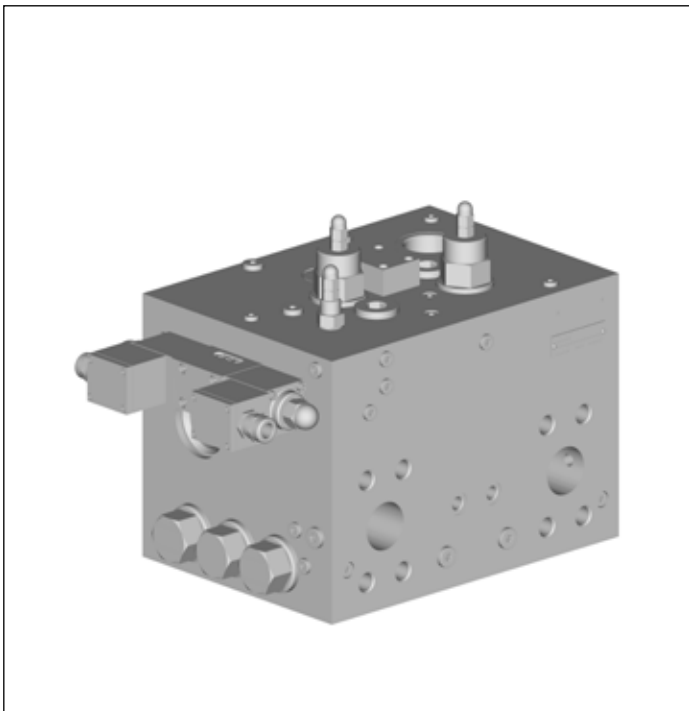


# Hydraulic free-wheeling and lock valve Hägglunds VFW-VHLCA

**RE 15384**  
Edition: 12.2015  
Replace: New



- ▶ Valid for Hägglunds motor CA100 S.015, CA100 S.042, CA140 S.015, CA140 S.042
- ▶ Maximum flow 1000 l/min (264gpm)
- ▶ Maximum pressure 350 bar (5076 psi)
- ▶ Open loop hydraulic system

## Features

- ▶ Compact and robust design
- ▶ Possible for remote pilot control of check valves
- ▶ Free wheeling and lock function
- ▶ Directional valve with detent function
- ▶ Protects the motor from overspeed at drilling applications

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## 1 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 Hägglunds VFW-VHLCA:

<b>VFW-VHLC</b>	<b>A</b>	<b>1000</b>	<b>350</b>	<b>00</b>	<b>00</b>
01	02	03	04	05	06

01	<b>Free wheeling and lock valve Compact motor CA</b>	<b>VFW- VHLC</b>
02	<b>Version</b>	<b>A</b>
03	<b>Maximum flow (l/min)</b>	<b>1000</b>
04	<b>Pressure range</b> Main pressure relief setting 350 bar, (5076 psi)	<b>350</b>
05	<b>Modification *)</b>	<b>00</b>
06	<b>Design</b> Standard Special index *)	<b>00</b> <b>01-99</b>

\*) To be filled in by Bosch Rexroth DC-IA/EHD

### **NOTICE**

#### **Shifting from free wheeling position into drive position during running of motor**

Damage on piston parts and camring

- ▶ Shifting from free-wheeling position into drive position must only be carried out when the motor is standing still

## 2 Functional description

The valve is designed to be used with Compact motors type, CA100 S.015, CA100 S.042, CA140 S.015, CA140 S.042.

Intended use of the valve is for two speed operation using free-wheeling of one part of the motor and for locking of the motor ports at a jammed drill string in a drilling application. The valve is suitable for open loop operation with tensioned load applications. A system is required to ensure that the motor is stationary before switching from free-wheeling position into drive position.

The valve is equipped with a pilot operated pressure relief valve (3) and (4) in each motor line which can relieve flow into the opposite motor line. The pressure relief valves is adjustable within a certain pressure range and will be delivered with a pressure setting of 350 bar (5076 psi).

A hydraulically controlled spring return spool valve (2) allows one part of the motor to drain out to tank at free-wheeling operation. The spool valve (2) is operated via an electrically controlled directional valve (5) with detent function in all positions and a pilot operated, 3-way directional valve (6). With the solenoid of the valve (5) de-energized the spool (5) remains in the last switched position. The pilot pressure to valve (6) can be adjusted within a pressure range of 7-210 bar (108-3046 psi).

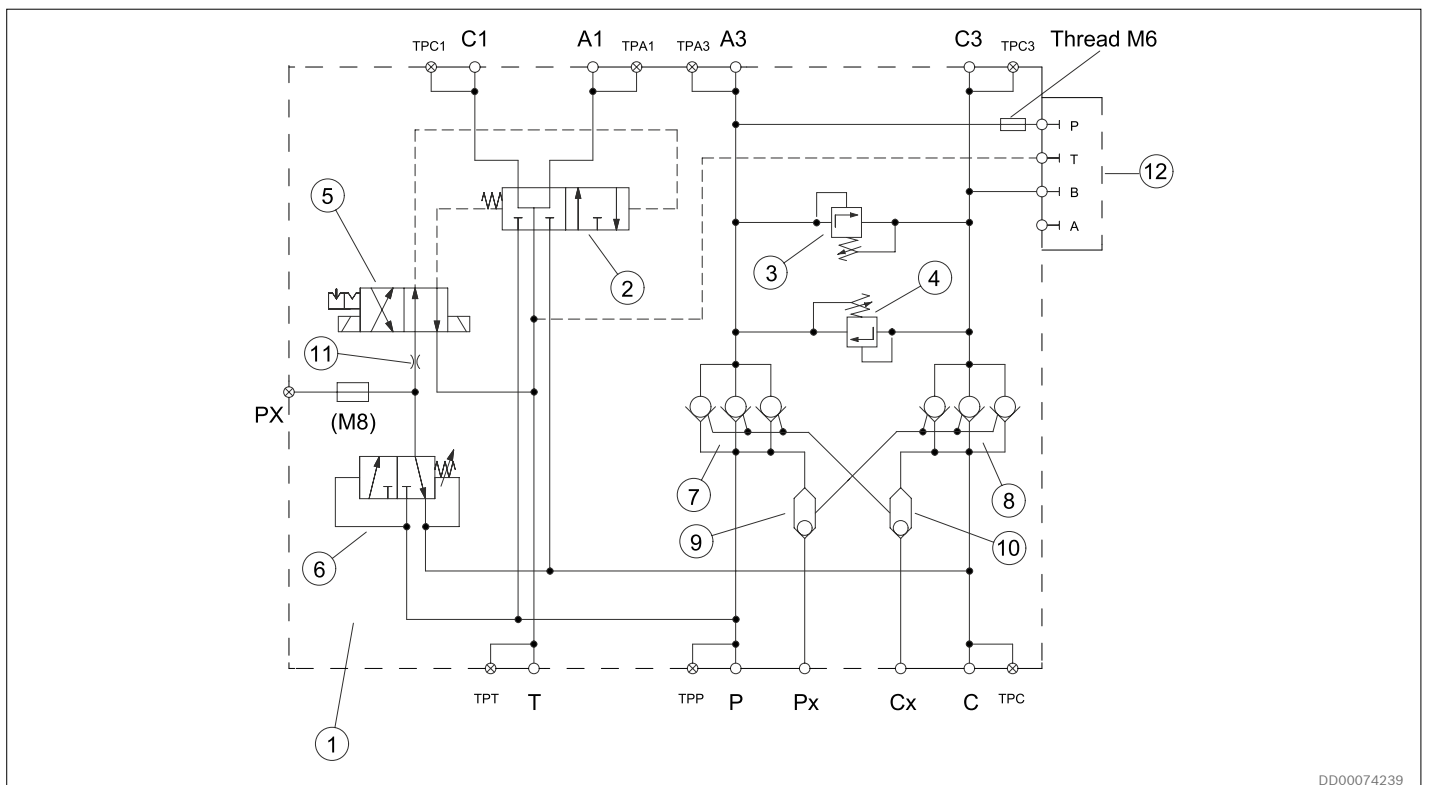
At free wheeling the case pressure shall be controlled with a pressure relief valve on the motor case drain line, maintaining a pressure of 1,0 bar (14,5 psi) to 1.5 bar (22 psi), (one of the D ports). Before the motor is put into free-wheeling the pilot control valve (5) is activated, which switches the main spool (2) and connects the motor ports AM and Cm to T.

T has to be connected to tank.

The valve is fitted with two triple pilot to open the check valves (7) and (8) with opening pressure of 2 bar (29 psi), one in each motor line. The pilot to open the check valves are normally operated from opposite motor line pressure. The pilot to open the check valves can be remote controlled via pilot connection Px and Cx. The check valves allows free flow from the valve the port P and C to the load port Am respectively Cm.

At a pilot pressure above 1:3 of the pressure at load port the check valves remains open. At a possible jammed drill string the pilot pressure on valve port P or C will decrease below 2 bar (29 psi) and close the current check valve and prevent the drill string from winding up.

The CETOP 03 connection P-T-B-A at the blind plate (12) can be used for venting of the loaded ports Am and Cm.



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Fig. 1: Hydraulic circuit for valve

### 3 Technical data

**Table 1: Technical data**

<b>Mechanical specification</b>		
Maximum operating pressure	350 bar	5076 psi
Maximum flow	1000 l/m	264 gpm (US)
Pilot pressure valve (6)	min	7 bar
	max	210 bar
Default setting	7 bar	108 psi
<b>Hydraulic fluid (refer to Data sheet RE 15414 Hydraulic fluid quick reference )</b>		
Maximum fluid temperature	70 °C	158 °F
Minimum fluid temperature	-25 °C	-13 °C
Maximum viscosity range	380 cSt	1760 SSU
Minimum viscosity range	20 cSt	98 SSU
Recommended operating viscosity	40 cSt	187 SSU
Weight	160 kg	346 lb
Surface treatment	Zinc plated and passivated (Cr3)	
<b>Pilot valve (electrical operated)</b>		
Solenoid protection class	IP65 (sea water protective)	
Solenoid current (24 VDC)	1,25 A	
Solenoid power (24 VDC)	30 W	

## 4 Pressure loss diagram

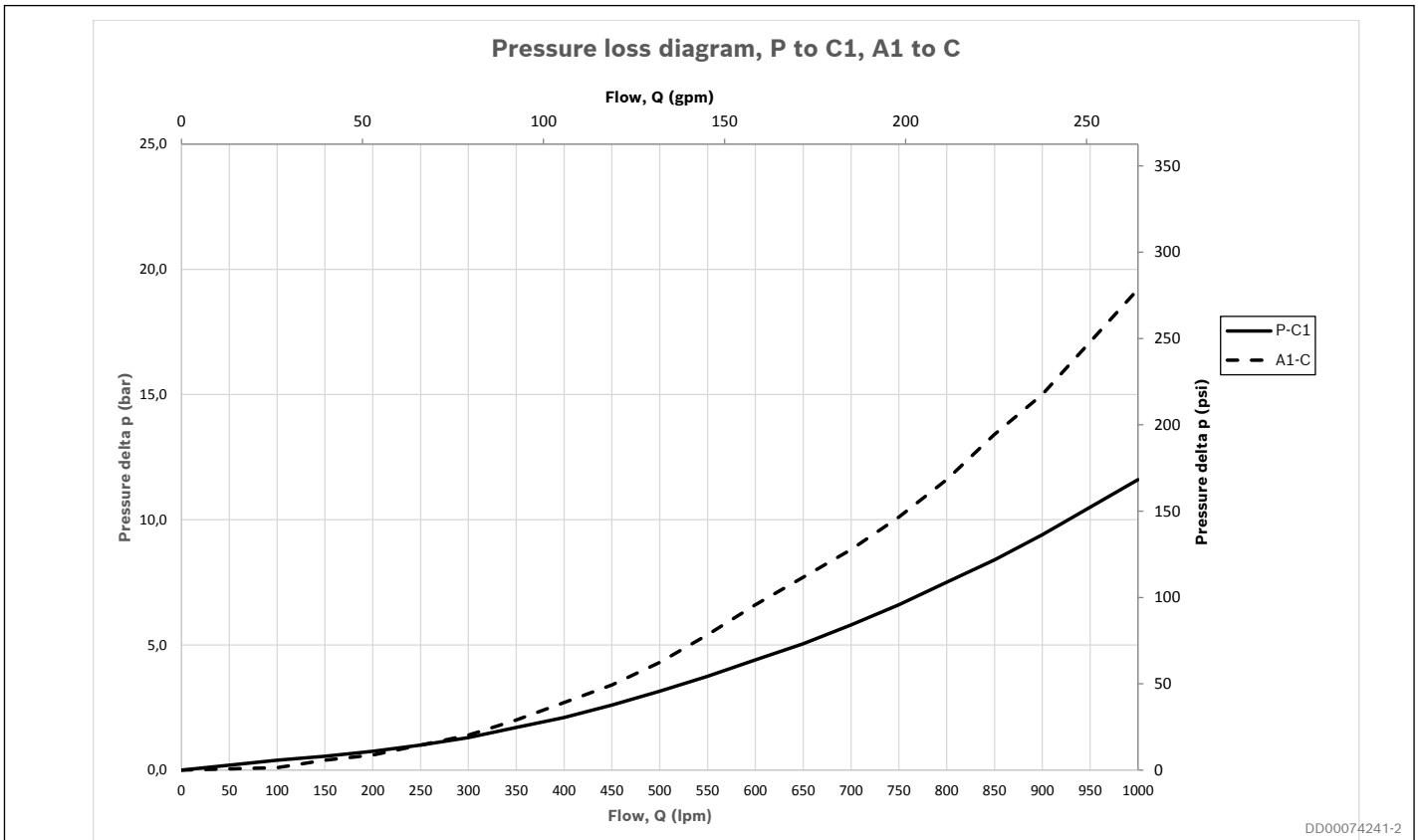


Fig. 2: Pressure loss diagram - P to C1, A1 to C, Viscosity 40 cSt /187 SSU Full displacement operation mode

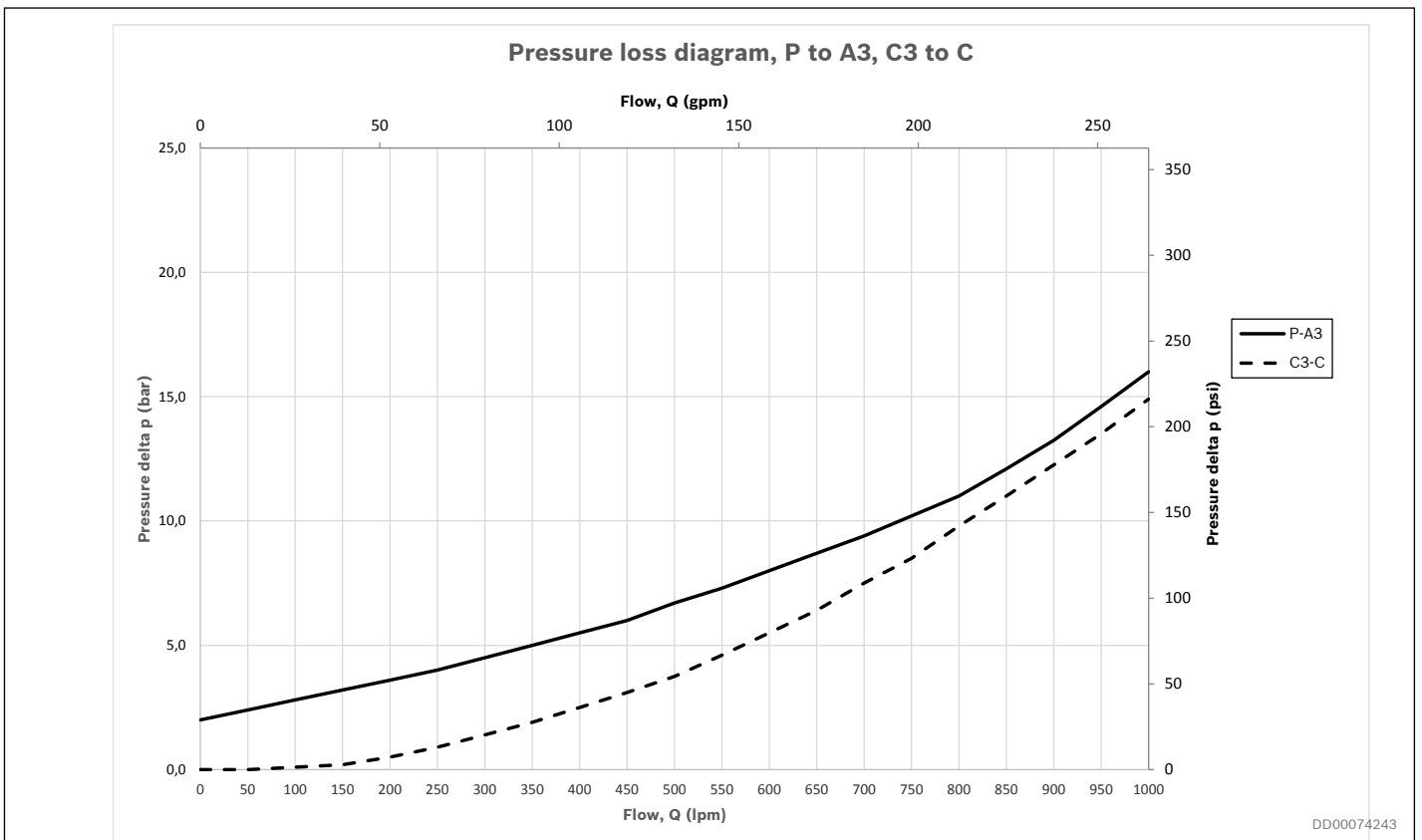
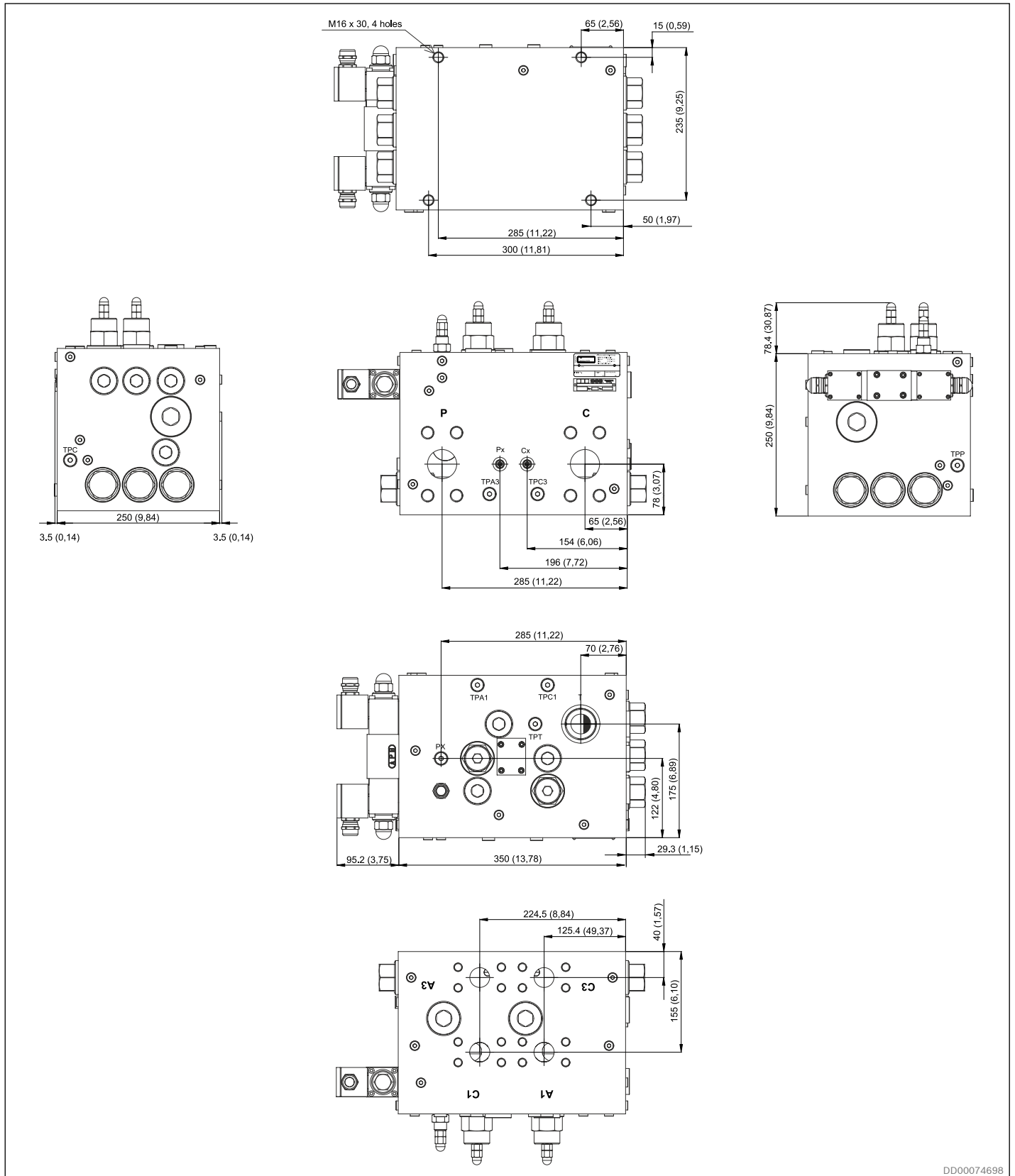


Fig. 3: Pressure loss diagram - P to A3, A3 to C, Viscosity 40 cSt /187 SSU Free-wheeling operation mode

## 5 Dimensions / Interface



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Fig. 4: Dimensions VFW-VHLCA

## 6 Installation

The valve shall be located on the side of the hydraulic motor and connected to the motor hydraulically via hydraulic hoses or tubes. The valve to be mounted on the machine or on a separate bracket via 4 threaded screw holes. Threaded hole, M16x30. 4 pcs screw M16, strength class 8.8, tightening torque 197 Nm (145 lbf ft). (See Fig. 4)

C1, A1, A3, C3 to be connected to motor.  
P, C to be connected to pump.

### Installation drawing – VFW-VHLCA

Refer to dimensional drawing: 041 0411.

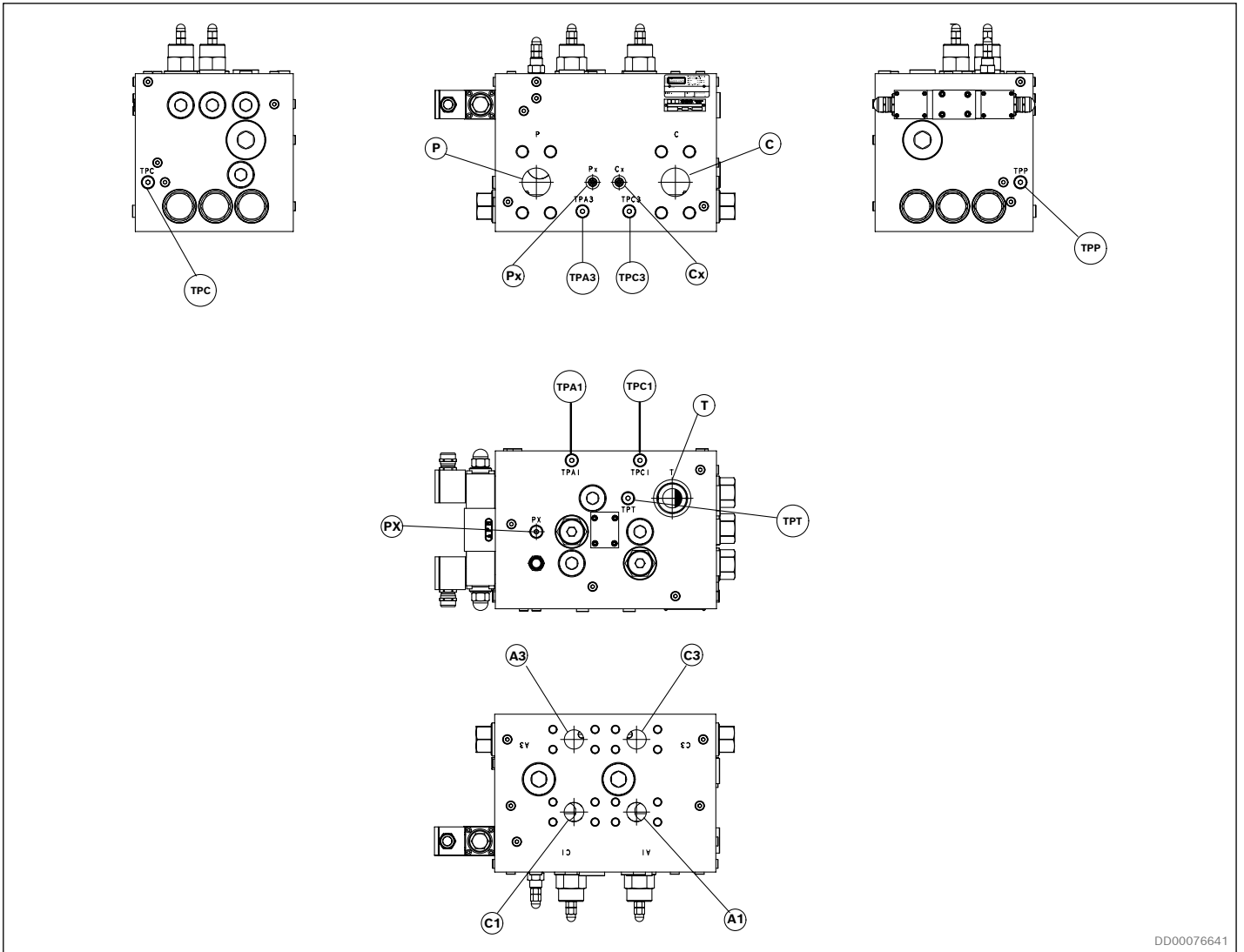


Fig. 5: Installation drawing VFW-VHLCA



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Table 2: Connections for VFW-VHLCA

Connections	Description	Dimension
P, C	Main connection	2" SAE 6000 *
A1, A3, C1, C3	Main connection	1 1/4" SAE 6000 *
T	Drain connection	G 1 1/2"
PX, Px, Cx	Pilot connection	G 1/4"
TPC, TPP, TPT, TPA1, TPC1, TPA3, TPC3	Measure connection	G 1/4"

\* J518C, Code 62, 414 Bar (6000 psi)

## 7 Required and additional documents

Title	Document no	Document type
 Hydraulic fluid quick reference	RE 15414	Data sheet
 VFW-VHLCA	041 0411*)	Dimension drawing

Documents available at .Bosch Rexroth Media Directory

\*) Documents only available at LHD extranet. Contact your Bosch Rexroth representative for information.

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