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1 General Description

If loads are to be raised and lowered using hydraulic winch drives, a load holding valve should be installed on the winch motor for safety reasons.

Load holding valves are suitable for motor and cylinder applications. They guarantee a leak-free locking of the consumer. The opening is not effected by the load pressure and is controlled by opposing side pressure. This prevents the consumer from getting ahead of the incoming volume flow. The load holding valves are suitable for applications that are subject to vibration, such as e.g. winch drives and are characterized by their high sensitivity and the direct joystick response.

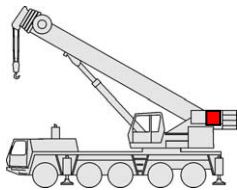
Advantages

- Quick installation
- Optimal dampening for tough application
- Adapting the dampening characteristics does not influence the start of opening

1.1 Applications

The WESSEL Load Holding Valve Winch enables low-loss load lifting by a check valve. The valve prevents any fast movement caused by the load as opposed to the incoming oil flow. The load can be retained without any oil leaking and lowering is controlled.

1.2 Mounting Location (Recommendation)



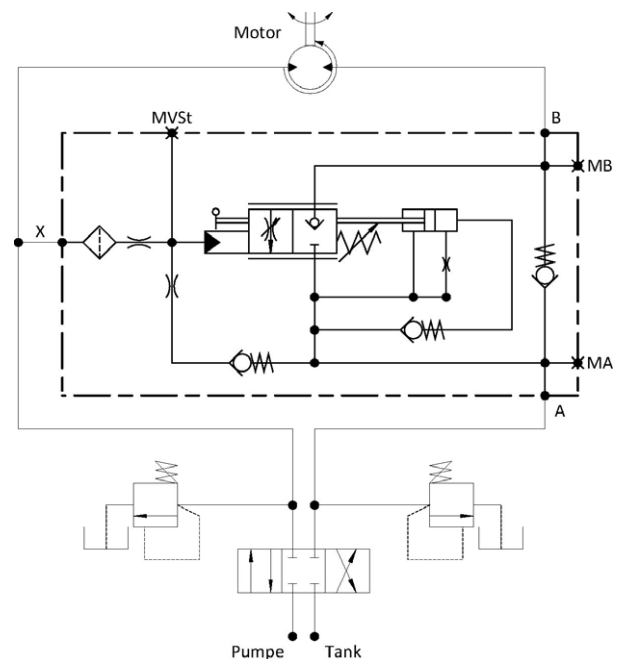
The Load holding valve Winch is flanged with port B directly onto the hydraulic winchmotor.

1.3 Function

The lifting-line from the winch control valve is connected to port A (lifting) of the load holding valve.

The lowering-line is directly connected to the winch motor. This line is also connected to the port X as a signal line to start the lowering operation..

For lifting the load, the volume flow is directed from port A through a check valve to the winch motor. In the idle position the load is locked leak-free. To lower the load, the valve is opened by the rising pressure in X. The initial opening is adjustable. The lowering of the load is very sensitive and independent of load pressure. Thus prevents driving loads faster than the incoming oil flow permits. The damped activation of the valve ensures a vibration-free operation.



1.4 Characteristics

- Oscillation-free load lowering
- Extremely precise and fine characteristics, especially with lower speeds
- Leakage free load retention
- Robust valve construction with redundant spring system ensures the greatest safety

2 Technical Data

Criteria		Unit	Value	
A, A1, B			SAE 3/4"	SAE 1"
			(DIN ISO 6162-2, SAE J518/2 (CODE62))	
Max. operating pressure		bar	420	
Pressure setting			See type code feature 04: Pressure setting	
Max. volume flow			See type code feature 03: Spool	
Weight		kg	6,2	12,5
Connection				
Connection	Connection sizes		Maximum Pressure	
X	G 1/4 ISO 1179-1	bar	420	
M1, M2, MVSt	G 1/4 ISO 1179-1	bar	420	
M1, M2, MVSt	G 1/4 ISO 1179-1	bar	420	
Installation position			any	
Hydraulics				
Hydraulic fluid		Mineral oil (HL, HLP) conforming with DIN 51524, other fluids upon request		
Hydraulic fluid temperature range		-20 – +80 °C		
Environmental temperature:		< +50 °C		
Viscosity range		2,8 – 500 mm ² /s		
Contamination grade		Filtering conforming with NAS 1638, class 9, with minimum retention rate $\beta_{10} \geq 75$		

3 Ordering Information

3.1 Type Code

00	01	02	03	04	05	06	07	08
LHW	3N			0	HYP03B			0
00	Product group							LHW
01	Design	standard						3D
02	Connection(s)	motor / cylinder ISO 6162-2 (SAE J518 Code62) metric	SAE ¾"					05C
			SAE 1"					05E
03	Spool	Design of the spool optimized for the specified volume flow. Specifications in l/min	SAE ¾"					200
			SAE ¾", SAE 1"					250
			SAE ¾", SAE 1"					300
			SAE ¾", SAE 1"					350
			SAE 1"					400
04	Pressure setting	unavailable						0
05	Activation	Hydraulically proportional. Port size G1/4						HYP03B
06	Damping (orifice selection)	minor damping					01	
		medium damping					02	
		strong damping					03	
07	Opening pressure	Pressure at port X, standard 16 bar = 016						XXX
08	Directional valve for mechanical brake	unavailable						0

XXX – fixed features XXX – customer selectable features ■ available ○ not available

Some theoretical configurations might be not feasible for technical reasons. For relating questions please ask for our advice.

3.2 Currently available Versions

The versions listed below are available standard-versions. Further versions in the range of the above mentioned features are available on request.

00	01	02	03	04	05	06	07	08	Designation	Part No.
LHW	3N	05C	350	0	HYP03B	02	015	0	LHW-3N SAE ¾" 350LPM 420BAR	536.060.007.9
LHW	3N	05E	400	0	HYP03B	02	016	0	LHW-3N SAE1" 400LPM 420BAR	537.060.010.9
LHW	3N	05E	400	0	HYP03B	03	016	0	LHW-3N SAE 1" 400LPM 420BAR	537.060.015.9

4 Description of Features according to Type Code

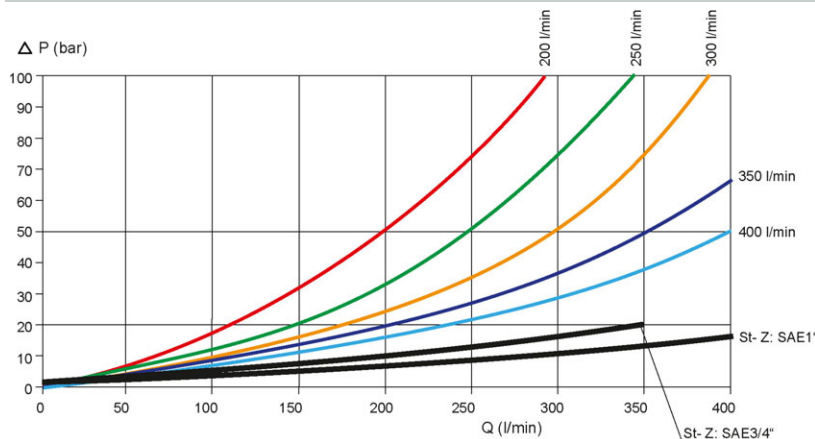
4.1 Feature 1: Design

Standard design

4.2 Feature 2: Connection Ports

The Load holding valve Winch is flanged with port B directly onto the hydraulic winchmotor. The lowering-line from the main control valve is directly connected the winch motor also to the piloting port X of the load holding valve.

4.3 Feature 3: Spool



4.4 Feature 4: Pressure Setting

Load holding valves of the design 3N are not equipped with a pressure relief valve.

4.5 Feature 5: Activation

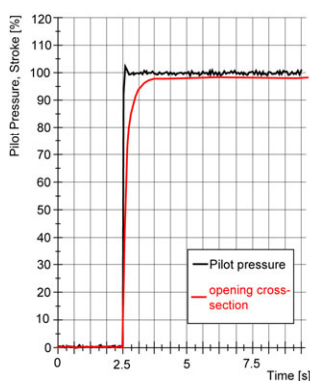
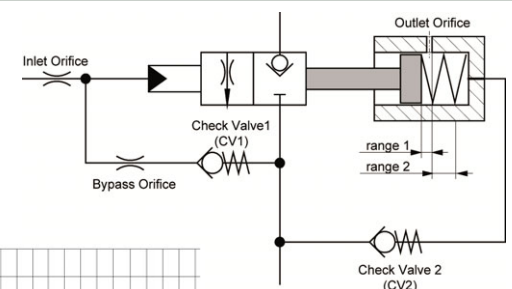
The valve is only activated externally for lowering operation. Therefore a pressure signal which is divided from the lowering line pilots the load holding valve at port X.

For lifting the load the flow is directed from port A via a check valve to the winch with low losses. In idle position the load is locked without any leakage. To lower the load the valve is opened by increasing pressure at port X.

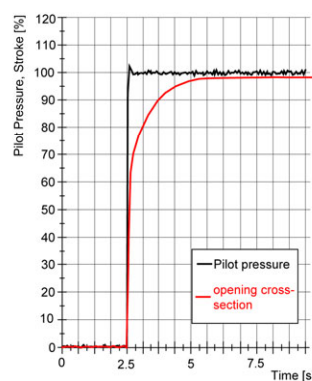
4.6 Feature 6: Damping System

Inlet and outlet orifices dampen the opening speed of the brake. WESSEL brake valves are additionally equipped with a stroke-dependent damping system:

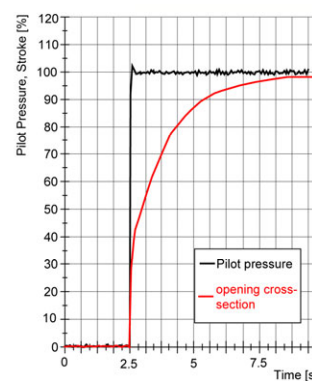
Small openings (range 1) with low damping are realized via an additional drain orifice. The further opening (range 2) is made with progressively increasing damping characteristics. A check-valve (CV 2) guarantees that the valve closes quickly.



minor damping



medium damping



strong damping

4.7 Feature 7: Opening Pressure

The valve is opened by the motor inlet pressure (lowering pressure).

The opening pressure defines the pressure which opens the leakage free seat valve. For WESSEL load holding valves the opening pressure is independent of the load pressure!

4.8 Feature 8: Directional valve for mechanical brake

Load holding valves of the design 3P have not provided any signal output for a mechanical brake and do not come with a switching valve for mechanical brakes.

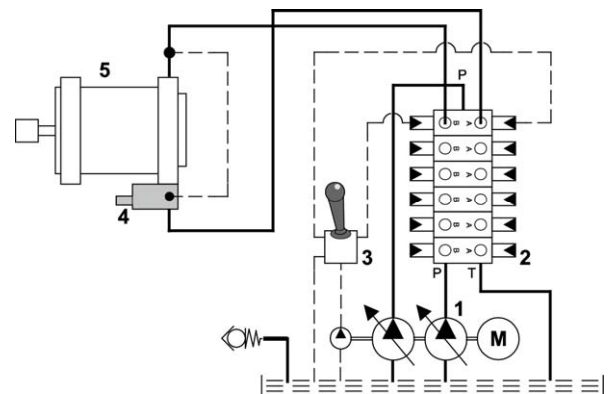
5 Installation

5.1 General Instructions

- Observe all installation and safety information of the construction machine manufacturer.
- Only technically permitted changes are to be made on the construction machine.
- The user has to ensure that the device is suitable for the respective application.
- Application exclusively for the range of application specified by the manufacturer.
- Before installation or deinstallation, the hydraulic system is to be depressurized.
- Settings are to be made by qualified personnel only.
- Opening is only to be performed with the approval of the manufacturer, otherwise the warranty is invalidated.
- The included connection recommendations are not guaranteed. The functionality and the technical specifications of the construction machine must be checked.

5.2 Connection Proposal

- Pump
- Main control valve
- Pilot control unit
- Load holding valve
- Winchmotor



5.3 Mounting - Mounting Space

- Observe the connection designations
- Observe the strength category and recommended torques (see appendix) of the fastening bolts
- Do not damage seals and flange surfaces
- The air must be exhausted from the hydraulic system
- Valve is mounted on the hydromotor by means of 4x cylinder head screws 8.8

	SAE	Thread A	Thread depth B	Torque Nm
	SAE CODE 62			
	3/4"	M10	71,5	49
	1"	M12	81,5	85

5.4 Setting the opening pressure



CAUTION!

The opening point of the load holding valve is specified in Feature 7, adjusted at port X. Due to the pressure dividing function the pressure at MVSt is at a lower level than specified in Feature 7.

Changes to the settings are only to be performed by authorized and trained personnel. The user is responsible for any changes made to the valve.

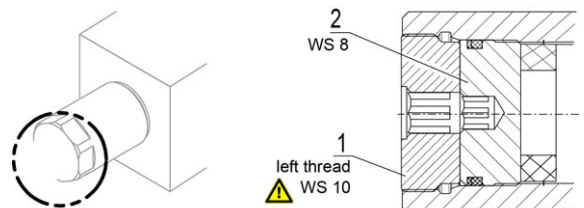
A setting under 13 bar is not permitted, measured at MVSt.



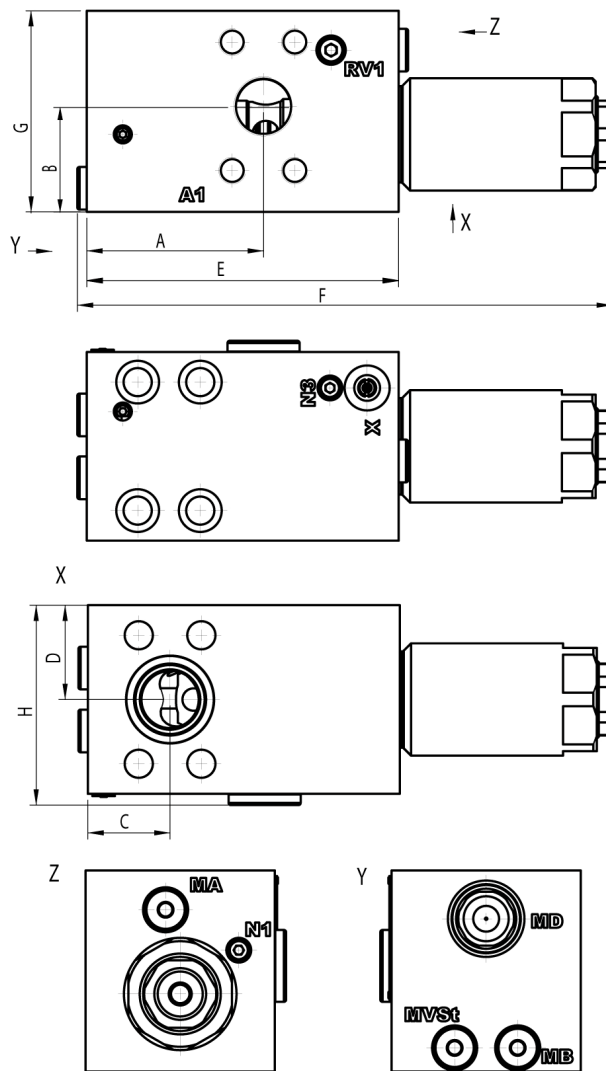
ATTENTION

During operation, the valve can heat up to the oil temperature.

- Remove seal (factory status).
- Loosen the AF10 (1) counternut, left-hand thread (Locknut completely screw out at 3/4" + 1" version)
- The opening start of the hose rupture valve must be approximately 0.5 bar above the opening start of the main control unit spool.
- Increase: Turn the set-screw AF8 (2) clockwise.
- Decrease: Turn the set-screws AF8 (2) counter-clockwise.
- An adjustment of 1mm thread corresponds a variation of the opening pressure fo 2,9 bar.
- Tighten the counternut AF10 (1).



5.5 Dimensions

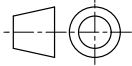


Criterion	Dimension ↑		
Connection		SAE 3/4"	SAE 1"
		DIN ISO 6162-2, SAE J518/2 (CODE62)	
A, A1	A (mm)	76	78,5
	B (mm)	39	47
B	C (mm)	40,5	36,5
	D (mm)	39,5	42
	E (mm)	132	138,5
	F (mm)	225,5	237,6
	G (mm)	79,5	89,5
	H (mm)	84,7	89

6 Notes, Standards and Safety Instructions

6.1 General Instructions

- The views in drawings are shown in accordance with the European normal projection variant



- A comma (,) is used as a decimal point in drawings
- All dimensions are given in mm

6.2 Standards

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

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

6.3 Safety requirements

- WESSEL-HYDRAULIK GmbH guarantees utilization of standard and proven safety principles in accordance with ISO 13849-2: 2003, Tables C.1 and C.2 for the construction of the valve described here.
- WESSEL-HYDRAULIK GmbH has a certified quality management system in accordance with DIN EN ISO 9001.
- The MTTFd value can be adopted from machine manufacturers with 150 years of experience for the described valve!
- Note: The user is therefore responsible for complying with the fundamental and proven safety principles according to ISO 13849-2: 2003, Tables C.1 and C.2 for the implementation and operation of the hydraulic component!