avoided, will result in death or serious injury.
WARNING	Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
CAUTION	Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates potential property damage: the product or the environment may be damaged.

1.2 Symbols

The following symbols identify notices that are not safety-relevant, but enhance the comprehensibility of the documentation.

Symbol	Meaning
	When this information is not observed, optimum use or operation of the product cannot be ensured.
▶	Single, independent step
1.	Numbered instructions:
2.	The number indicates that the different steps are to be performed successively.
3.	

1.3 General safety instructions

DANGER	
Danger from excessively high pressure	Danger to life or risk of injury, damage to equipment. Using the valve above the permissible maximum pressure can cause valve burst and hydraulic fluid to escape under high pressure.
▶	Use the valve within the permissible maximum pressure.
Pressurized valve	Danger to life or risk of injuries when working on valve in system not being depressurized.
▶	Protect the system against being energized.
▶	Make sure that the system is depressurized.
▶	Do not disconnect any line connection, ports and components when the system is pressurized.
▶	Always ensure that no energy is accumulated before any measures.
Danger from suspended loads	Danger to life or risk of injury, damage to equipment. Improper handling may cause the valve to fall down and lead to injuries, e.g. crushing or broken bones or damage to the product.
▶	Use suitable lifting device for transport, storage, installation, removal and repair.
▶	Never stand under or put your hands under suspended loads.
▶	Make sure the valve is well mounted or anchored when the lifting device is disconnected.
▶	Use your personal protective equipment (e.g. safety glasses, safety gloves, suitable working clothes, safety shoes).

WARNING

Escaping oil mist

Risk of explosion, fire, health hazard, environmental pollution.

- ▶ Depressurize the machine/system and repair the leak.
- ▶ Keep open flames and ignition sources away from the valve.
- ▶ If the valve is to be situated in the vicinity of ignition sources or powerful thermal radiators, a shield must be erected to ensure that any escaped hydraulic fluid cannot ignite, and to protect cables and hose lines from premature aging.

Climbing

Falling hazard.

- ▶ Never use the valve and all its components (including the protective cover) as a handle or step.

CAUTION

Hot surfaces

Risk of burns.

- ▶ Allow the valve to cool down sufficiently before touching it.
- ▶ Wear heat-resistant protective clothing, e.g. gloves.

Sharp edges

Risk of cutting injury due to metal plate parts in the product.

- ▶ Use your personal protective equipment (e.g. safety gloves, suitable working clothes, safety shoes, safety glasses).

Contact with hydraulic fluid

Hazard to health/health impairment e.g. eye injuries, skin damage, toxication during inhalation.

- ▶ Avoid contact with hydraulic fluids.
- ▶ When working with hydraulic fluids, strictly observe the safety instructions provided by the lubricant manufacturer.
- ▶ Use your personal protective equipment (e.g. safety glasses, safety gloves, suitable working clothes, safety shoes).
- ▶ If hydraulic fluid should, nevertheless, come into contact with your eyes, bloodstream or is swallowed, consult a doctor immediately.
- ▶ Remove any spilled oil to prevent slipping injuries.

Escaping hydraulic fluid due to machine/system leakage

Risk of burns and risk of injury due to escaping oil jet.

- ▶ Depressurize the machine/system and repair the leak.
- ▶ Never attempt to block or seal the leak or oil jet with a cloth.

NOTICE

Damage from improper handling

Product can be damaged.

- ▶ Never use the product as a handle or step.
- ▶ Protect the valve and all its sensitive components from impacts (e.g. cables, sensors and valves).
- ▶ Avoid damages and scratches on the mounting and sealing surfaces of the valve.
- ▶ Leave the protective plugs on the ports until shortly before the lines are connected.
- ▶ Make sure that the electronics are not electro-statically charged.

Escaping or spilling hydraulic fluid

Environmental pollution and contamination of the ground water.

- ▶ Use an oil binding agent if hydraulic fluid is spilled.
- ▶ Observe the information in the safety data sheet for the hydraulic fluid and the specifications provided by the system manufacturer.

Improper cleaning

Product can be damaged.

- ▶ Plug all openings with the appropriate protective equipment in order to prevent detergents from entering the hydraulic system.
- ▶ Never use solvents or aggressive detergents. Use only water and, if necessary, a mild detergent to clean the valve system.
- ▶ Do not point the power washer at sensitive components, e.g. pressure sensors, directional valves, electrical connections and components.
- ▶ Use lint-free cloths for cleaning

NOTICE

Contamination of the hydraulic fluid

The cleanliness of the hydraulic fluid has a considerable impact on the cleanliness and service life of the hydraulic system. Contamination of the hydraulic fluid could cause premature wear and malfunctions.

- ▶ Make sure that the working environment at the installation site is fully free of dust and foreign substances in order to prevent contaminants, such as welding beads or metal cuttings, from getting into the hydraulic lines and causing product wear or malfunctions. The valve must be installed in a clean condition.
- ▶ Use only clean connections, hydraulic lines and attachments (e.g. measuring equipment).
- ▶ No contaminants may enter the connections when they are plugged.
- ▶ Before commissioning, make sure that all hydraulic connections are tight and that all of the connection seals and plugs are installed correctly to ensure that they are leakproof and fluids and contaminants are prevented from penetrating the product.
- ▶ Use a suitable filter system to filter hydraulic fluid during filling to minimize solid impurities and water in the hydraulic system.

Environmental pollution due to incorrect disposal

Careless disposal of the valve system and its fittings, the hydraulic fluid, the packaging material and the electronic components could lead to pollution of the environment.

- ▶ Dispose of the valve, hydraulic fluid, electronic components and packaging in accordance with the national regulations in your country.
- ▶ Dispose of the hydraulic fluid in accordance with the applicable safety data sheet for the hydraulic fluid.

2 Ordering code

In order to identify Hägglunds equipment exactly, the following ordering code is used. These ordering codes should be stated in full in all correspondence e.g. when ordering spare parts.

Example VQCC 800:

VQC	C	800	1	3	0	00
01	02	03	04	05	06*	07*

01	Hydraulic quick stop valve VQC	VQC
02	Version	C
03	Maximum flow 800 liters/min	800
04	Control voltage Standard 24 VDC 110 VAC (not in combination with Hägglunds QECC)	1 2
05	Painting system C3 (normal industrial atmosphere) C5M (marine and other aggressive atmospheres)	3 5
06*	Modification	0-9
07*	Design Standard Special index (Customer specific adaption)	00 01-99

*) To be filled in by Bosch Rexroth AB.

3 Functional description

3.1 General

The hydraulic quick stop valve VQCC 800 is designed to stop a roll mill without stopping the electric motor and without any need of a mechanical brake.

The quick stop valve VQCC 800 is equipped with two active stop cartridge valves to achieve performance level D and category 3 according to EN ISO 13849 and to fulfill DIN EN 1417.

The stop is done by blocking the oil flow from the Hägglunds hydraulic motor. A very short braking time is possible due to the small moment of inertia and very quick response from the hydraulic valve.

3.2 Function

The high (working) pressure shall be connected to the IN port or alternative the IN1 port and the low (return) pressure to the OUT port on the valve. The cartridge valves (1, 2 and 3) are controlled by the solenoid valves (4, 5 and 6). The quick stop valve VQCC 800 can be mounted to the hydraulic motor for clockwise rotation; A on valve to C on motor, or counter clockwise rotation; A on valve to A on motor.

The rotation seen viewed from shaft side of the motor. Deactivated stop cartridge valves is indicated by inductive sensors.

Running condition

In normal operating condition the solenoid valves (4, 5 and 6) are energized, making the stop cartridge valves (1 and 2) open and bypass cartridge valve (3) closed.

Stop condition

When activating the quick stop function, the solenoid valves (4, 5 and 6) are de-energized which will open bypass cartridge valve (3) and close stop cartridge valves (1 and 2). In same sequence the pump will be destroyed by Hägglunds control system (Spider) if installed.

Note!

Hägglunds VQCC 800 does not alone fulfill the requirements for category 3 according to DIN EN 1417

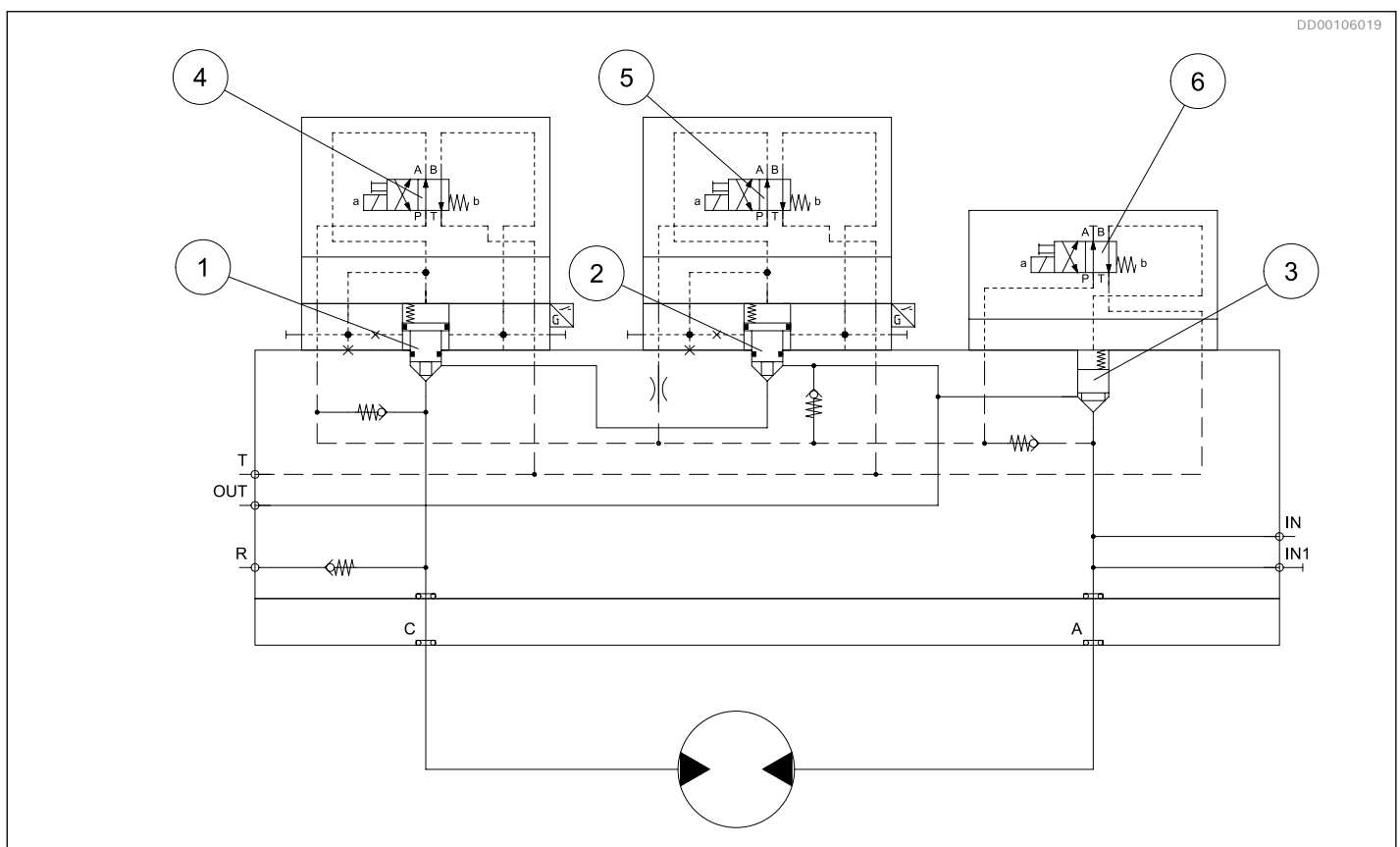


Fig. 1: Hydraulic circuit, VQCC 800

4 Technical data

4.1 General data

Table 1: Technical data Valve VQCC 800

Maximum operating pressure	350 bar	5000 psi
Minimum charge pressure	15 to 350 bar	220 to 5000 psi
Maximum flow	800 l/min	208 gpm
Pilot valve interface	NG6	
Temperature range	-25 to +70 °C	-13 to + 158 °F
Viscosity range	20 to 380 cSt	
Weight	85kg	187 lb
MTTF _D	100 years	
Response time	<150ms valid for 40cSt	
Surface treatment	Zink passivated (Fe//Ni5//Zn8//Cn//T0) + paint*)	

*) Motor connection surface zink passivated (not painted).

4.2 Painting system

Corrosion protection

The painting system of Häggglunds motors and accessories are available in two different corrosivity categories regarding corrosion protection in accordance with SS-EN ISO 12944:

- C3 - Corrosivity category Medium - which is recommended for normal urban and industrial atmosphere.
- C5M - Corrosivity category Very High - which is recommended for marine environment with high salt load or other aggressive atmosphere.

Colour

Standard colour for Häggglunds motors and accessories is orange (RAL 2002).

4.3 Calculation (quick stop function)

With Häggglunds hydraulic roll mill drive.

General

As the rubber roll mills are manually operated the time to stop the rolls is of utmost importance.

Stopping of the roll can be calculated according to following:

φ	Stop angle	°
n	Speed	rpm
J_{machine}	Moment of inertia machine	kg·m ²
J_{motor}	Moment of inertia motor	kg·m ²
T_s	Specific torque motor	Nm/bar
Δp	Pressure over motor	bar
t_s	Response time hydraulic valve	s

$$\varphi = \pi \cdot n^2 \cdot (J_{\text{machine}} + J_{\text{motor}}) / (10 \cdot T_s \cdot \Delta p) + 6 \cdot n \cdot t_s$$

Example:

CB400 typical application for a rubber roll mill

$$n = 15 \text{ rpm}$$

$$J_{\text{machine}} = 350 \text{ kgm}^2$$

$$J_{\text{motor}} = 18.3 \text{ kgm}^2$$

$$\varphi = \pi \cdot 15^2 \cdot (350 + 18.3) / (10 \cdot 400 \cdot 350) + 6 \cdot 15 \cdot 0,15 = 13,7^\circ$$

5 Operating data

5.1 Operating data, solenoid

CAUTION

Wrong polarity

Wrong polarity will destroy the transient suppressor

- ▶ Ensure that the solenoid is connected correctly!

Table 2: Operating data Solenoid

Supply voltage	24	VDC
Power consumption	30	W
Electric contact	DIN EN 175301-803	

Contact with built-in transient suppressor and indicator for electrical activation.

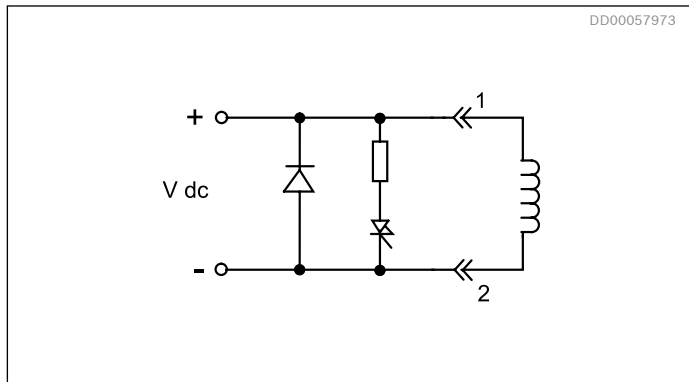


Fig. 2: Electric circuit, contact

5.2 Operating data, inductive sensor

Table 3: Operating data Inductive sensor

PNP Normally-open		
Supply voltage	U _b	12...30 VDC
Rated operational voltage	U _e	24 VDC
Voltage drop U _d at I _e	U _d	≤ 2,5 V
Rated operational current	I _e	200 mA
IEC 60529 protection	IP	IP67

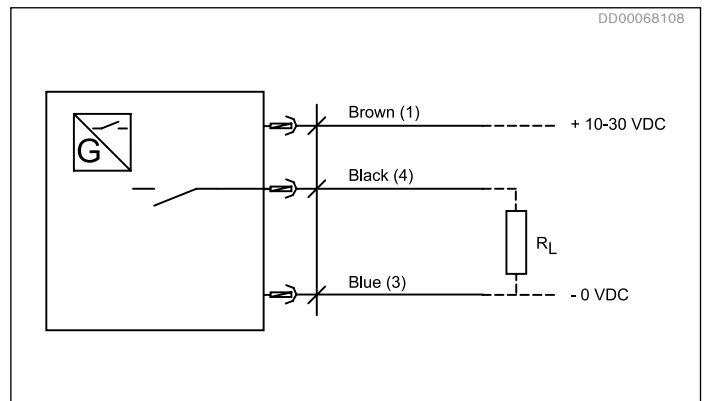


Fig. 3: Electric circuit, inductive sensor

Mating inductive sensor connector

Mating connectors suitable for K24 4-pole, M12 x 1 with screw connection, cable gland PG 9.

Note!

Inductive sensor connector must be ordered separately. See data sheet [RE08006](#).

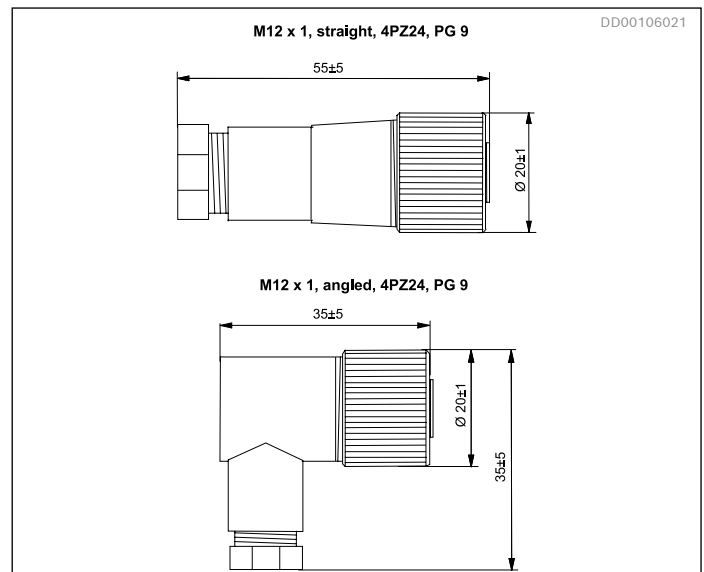


Fig. 4: Inductive sensor connector

6 Pressure loss diagram

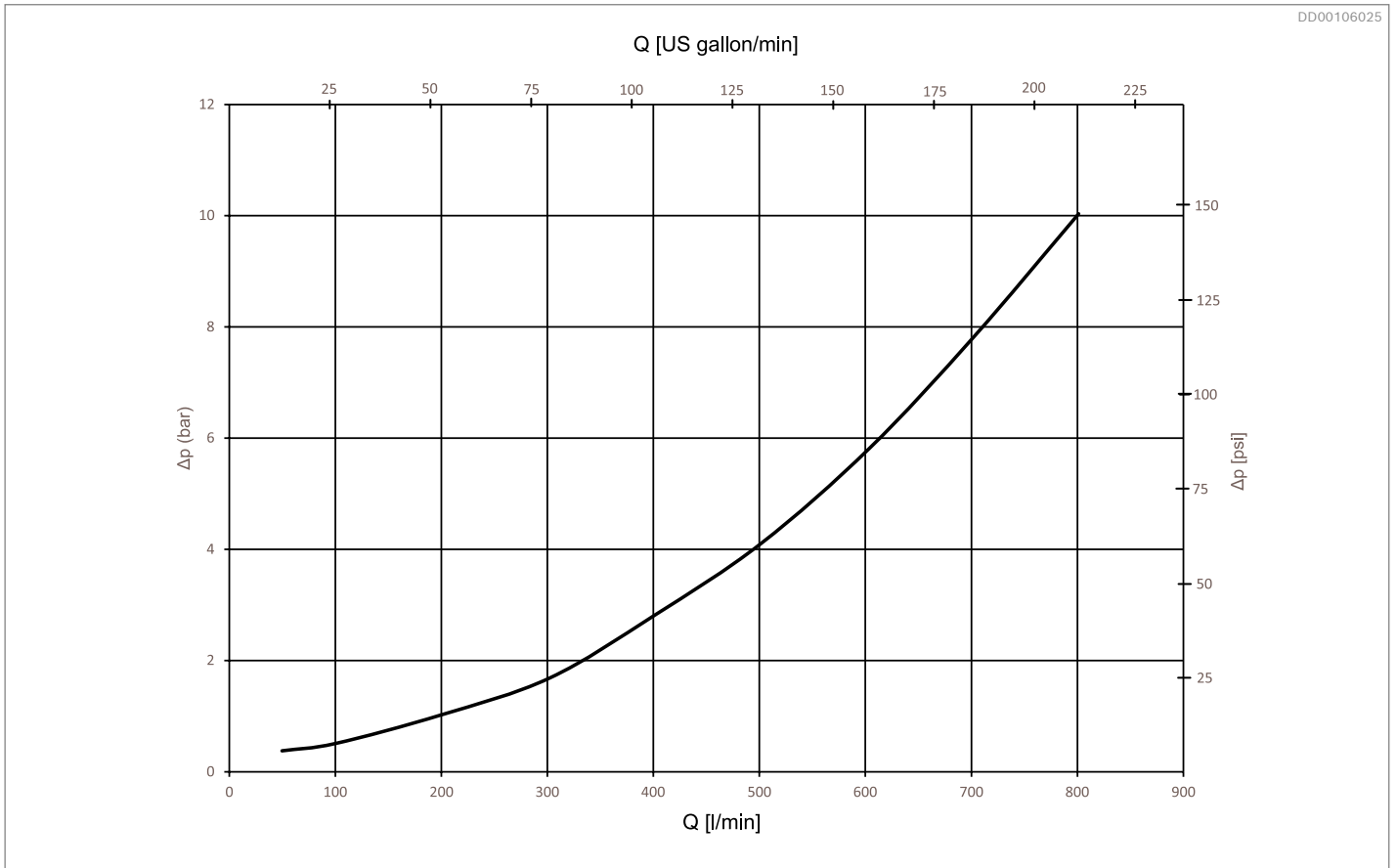


Fig. 5: IN to OUT in normal operating condition, viscosity 40 cSt

7 Dimensions / Interface

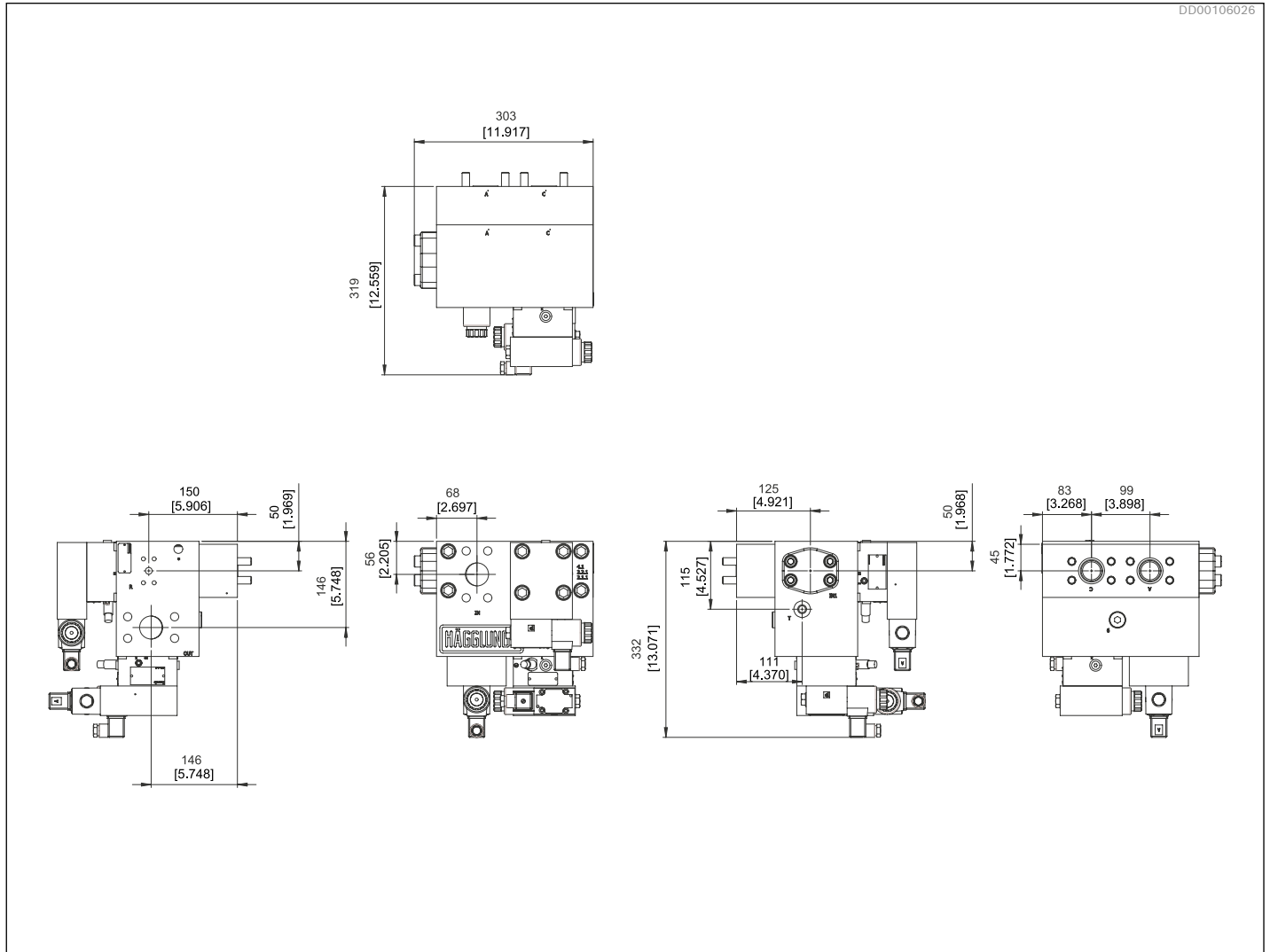


Fig. 6: Dimensions VQCC 800

8 Installation

NOTICE

Connection of valve to the hydraulic motor

Wrong connection causes incorrect valve stop function

- ▶ Ensure that the valve is connected correctly to the hydraulic motor due to rotation direction

Clockwise rotation (seen from shaft side of the motor):
A-connection on valve to C-connection on hydraulic motor

Counter clockwise rotation (seen from shaft side of the motor): A-connection on valve to A-connection on hydraulic motor

8.1 Fitting the VQCC 800 on Hägglunds CA motor

1. Remove protective covers from motor mounting surface and clean the connection surfaces on the adapter (2).
2. Place the O-rings (1) in their proper position on the adapter mounting surface (2). Use clean grease to keep O-rings fixed during assembling.
3. Mount the adapter (2) on to the motor with the ports in their correct position. Tighten screws (3). Remove protective cover from adapter mounting surface and clean the connection surface on the valve (4).
4. Place the O-rings (1) in their proper position on the valve mounting surface. Use clean grease to keep O-rings fixed during assembling.
5. Mount valve (4) against the adapter (2) with the ports in correct position.
6. Tighten the screws (5).
7. Restore paint finish and protect exposed surfaces.

Pos	Description
1	4 pcs o-ring 37.69 x 3.53 NBR90 (included in delivery)
2	Adapter (Included in delivery)
3	8 pcs 1/2 UNC x 2 3/4" (included in delivery) Tightening torque: 131 Nm (97 lbf-ft)
4	Valve VQCC 800
5	4 pcs M16 x 100 (included in delivery) Tightening torque: 277 Nm (204 lbf-ft)

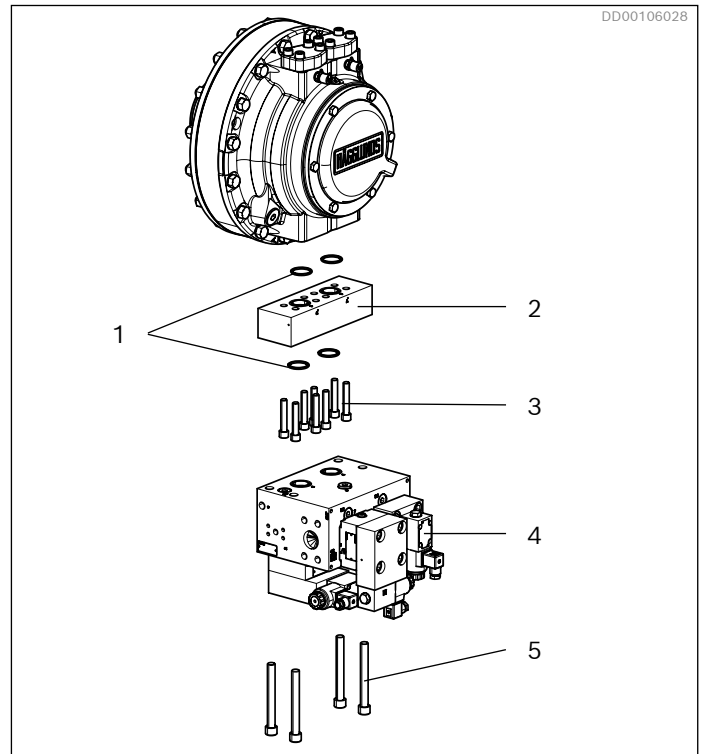


Fig. 7: VQCC 800 mounting on CA motor

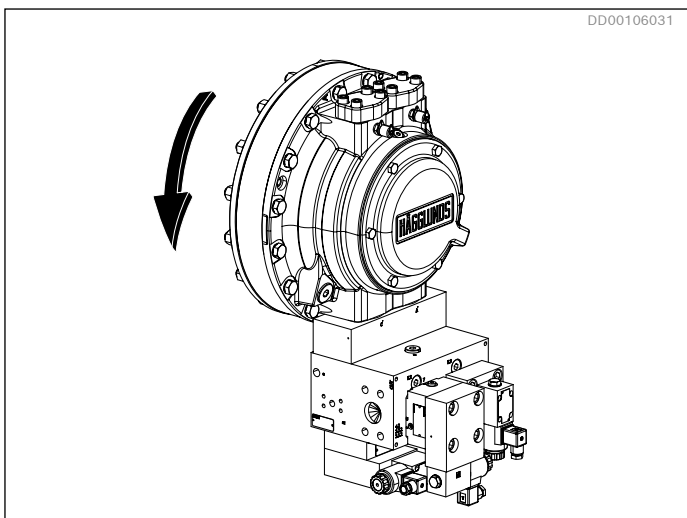


Fig. 8: Valve position on CA motor for clockwise drive shaft rotation as viewed from shaft side of the motor. A port on valve connected to C port on motor

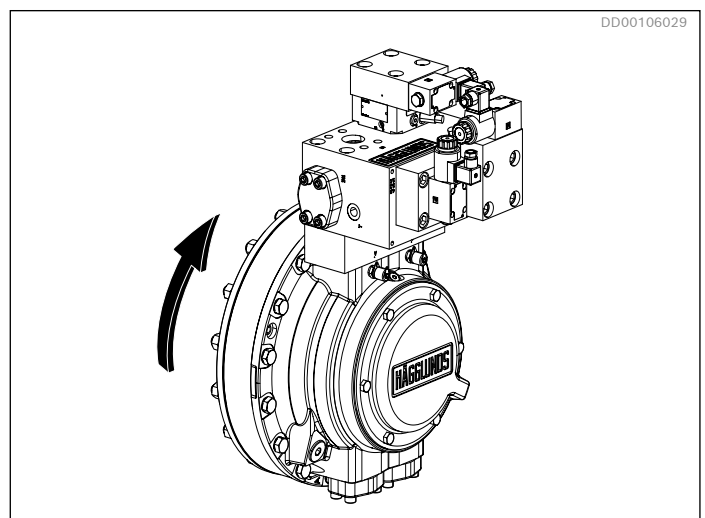


Fig. 9: Valve position on CA motor for counter clockwise drive shaft rotation as viewed from shaft side of the motor. A port on valve connected to A port on motor

8.2 Fitting the VQCC 800 on Hägglunds CB motor

1. Remove protective covers from motor mounting surface and clean the connection surfaces on the adapter (2).
2. Place the O-rings (1) in their proper position on the adapter mounting surface (2). Use clean grease to keep O-rings fixed during assembling.
3. Mount the adapter (2) on to the motor with the ports in their correct position. Tighten screws (3). Remove protective cover from adapter mounting surface and clean the connection surface on the valve (4).
4. Place the O-rings (1) in their proper position on the valve mounting surface. Use clean grease to keep O-rings fixed during assembling.
5. Mount valve (4) against the adapter (2) with the ports in correct position.
6. Tighten the screws (5).
7. Restore paint finish and protect exposed surfaces.

Pos	Description
1	4 pcs o-ring 37.69 x 3.53 NBR90 (included in delivery)
2	Adapter (Included in delivery)
3	8 pcs 1/2 UNC x 2 3/4" (included in delivery) Tightening torque: 131 Nm (97 lbf-ft)
4	Valve VQCC 800
5	4 pcs M16 x 100 (included in delivery) Tightening torque: 277 Nm (204 lbf-ft)

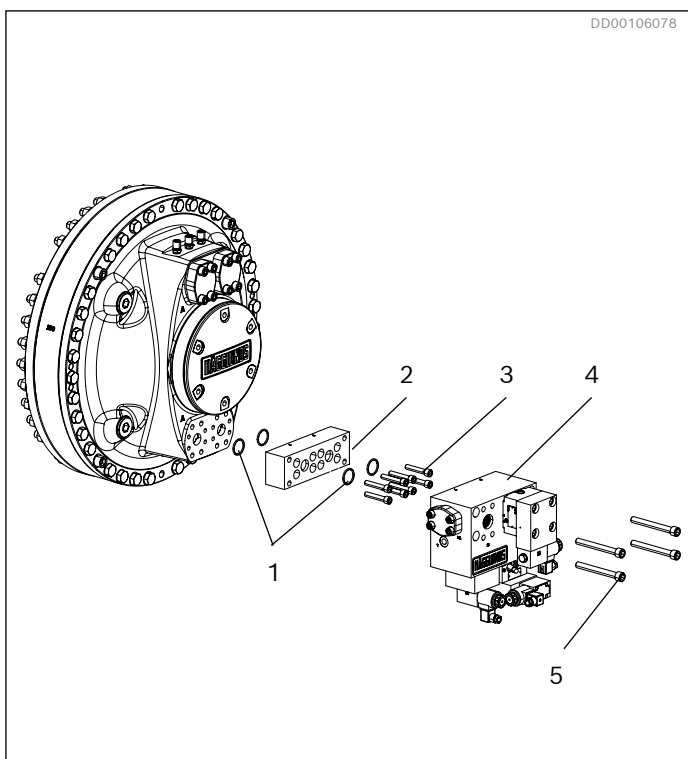


Fig. 10: VQCC 800 mounting on CB motor

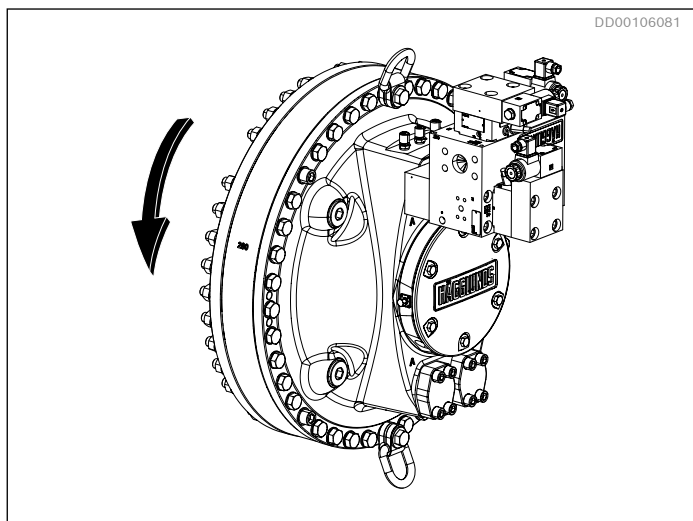


Fig. 11: Valve position on CB motor for clockwise drive shaft rotation as viewed from shaft side of the motor. A port on valve connected to C port on motor

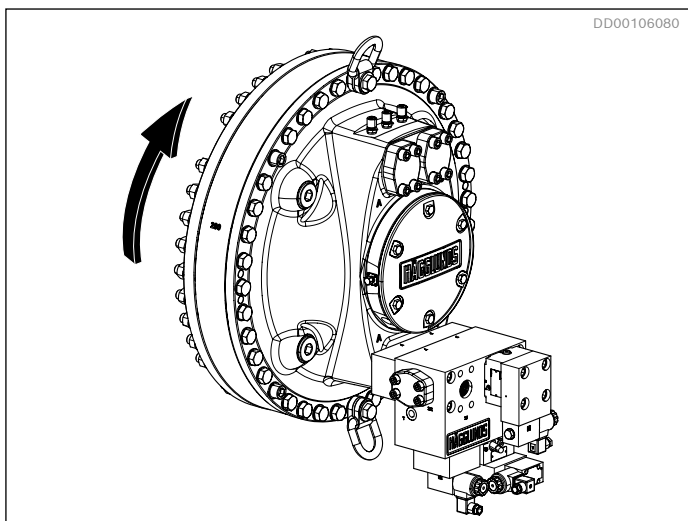


Fig. 12: Valve position on CA motor for counter clockwise drive shaft rotation as viewed from shaft side of the motor. A port on valve connected to A port on motor

8.3 Fitting the VQCC 800 on Hägglungs CBm motor

1. Remove the protective covers (8) from motor mounting surface and the plastic plugs from the adapter mounting surfaces.(7).
2. Place the O-rings (6) in their proper position on the adapter mounting surface (7).
3. Use clean grease to keep O-rings fixed during assembly. Clean the connection surfaces on the adapter (7). Mount the adapter onto the motor with the ports in their correct position and remount the protective covers (8) on the adapter (7). Tighten the screws (9).
4. Place the O-rings (1) in their proper position on the adapter mounting surface (2). Use clean grease to keep O-rings fixed during assembling.
5. Remove protective cover from adapter mounting surface and clean the connection surfaces on the adapter (2).
6. Mount the adapter (2) on to the adapter (7). Tighten screws (3).
7. Place the O-rings (1) in their proper position on the valve mounting surface. Use clean grease to keep O-rings fixed during assembling.
8. Clean the connection surface on the valve (4) and mount the valve against the adapter (2) with the ports in correct position.
9. Tighten the screws (5).
10. Restore paint finish and protect exposed surfaces.

Note!
Adapter VA 1000-15 must be ordered separately!

Pos	Description
1	4 pcs o-ring 37.69 x 3.53 NBR90 (included in delivery)
2	Adapter (Included in delivery)
3	8 pcs 1/2 UNC x 2 3/4" (included in delivery) Tightening torque: 131 Nm (97 lbf-ft)
4	Valve VQCC 800
5	4 pcs M16 x 100 (included in delivery) Tightening torque: 277 Nm (204 lbf-ft)
6	2 pcs O-ring 56,74 x 3,53 NBR 90 (included in VA 1000 15)
7	Adapter VA 1000 15 (not included in delivery, see data sheet RE 15383 Hägglungs valve adapters)
8	Protective covers (included on motor)
9	8 pcs 3/4 UNC x 7" (included in VA 1000 15) Tightening torque 568 Nm (419 lbf ft)

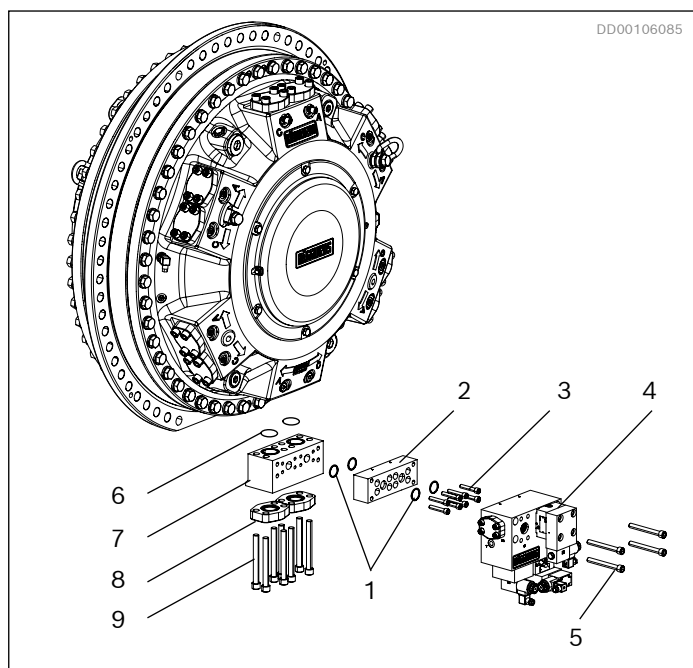


Fig. 13: VQCC 800 mounting on CBm motor

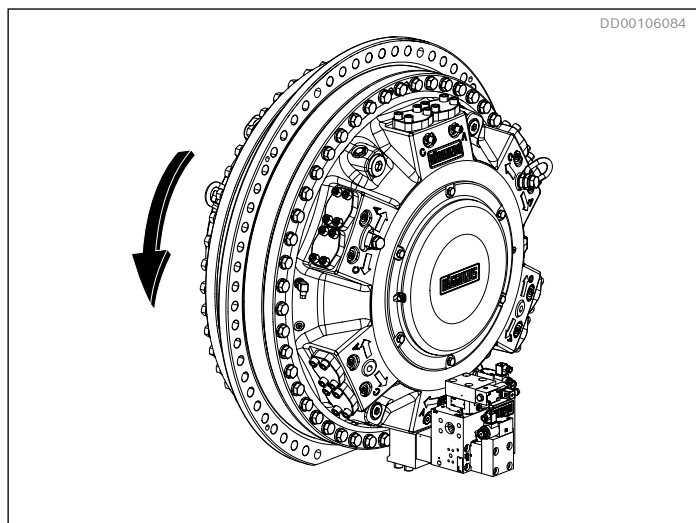


Fig. 14: Valve position on CBm motor for clockwise drive shaft rotation as viewed from shaft side of the motor. A port on valve connected to C port on motor

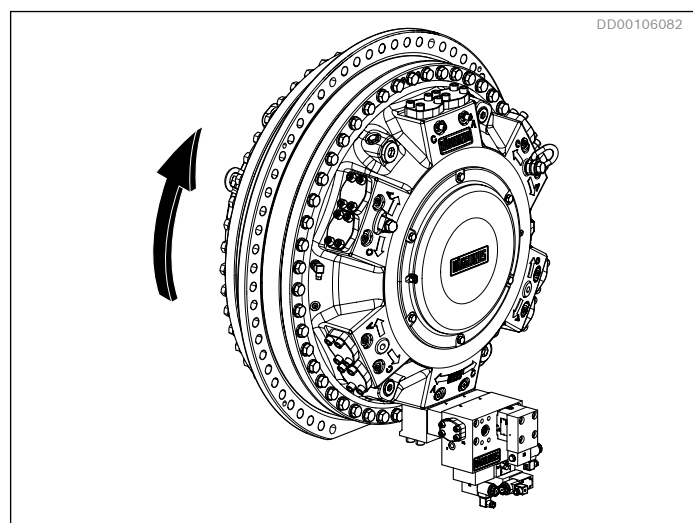


Fig. 15: Valve position on CA motor for counter clockwise drive shaft rotation as viewed from shaft side of the motor. A port on valve connected to A port on motor

8.4 Installation drawing

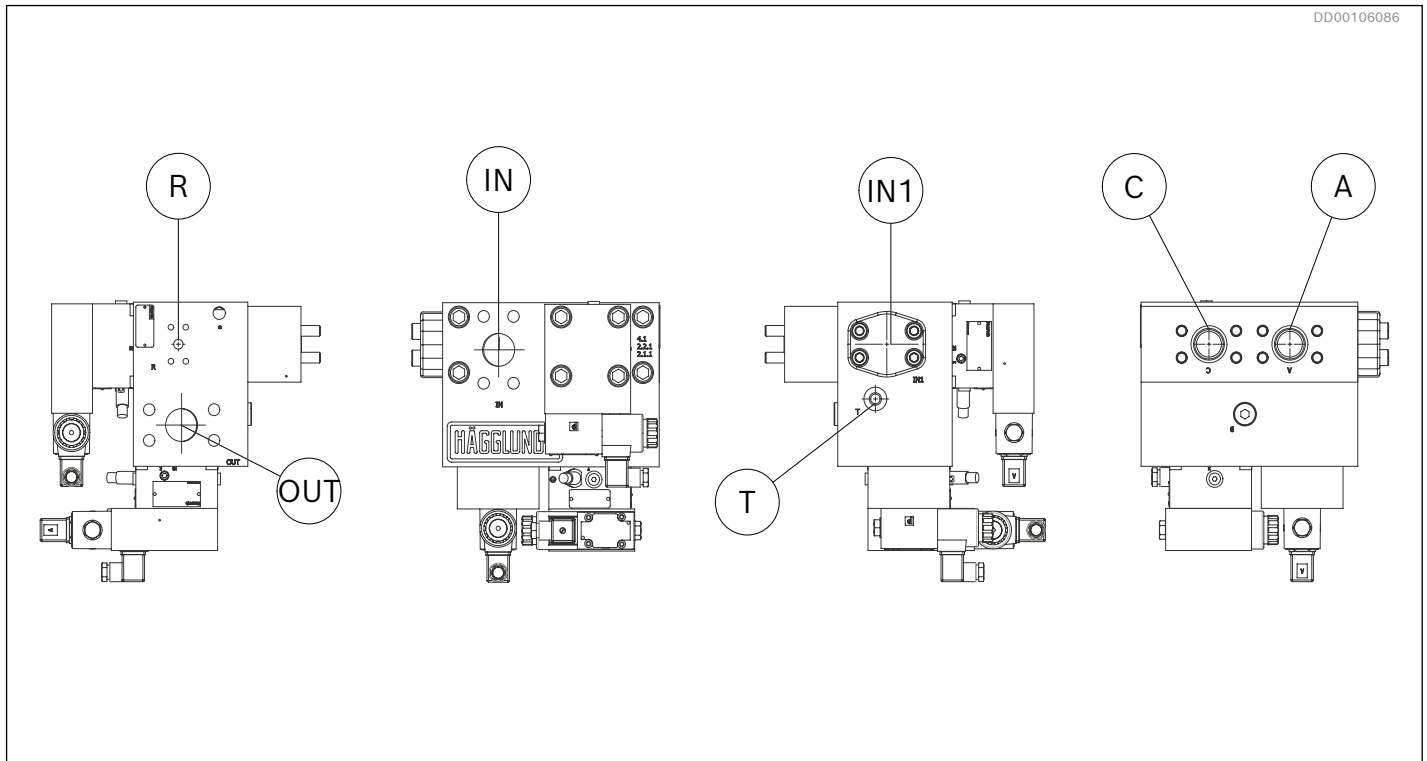










Fig. 16: Hydraulic connections VQCC 800

Connection	Description	Port connection
IN, OUT	Main connection	SAE 1 1/2"
A, C	Main connection	SAE 1 1/4"
T	Tank / Drain	G 3/8"
R	Reverse	SAE 1/2"
IN1	Alternative connection	SAE 1 1/4"

9 Related documents

	Title	Document no	Document type
	Installation and maintenance manual, Hägglunds CA	RE 15305-WA	Installation & Maintenance manual
	Installation and maintenance manual, Hägglunds CB	RE 15302-WA	Installation & Maintenance manual
	Installation and maintenance manual, Hägglunds CBm	RE 15300-WA	Installation & Maintenance manual
	Hydraulic fluid quick reference	RE 15414	Data Sheet
	Valve adapters Hägglunds VA 1000	RE 15383	Data Sheet
	Quick stop Electronic Control Hägglunds QECC	RE 15370	Data Sheet
	Mating connectors and cable sets for valves and sensors in hydraulics	RE 08006	Data Sheet
	VQCC 800	078 5912 *)	Dimension drawing

*) Documents only available at myRexroth. Contact your Bosch Rexroth representative for information.

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