

1 General

1.1 Flow Divider 133.991.001.9 splits the volume flow in a constant ratio onto four consumers. The allocation is done independent of load and pump pressure. The Flow Divider can be used for a self-driven mobile working machine, for which the driving motors shall be operated at a certain rotation speed ratio

1.2 Applications

With its feature as hydraulic differential the Multiple Flow Divider may for example be used in asphalt milling machines.

1.3 Mounting Location (Recommendation)

The Flow Divider is used in closed circuit systems between driving pump and driving motors.

2 Function

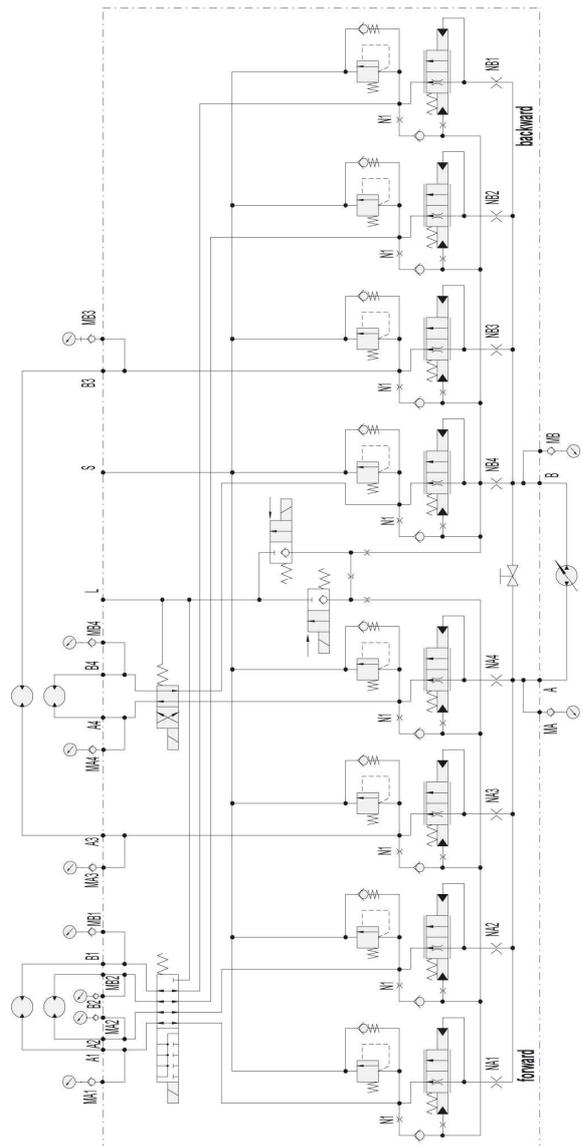
The Flow Divider is connected with the pump at ports A and B. On the driving side there are ports A1 and A2, B1 and B2 available for connection of the hydromotor of the front axle. Ports A3 and A4 as well as B3 and B4 are connected to the hydromotor of the rear axle. In case of the present design of the Flow Divider about one third of the volume flow received is distributed to the two front motors and two third of the volume flow received is distributed to the rear motors. Other volume flow partitions are feasible on request. For forward and reverse flow direction identical Flow Dividers exists which may be switched on and off according to demand. As further functions are available:

1. Pressure suction valve in every single circuit;
 2. A directional valve for unloading of the radial pistons of front motors
 3. A directional valve for reversing direction of a rear wheel;
 4. An integrated feed-function by connectable and disconnectable forward and backward driving
 5. A manually operable pump short circuit
- to 1: For pressure protection in closed circuits (440 bar) the pressure suction valves are connected to the feed pressure (port S) respectively with a pre-charged tank (eg 4 bar). On connection to the feed pump a feed in the low-pressure-side takes place about this.
- to 2: In switched position the directional valve drains off the lines of the radial piston motor to the tank. This will cause the single pistons to be able to move and the shaft may rotate freely on transport rides.
- to 3: The rear wheel's reversal of direction of rotation is done in order to enable the machine either a wide standing position (wheel extended) or to be able to better mill around kerbs and small obstacles in tight radiuses (retracted wheel).
- to 4: The feed function in port L serves as cooling in the open system. The feed function arises by the way of switching in and off of lines for forward and backward driving. The machine manufacturer has to review the feed quantity.
- to 5: The short circuit of the pump is used if the machine has to be towed. The pump can rotate freely and by residual flow resistance in the Flow Divider the motors slowly turn against the resistance of these flow resistances.

3 Characteristics

- High inlet pressure range
- High accuracy of division
- Numerous secondary functions

4 Hydraulic Diagram



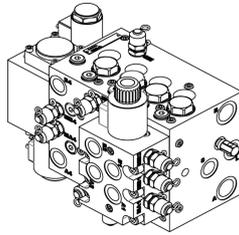
Designation of connection::

- | | |
|-------------------------|-------------------------|
| A1;B1,A2;B2,A3;B3,A4,B4 | Ports for wheel engines |
| A, B | Inlet pump |
| S | Port feed or tank |
| L | Tank line |

Multiple Flow Divider

hydraulic differential lock

133.991.001.9



5 Technical Data

5.1 General

Installation position: Any
Weight: 34.2 kg

5.2 Ports

A1; A2; A3; A4	G1/2	ISO 1179-1
B1; B2; B3; B4	G1/2	ISO 1179-1
S; L	G1/2	ISO 1179-1
A; B	G3/4	ISO 1179-1
MA; MA1; MA2; MA3; MA4	M14x1.5	ISO 9974-1
MB; MB1; MB2; MB3; MB4	M14x1.5	ISO 9974-1

5.3 Hydraulic

Maximum input pressure:	440 bar port A, A1, A2, A3, A4 440 bar port B, B1, B2, B3, B4 50 bar port S 5 bar port L
Max. input volume flow:	A/B max 100 l/min (Qmax)
Output volume flow:	A1/B1 14 % Qmax A2/B2 14 % Qmax A3/B3 36 % Qmax A4/B4 36 % Qmax
Hydraulic fluid:	Mineral oil (HL, HLP) conforming with DIN 51524, other fluids upon request
Hydraulic fluid temperature range into the valve:	-20 – +100 °C
Viscosity range:	2,8 – 500 mm ² /s (vorzugsweise 30 bis 46)
Contamination grade::	Filtration NAS 1638, class 8)

5.4 Elektric

Supply voltage:	24 V DC
Voltage tolerances:	±10 %
Duty time:	100 %
Protection category based on DIN 40050:	IP 65
Power supply:	Angled connector ISO 4400 / DIN EN 43650

5.5 Standards

The following standards are to be observed because of the surface temperatures on the lowering brake valve:

- EN 563
Temperatures on surfaces that can be touched.
- EN 982
Safety-technical requirements for fluid-technical systems and their components.

6 Safety Requirements

- WESSEL-HYDRAULIK GmbH confirms that the fundamental and proven Safety Standards according to ISO 13849-2: 2003, tables C.1 and C.2 had been used

for the design of the herein described valve (Flow Divider).

- The Quality Management System of WESSEL-HYDRAULIK GmbH is certified according to DIN EN ISO 9001
- **The MTTFd-value for the herein described valve can be assumed as 150 years**
- Note: The user is responsible for the observance of the fundamental and proven Safety Standards according to ISO 13849-2: 2003, tables C.1 and C.2 for the implementation and the use of the hydraulic component.

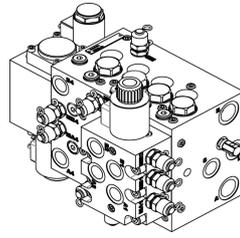
7 Assembly Instruction

General Notes

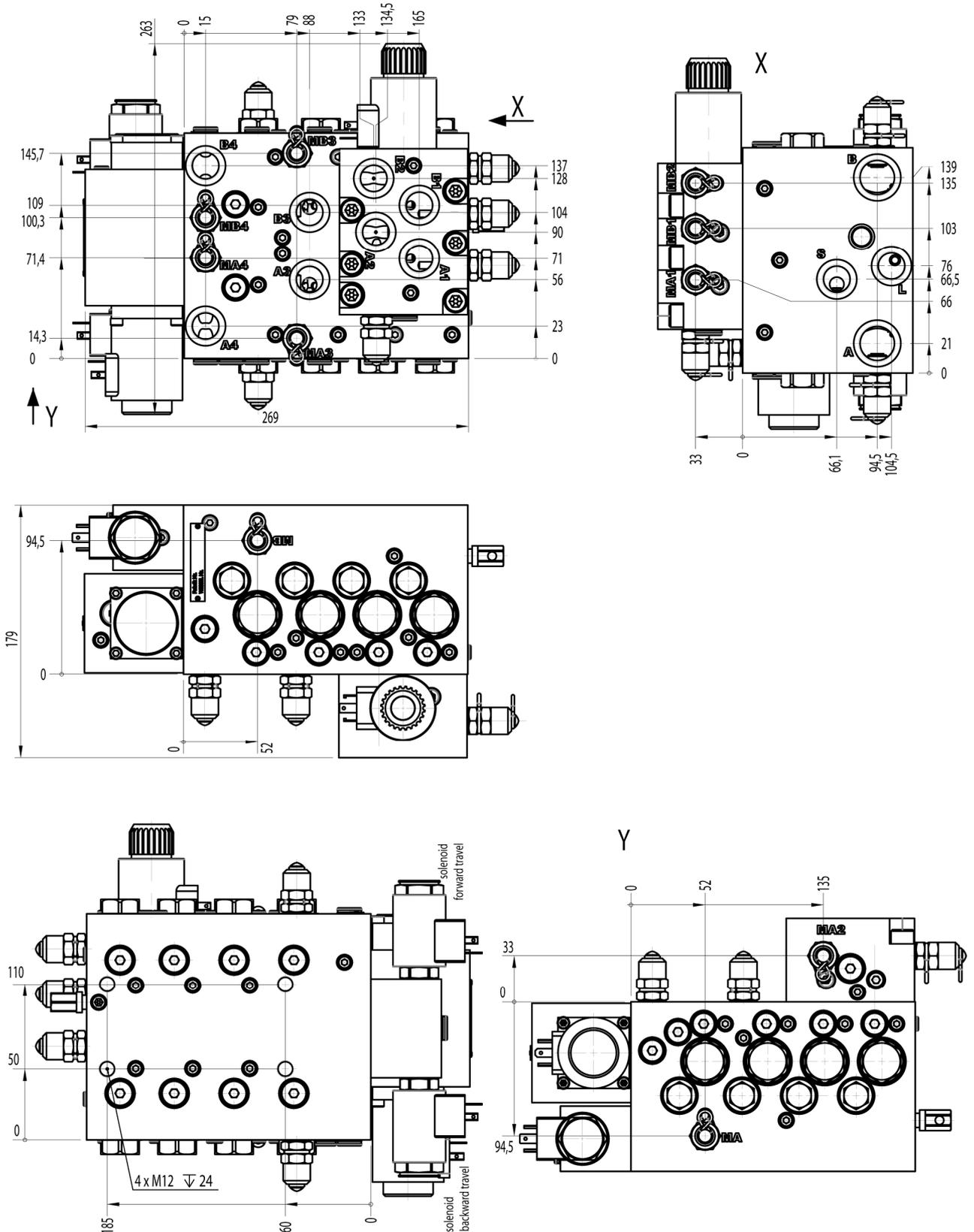
- Observe all installation and safety information of the construction machine manufacturer.
- The user has to ensure that the device is suitable for the respective application.
- Utilisation exclusively for the purpose proposed by WESSEL-HYDRAULIK GmbH.
- The installation of the valve as well as modification of the settings which require opening of the valve should only be carried out by authorized and well trained personnel. The warranty expires by unprofessional opening, modifying or reassembling of the valve. The user is responsible for any modification made to the valve.
- Welds on the valve are not allowed
- **CAUTION:** Hydraulic hoses should not contact the valve, as this could cause thermal damage. It is important to note standards EN 563 and EN 982.
- **ATTENTION:** Valve will heat to the temperature of the hydraulic fluid.

8 Installation

- **ATTENTION:** Valve may only be adjusted by qualified personnel
- **ATTENTION:** Prior to installation/removal the hydraulic system has to be depressurized
- **ATTENTION:** Take care that during the complete period of installation no contamination can enter into the hydraulic system and that the flange surfaces are clean and free of pollution.



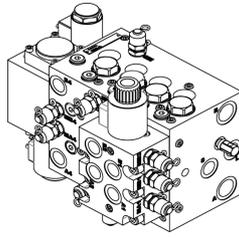
7.1 Connection Dimensions



Multiple Flow Divider

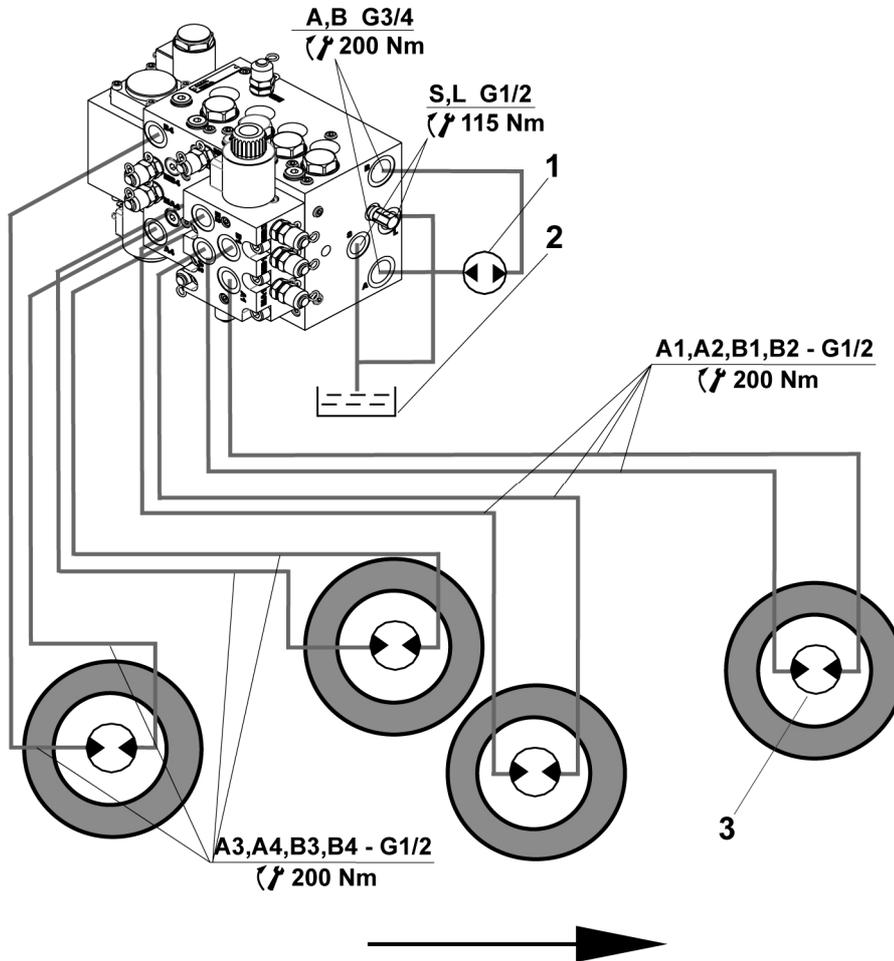
hydraulic differential lock

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7.2 Connection Recommendations

The enclosed installation proposal is without any warranty. The operation and technical details have to be checked prior to the installation.



- 1 Pump
- 2 Tank
- 3 Motor