Differential Lock Valve

Series MT..DV (for 2 motors)

- robust and reliable
- energy-optimised over the whole flow range
- simple control
- compact design offers space-saving installation
- reliable, uniform motion of the wheel-drives being controlled

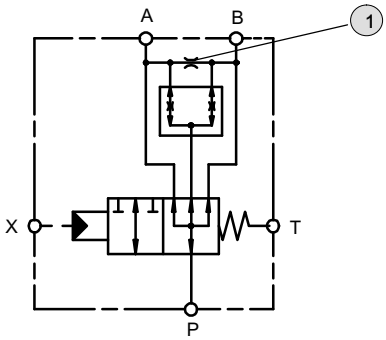
1 Description

The differential lock valve consists essentially of a bi-directional flow divider (dividing and combining) and a directional valve for optionally bypassing the flow divider.

It is intended for use in either open- or closed-loop hydrostatic drives with parallel-connected hydraulic motors. When the lock valve is switched OFF, the inlet flow can divide itself among the mo-tors in any required manner. When the lock valve is switched ON, however, the inlet flow is divided into two pressure compensated portions in accordance with the division ratio of the lock valve. The motors are thus driven at fixed speeds, regardless of their respective loads. This arrangement prevents any hydraulic wheel motor from spinning in conditions of poor traction. A balancing orifice can optionally be arranged between the outlets A and B. This allows some redistribution of flow and prevents un-wanted torque build-up between wheels in these circumstances, and when turning. The differential lock valves can be supplied with either hydraulic, or electro-hydraulic, actuation.

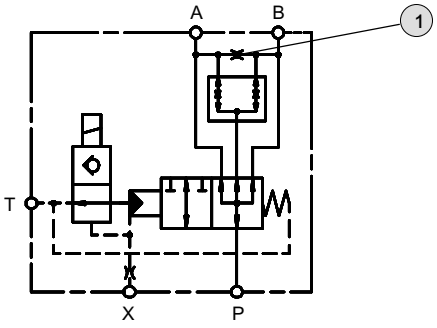
2 Symbols

2.1 Hydraulic actuation



1	Balance orifice can be fitted

2.2 Electro-hydraulic actuation



3 Technical data

Hydraulical characteristics	Description, value, unit	
	Size 08	Sice 16
Nominal flow rate Q_{max}	100 l/min	250 l/min
Flow range 2) 1)	25 l/min, 50 l/min, 75 l/min, 100 l/min	120 l/min, 160 l/min, 200 l/min, 250 l/min
Operating pressure p_{max}	420 bar	
Pilot pressure $p_{st\ min.}$- $p_{st\ max.}$	10 bar ... 30 bar	
Viscosity range	10 mm^2/s ... 300 mm^2/s	
Maximum fluid cleanliness	ISO 4406, class 21/18/14 (NAS 1638 class 9); achievable with a filter rating of $ß_{10} \geqq 75$	
Operating fluid temperature range	-20 °C ... +80 °C	
Division ratio (for others, contact Bucher)	1:1	
Fluids	HL/HLP mineral oils DIN 51524; other fluids consult Bucher	

Electrical characteristics	Description, value, unit
Voltage	Direct currant voltage12 or 24 DC
Power consumption	30 W
Nitrile seals	NBR
Duty cycle	100 ED %
Ambient temperature	max. +80 °C
Coil temperature	max. +140 °C
Enclosure protection DIN 40050	IP65
Electrical connection	Connecting plug to DIN 43650

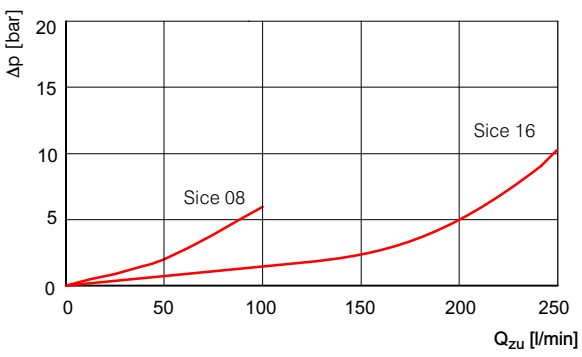
1) State the application's effective nominal flow when ordering

2) Note the minimum flow per section 4.2

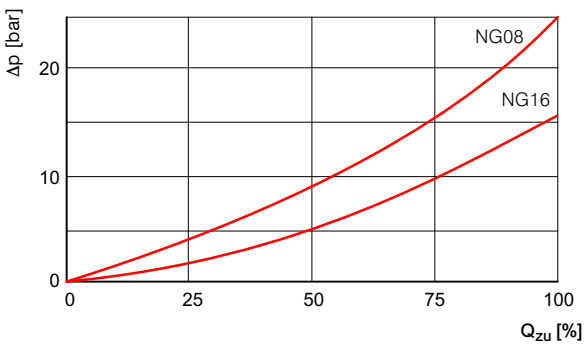
4 Performance graphs

4.1 Flow resistance (at 35 mm^2/s)

Dividing function switched OFF
(in relation to the input Q_{zu} volume flow rate)

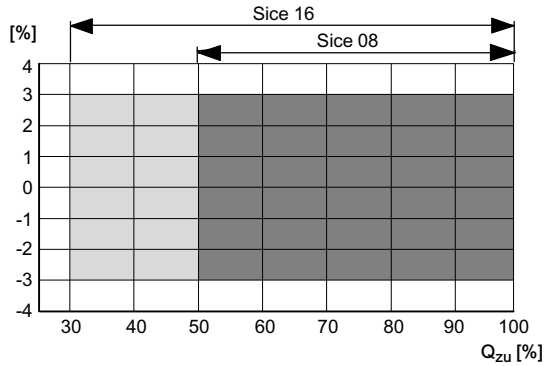


Dividing function switched ON
(in relation to the flow range)



4.2 Division accuracy

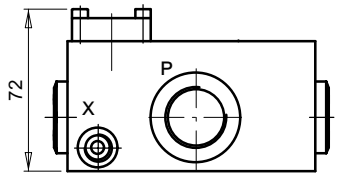
Percentage of the applicable nominal flow without a balancing orifice between A and B (hole plugged)



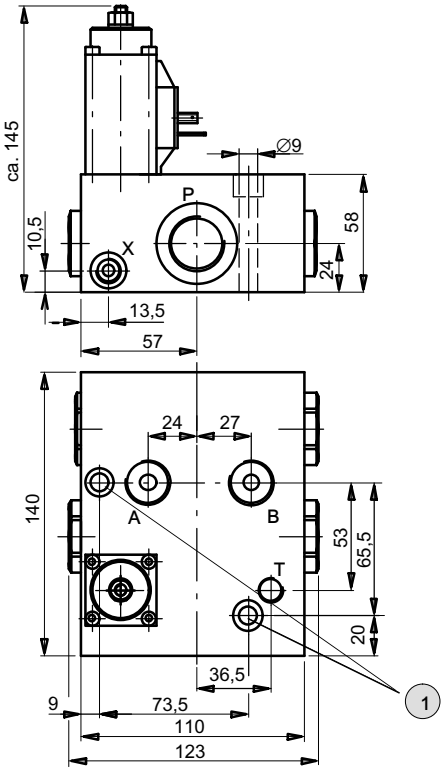
5 Dimensions

5.1 MT08DV

Hydraulic actuation MT08DV...-*H-...

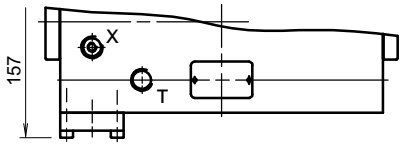


electro-hydraulic actuation MT08DV...-EH-...

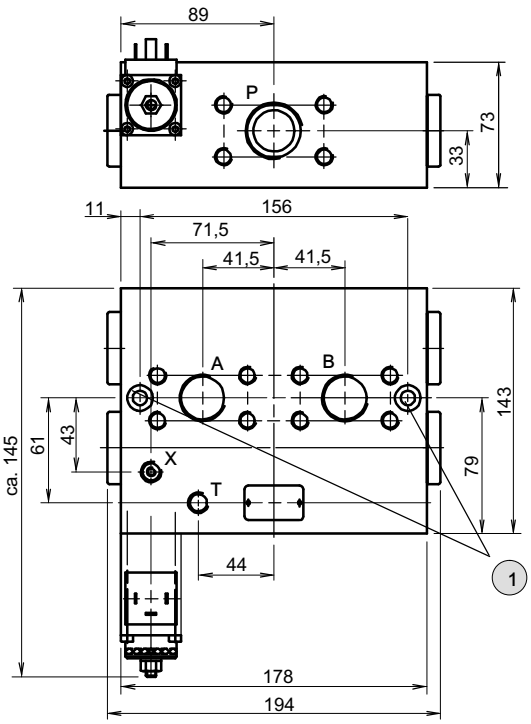


5.2 MT16DV

hydraulic actuation MT16DV...-*H-...



electro-hydraulic actuation MT16DV...-EH-...



1	Clearance holes for M8 mounting cap screws to DIN 912

MT08DV				MT16DV		
Port threads:	Port	P	M27 x 2	Port threads:		
	Ports	A and B	M22 x 1,5	Port	P	M 33 x 2, alternatively SAE (3000 PSI) R $1^{1}/_{4}$
	Ports	X and T	M12 x 1,5	Ports	A and B	M 27 x 2, alternatively SAE (3000 PSI) R 1”
				Ports	X and T	M 12 x 1,5For SAE flanges, see data sheet 100-P-000049

6 Ordering code

M T 0 8 D V 1 0 0 2 5 - E H - 0 G 1 2 D ... [4]

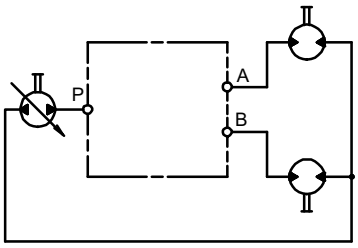
Differential lock valve	= MT..DV	
Nom. size	= 08 or 16	
Division	1 : 1	= 10
	1:1,5 etc. [3]	= 15
Nominal flow rate per. sect. 3.	e. g. 25 l/min	= 025
Type of actuation	hydraulic	= *H
	electro-hydraulic	= EH
Design no.		
Coil voltage	DC 12Volt	= G12
	DC 24Volt	= G24
	with actuation type *H	= ***

3) With unequal division, the larger flow goes to port B

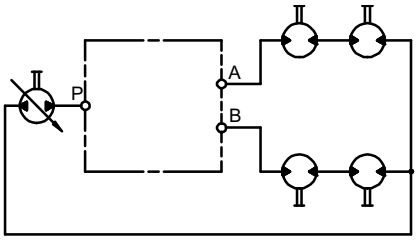
4) Size of balancing orifices must be plainly stated (see also sect. 2) e.g. 0.6 / 0.8 / 1.0 etc. e.g.:
if balancing orifice D is to be 0.8 mm, then D = 0.8

7 Application example

7.1 2-wheel drive



7.2 4-wheel drive



8 Installation

Horizontal mounting is recommended. Do not bolt the valve body onto an uneven mounting surface.

9 Options

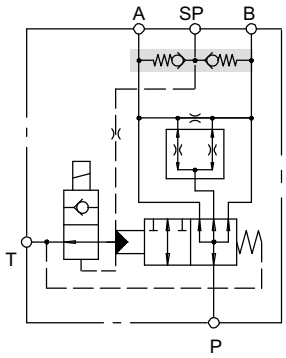
In addition to the standard versions, differential-lock valves can also be equipped with numerous auxiliary functions and combined in customer-specific manifold blocks. In these cases, the technical data and performance graphs may differ from standard.

/07 = With anti-cavitation valves
Connection thread in inches: P = G1“
A+B = G3/4“
T+Sp = G1/4“

/11 = With anti-shock valve
(pressure-relief valve + anti-cavitation valve)

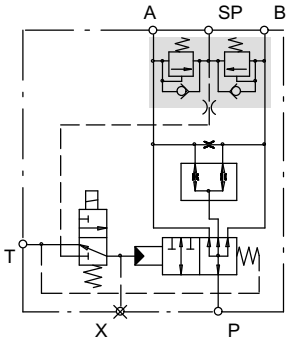
9.1 Examples

MT..DV../07



With make-up valves and inch-size port threads

MT..DV../11



With anti-shock valves
(pressure-relief and make-up valves)

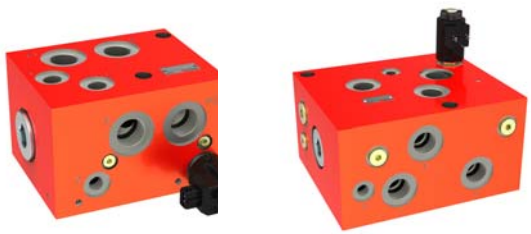
The valve bodies can also be applied for assembly on hydraulic pumps and with customer-specific ports.

10 System augmentation

10.1 Switch valve for traction drives

10.1.1 USV08 und USV16 series

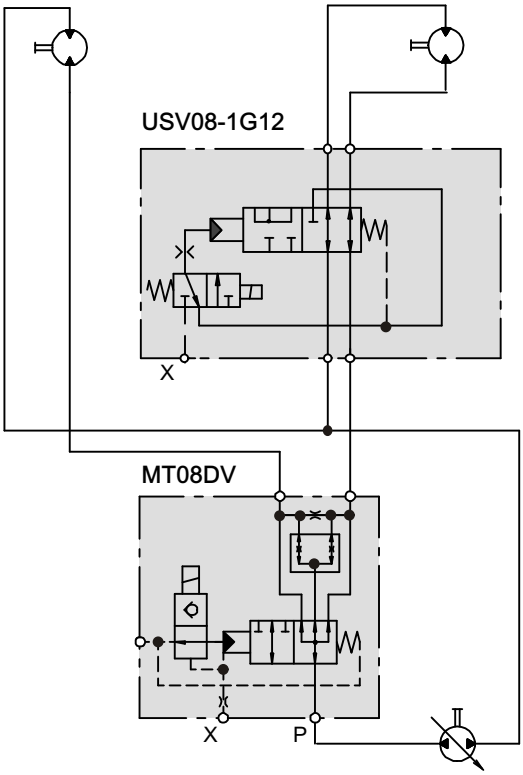
These valves enable switching from a serial connection, for example “drive mode,” into a parallel connection using a differential lock valve. For the user, such solutions mean reliable output and fast operating speeds.



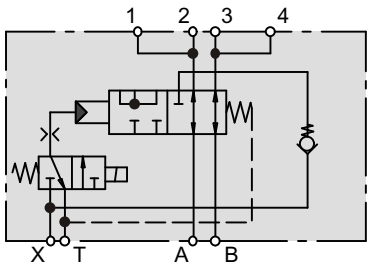
10.1.2 Application examples

- Sweepers
- Black-top pavers
- Cold milling machines
- Trench rollers
- Farm sprayers

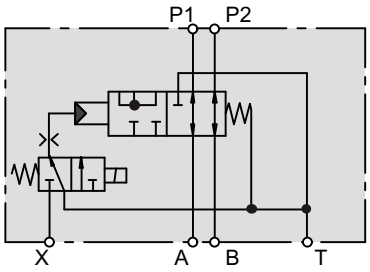
10.1.3 Circuit diagram



USV16-0G12



USV08-1J12



Hydraulical characteristics	Description, value, unit	
	Sice 08	Sice 16
Operating pressure p_{max}	420 bar	420 bar
Nominal flow rate	120l/min	160l/min
Dimensions (valve body without solenoid)	160mmx105mmx130mm	220mmx118mmx185mm
Ordering information and order number	USV08-1J12 = 100032930	USV16-0G12 0 100028253
Fluid temperature range	-20 °C ... +80 °C	
Viscosity range	10 mm^2/s ... 250 mm^2/s	
Maximum fluid cleanliness	ISO 4406, class 21/18/14 (NAS 1638 class 9); achievable with a filter rating of $ß_{10} \geqq 75$	
Nitrile seals	NBR (Nitril-Butadien-Kautschuk)	
Port threads	A,B,P = M27x2 nach DIN EN ISO 9974-1	

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