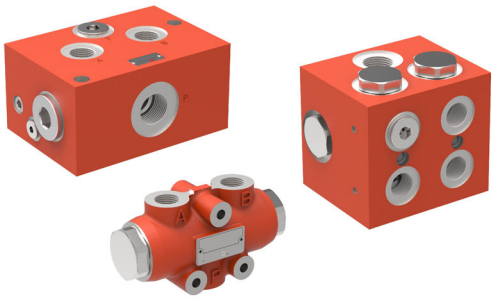
Flow Divider

Bi-directional
Series MTDA



- robust, simple and reliable
- easy to service
- flows can be split or merged with accuracy (divide/combine functions).
- the flow division ratio can be altered to suit customer requirements.

1 Description

1.1 General

Series MTDA units are flow dividing valves that operate automatically. They are intended for use with hydraulic fluids. They divide a flow, the total rate of which may be varied, up to 4 part-flows. When flow passes through a valve in the opposite direction, the part-flows are combined into one single flow (added). The dividing and combining functions are largely independent of the pressures of the divided flows and of the fluid viscosity.

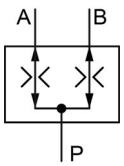
In order for the valve to work properly, a continuous flow is required at all ports. For example, if one actuator is no longer able to move, then the other part-flow will also be restricted. If the actuators served by the flow divider operate at different pressures, then the pressure of the total flow entering the valve will correspond to the higher of the two actuator pressures. Large pressure differences may give rise to significant heat generation, which must be taken into consideration when designing the system.

1.2 Application examples

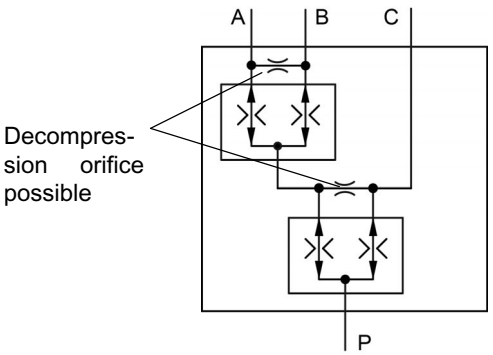
- Work access platforms
- Lifting platform
- Harvesters
- Municipal equipment
- Snow/ice clearing equipment
- Wood chippers
- Raod rollers
- Tail lifts

2 Symbols

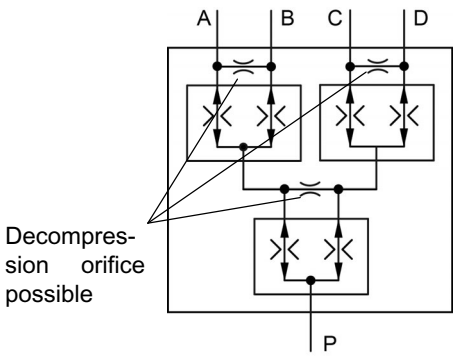
2 part-flows



3 part-flows



4 part-flows



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3 Technical data

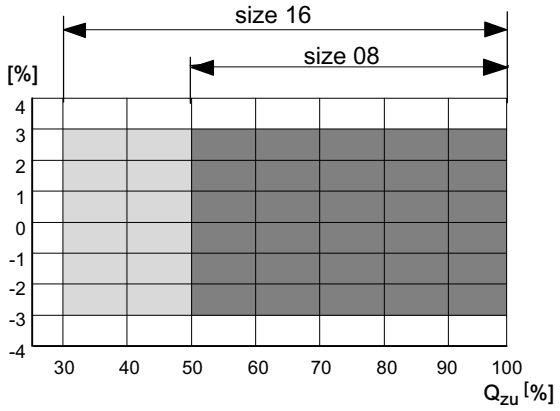
General characteristics		Unit	Description, value
Maximum operating pressure		bar	315 bar
Oil temperature range		°C	-20 ... +80
Viscosity range		mm^2/s	10 ... 300
Minimum fluid cleanliness			ISO 4406 class 20/18/15
Nitrile seals			NBR (Nitril-Butadin-Kautschuk)
Weight:	MTDA08 MTDA16 MTDA..3F MTDA..4F	kg	1,5 8 8,3 8,4

4 Performance graph

Values refer to an viscosity of 35 mm^2/s.

4.1 Division accuracy [%]

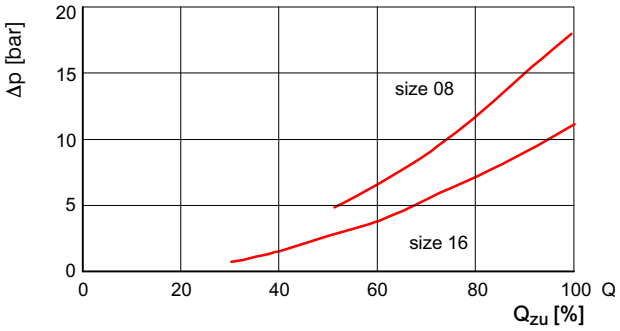
Division accuracy +/- 3% of the max. flow rate, based on control flow range of the respective flow divider (see chapter 6).



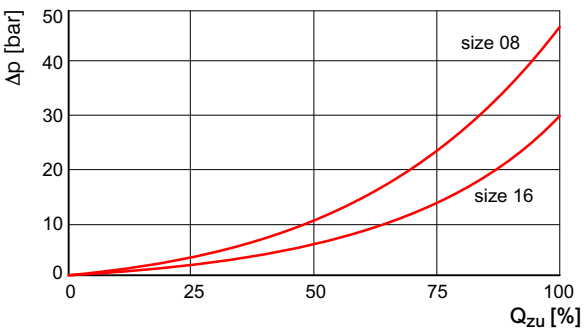
4.2 Pressure drop characteristics (Δp)

Pressure drop v. flow rate

4.2.1 MTDA08 / MTDA16



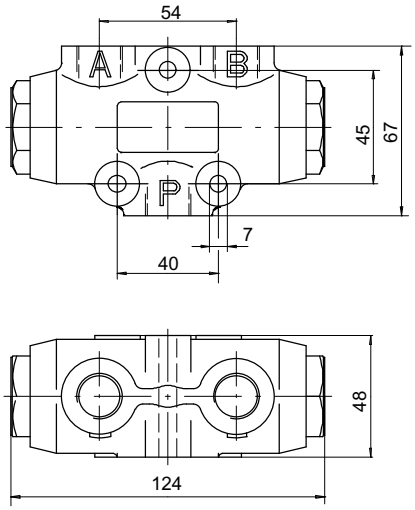
4.2.2 MTDA..3F / MTDA..4F



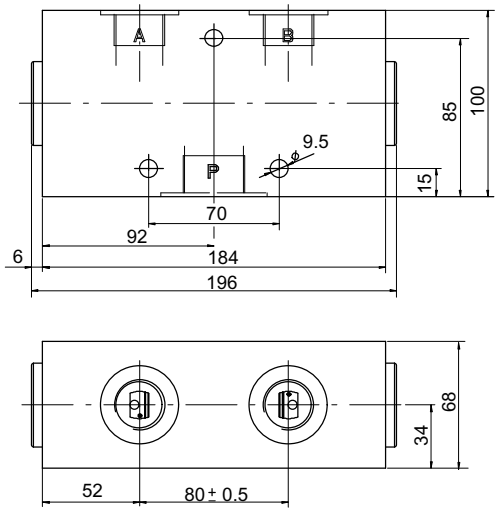
IMPORTANT : Q_{zu} = really inlet flow (0% = 0 l/min, 100% = maximum control flow)
Higher division accuracy on enquiry.

5 Dimensions

5.1 MTDA08



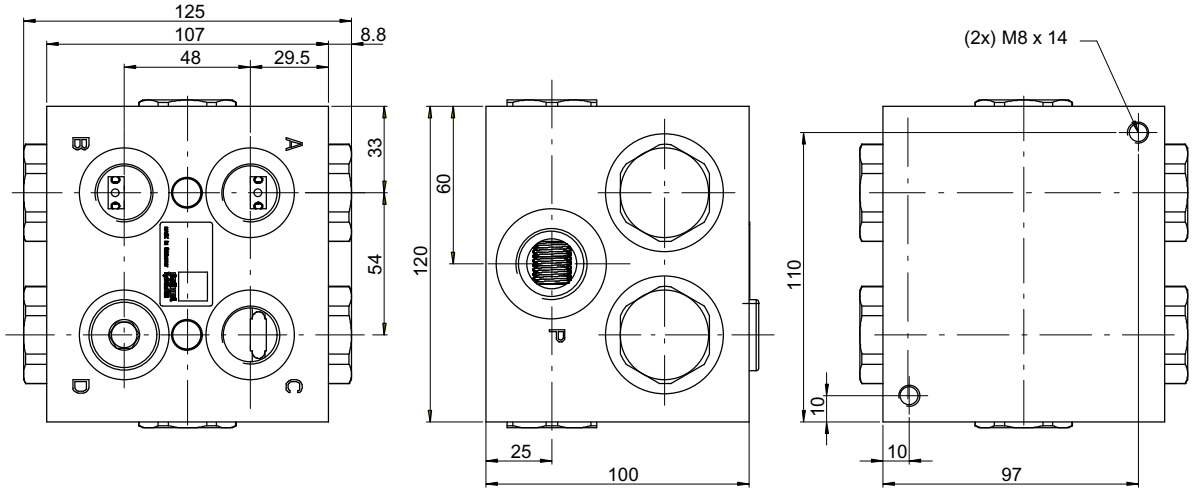
5.2 MTDA16



5.2.1 Port threads

Flow range [l/min]	Metric		Inch	
	Port P	Port A + B	Port P	Port A + B
004 … 025	M18 x 1,5	M18 x 1,5	G⅜“	G⅜“
032 … 100	M22 x 1,5	M18 x 1,5	G½“	G⅜“
100 … 120	M27 X 2	M22 x 1,5	G⅜“	G½“
160 … 250	M33 x 2	M27 x 2	G1“	G¾“

5.3 MTDA083F / MTDA084F



5.3.1 Port threads

Flow range [l/min]	Metric		
	Port P	Port A+B	Port C+D
004 … 100	M27 x 2	M22 x 1,5	M22 x 1,5

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6 Ordering code

6.1 MTDA08 / MTDA16

M	T	D	A	0	8	-	0	0	4	M	3	0	/	

Flow divider

Bi-directional

Port thread

Nominal size 08
16

Control flow range [l/min]

MTDA08				MTDA16	
004	= 2-4	025	= 12-25	100	= 35-100
006	= 3-6	032	= 16-32	120	= 40-120
008	= 4-8	050	= 25-50	160	= 50-160
012	= 6-12	075	= 37-75	200	= 60-200
016	= 8-16	100	= 50-100	250	= 75-250

Port threads Metric = M
Inch = R

Division ratio, see section 6.4 (no valid for division ratio 1:1)

Option (to be inserted by the factory)

6.2 MTDA083F

MT	D	A	08	3F	10	10	025	-	M

Flow divider

Bi-directional

Port thread

Nominal Size = 08

Tripple flow divider = 3F

Division ratio A to B+C 1:1 = 10
1:1,5 = 15 etc. [1)]

Division ratio B to C 1:1 = 10
1:1,5 = 15 etc. [1)]

Control flow range [l/min]

004	= 2-4	016	= 8-16	50	= 25-50
006	= 3-6	025	= 12-25	75	= 37-75
008	= 4-8	032	= 16-32	100	= 50-100
012	= 6-12				

Port thread
Metric = M (other port threads on request)

1) With unequal division: For the division ratio A to B+C, the larger part-flow must be at outlet B+C.
For the division ratio B to C, the larger part-flow must be at outlet C.

6.3 MTDA084F

MT	D	A	08	4F	10	10	10	025	-	M

Flow divider

Bi-directional

Port thread

Nominal Size = 08

Fourfold flow divider = 4F

Division ratio A+B to C+D
1:1 = 10
1:1,5 = 15 etc. 1)

Division ratio A to B
1:1 = 10
1:1,5 = 15 etc. 1)

Division ratio C to D
1:1 = 10
1:1,5 = 15 etc. 1)

Control flow range [l/min]

004	= 2-4	016	= 8-16	50	= 25-50
006	= 3-6	025	= 12-25	75	= 37-75
008	= 4-8	032	= 16-32	100	= 50-100
012	= 6-12				

Port thread
Metric = M (other port threads on request)

1) With unequal division: For the division ratio A+B to C+D, the larger part-flow must be at outlet C+D.
For the division ratio A to B, the larger part-flow must be at outlet B.
For the division ratio B to C, the larger part-flow must be at outlet C.

6.4 Unequal division on enquiry

In the case of unequal division, the division ratio is shown in the flow divider model code

e. g. 13 = 1 : 1,3
20 = 1 : 2
30 = 1 : 3

Ordering example:

Flow range: Q_{zu} 60 l/min with unequal division of 1 : 3

Flow divider: **MTDA08-075M30**

At an inlet flow rate of 60 l/min the unequal divisionprod. : 15 l/min at port A and 45 l/min at port B

6.5 Example for division accuracy

Flow range: Q_{zu} 60 l/min, required division of QA/QB = 30 l/min (division 1 : 1)

Flow divider: **MTDA08-075M**

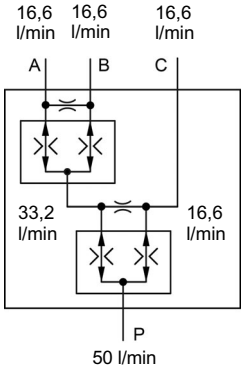
flow range 37...75 l/min
max. flow rate 75 l/min

max. allowable deviation = 75 l/min x ±3% = ±2,25 l/min

resulting part- flow rate at Q_{zu} 60 l/min:

Port A - Q_{min} = 27,75 l/min / Q_{max} = 32,25 l/min
Port B - Q_{min} = 27,75 l/min / Q_{max} = 32,25 l/min

6.6 Example Division MTDA083F2010050



A = 16,6 l/min
B = 16,6 l/min
C = 16,6 l/min

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7 End-stop synchronisation of parallel-connected cylinders

When one of the two cylinders reaches its end-stop, the flow to the other cylinder drops to approx. 5 - 10% of its nominal rate. This pressure-dependent leakage flow enables the other cylinder to slowly re-synchronise itself. To enable full-speed re-synchronisation of the lagging cylinder, each actuator line from the flow divider must be equipped with a pressure relief valve.

8 Installation attitude and mounting

To prevent the weight of the spool causing division inaccuracies, the valve must be installed so that the spool axis is horizontal. When mounting the valve, make sure that the body is not subjected to any distorting forces. Do not use tapered-thread pipe fittings.

9 Fluid cleanliness

MTDA flow divider require fluid with a minimum cleanliness level of ISO 4406 code 20/18/15.

We recommend the use of fluids that contain anti-wear additives for mixed-friction operating conditions. Fluids without appropriate additives can reduce the service life of pumps and motors.

10 Fluid cleanliness

Cleanliness class (RK) onto ISO 4406.

Code ISO 4406	Number of particles / 100 ml		
	≥ 4 µm	≥ 6 µm	≥ 14 µm
23/21/18	8000000	2000000	250000
22/20/18	4000000	1000000	250000
22/20/17	4000000	1000000	130000
22/20/16	4000000	1000000	64000
21/19/16	2000000	500000	64000
20/18/15	1000000	250000	32000
19/17/14	500000	130000	16000
18/16/13	250000	64000	8000
17/15/12	130000	32000	4000
16/14/12	64000	16000	4000
16/14/11	64000	16000	2000
15/13/10	32000	8000	1000
14/12/9	16000	4000	500
13/11/8	8000	2000	250

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Classification: 430.310.335.310.