

RE 64 642/04.00

Replaces: 09.98



Pressure relief and anti-cavitation valves (cartridge type) for mobile applications

Nominal sizes 10 to 40

Maximum operating pressure 420 bar

Maximum flow 680 L/min

H/A 3022

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Features

- Pressure valves protect the pump and or actuator as well as the system against over pressure
- Anti-cavitation valves prevent filling problems and, therefore, cavitation during actuator movements that are caused by load influences
- Pressure and anti-cavitation valves are available as valve combinations for fitting into hydraulic components, manifolds or line mounting
- Various versions (direct actuated, pilot operated and hydraulic unloading)

Description and application, symbols**Pressure relief valve,
direct operated**

Direct operated valves seal free of leakage and are used mainly as cylinder safety valves.

**Pressure relief valve,
pilot operated**

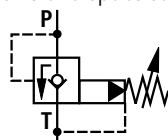
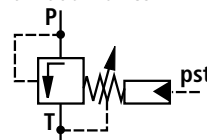
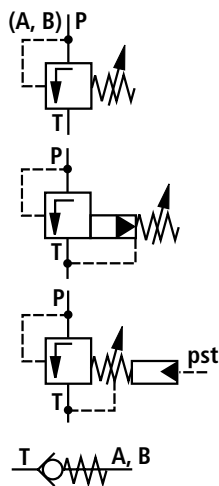
Depending on their design, pilot operated pressure relief valves are either leak-free or subject to leakage and, depending on type, allow pilot oil to flow to tank before the set pressure is reached. Used mainly for services with loads below the primary pressure of a directional control valve block, and for hydraulic motors.

**with pressures
sequence stage****Anti-cavitation valve**

Oil lost through leakage or operation of pressure relief valves is replaced by anti-cavitation valves. Their cracking pressure is normally above 0.5 bar, therefore, the inlet pressure must be higher than the atmospheric pressure.

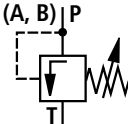
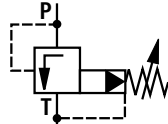
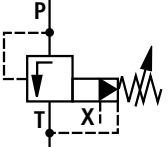
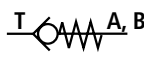
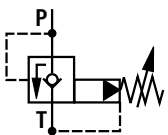
**Combined pressure relief/
anti-cavitation valve,
pilot operated
with pressure sequence
stage
or pressure cut-off stage**

Inexpensive and space saving alternative to individual valves.

**pilot operated****with pressure sequence stage****with pressure cut-off stage****Special note:**

- When exchanging valve cartridges, take note of the correct tightening torque!
- The setting of given pressure values is achieved at:
 - direct operated pressure valves at a flow of 2 to 3 L/min
 - pilot operated pressure valves at a flow of 10 L/min.
- Maximum permissible degree of contamination of the fluid is to NAS 1638 class 9.
We, therefore, recommend a filter with a minimum retention rate of $B_{10} \geq 75$.

Ordering details

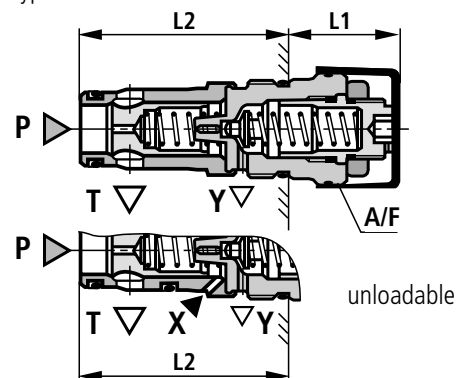
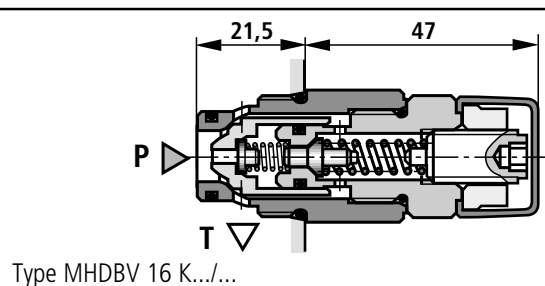
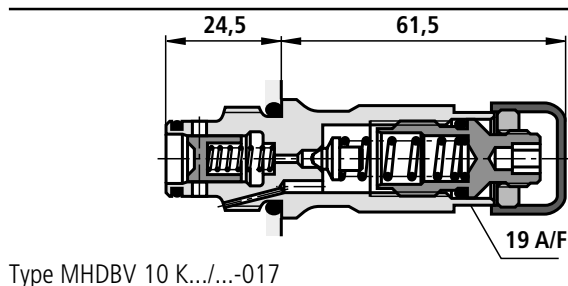
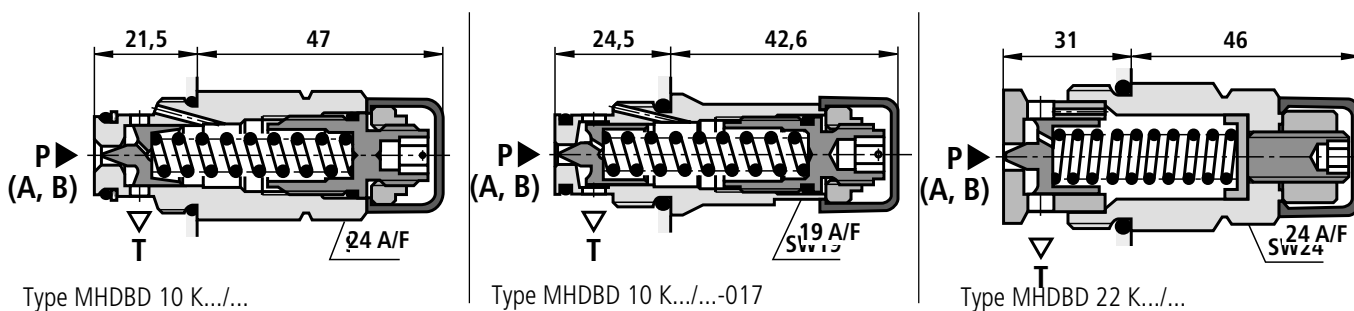
Valve type, symbols	For control block	Material no.	Designation	Seal kit M = NBR V = FPM	Tightening torque ± 10 Nm	Char. curves, see pages 7 to 11	Installation cavity, see pages 6 & 7
Pressure relief valve, direct operated 	M1-16	502051	MHDBD 10 K2-1X/050M	309720M	90	D1	FB
	SM12	365729	MHDBD 10 K2-1X/100M	309720M	90	D1	FB
	SP12	394225	MHDBD 10 K2-1X/100V	309602V	70	D1	FB
	MHB10S	360331	MHDBD 10 K2-1X/200M	309720M	70	D1	FB
		394226	MHDBD 10 K2-1X/200V	309602V	90	D1	FB
		364462	MHDBD 10 K2-1X/315M	309720M	90	D1	FB
		394227	MHDBD 10 K2-1X/315V	309602V	90	D1	FB
		362701	MHDBD 10 K2-1X/420M	309720M	90	D1	FB
		389255	MHDBD 10 K2-1X/420V	309602V	90	D1	FB
	M2-10	368719	MHDBD 10 K2-1X/100M-017	309539M	50	D1	FA
		355146	MHDBD 10 K2-1X/200M-017	309539M	50	D1	FA
		353767	MHDBD 10 K2-1X/315M-017	309539M	50	D1	FA
	M1-22	316256	MHDBD 22 K2-1X/315M	309509M	150	D7	FG
		316257	MHDBD 22 K2-1X/200M		150	D7	FG
Pressure relief valve, pilot operated 	M2-10	497855	MHDBV 10 K2-1X/315M-017	309539M	50	D8	FA
		334901	MHDBV 10 K2-1X/315V-017	309535V	50	D8	FA
	MO-10	342180	MHDBV 16 K2-1X/100M	309523M	90	D4	FB
	M1-16	339308	MHDBV 16 K2-1X/420M	309523M	90	D4	FB
	SM12; SP12						
	MO-16/22	304674	MHDBV 22 K2-1X/420YM	309625M	80	D2	FD
	M1-16/22/32	307482	MHDBV 22 K2-1X/420 YV	309675V	80	D2	FD
Pressure relief valve pilot operated, unloadable 	MO-16/22	307480	MHDBV 22 K2-1X/420XYM	309639M	80	D2	FD
	M1-16/22/32	453925	MHDBV 22 K2-1X/420XYV	309685V	80	D2	FD
	MO-32/40	308696	MHDBV 40 K2-1X/420XYM	309689M	300	D3	FL
		382742	MHDBV 40 K2-1X/420XYV	309564V	300	D3	FL
Anti-cavitation valve 	M8-16/18	936509	MHSV 16 KB1-2X/VFH	309551V	100		FH
	SP08; MO-10; M1-16	936508	MHSV 16 KB1-2X/VFB	309546M	90	N1	FB
	SM12; SP12				70	N1	FB
	M8-22/25; M7-1X; SX18	936725	MHSV 22 KB1-2X/VFC	309598	¹⁾ 100	N2	FC
	SM18; SP18; M5-20				¹⁾ 100	N2	FC
	M1-22	316265	MHSV 22 KB1-1X/M	309500M	150	N4	FG
	M7-22-2X	936888	MHSV 22 KB1-2X/VLG		100		LG
	M1-32; M8-32	936726	MHSV 32 KB1-2X/VFK	309721V	150	N3	FK
Relief/anti-cavitation valve, pilot operated, 	M8-16/18	936469	MHDBN 16 K2-2X/420VFH		100		FH
	MO-10; SP08	936468	MHDBN 16 K2-2X/100VFB	309550V	90	D4/N1	FB
	M1-16; M4-15	936467	MHDBN 16 K2-2X/420VFB	309550V	90	D4/N1	FB
	SM12; SP12				70	D4/N1	FB
	M8-22/25; M7-1X; SX18	936834	MHDBN 22 K2-2X/100VFC	309598V	¹⁾ 100	D5/N2	FC
	SM18; SP18; M5-20	936718	MHDBN 22 K2-2X/420VFC	309598V	100	D5/N2	FC
	M1-22	936870	MHDBN 22 K2-2X/350VFG		150	D9/N5	FG
	M7-22-2X	936719	MHDBN 22 K2-2X/420VLG		100		LG
	M1-32	936882	MHDBN 32 K2-2X/100VFK	309559V	150	D6/N3	FK
	M5-25/32	936722	MHDBN 32 K2-2X/420VFK	309559V	150	D6/N3	FK
	M8-32				150	D5/N3	FK

¹⁾ 70 Nm by types SM18 / SP18 / SX18

Unit dimensions

(Dimensions in mm)

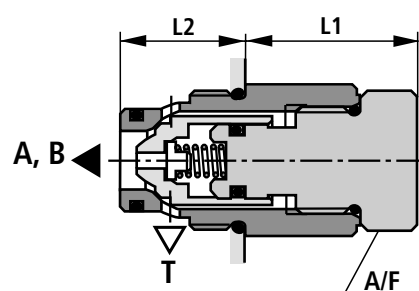
Pressure relief valve, direct operated



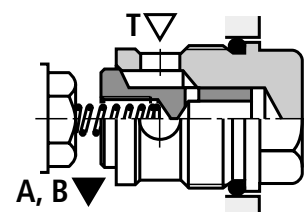
Type	L1	L2	A/F
MHDBV 22 K.../...Y	27	65	30
MHDBV 40 K.../...Y	30	76	36
MHDBV 22 K.../...XY	27	65	30
MHDBV 40 K.../...XY	30	76	36

Pressure relief valve,
pilot operated and
pilot operated, unloadable

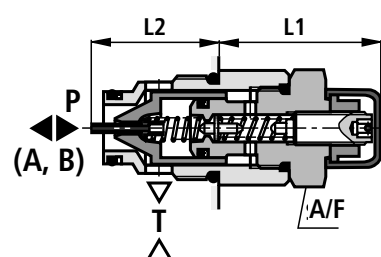
Anti-cavitation valve



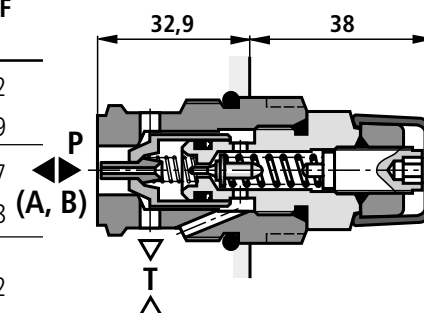
Type	L1	L2	A/F
MHSV 16 K.../...	47	24.3	22
MHSV 16 K.../...FH	24.4	35	22
MHSV 22 K.../...FC	31.6	31.5	27
MHSV 22 K.../...LG	29.3	38.5	28
MHSV 32 K.../...	33.7	36	32
MHDBV 40 K.../...XY	30	76	36



Type MHSV 22 K.../...

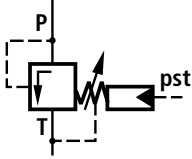
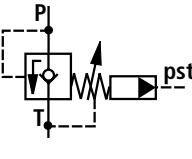
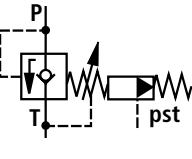
Relief/anti-cavitation valve,
pilot operated

Type	L1	L2	A/F
MHDBN 16 K.../...	47	24.3	22
MHDBN 16 K.../...FH	52.3	35	19
MHDBN 22 K.../...FC	48.1	35.5	27
MHDBN 22 K.../...LG	52.1	38.5	28
MHDBN 32 K.../...	50.2	40.9	32



Type MHDBN 22 K.../350.

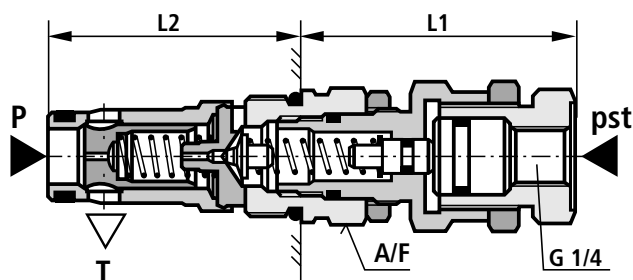
Ordering details

Valve type, symbols	For control block	Material no.	Designation	Seal kit M = NBR V = FPM	Tightening torque ± 10 Nm	Char. curves, see pages 7 to 11	Installation cavity, see pages 6 and 7
Pressure relief valve, pilot operated with pressure sequence stage, hydraulically actuated 	M0-16/22 M1-16/22/32	307944	MHDBH 22 K9-1X/420YM	309662M	80	D2	FD
	M0-32/40	408463	MHDBH 40 K9-1X/420YM	309699M	300	D3	FL
Relief/anti-cavitation valve, pilot operated with pressure sequence stage, hydraulically actuated 	M8-16/18	936676	MHDBB 16 K9-2X/420VFH01	—	—	—	FH
	M1-16 SM12; SP12	936672	MHDBB 16 K9-2X/420VFB01	—	90 70	D4/N1	FB
	M5-20 M8-22/25 SM18; SP18	936679	MHDBB 22 K9-2X/420VFC01	—	100 100 70	D5/N2	FC
	M7-22-2X	936960	MHDBB 22 K9-2X/420VLG01	—	100	—	LG
	M1-32 M5-25/32	936956	MHDBB 32 K9-2X/420VFK01	—	150	D6/N3	FK
Relief/anti-cavitation valve, pilot operated with pressure cut-off stage, hydraulically actuated 	M8-16/18	936657	MHDBL 16 K9-2X/420VFH01	—	100	—	FH
	M1-16 SM12; SP12	936656	MHDBL 16 K9-2X/420VFB01	—	90 70	D4/N1	FB
	M8-22/25 M5-20 SM-18/SP-18	936680	MHDBL 22 K9-2X/420VFC01	—	100 100 70	D5/N2	FC
	M1-32 M5-25/32 M8-32	936721	MHDBL 32 K9-2X/420VFK01	—	150	D6/N3	FK

Unit dimensions

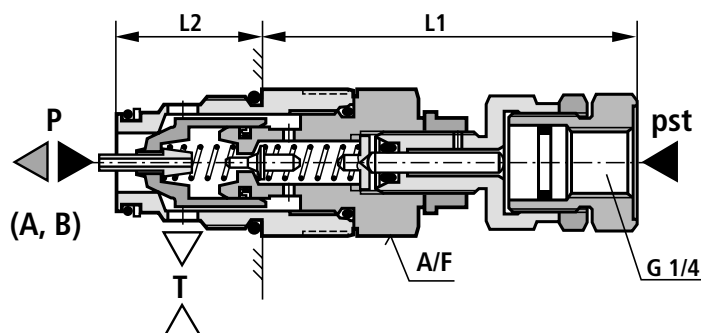
(Dimensions in mm)

Pressure relief valve, pilot operated with pressure sequence stage, hydraulically actuated



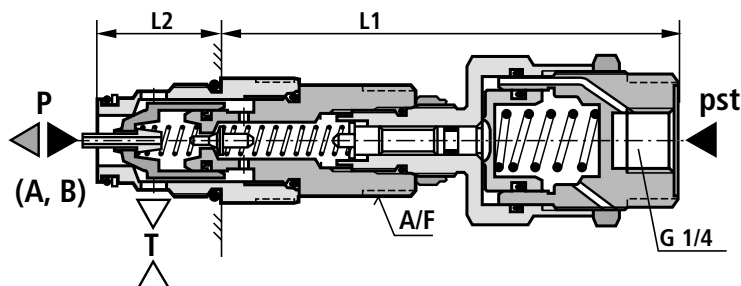
Type	L1	L2	A/F
MHDBH 22 K9-1X/420YM	61	65	30
MHDBH 40 K9-1X/420YM	61	76	36

Relief/anti-cavitation valve, pilot operated with pressure sequence stage, hydraulically actuated



Type	L1	L2	A/F
MHDBB 16 K9-2X/420VFB01	84.8	24.3	24
MHDBB 16 K9-2X/420VFH01	90.4	35	24
MHDBB 22 K9-2X/420VFC01	82.2	35.5	30
MHDBB 22 K9-2X/420VLG	88.9	38.5	22
MHDBB 32 K9-2X/420VFK01	81.9	40.9	34

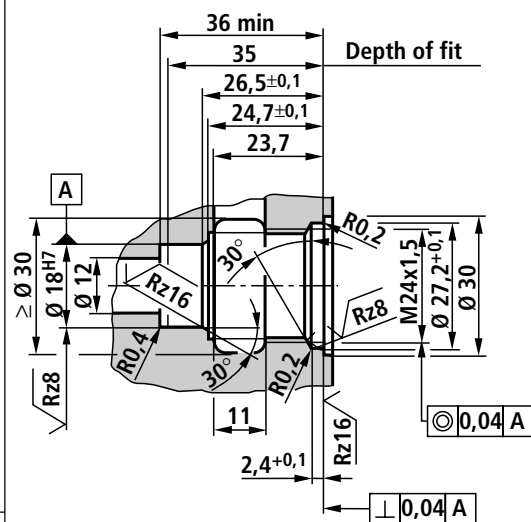
Relief/anti-cavitation valve, pilot operated with pressure cut-off stage, hydraulically actuated



Type	L1	L2	A/F
MHDBL 16 K9-2X/420VFB01	117.5	24.5	24
MHDBL 16 K9-2X/420VFH01	111.4	35	24
MHDBL 22 K9-2X/420VFC01	114.9	35.5	30
MHDBL 32 K9-2X/420VFK01	114.6	40.9	34

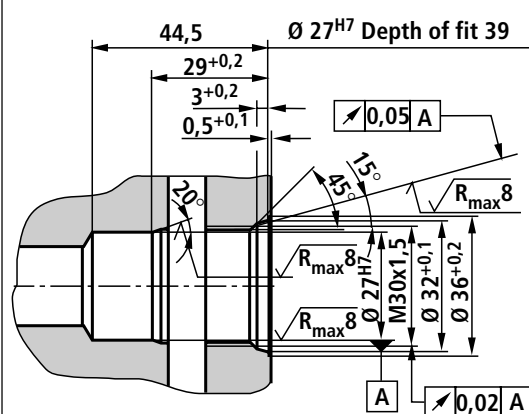
MHDB / MHSV

FH



M24x1.5

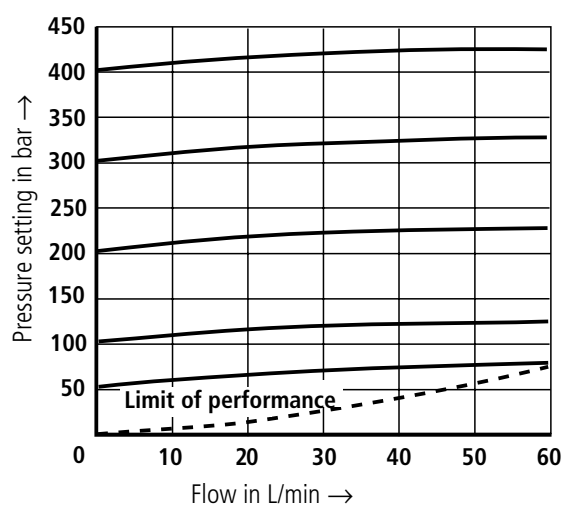
LG



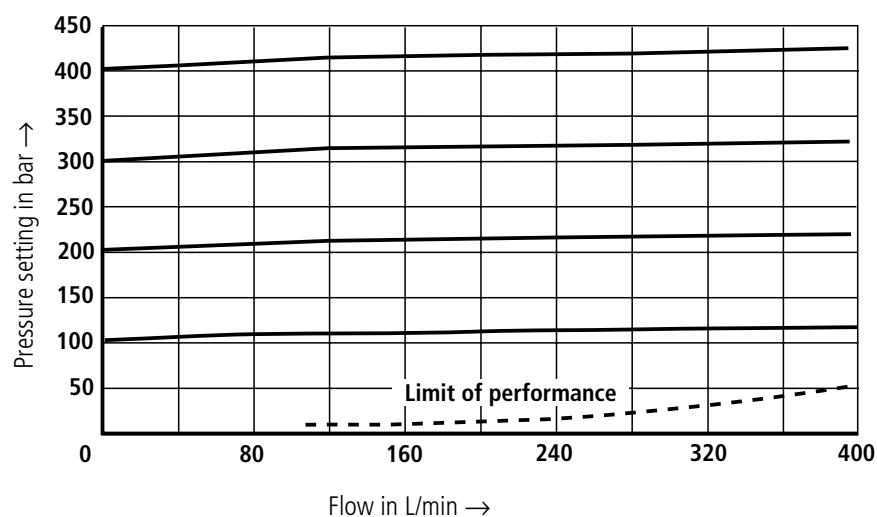
M30x1.5

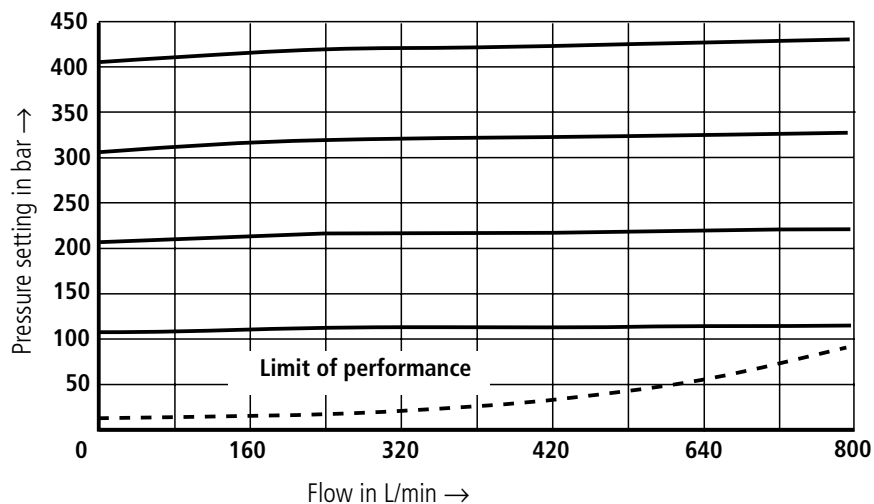
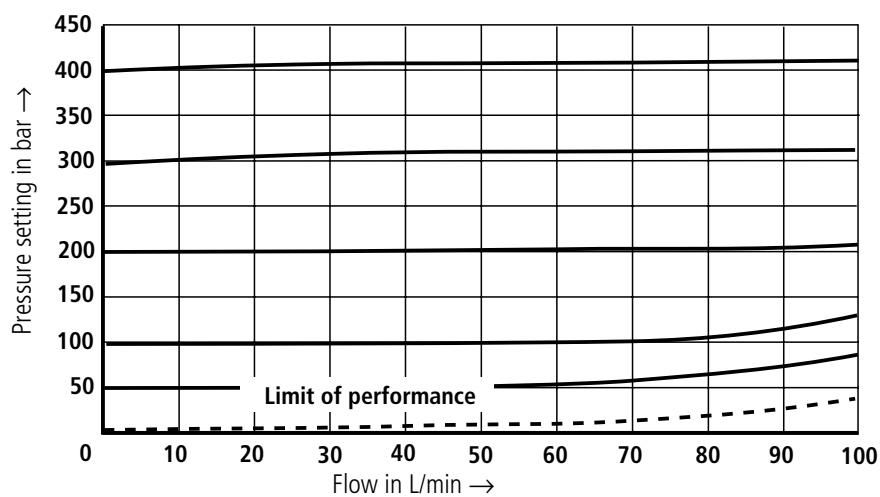
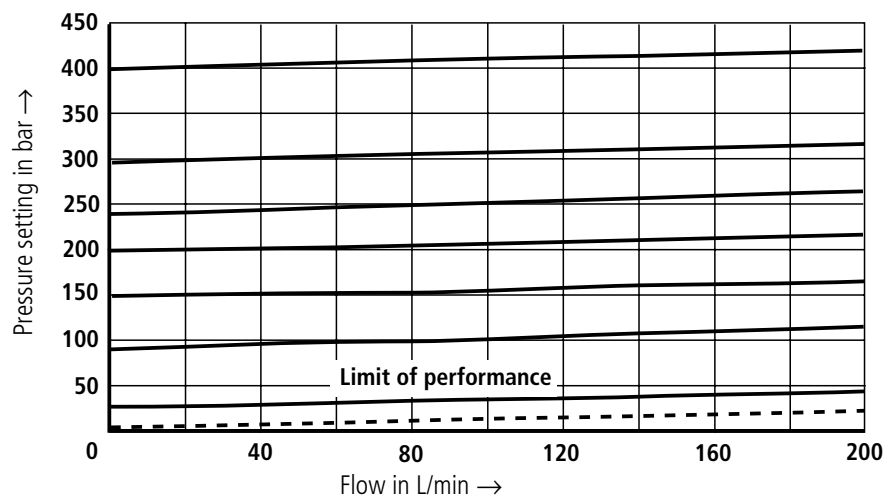
Characteristic curves (measured at $\nu = 41 \text{ mm}^2/\text{s}$ and $\vartheta = 50 \text{ }^\circ\text{C}$)

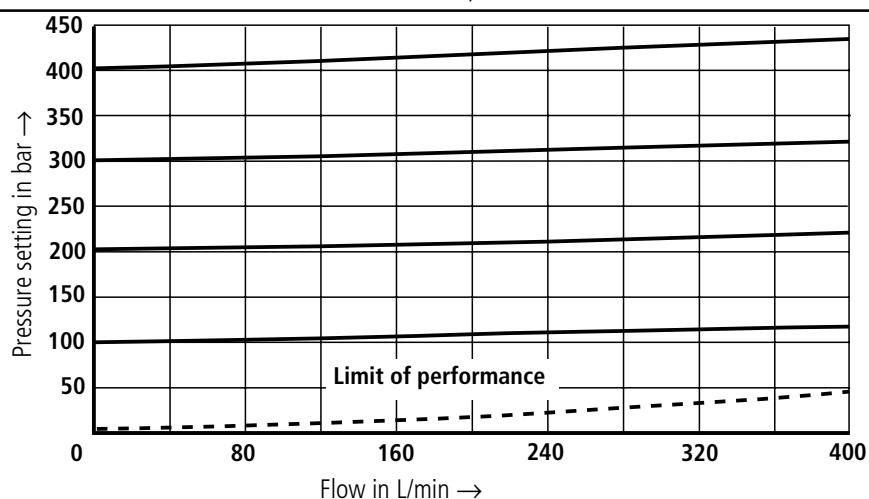
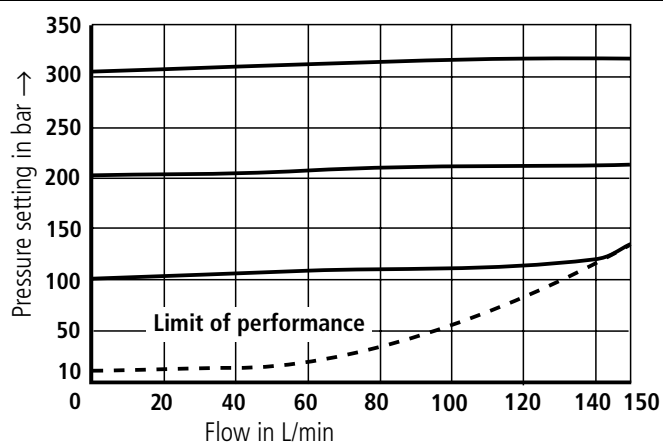
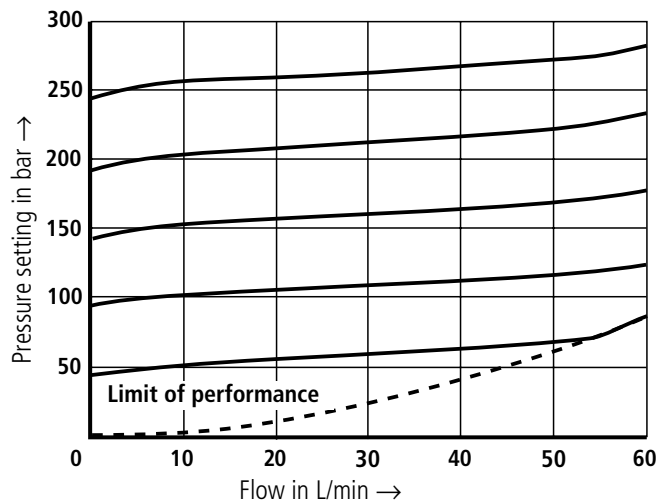
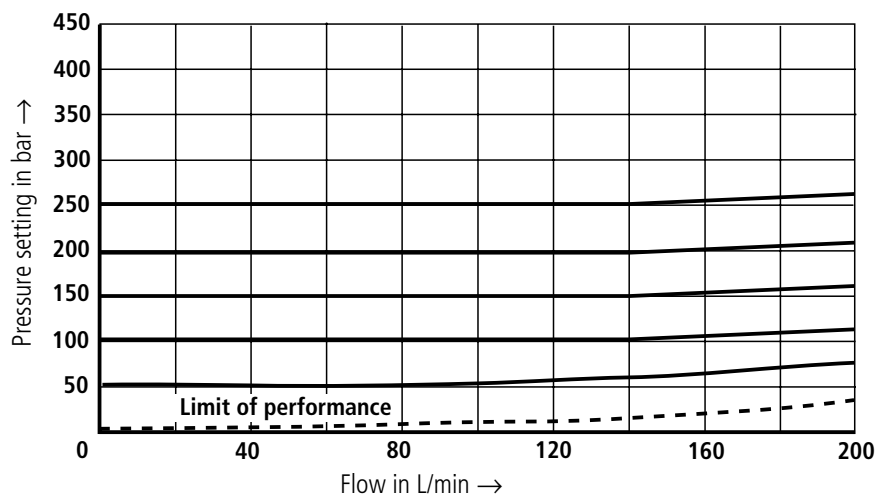
D1

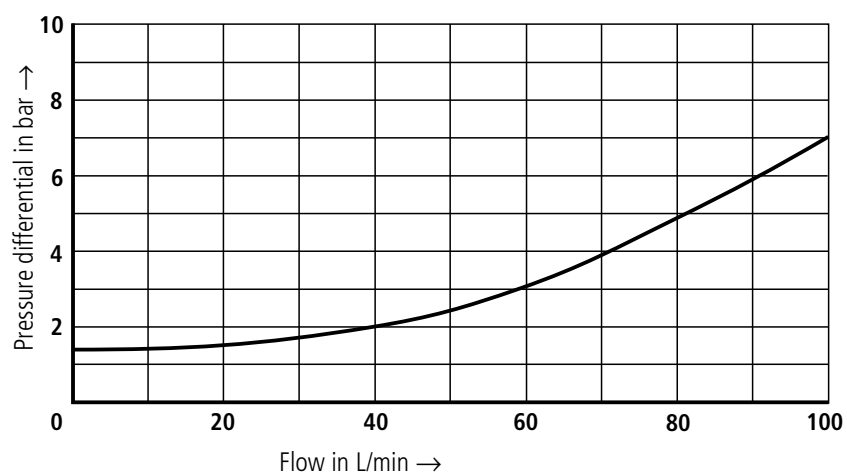
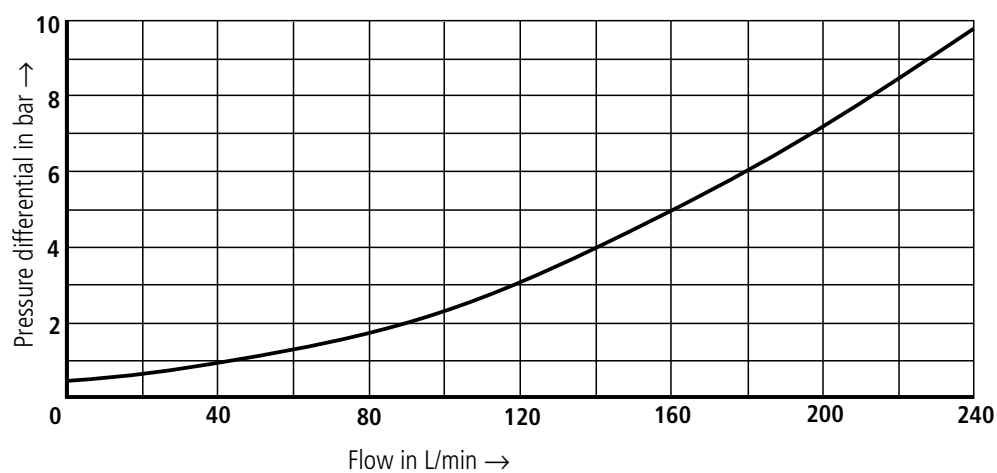
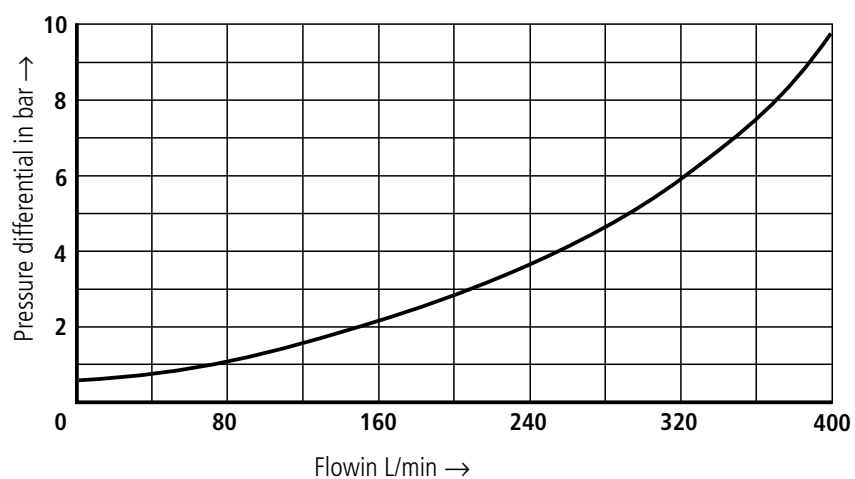


D2

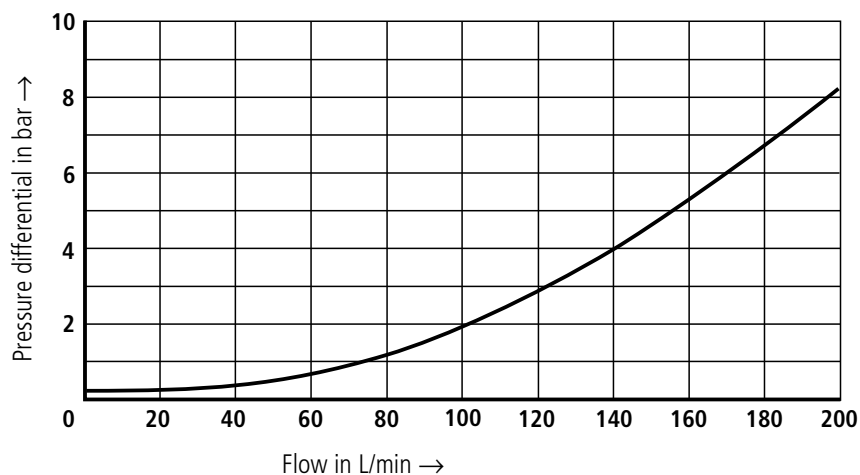
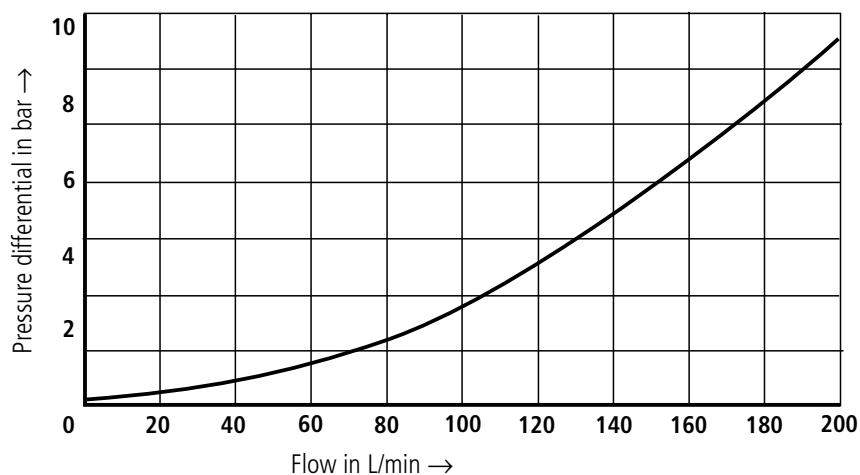


Characteristic curves (measured at $\nu = 41 \text{ mm}^2/\text{s}$ and $\vartheta = 50 \text{ }^\circ\text{C}$)**D3****D4****D5**

Characteristic curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $\vartheta = 50 \text{ }^\circ\text{C}$)**D6****D7****D8****D9**

Characteristic curves (measured at $\nu = 41 \text{ mm}^2/\text{s}$ and $\vartheta = 50 \text{ }^\circ\text{C}$)**N1****N2****N3**

Characteristic curves (measured at $v = 41 \text{ mm}^2/\text{s}$ and $\vartheta = 50 \text{ }^\circ\text{C}$)

N4

N5

Ordering details: anti-cavitation valve type MHSV...

MH	S	V		K	B	1	-	/			*
Mobile hydraulics		= MH								Further details in clear text	
Anti-cavitation valve		= S								SO number (3 digit)	
Without drain connection		= V								Installation cavity	
Nominal size 16		= 16								FB = M24 x 1	
Nominal size 22		= 22								FC = M28 x 1	
Nominal size 32		= 32								FK = M33 x 1	
Valve version										FH = M24x1.5	
Cartridge				= K						FG = M30x1.5	
Without pilot control poppet				= B						LG = M30x1.5	
Cracking pressure 0,5 bar						= 1				M = NBR seals suitable for mineral oil (HL, HLP) to DIN 51 524	
										V = FKM seals suitable for phosphate ester (HFD-R)	
										2X = Series 20 to 29 (20 to 29: unchanged installation and connection dimensions)	
										For type MHSV...FG (for cavity „FG“)	
										1X = Series 10 to 19 (10 to 19: unchanged installation and connection dimensions)	

Note:
If valve type differs from those listed on page 2 of the catalogue sheet, please consult us!

Note:

If valve type differs from those listed on page 2 of the catalogue sheet, please consult us!

Ordering details: pressure relief valves / relief/anti-cavitation valves type MHDB...

MH K - / *											
Mobile hydraulics = MH			Further details in clear text								
Pressure relief valve:			SO number, (3 digit) for variations from standard series								
• pilot operated = DBV			1) 01 = 3) Threaded connection p _{st}								
• direct operated = DBD			Installation cavity								
• pilot operated, with hydraulic pressure sequence stage = DBH			FA = M22 x 1.5								
Relief/anti-cavitation valve = DBN			FB = M24 x 1								
DBN + pressure sequence stage = DBB			FH = M24x1.5								
DBN + pressure cut-off stage = DBL			FC = M28 x 1								
Nominal size 10 = 10			FD = M28 x 1.5								
Nominal size 16 = 16			FG = M30 x 1.5								
Nominal size 22 = 22			LG = M30x1.5								
Nominal size 32 = 32			FK = M33 x 1								
Nominal size 40 = 40			FL = M39x1.5								
Valve version			M = NBR seals, suitable for mineral oil (HL, HLP) to DIN 51 524								
Cartridge = K			V = FKM seals, suitable for phosphate ester (HFD-R)								
Adjustment			No code = Internal pilot oil supply and drain								
Set screw with protective cap = 2			X = Internal pilot oil supply, unloadable								
Settable at pressure sequence/cut-off stage ³⁾ = 9			Y = Internal pilot oil supply								
Series 10 to 19 = 1X			XY = External pilot oil drain								
(10 to 19: unchanged installation and connection dimensions)			100 = 100 bar max. possible pressure setting								
For types DBN, DBB and DBL			200 = 200 bar max. possible pressure setting								
Series 20 to 29 = 2X			315 = 315 bar max. possible pressure setting								
(20 to 29: unchanged installation and connection dimensions)			350 = 350 bar max. possible pressure setting								
			²⁾ 420 = 420 bar max. possible pressure setting								

Note:

If valve type differs from those listed on page 2 of the catalogue sheet, please consult us!

- 1) – 017 = cartridge "FA" (M22 x 1.5)
- 2) These values are valid for the cartridge. If the cartridge is fitted in a housing with a lower operating pressure than the max. possible setting of the cartridge, care must be taken to ensure that the cartridge setting does not exceed the lower pressure of the housing.
- 3) Required only for versions "DBB" and "DBL".

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