



MC10MV type pressure relief valves - 2 way

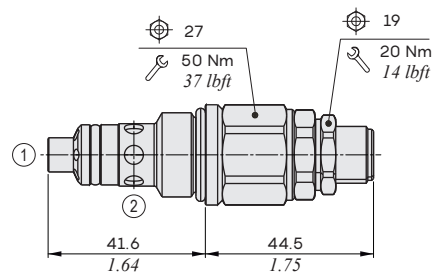
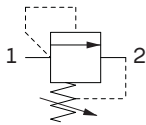
- Direct acting
- Poppet type
- Mechanical control with screw adjustment
- Prepared for antitampering cap
- Different springs available to vary pressure range
- The backpressure values on line 2 must be added to valve nominal setting

Technical specifications and diagrams are measured with mineral oil of 46 cSt viscosity at 40°C (104°F) temperature.

MC10MV

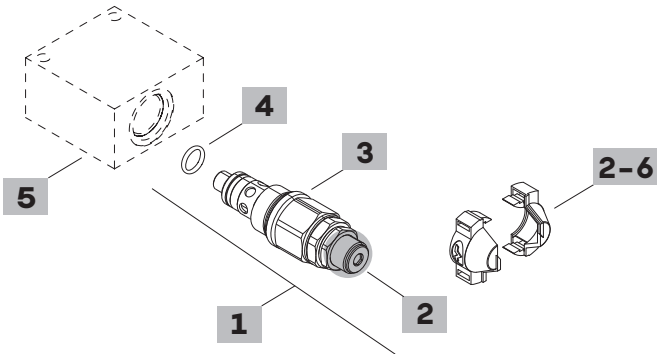
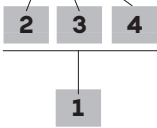
Nominal flow		70 l/min (18.5 US gpm)
Max. pressure		260 bar (3770 psi)
Oil leakage	at 80% of max. pressure setting	0.25 cm³/min (0.015 in³/min)
Fluid		mineral based or synthetic hydraulic fluid with lubricating properties
Viscosity		10-200 cSt
Max level of contamination		20/18/14 ISO4406
Fluid temperature	with NBR seals+Polyurethane with FPM seals	from -25°C (-13°F) to 90°C (194°F) from -20°C (-4°F) to 110°C (230°F)
Environmental temp. for working conditions		from -20°C (-4°F) to 60°C (140°F)
Cavity		SAE 10/2 A
Weight		0.18 kg (0.396 lb)

NOTE - For different conditions, please contact Walvoil Sales Dpt.



Ordering codes and description composition

MC10MV/0Y2B



1 Cartridges

TYPE	CODE	DESCRIPTION
MC10MV/0Y1B	OMC100020A03	Pressure range 1
MC10MV/0Y2B	OMC100020A04	Pressure range 2
MC10MV/0Y3B	OMC100020A05	Pressure range 3
MC10MV/0Y4B	OMC100020A06	Pressure range 4

2 Adjustments

TYPE	DESCRIPTION
Y	With screw
X	Valve set with antitampering cap (part code: see point 6)

3 Pressure range

Standard setting is referred to 5 l/min (1.32 Us gpm) flow	
TYPE	DESCRIPTION
1	Pressure range 5÷75 bar (72.5÷1100 psi); Std. setting 50 bar (725 psi)
2	Pressure range 76÷125 bar (1100÷1800 psi); Std. setting 80 bar (1160 psi)
3	Pressure range 126÷220 bar (1800÷3190 psi); Std. setting 175 bar (2540 psi)
4	Pressure range 215÷260 bar (3120÷3770 psi); Std. setting 220 bar (3190 psi)

4 Seals

TYPE	DESCRIPTION
B	NBR (Buna) o-ring seals, std configuration
V	FPM (Viton) o-ring seals, contact Sales Dept

5 Valve body

TYPE	CODE	DESCRIPTION
SAE10/2-G 3/8	3CC1020C11	Aluminium body for cavity 10 valve, G 3/8 std thread

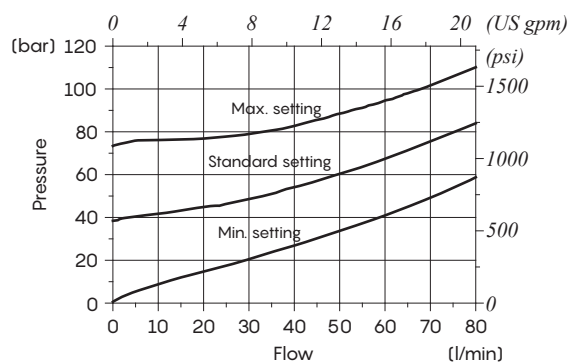
Note: aluminium body can stand up to 210 bar (3050 psi)
For steel bodies or different threading see from page 208

6 Accessories

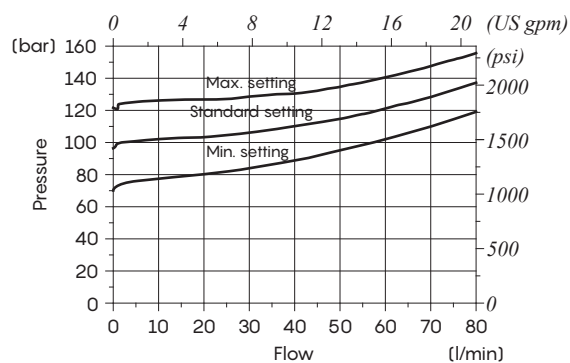
TYPE	CODE	DESCRIPTION
-	4COP126301	Antitampering cap (x2)

Rating diagrams

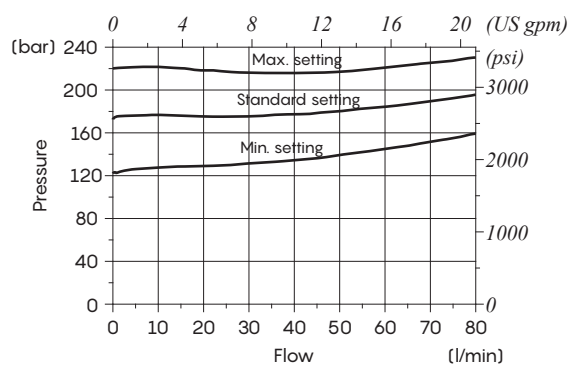
MC10MV pressure vs. flow
Pressure range 1



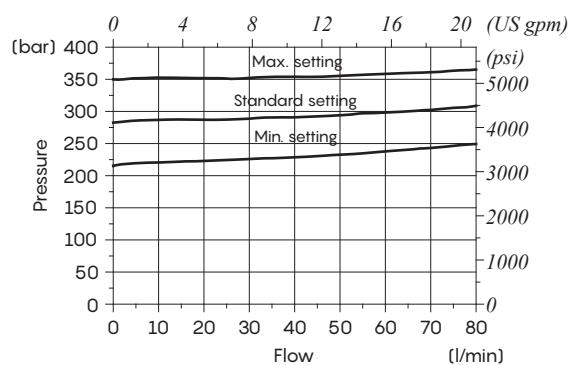
MC10MV pressure vs. flow
Pressure range 2



MC10MV pressure vs. flow
Pressure range 3



MC10MV pressure vs. flow
Pressure range 4







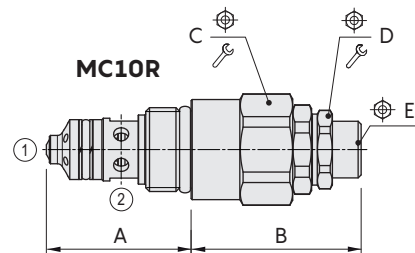
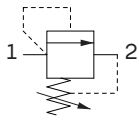
MC..R type pressure relief valves – 2 way

- Direct acting
- Poppet type
- Mechanical control with screw adjustment
- Prepared for antitampering cap
- Different springs available to vary pressure range
- The backpressure values on line 2 must be added to valve nominal setting
- From SAE08 to SAE10 cavities

Technical specifications and diagrams are measured with mineral oil of 46 cSt viscosity at 40°C (104°F) temperature.

		MC08R	MC09R	MC10R
Nominal flow		25 l/min (6.6 US gpm)	35 l/min (9.2 US gpm)	60 l/min (15.8 US gpm)
Max. pressure		350 bar (5100 psi)		
Oil leakage	at 80% of max. pressure setting	2 cm³/min (0.122 in³/min)		
Fluid		mineral based or synthetic hydraulic fluid with lubricating properties		
Viscosity		10–200 cSt		
Max level of contamination		20/18/14 ISO4406		
Fluid temperature	with NBR seals+Polyurethane with FPM seals	from -25°C (-13°F) to 90°C (194°F) from -20°C (-4°F) to 110°C (230°F)		
Environmental temp. for working conditions		from -20°C (-4°F) to 60°C (140°F)		
Cavity		SAE 08/2 A	SAE 09/2 A	SAE 10/2 A
Weight		0.170 kg (0.37 lb)	0.230 kg (0.51 lb)	0.315 kg (0.69 lb)

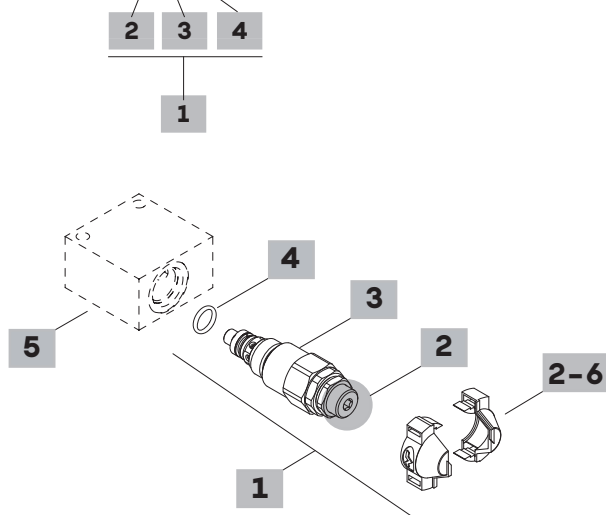
NOTE - For different conditions, please contact Walvoil Sales Dpt.



Valve type	A		B		C		D		E	
	mm	in	mm	in	Nm	lbft	Nm	lbft	Nm	lbft
MC08R	34	1.34	46.6	1.83	24	30	22	19	20	15
MC09R	33.8	1.33	46.6	1.83	24	42	31	19	20	15
MC10R	38.3	1.50	44.4	1.75	27	50	37	19	20	15

Ordering codes and description composition

MC08R/OY1B



1 Cartridges

TYPE	CODE	DESCRIPTION
SAE cavity 08/2 A		
MC08R/OY1B	OMC08002050	Pressure range 1
MC08R/OY2B	OMC08002051	Pressure range 2
MC08R/OY3B	OMC08002052	Pressure range 3
SAE cavity 09/2 A		
MC09R/OY1B	OMC09002000	Pressure range 1
MC09R/OY2B	OMC09002001	Pressure range 2
MC09R/OY3B	OMC09002002	Pressure range 3
SAE cavity 10/2 A		
MC10R/OY1B	OMC10002023	Pressure range 1
MC10R/OY2B	OMC10002024	Pressure range 2
MC10R/OY3B	OMC10002025	Pressure range 3

2 Adjustments

TYPE	DESCRIPTION
Y	With screw
X	Valve set with antitampering cap (part code: see point 6)

3 Pressure range

Standard setting is referred to 5 l/min (1.32 US gpm) flow

TYPE	DESCRIPTION
1	Pressure range 10÷120 bar (145÷1740 psi); Std. setting 80 bar (1160 psi)
2	Pressure range 40÷200 bar (580÷2900 psi); Std. setting 175 bar (2540 psi)
3	Pressure range 200÷350 bar (2900÷5100 psi); Std. setting 250 bar (3600 psi)

4 Seals

TYPE	DESCRIPTION
B	NBR (Buna)+Polyurethane o-ring seals, std configuration
V	FPM (Viton) o-ring seals, contact Sales Dept

5 Valve body

TYPE	CODE	DESCRIPTION
SAE08/2-G 3/8	3CC0820C11	Aluminium body for cavity 08 valve, G 3/8 std thread
SAE09/2-G 3/8	3CC0920C11	Aluminium body for cavity 09 valve, G 3/8 std thread
SAE10/2-G 3/8	3CC1020C11	Aluminium body for cavity 10 valve, G 3/8 std thread

Note: aluminium body can stand up to 210 bar (3050 psi)
For steel bodies or different threading see from page 208

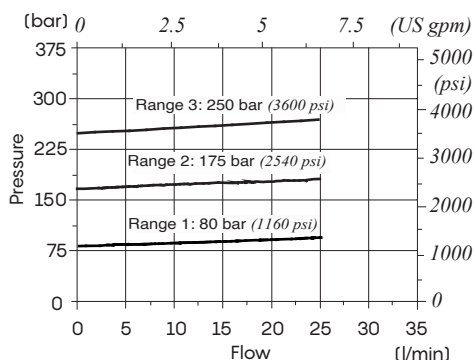
6 Accessories

TYPE	CODE	DESCRIPTION
-	4COP126301	Antitampering cap (x2)

Rating diagrams

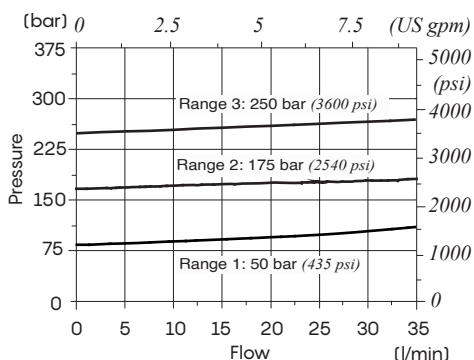
MC08R pressure vs. flow

Std. setting at 5 l/min (1.32 US gpm)



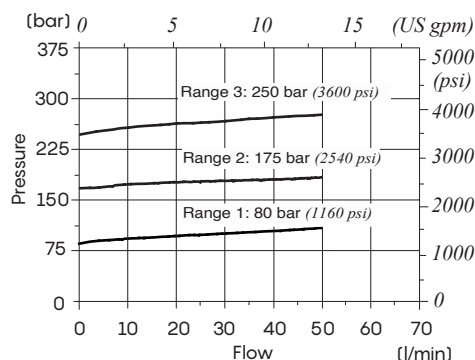
MC09R pressure vs. flow

Std. setting at 5 l/min (1.32 US gpm)



MC10R pressure vs. flow

Std. setting at 5 l/min (1.32 US gpm)





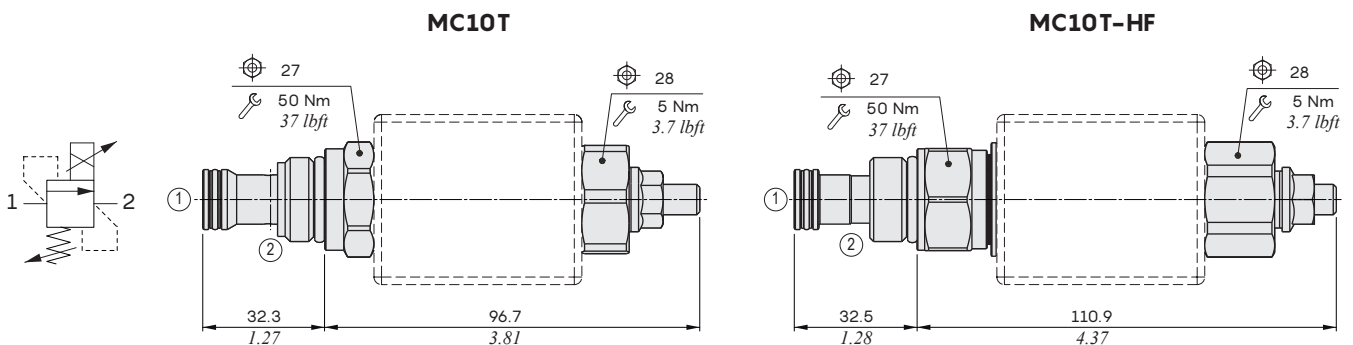
MC10T - MC10T-HF type pressure relief valves - 2 way

- Solenoid proportional type, direct acting
- Poppet type
- Decreasing pressure with increasing current (N.C)
- System of purging of air
- Applications for low flow rates (max. 10 l/min - 2.64 US gpm)

Technical specifications and diagrams are measured with mineral oil of 46 cSt viscosity at 40°C (104°F) temperature.

MC10T		MC10T-HF
Max. flow	3 l/min (0.79 US gpm)	10 l/min (2.64 US gpm)
Max. pressure	350 bar (5100 psi)	250 bar (3600 psi)
Oil leakage	at 80% of max. pressure setting	
	0.25 cm ³ /min (0.015 in ³ /min)	0.50 cm ³ /min (0.030 in ³ /min)
Fluid	mineral based or synthetic hydraulic fluid with lubricating properties	
Viscosity	10-200 cSt	
Max level of contamination	18/16/13 ISO4406	
Fluid temperature	with NBR seals+Polyurethane with FPM seals	from -25°C (-13°F) to 90°C (194°F) from -20°C (-4°F) to 110°C (230°F)
Environmental temp. for working conditions	from -20°C (-4°F) to 60°C (140°F)	
Cavity	SAE 10/2	
Coil type*	BH or BQP19	BQP19
Nominal voltages	12VDC - 24VDC	
Power rating	33 W (BH) - 15 W (BQP19)	15 W
Max. control current	12V->1.70 A - 24V->0.85 (BH) 12V->1.25 A - 24V->0.63 A (BQP19)	12V->1.25 A - 24V->0.63 A
Dither frequency	150 Hz	
Hysteresis	<5%	
Weight	0.54 kg (1.19 lb)	0.87 kg (1.91 lb)

NOTE - For different conditions, please contact Walvoil Sales Dpt. - *For coils further features see from page 201.

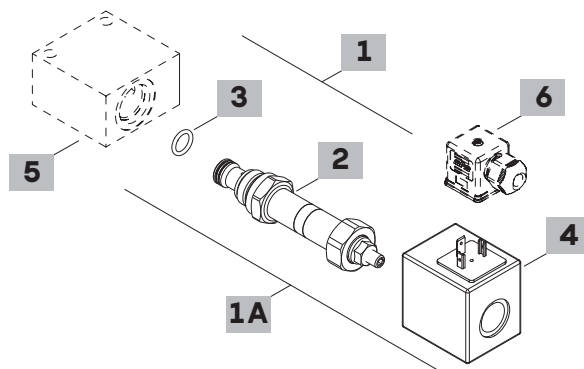


Ordering codes and description composition

MC10T/001B



MC10T/031B



1 Cartridges

TYPE	CODE	DESCRIPTION
MC10T/001B	OMC10002047	Pressure range 1
MC10T/002B	OMC10002048	Pressure range 2
MC10T/003B	OMC10002049	Pressure range 3

1A Complete cartridges with coil

TYPE	CODE	DESCRIPTION
MC10T/031B	OMC10002019	Pressure range 1 , 12VDC
MC10T/032B	OMC10002020	Pressure range 2 , 12VDC
MC10T/033B	OMC10002021	Pressure range 3 , 12VDC
MC10T-HF/033B	OMC10002070	Pressure range 3 , 12VDC

2 Pressure range

TYPE	DESCRIPTION
MC10T	
1	Pressure range 15÷130 bar (217÷1885 psi);
2	Pressure range 15÷170 bar (217÷2465 psi);
3	Pressure range 15÷210 bar (217÷3045 psi);
MC10T-HF	
3	Pressure range 20÷225 bar (290÷3260 psi);

Note: for further pressure range contact Sales Dept

3 Seals

TYPE	DESCRIPTION
B	NBR (Buna)+Polyurethane o-ring seals, std configuration
V	FPM (Viton) o-ring seals, contact Sales Dept

4 Coils

TYPE	CODE	DESCRIPTION
2) BH 12VDC	4SLD001200A	12VDC-ISO4400 coil
3) BQP19 12VDC	4SL5000126A	12VDC-ISO4400 coil
4) BH 24VDC	4SLD002400A	24VDC-ISO4400 coil
5) BQP19 24VDC	4SL5000245A	24VDC-ISO4400 coil

Note: for HF version use only BQP19 coil
For complete coils list see from page 201

5 Valve body

TYPE	CODE	DESCRIPTION
SAE10/2-G 3/8	3CC1020C11	Aluminium body for cavity 10 valve, G 3/8 std thread

Note: aluminium body can stand up to 210 bar (3050 psi)
For steel bodies or different threading see from page 208

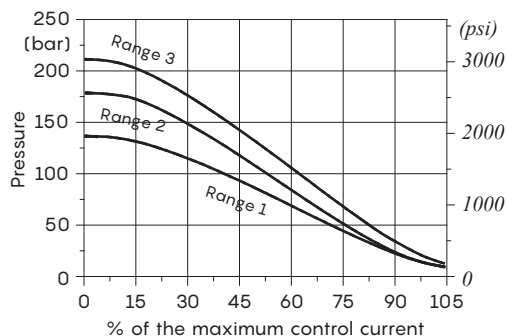
6 Connector

TYPE	CODE	DESCRIPTION
ISO4400	4CN1009995B	Connector

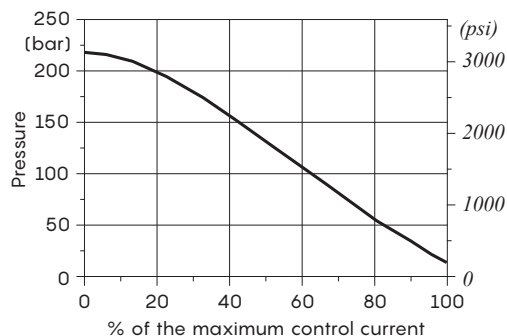
For complete connectors list see from page 201

Rating diagrams

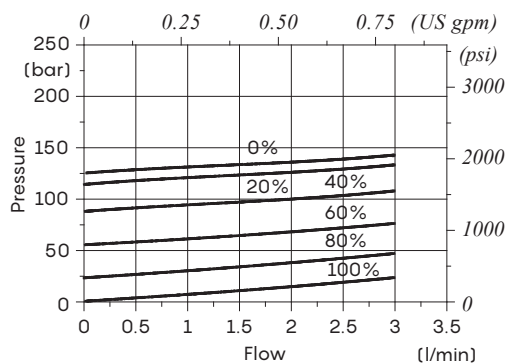
MC10T pressure setting vs. % max. control current
at 1 l/min (0.26 US gpm)



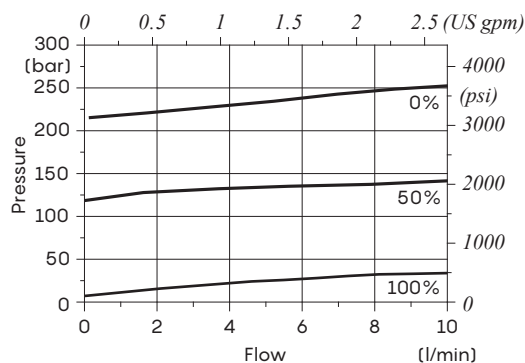
MC10T-HF pressure setting vs. % max. control current
at 2 l/min (0.53 US gpm)



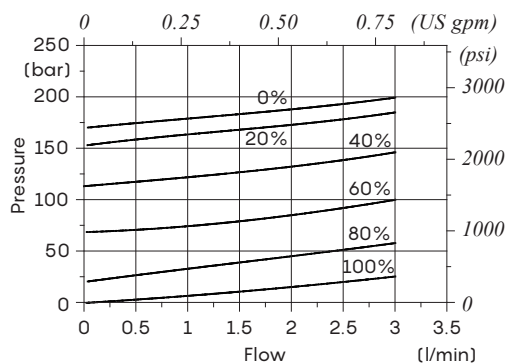
MC10T pressure vs. flow 1->2
for % of control current - Pressure range 1



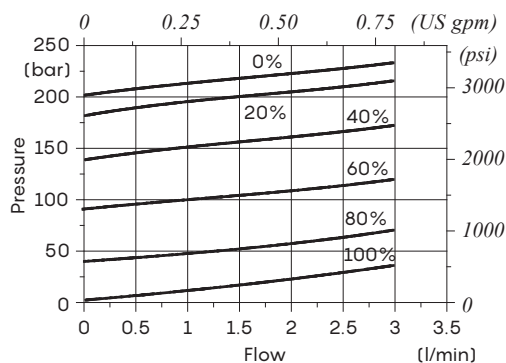
MC10T-HF pressure vs. flow 1->2
for % of control current



MC10T pressure vs. flow 1->2
for % of control current - Pressure range 2



MC10T pressure vs. flow 1->2
for % of control current - Pressure range 3







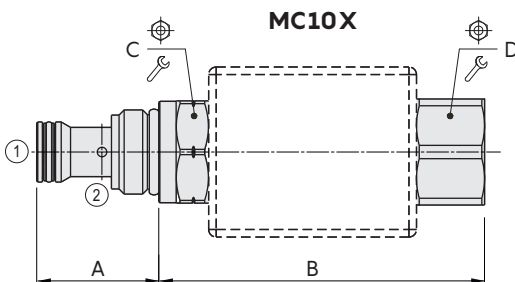
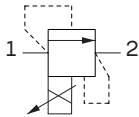
MC10X - MC10X-HF type pressure relief valves - 2 way

- Solenoid proportional type, direct acting
- Poppet type
- Decreasing pressure with increasing current (N.C)
- System of purging of air
- Applications for low flow rates (max. 10 l/min - 2.64 US gpm)

Technical specifications and diagrams are measured with mineral oil of 46 cSt viscosity at 40°C (104°F) temperature.

		MC10X	MC10X-HF
Max. flow		3 l/min (0.79 US gpm)	10 l/min (2.64 US gpm)
Max. pressure		350 bar (5100 psi)	250 bar (3600 psi)
Oil leakage	at 80% of max. pressure setting	0.25 cm ³ /min (0.015 in ³ /min)	0.50 cm ³ /min (0.030 in ³ /min)
Fluid		mineral based or synthetic hydraulic fluid with lubricating properties	
Viscosity		10-200 cSt	
Max level of contamination		18/16/13 ISO4406	
Fluid temperature	with NBR seals+Polyurethane with FPM seals	from -25°C (-13°F) to 90°C (194°F) from -20°C (-4°F) to 110°C (230°F)	
Environmental temp. for working conditions		from -20°C (-4°F) to 60°C (140°F)	
Cavity		SAE 10/2	
Coil type*		BH or BQP19	BQP19
Nominal voltages		12VDC - 24VDC	
Power rating		33 W (BH) - 15 W (BQP19)	15 W
Max. control current		12V->1.70 A - 24V->0.85 (BH) 12V->1.25 A - 24V->0.63 A (BQP19)	12V->1.25 A - 24V->0.63 A
Dither frequency		150 Hz	
Hysteresis		<5%	
Weight		0.760 kg (1.67 lb)	0.863 kg (1.90 lb)

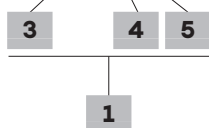
NOTE - For different conditions, please contact Walvoil Sales Dpt. - *For coils further features see from page 201.



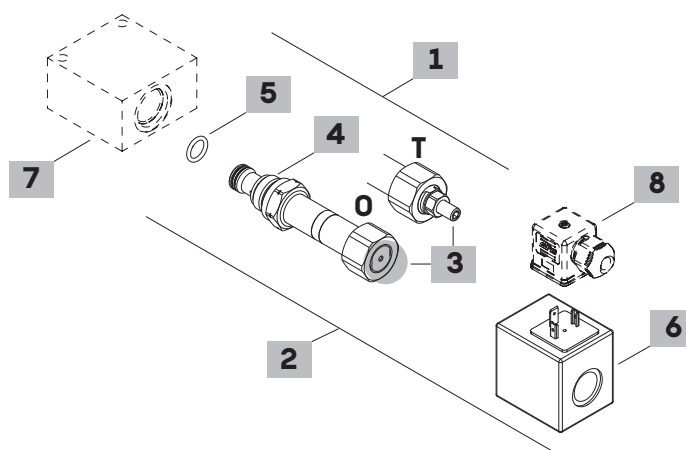
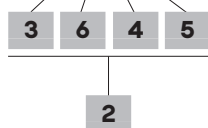
Valve type	A		B				C			D		
			N / O without emergency		T screw							
	mm	in	mm	in	mm	in		Nm	lbft		Nm	lbft
MC10X	32.3	1.27	86.2	3.39	-	-	27	50	37	28	5	3.7
MC10X-HF	32.5	1.28	94.5	3.72	116.5	4.59	27	50	37	28	5	3.7

Ordering codes and description composition

MC10X/001B



MC10X/031B



1 Cartridges

TYPE	CODE	DESCRIPTION
MC10X/001B	OMC10002050	Pressure range 1
MC10X/002B	OMC10002051	Pressure range 2
MC10X/003B	OMC10002052	Pressure range 3

2 Complete cartridges with coil

TYPE	CODE	DESCRIPTION
MC10X/031B	OMC10002039	Pressure range 1 , 12VDC
MC10X/032B	OMC10002040	Pressure range 2 , 12VDC
MC10X/033B	OMC10002041	Pressure range 3 , 12VDC
MC10X-HF/033B	OMC10002064	Pressure range 3 , 12VDC
MC10X-HF/T33B	OMC10002089	Pressure range 3 , 12VDC

3 Emergency

TYPE	DESCRIPTION
0	Without override
T	With screw

4 Pressure range

TYPE	DESCRIPTION
MC10X	
1	Pressure range 7÷120 bar (102÷1740 psi);
2	Pressure range 7÷170 bar (102÷2450 psi);
3	Pressure range 7÷210 bar (102÷3050 psi);
MC10X-HF	
3	Pressure range 3÷230 bar (43÷3330 psi);

Note: for further pressure range contact Sales Dept

5 Seals

TYPE	DESCRIPTION
B	NBR (Buna)+Polyurethane o-ring seals, std configuration
V	FPM (Viton) o-ring seals, contact Sales Dept

6 Coils

TYPE	CODE	DESCRIPTION
2) BH 12VDC	4SLD001200A	12VDC-ISO4400 coil
3) BQP19 12VDC	4SL5000126A	12VDC-ISO4400 coil
4) BH 24VDC	4SLD002400A	24VDC-ISO4400 coil
5) BQP19 24VDC	4SL5000245A	24VDC-ISO4400 coil

Note: for HF version use only BQP19 coil
For complete coils list see from page 201

7 Valve body

TYPE	CODE	DESCRIPTION
SAE10/2-G 3/8	3CC1020C11	Aluminium body for cavity 10 valve, G 3/8 std thread

Note: aluminium body can stand up to 210 bar (3050 psi)
For steel bodies or different threading see from page 208

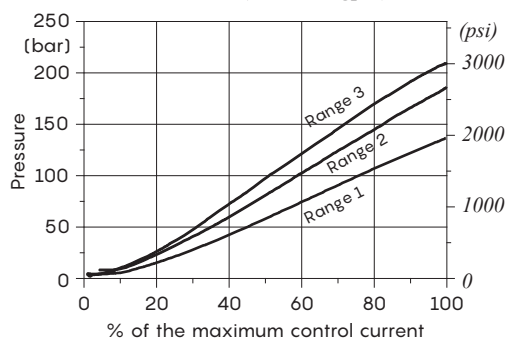
8 Connector

TYPE	CODE	DESCRIPTION
ISO4400	4CN1009995B	Connector

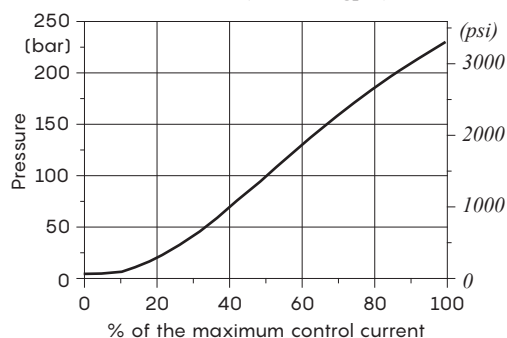
For complete connectors list see from page 201

Rating diagrams

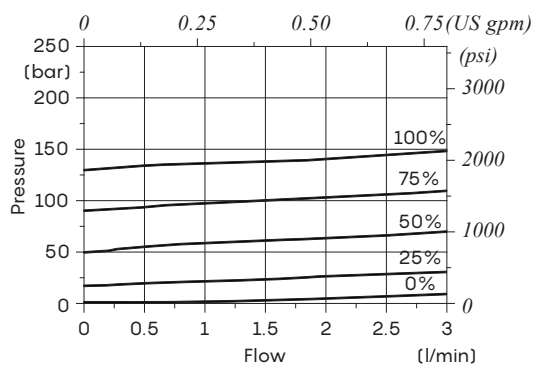
MC10X pressure setting vs. % max. control current
at 1 l/min (0.26 US gpm)



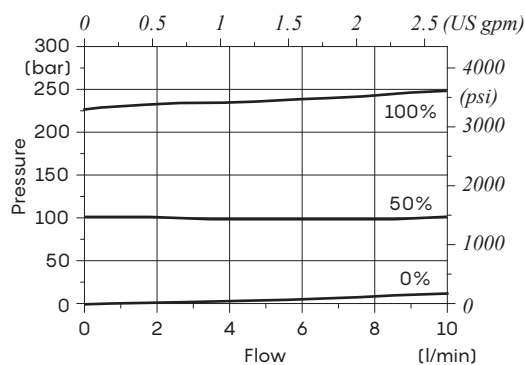
MC10X-HF pressure setting vs. % max. control current
at 2 l/min (0.53 US gpm)



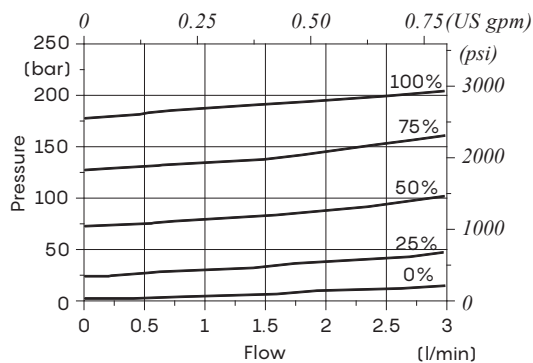
MC10X pressure vs. flow 1->2
for % of control current - Pressure range 1



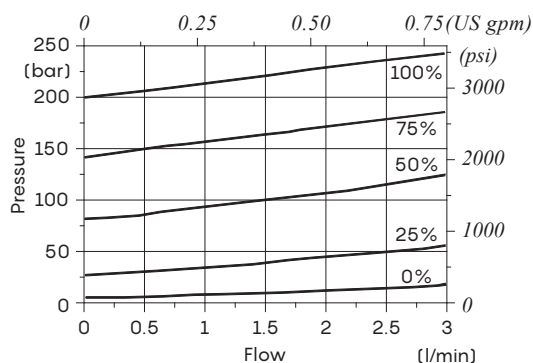
MC10X-HF pressure vs. flow 1->2
for % of control current



MC10X pressure vs. flow 1->2
for % of control current - Pressure range 2



MC10X pressure vs. flow 1->2
for % of control current - Pressure range 3







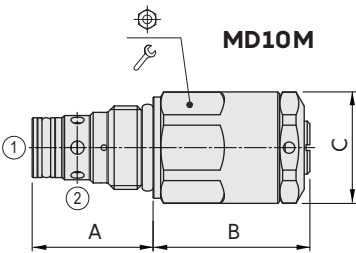
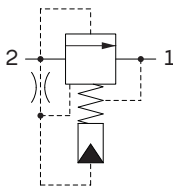
**MD..M type
shockless pressure relief valves – 2 way**

- Direct acting
- Poppet type
- Damp valve
- Different reaction time available
- From SAE10 to SAE12 cavities

Technical specifications and diagrams are measured with mineral oil of 46 cSt viscosity at 40°C (104°F) temperature.

		MD10M	MD12M
Nominal flow		60 l/min (15.8 US gpm)	120 l/min (31.7 US gpm)
Max. pressure		350 bar (5100 psi)	
Oil leakage	at 80% of max. pressure setting	5 cm³/min (0.30 in³/min)	5 cm³/min (0.30 in³/min)
Fluid		mineral based or synthetic hydraulic fluid with lubricating properties	
Viscosity		10–200 cSt	
Max level of contamination		20/18/14 ISO4406	
Fluid temperature	with NBR seals+PTFE with FPM seals	from -25°C (-13°F) to 90°C (194°F) from -20°C (-4°F) to 110°C (230°F)	
Environmental temp. for working conditions		from -20°C (-4°F) to 60°C (140°F)	
Cavity		SAE 10/2	SAE 12/2
Weight		0.200 kg (0.44 lb)	0.355 kg (0.78 lb)

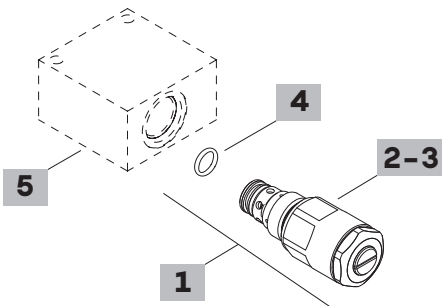
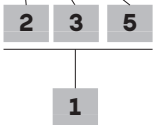
NOTE – For different conditions, please contact Walvoil Sales Dpt.



Valve type	A		B		C				
	mm	in	mm	in	mm	in	Nm	lbft	
MD10M	32	1.25	41.5	1.63	Ø29.5	Ø1.16	27	50	37
MD12M	46	1.81	46.5	1.83	Ø35	Ø1.38	32	85	62.7

Ordering codes and description composition

MD10M/313B



1 Cartridges

TYPE	CODE	DESCRIPTION
SAE cavity 10/2		
MD10M/313B	OMD10002027	Pressure range 13
SAE cavity 12/2		
MD12M/513B	OMD12002004	Pressure range 13

2 Reaction time

TYPE	DESCRIPTION
2	Reaction time 0.2 sec. (± 0.1 sec.)
3	Reaction time 0.3 sec. (± 0.1 sec.)
4	Reaction time 0.4 sec. (± 0.1 sec.)
5	Reaction time 0.5 sec. (± 0.1 sec.)
6	Reaction time 0.6 sec. (± 0.1 sec.)
7	Reaction time 0.7 sec. (± 0.1 sec.)

3 Pressure range

TYPE	DESCRIPTION
SAE cavity 10/2	
11	Pressure range 130÷200 bar (1900÷2900 psi); Pressure ratio 1.9
12	Pressure range 180÷240 bar (2610÷3480 psi); Pressure ratio 2.2
13	Pressure range 220÷290 bar (3190÷4200 psi); Setting 250 bar (3625 psi) at 25 l/min (6.6 US gpm); Pressure ratio 2.4
21	Pressure range 170÷270 bar (2465÷3915 psi); Pressure ratio 2.5
22	Pressure range 220÷290 bar (3190÷4200 psi); Pressure ratio 2.8
SAE cavity 12/2	
11	Pressure range 125÷155 bar (1810÷2250 psi); Pressure ratio 1.7
12	Pressure range 160÷190 bar (2320÷2760 psi); Pressure ratio 1.9
13	Pressure range 180÷240 bar (2610÷3480 psi); Setting 220 bar (3190 psi) at 60 l/min (16 US gpm); Pressure ratio 2.2
21	Pressure range 150÷185 bar (1900÷2685 psi); Pressure ratio 2
22	Pressure range 190÷235 bar (2760÷3400 psi); Pressure ratio 2.35
23	Pressure range 230÷275 bar (3335÷3990 psi); Pressure ratio 2.55

4 Seals

TYPE	DESCRIPTION
B	NBR (Buna)+PTFE o-ring seals, std configuration

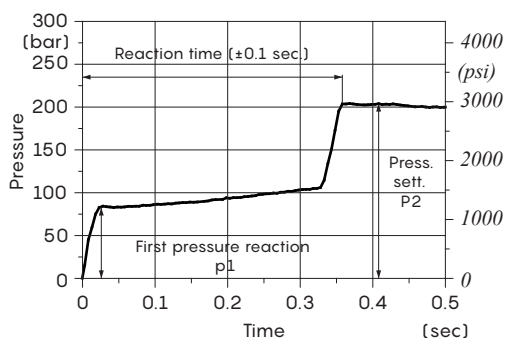
5 Valve body

TYPE	CODE	DESCRIPTION
SAE10/2-G 3/8	3CC1020C11	Aluminium body for cavity 10 valve, G 3/8 std thread
SAE12/2-G 1/2	3CC1220D11	Aluminium body for cavity 12 valve, G 1/2 std thread

Note: aluminium body can stand up to 210 bar (3050 psi)
For steel bodies or different threading see from page 208

Rating diagrams

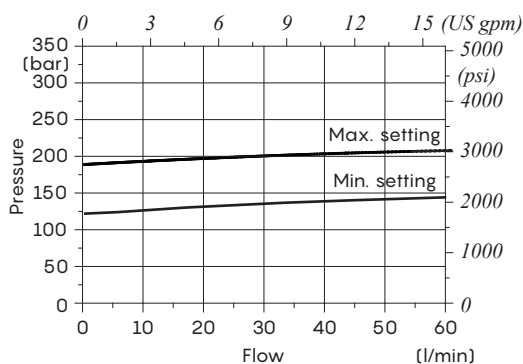
**MD10M performance curve example
with typical dimensions**



Pressure ratio: $R_p = \frac{p_2}{p_1}$

First pressure reaction: $p_1 = \frac{p_2}{R_p}$

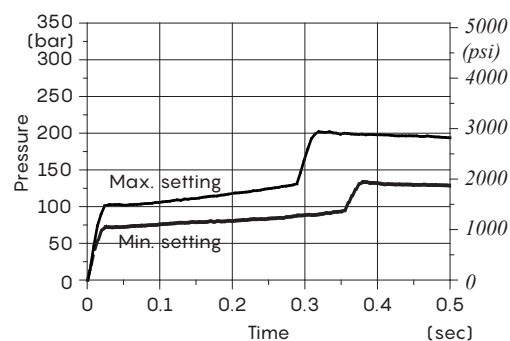
**MD10M pressure vs. flow
at max. and min. setting**



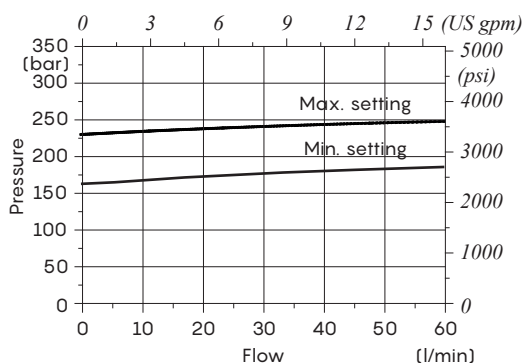
Pressure range 11

130÷200 bar
(1900÷2900 psi)
Pressure ratio 1.9
Q=60 l/min
(15.8 US gpm)

**MD10M performance curve
at max. and min. setting**



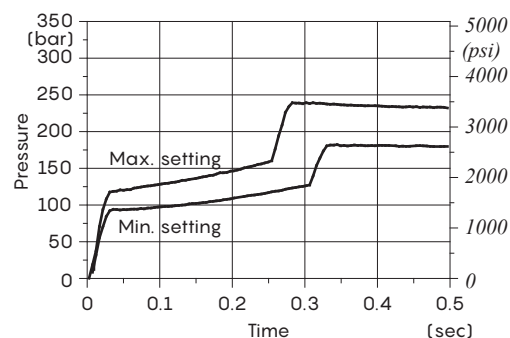
**MD10M pressure vs. flow
at max. and min. setting**



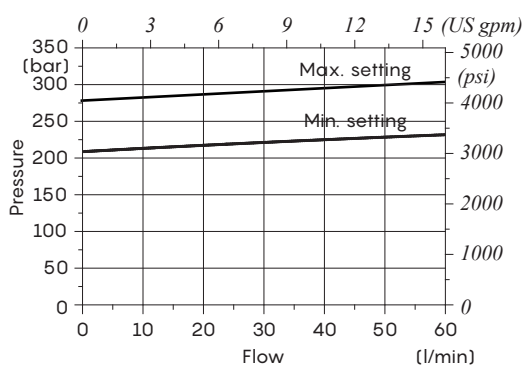
Pressure range 12

180÷240 bar
(2610÷3480 psi)
Pressure ratio 2.2
Q=60 l/min
(15.8 US gpm)

**MD10M performance curve
at max. and min. setting**



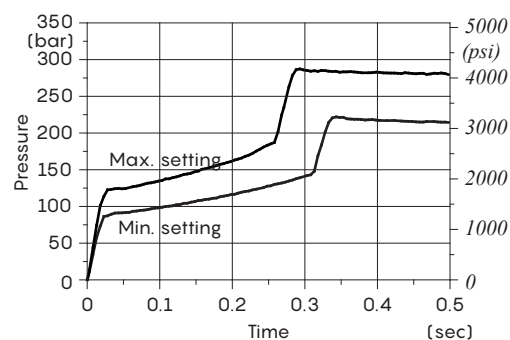
**MD10M pressure vs. flow
at max. and min. setting**



Pressure range 13

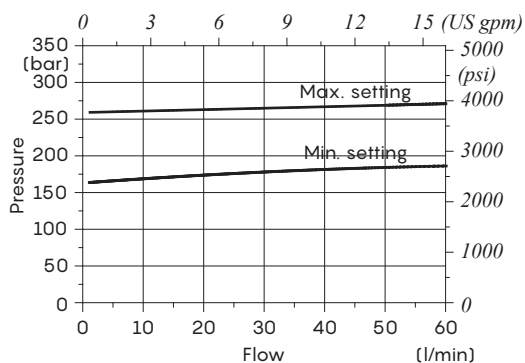
220÷290 bar
(3190÷4200 psi)
Setting 250 bar (3625 psi) at 25 l/min
(6.6 US gpm)
Pressure ratio 2.4
Q=60 l/min
(15.8 US gpm)

**MD10M performance curve
at max. and min. setting**



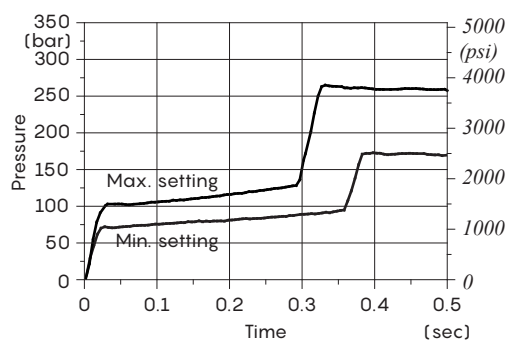
Rating diagrams

MD10M pressure vs. flow
at max. and min. setting

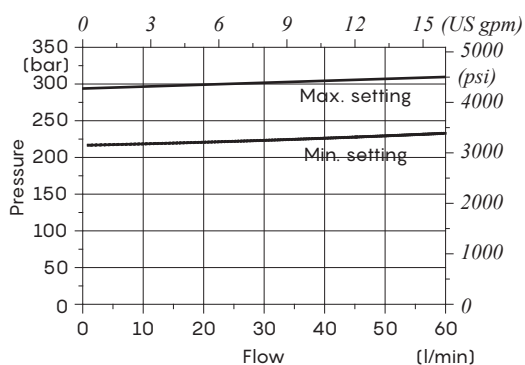


Pressure range
21
170÷270 bar
(2465÷3915 psi)
Pressure ratio 2.5
Q=60 l/min
(15.8 US gpm)

MD10M performance curve
at max. and min. setting

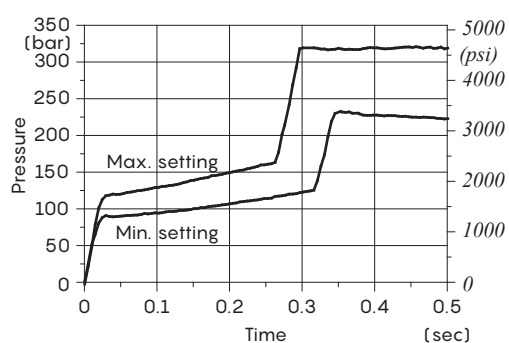


MD10M pressure vs. flow
at max. and min. setting

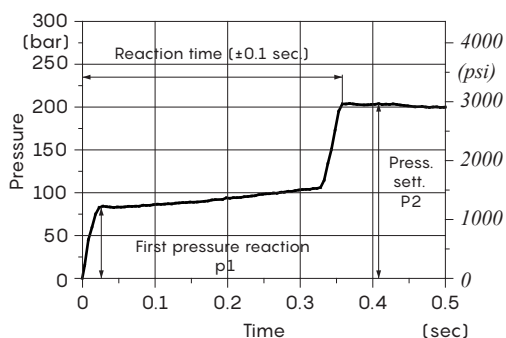


Pressure range
22
220÷290 bar
(3190÷4200)
Pressure ratio 2.8
Q=60 l/min
(15.8 US gpm)

MD10M performance curve
at max. and min. setting



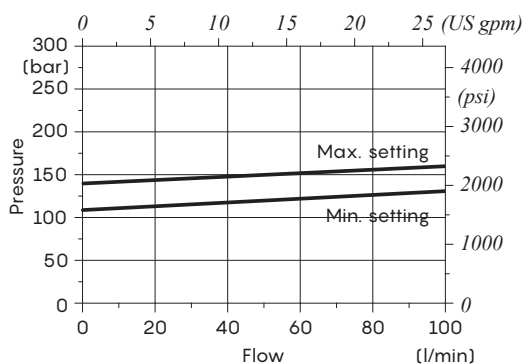
**MD12M performance curve example
with typical dimensions**



Pressure ratio: $R_p = \frac{p_2}{p_1}$

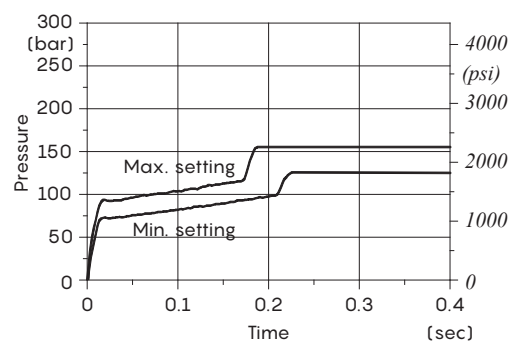
First pressure reaction: $p_1 = \frac{p_2}{R_p}$

**MD12M pressure vs. flow
at max. and min. setting**

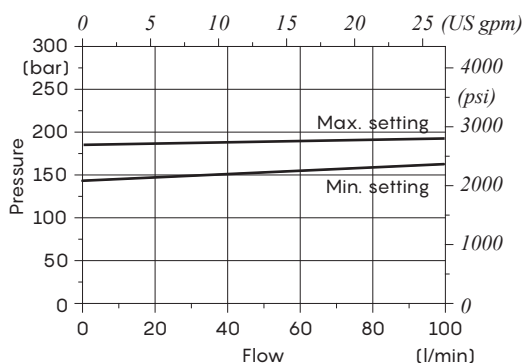


Pressure range 11
125÷155 bar
(1810÷2250 psi)
Pressure ratio 1.7
Q=100 l/min
(26.4 US gpm)

**MD12M performance curve
at max. and min. setting**

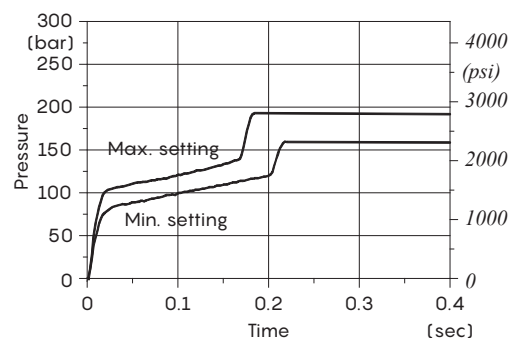


**MD12M pressure vs. flow
at max. and min. setting**

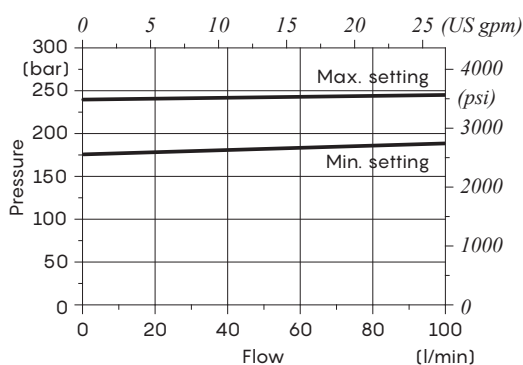


Pressure range 12
160÷190 bar
(2320÷2760 psi)
Pressure ratio 1.9
Q=100 l/min
(26.4 US gpm)

**MD12M performance curve
at max. and min. setting**

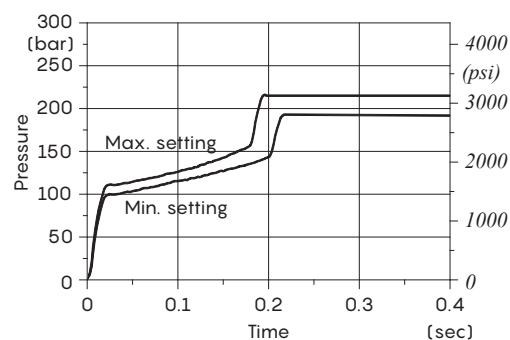


**MD12M pressure vs. flow
at max. and min. setting**



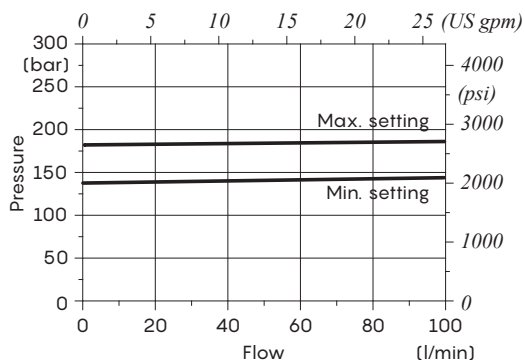
Pressure range 13
180÷220 bar
(2610÷3190 psi)
Setting 220 bar (3190 psi) at 60 l/min
(16 US gpm)
Pressure ratio 2.2
Q=100 l/min
(26.4 US gpm)

**MD12M performance curve
at max. and min. setting**



Rating diagrams

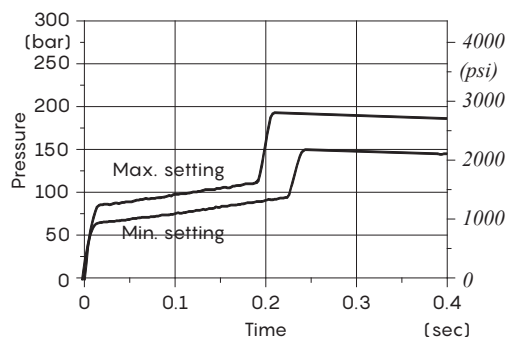
MD12M pressure vs. flow
at max. and min. setting



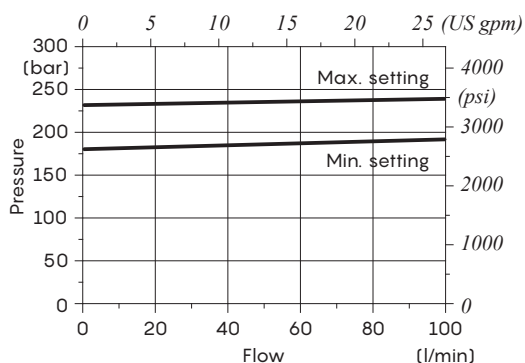
Pressure range 21

150÷185 bar
(1900÷2685 psi)
Pressure ratio 2
Q=100 l/min
(26.4 US gpm)

MD12M performance curve
at max. and min. setting



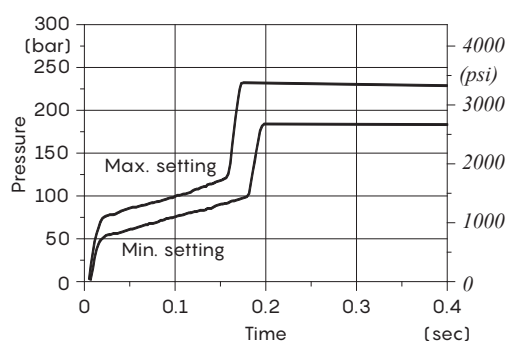
MD12M pressure vs. flow
at max. and min. setting



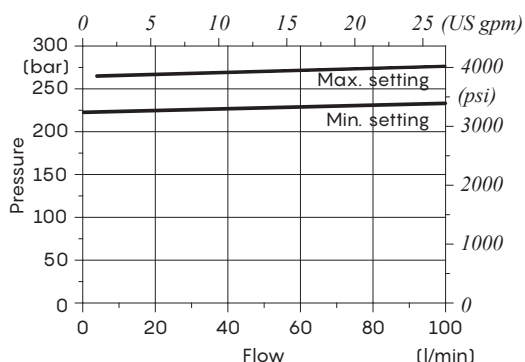
Pressure range 22

190÷235 bar
(2760÷3400)
Pressure ratio 2.35
Q=100 l/min
(26.4 US gpm)

MD12M performance curve
at max. and min. setting



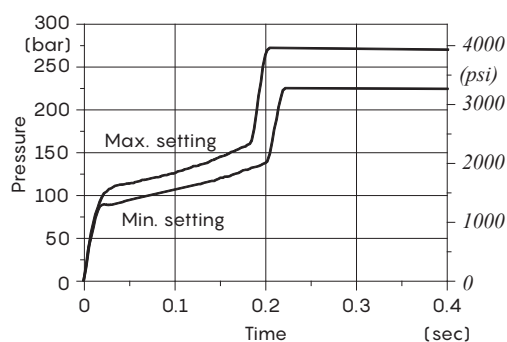
MD12M pressure vs. flow
at max. and min. setting



Pressure range 23

230÷275 bar
(3335÷3990)
Pressure ratio 2.55
Q=100 l/min
(26.4 US gpm)

MD12M performance curve
at max. and min. setting





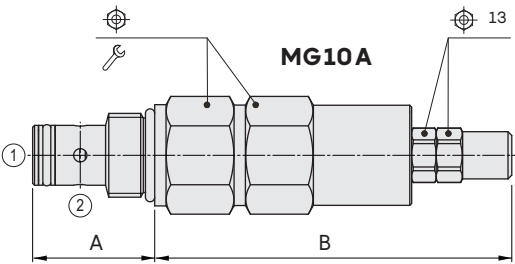
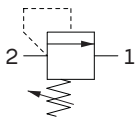
**MG..A type
pressure relief valves – 2 way**

- Differential operated
- Poppet type
- Available with different types of adjustments
- The backpressure values on line 1 must be added to valve nominal setting
- Prepared for antitampering cap
- From SAE10 to SAE12 cavities

Technical specifications and diagrams are measured with mineral oil of 46 cSt viscosity at 40°C (104°F) temperature.

MG10A		MG12A
Nominal flow	60 l/min (15.8 US gpm)	100 l/min (26.4 US gpm)
Max. pressure	350 bar (5100 psi)	
Oil leakage	at 80% of max. pressure setting	2 cm³/min (0.122 in³/min)
Fluid	mineral based or synthetic hydraulic fluid with lubricating properties	
Viscosity	10–200 cSt	
Max level of contamination	20/18/14 ISO4406	
Fluid temperature	with NBR seals+PTFE with FPM seals	from -25°C (-13°F) to 90°C (194°F) from -20°C (-4°F) to 110°C (230°F)
Environmental temp. for working conditions	from -20°C (-4°F) to 60°C (140°F)	
Cavity	SAE 10/2	SAE 12/2
Weight	0.34 kg (0.75 lb)	0.87 kg (1.92 lb)

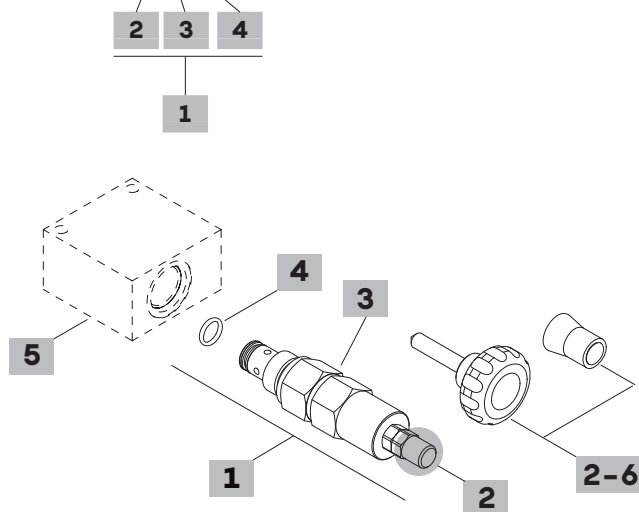
NOTE – For different conditions, please contact Walvoil Sales Dpt.



Valve type	A		B				
	mm	in	mm	in	Nm	lbf·ft	
MG10A/0S	32.3	1.27	94.5	3.72	27	50	37
MG12A/0S	46	1.81	126.5	4.98	36	80	59

Ordering codes and description composition

MG10A/0S1B



1 Cartridges

TYPE	CODE	DESCRIPTION
SAE cavity 10/2		
MG10A/0S1B	OMG10002009	Pressure range 1
MG10A/0S2B	OMG10002002	Pressure range 2
MG10A/0S3B	OMG10002003	Pressure range 3
MG10A/0S4B	OMG10002001	Pressure range 4
SAE cavity 12/2		
MG12A/0S1B	OMG12002000	Pressure range 1
MG12A/0S2B	OMG12002001	Pressure range 2
MG12A/0S3B	OMG12002002	Pressure range 3

2 Adjustments

TYPE	DESCRIPTION
S	Screw with cap
V	With handwheel (part code: see point 6)
X	Valve set with antitampering cap (part code: see point 6)

3 Pressure range

Standard setting is referred to 5 l/min (1.32 US gpm) flow

TYPE	DESCRIPTION
1	For SAE cavity 10/2: pressure range 30÷100 bar (435÷1450 psi); Std. setting 80 bar (1160 psi) For SAE cavity 12/2: pressure range 20÷100 bar (290÷1450 psi); Std. setting 50 bar (725 psi)
2	Pressure range 50÷200 bar (725÷2900 psi); Std. setting 150 bar (2175 psi)
3	Pressure range 150÷350 bar (2175÷5100 psi); Std. setting 250 bar (3625 psi)
4	Pressure range 5÷60 bar (72.5÷870 psi); Std. setting 30 bar (435 psi); only for SAE cavity 10/2

4 Seals

TYPE	DESCRIPTION
B	NBR (Buna)+PTFE o-ring seals, std configuration
V	FPM (Viton) o-ring seals, contact Sales Dept

5 Valve body

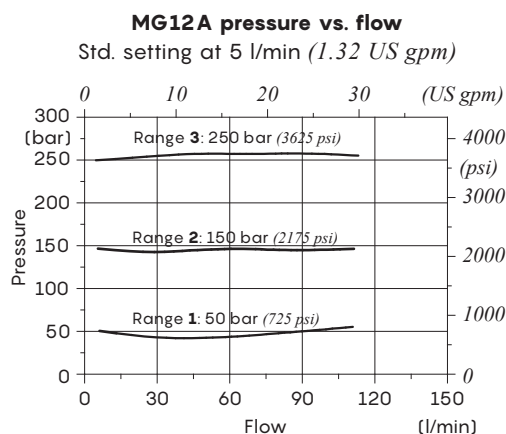
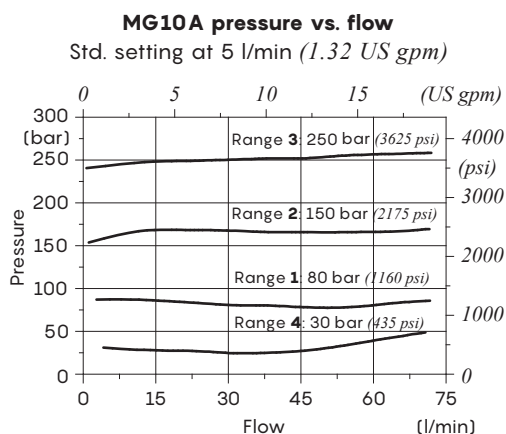
TYPE	CODE	DESCRIPTION
SAE10/2-G 3/8	3CC1020C11	Aluminium body for cavity 10 valve, G 3/8 std thread
SAE12/2-G 1/2	3CC1220D11	Aluminium body for cavity 12 valve, G 1/2 std thread

Note: aluminium body can stand up to 210 bar (3050 psi)
For steel bodies or different threading see from page 208

6 Accessories

TYPE	CODE	DESCRIPTION
-	4VL2407100	Handwheel
-	4COP120420	Antitampering cap

Rating diagrams





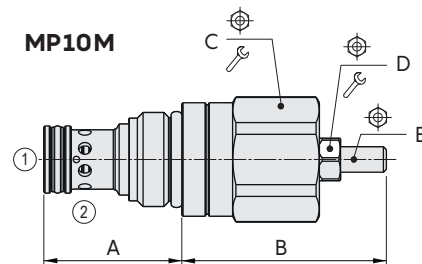
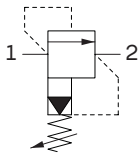
MP..M type pressure relief valves – 2 way

- Pilot operated
- Spool type
- Mechanical control with screw adjustments
- Different springs available to vary pressure range
- The backpressure values on line 2 must be added to valve nominal setting

Technical specifications and diagrams are measured with mineral oil of 46 cSt viscosity at 40°C (104°F) temperature.

		MP10M	MP12M	MP16M
Nominal flow		120 l/min (31.7 US gpm)	200 l/min (52.8 US gpm)	400 l/min (105.67 US gpm)
Max. pressure		Port 1= 350 bar (5100 psi) Port 2= 30 bar (435 psi)		350 bar (5100 psi)
Oil leakage	at 80% of max. pressure setting	25 cm³/min (1.525 in³/min)		100 cm³/min (6.102 in³/min)
Fluid		mineral based or synthetic hydraulic fluid with lubricating properties		
Viscosity		10–200 cSt		12–400 cSt
Max level of contamination		18/16/13 ISO4406		20/18/14 ISO4406
Fluid temperature	with NBR seals+Polyurethane with FPM seals	from -25°C (-13°F) to 90°C (194°F) from -20°C (-4°F) to 110°C (230°F)		
Environmental temp. for working conditions		from -20°C (-4°F) to 60°C (140°F)		
Cavity		SAE 10/2	SAE 12/2	SAE 16/2
Weight		0.190 kg (0.42 lb)	0.300 kg (0.66 lb)	0.490 kg (1.080 lb)

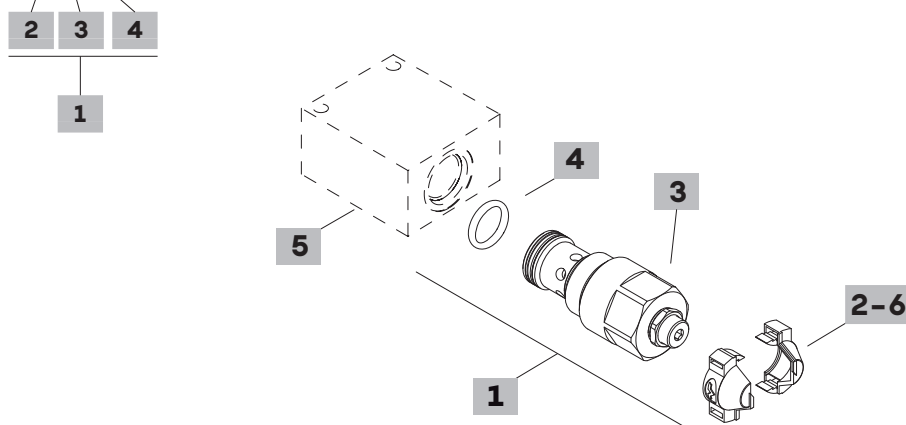
NOTE – For different conditions, please contact Walvoil Sales Dpt.



Valve type	A		B		C		D		E	
	mm	in	mm	in	Nm	lbf	Nm	lbf	Nm	lbf
MP10M	32.6	1.28	48.3	1.90	27	50	37	10	6.6	4.9
MP12M	45	1.77	46.9	1.85	32	80	59	10	6.6	4.9
MP16M	45.2	1.78	49.8	1.96	36	100	74	19	20	15

Ordering codes and description composition

MP16M/OY2B



1 Cartridges

TYPE	CODE	DESCRIPTION
SAE cavity 10/2		
MP10M/OG1B	OMP10002091	Pressure range 1
MP10M/OG2B	OMP100020A00	Pressure range 2
MP10M/OG3B	OMP10002093	Pressure range 3
SAE cavity 12/2		
MP12M/OG1B	OMP12002046	Pressure range 1
MP12M/OG2B	OMP12002047	Pressure range 2
MP12M/OG3B	OMP12002048	Pressure range 3
SAE cavity 16/2		
MP16M/OY1B	OMP16002017	Pressure range 1
MP16M/OY2B	OMP16002013	Pressure range 2
MP16M/OY3B	OMP16002014	Pressure range 3

2 Adjustments

TYPE	DESCRIPTION
G/Y	With screw
X	Valve set with antitampering cap (part code: see point 6)

3 Pressure range

TYPE	DESCRIPTION
1	Pressure range 5÷50 bar (72.5÷725 psi);
2	Pressure range 50÷220 bar (725÷3190 psi);
3	Pressure range 150÷350 bar (2175÷5100 psi);

4 Seals

TYPE	DESCRIPTION
B	NBR (Buna)+Polyurethane o-ring seals, std configuration
V	FPM (Viton) o-ring seals, contact Sales Dept

5 Valve body

TYPE	CODE	DESCRIPTION
SAE10/2-G 3/8	3CC1020C11	Aluminium body for cavity 10 valve, G 3/8 std thread
SAE12/2-G 1/2	3CC1220D11	Aluminium body for cavity 12 valve, G 1/2 std thread
SAE16/2-G 3/4	3CC1620E11	Aluminium body for cavity 16 valve, G 3/4 std thread

Note: aluminium body can stand up to 210 bar (3050 psi)
For steel bodies or different threading see from page 208

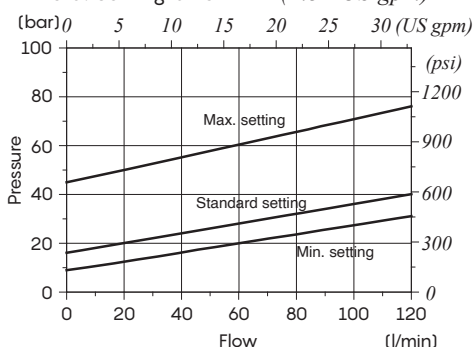
6 Accessories

TYPE	CODE	DESCRIPTION
-	4COP116420	Cap (for MP10M / MP12M)
-	4COP126300	Antitampering cap (x2) (for MP16M)

Rating diagrams

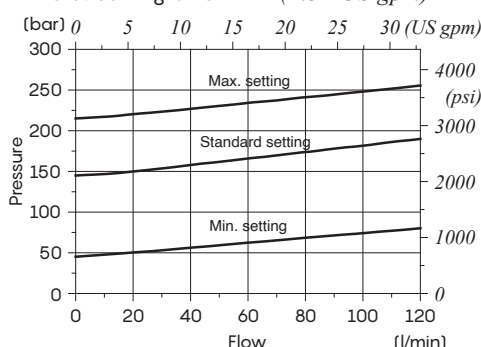
MP10M pressure vs. flow

Std. setting at 5 l/min (1.32 US gpm)



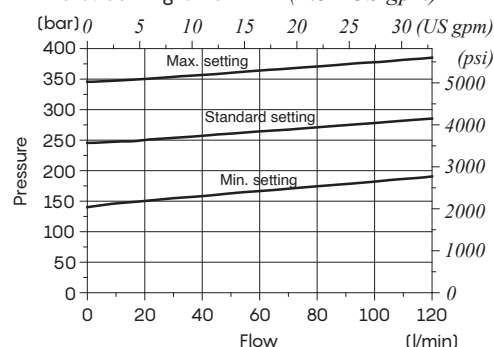
MP10M pressure vs. flow

Std. setting at 5 l/min (1.32 US gpm)



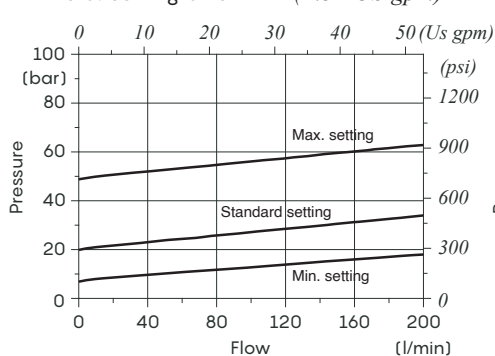
MP10M pressure vs. flow

Std. setting at 5 l/min (1.32 US gpm)



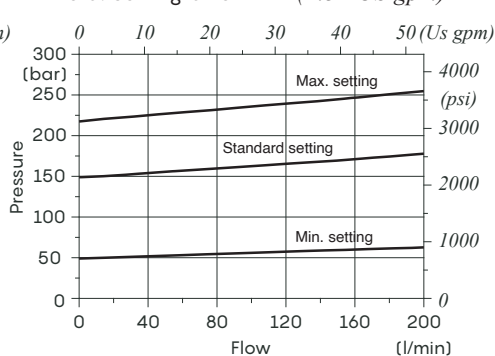
MP12M pressure vs. flow

Std. setting at 5 l/min (1.32 US gpm)



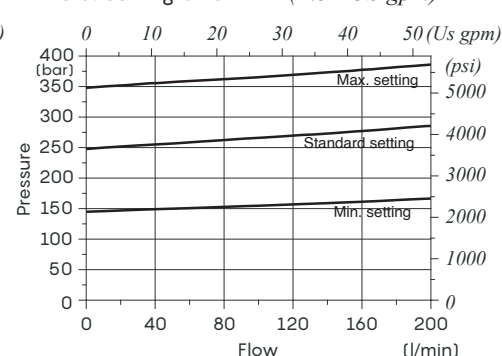
MP12M pressure vs. flow

Std. setting at 5 l/min (1.32 US gpm)



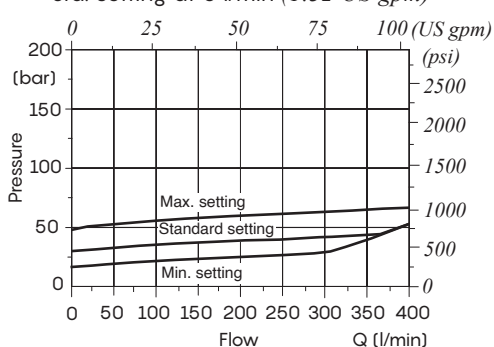
MP12M pressure vs. flow

Std. setting at 5 l/min (1.32 US gpm)



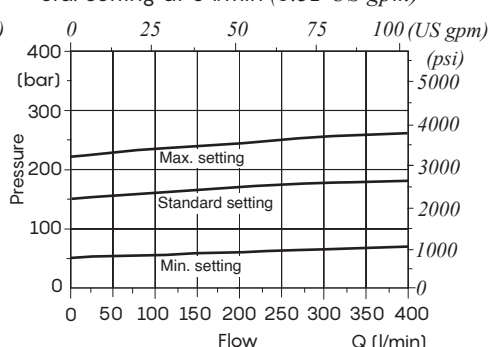
MP16M pressure vs. flow

Std. setting at 5 l/min (1.32 US gpm)



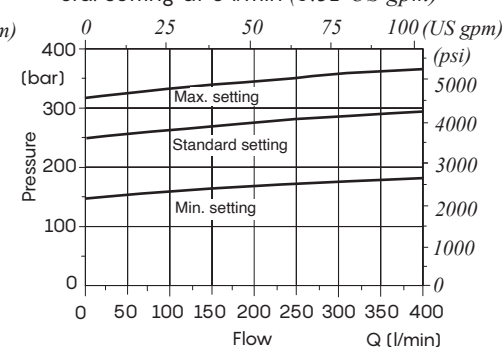
MP16M pressure vs. flow

Std. setting at 5 l/min (1.32 US gpm)



MP16M pressure vs. flow

Std. setting at 5 l/min (1.32 US gpm)







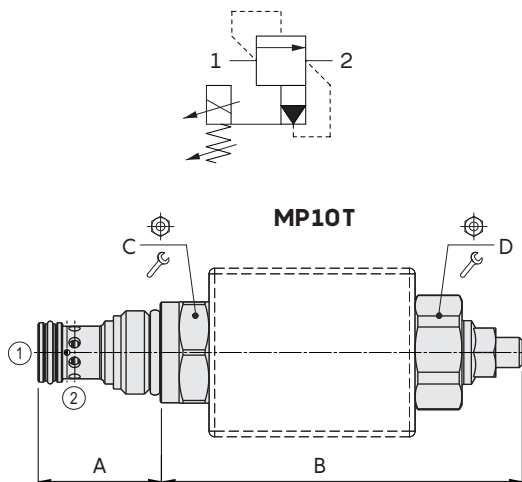
MP..T type pressure relief valves – 2 way

- Solenoid proportional type, direct acting
- Spool type
- Decreasing pressure with increasing current (N.C)
- Applications for high flow rates (max. 200 l/min – 52.8 US gpm)
- System of purging of air
- From SAE10 to SAE12 cavities

Technical specifications and diagrams are measured with mineral oil of 46 cSt viscosity at 40°C (104°F) temperature.

		MP10T	MP12T
Nominal flow		120 l/min (31.7 US gpm)	200 l/min (52.8 US gpm)
Max. pressure		350 bar (5100 psi)	
Oil leakage	at 80% of max. pressure setting	<150 cm ³ /min (9.15 in ³ /min)	<200 cm ³ /min (<12.2 in ³ /min)
Fluid		mineral based or synthetic hydraulic fluid with lubricating properties	
Viscosity		10–200 cSt	
Max level of contamination		18/16/13 ISO4406	
Fluid temperature	with NBR seals+Polyurethane with FPM seals	from -25°C (-13°F) to 90°C (194°F) from -20°C (-4°F) to 110°C (230°F)	
Environmental temp. for working conditions		from -20°C (-4°F) to 60°C (140°F)	
Cavity		SAE 10/2	SAE 12/2
Coil type*		BH or BQP19	
Nominal voltages		12VDC – 24VDC	
Power rating		33 W (BH) – 15 W (BQP19)	
Max. control current		12V->1.70 A – 24V->0.85 (BH) 12V->1.25 A – 24V->0.63 A (BQP19)	
Dither frequency		200 Hz	
Hysteresis		<5%	
Weight		0.77 kg (1.70 lb)	0.92 kg (2.03 lb)

NOTE – For different conditions, please contact Walvoil Sales Dpt. – *For coils further features see from page 201.



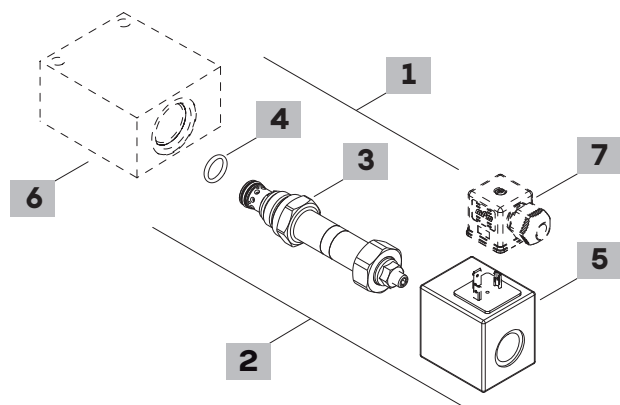
Valve type	A		B		C			D		
										
	mm	in	mm	in	Nm	lbf	Nm	lbf		
MP10T	32.6	1.28	100	3.94	27	50	37	28	5	3.7
MP12T	45	1.81	115	4.53	32	85	62.7	28	5	3.7

Ordering codes and description composition

MP10T/001B



MP10T/031B



1 Cartridges

TYPE	CODE	DESCRIPTION
SAE cavity 10/2		
MP10T/001B	OMP10002051	Pressure range 1
MP10T/002B	OMP10002052	Pressure range 2
MP10T/003B	OMP10002053	Pressure range 3
MP10T/004B	OMP100020A02	Pressure range 4
SAE cavity 12/2		
MP12T/001B	OMP12002028	Pressure range 1
MP12T/002B	OMP12002029	Pressure range 2
MP12T/003B	OMP12002030	Pressure range 3
MP12T/004B	OMP12002035	Pressure range 4

2 Complete cartridges

TYPE	CODE	DESCRIPTION
SAE cavity 10/2		
MP10T/031B	OMP10002035	Pressure range 1 , 12VDC
MP10T/032B	OMP10002036	Pressure range 2 , 12VDC
MP10T/033B	OMP10002037	Pressure range 3 , 12VDC
SAE cavity 12/2		
MP12T/031B	OMP12002020	Pressure range 1 , 12VDC
MP12T/032B	OMP12002021	Pressure range 2 , 12VDC
MP12T/033B	OMP12002022	Pressure range 3 , 12VDC
MP12T/034B	OMP12002027	Pressure range 4 , 12VDC

3 Pressure range

TYPE	DESCRIPTION
1	Pressure range 8+130 bar (116÷1900 psi)
2	Pressure range 8+180 bar (116÷2600 psi)
3	Pressure range 8+240 bar (116÷3500 psi)
4	Pressure range 8+300 bar (116÷4350 psi);

Note: for further pressure range contact Sales Dept

4 Seals

TYPE	DESCRIPTION
B	NBR (Buna)+Polyurethane o-ring seals, std configuration
V	FPM (Viton) o-ring seals, contact Sales Dept

5 Coils

TYPE	CODE	DESCRIPTION
2) BH 12 VDC	4SLD001200A	12VDC-ISO4400 coil
3) BQP19 12 VDC	4SL5000126A	12VDC-ISO4400 coil
4) BH 24 VDC	4SLD002400A	24VDC-ISO4400 coil
5) BQP19 24 VDC	4SL5000245A	24VDC-ISO4400 coil

For complete coils list see from page 201

6 Valve body

TYPE	CODE	DESCRIPTION
SAE10/2-G 3/8	3CC1020C11	Aluminium body for cavity 10 valve, G 3/8 std thread
SAE12/2-G 1/2	3CC1220D11	Aluminium body for cavity 12 valve, G 1/2 std thread

Note: aluminium body can stand up to 210 bar (3050 psi)

For steel bodies or different threading see from page 208

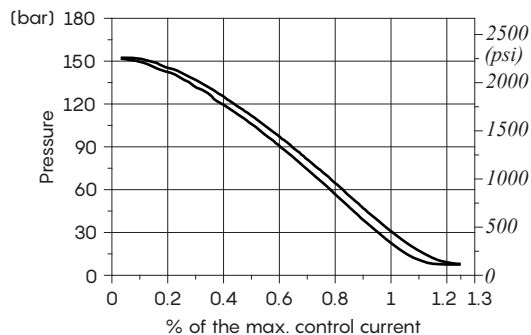
7 Connector

TYPE	CODE	DESCRIPTION
ISO4400	4CN1009995B	Connector

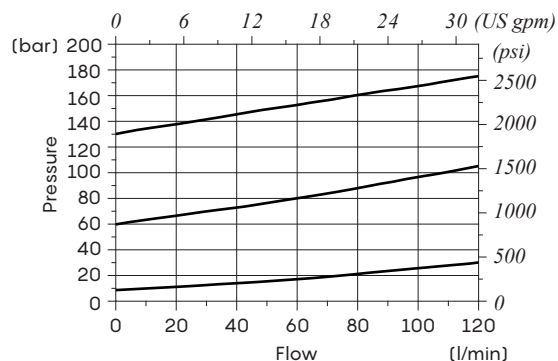
For complete connectors list see from page 201

Rating diagrams

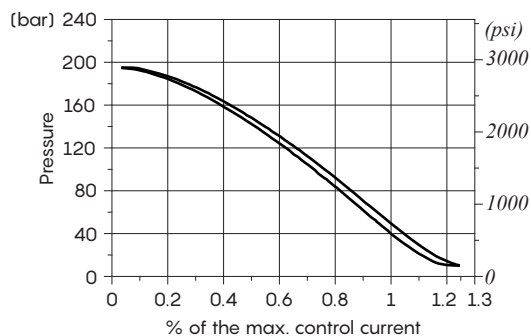
MP10T pressure setting vs. % max. control current
at 5 l/min (1.32 US gpm)



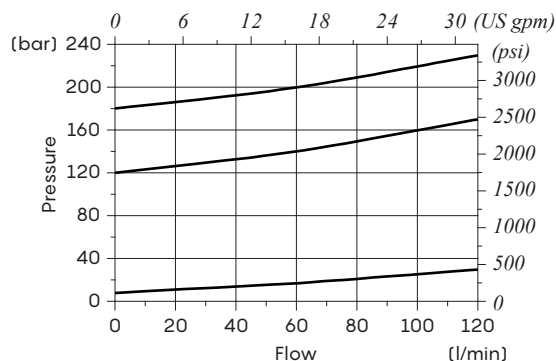
MP10T pressure vs. flow 1->2
for % of control current - Pressure range 1



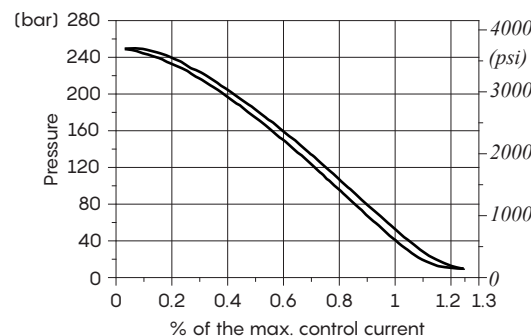
MP10T pressure setting vs. % max. control current
at 5 l/min (1.32 US gpm)



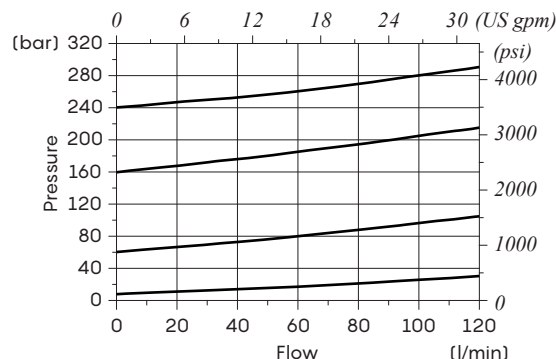
MP10T pressure vs. flow 1->2
for % of control current - Pressure range 2



MP10T pressure setting vs. % max. control current
at 5 l/min (1.32 US gpm)

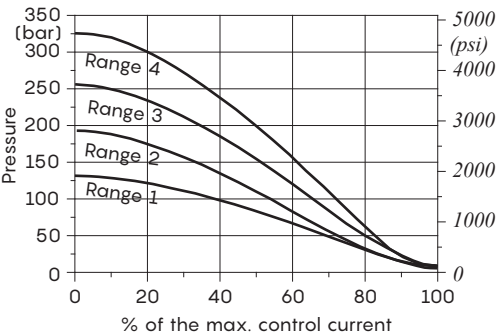


MP10T pressure vs. flow 1->2
for % of control current - Pressure range 3

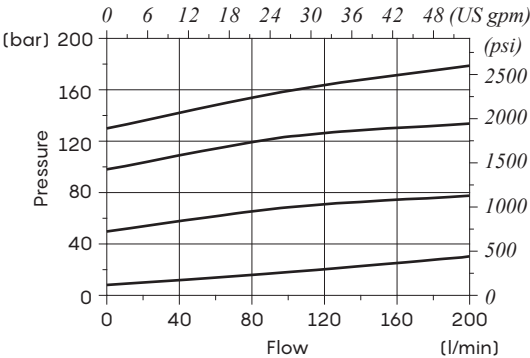


Rating diagrams

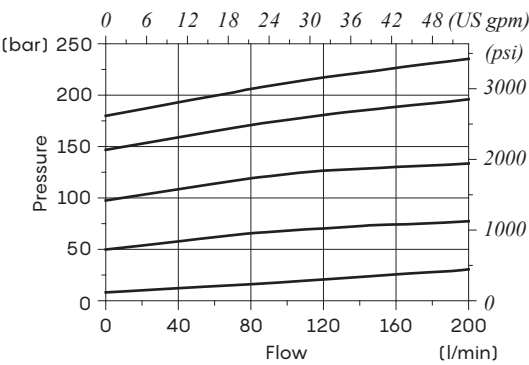
MP12T pressure setting vs. % max. control current
at 10 l/min (2.6 US gpm)



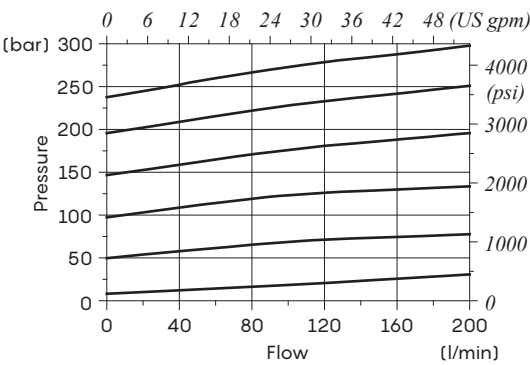
MP12T pressure vs. flow 1->2
for % of control current - Pressure range 1



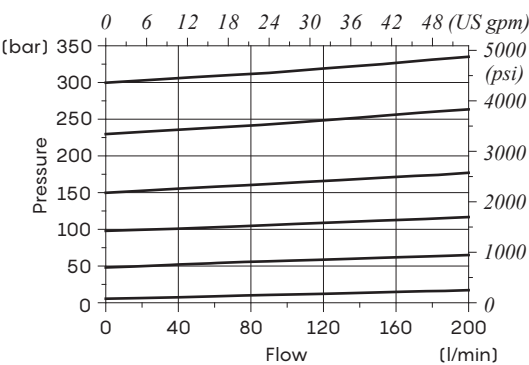
MP12T pressure vs. flow 1->2
for % of control current - Pressure range 2



MP12T pressure vs. flow 1->2
for % of control current - Pressure range 3



MP12T pressure vs. flow 1->2
for % of control current - Pressure range 4





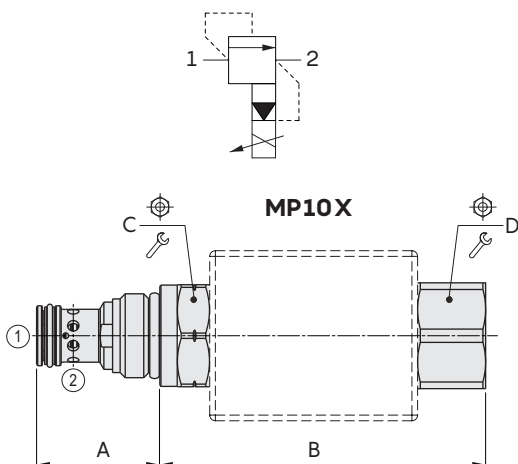
MP..X type pressure relief valves – 2 way

- Solenoid proportional type, pilot operated
- Spool type
- Increasing pressure with increasing current (N.O)
- Applications for high flow rates (max. 200 l/min – 52.8 US gpm)
- System of purging of air
- From SAE10 to SAE12 cavities

Technical specifications and diagrams are measured with mineral oil of 46 cSt viscosity at 40°C (104°F) temperature.

		MP10X	MP12X
Max. flow		120 l/min (31.7 US gpm)	200 l/min (52.8 US gpm)
Max. pressure		350 bar (5100 psi)	
Oil leakage	at 80% of max. pressure setting	<150 cm ³ /min (9.15 in ³ /min)	<200 cm ³ /min (12.2 in ³ /min)
Fluid		mineral based or synthetic hydraulic fluid with lubricating properties	
Viscosity		10-200 cSt	
Max level of contamination		18/16/13 ISO4406	
Fluid temperature	with NBR seals+Polyurethane with FPM seals	from -25°C (-13°F) to 90°C (194°F) from -20°C (-4°F) to 110°C (230°F)	
Environmental temp. for working conditions		from -20°C (-4°F) to 60°C (140°F)	
Cavity		SAE 10/2	SAE 12/2
Coil type*		BH or BQP19	
Nominal voltages		12VDC – 24VDC	
Power rating		33 W (BH) – 15 W (BQP19)	
Max. control current		12V->1.70 A – 24V->0.85 (BH) 12V->1.25 A – 24V->0.63 A (BQP19)	
Dither frequency		150-200 Hz	
Hysteresis		<5%	
Weight		0.76 kg (1.67 lb)	0.88 kg (1.94 lb)

NOTE – For different conditions, please contact Walvoil Sales Dpt. – *For coils further features see from page 201.



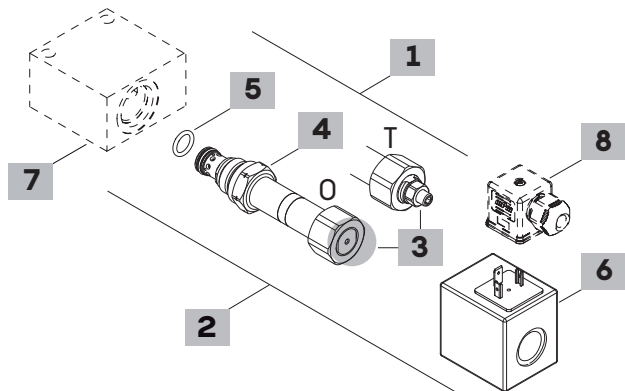
Valve type	A		B				C			D		
	mm	in	N / O without emergency		T screw						Nm	lbf
			mm	in	mm	in		Nm	lbf	Nm		
MP10X	32.6	1.28	86	3.38	104.2	4.10	27	50	37	28	5	3.7
MP12X	45	1.77	103	4.05	118.3	4.66	32	85	62.7	28	5	3.7

Ordering codes and description composition

MP10X/001B



MP10X/031B



1 Cartridges

TYPE	CODE	DESCRIPTION
SAE cavity 10/2		
MP10X/001B	OMP10002054	Pressure range 1
MP10X/002B	OMP10002055	Pressure range 2
MP10X/003B	OMP10002056	Pressure range 3
MP10X/004B	OMP10002057	Pressure range 4
SAE cavity 12/2		
MP12X/001B	OMP12002031	Pressure range 1
MP12X/002B	OMP12002032	Pressure range 2
MP12X/003B	OMP12002033	Pressure range 3
MP12X/004B	OMP12002034	Pressure range 4

2 Complete cartridges

TYPE	CODE	DESCRIPTION
SAE cavity 10/2		
MP10X/031B	OMP10002044	Pressure range 1 , 12VDC
MP10X/032B	OMP10002045	Pressure range 2 , 12VDC
MP10X/033B	OMP10002046	Pressure range 3 , 12VDC
MP10X/034B	OMP10002047	Pressure range 4 , 12VDC
SAE cavity 12/2		
MP12X/031B	OMP12002023	Pressure range 1 , 12VDC
MP12X/032B	OMP12002024	Pressure range 2 , 12VDC
MP12X/033B	OMP12002025	Pressure range 3 , 12VDC
MP12X/034B	OMP12002026	Pressure range 4 , 12VDC

3 Emergency

TYPE	DESCRIPTION
0	Without override
T	With screw

4 Pressure range

TYPE	DESCRIPTION
1	Pressure range 10÷120 bar (145÷1740 psi)
2	Pressure range 10÷160 bar (145÷2320 psi)
3	Pressure range 10÷230 bar (145÷3335 psi)
4	Pressure range 10÷350 bar (145÷5100 psi);

Note: for further pressure range contact Sales Dept

5 Seals

TYPE	DESCRIPTION
B	NBR (Buna)+Polyurethane o-ring seals, std configuration
V	FPM (Viton) o-ring seals, contact Sales Dept

6 Coils

TYPE	CODE	DESCRIPTION
2) BH 12VDC	4SLD001200A	12VDC-ISO4400 coil
3) BQP19 12VDC	4SL5000126A	12VDC-ISO4400 coil
4) BH 24VDC	4SLD002400A	24VDC-ISO4400 coil
5) BQP19 24VDC	4SL5000245A	24VDC-ISO4400 coil

For complete coils list see from page 201

7 Valve body

TYPE	CODE	DESCRIPTION
SAE10/2-G 3/8	3CC1020C11	Aluminium body for cavity 10 valve, G 3/8 std thread
SAE12/2-G 1/2	3CC1220D11	Aluminium body for cavity 12 valve, G 1/2 std thread

Note: aluminium body can stand up to 210 bar (3050 psi)
For steel bodies or different threading see from page 208

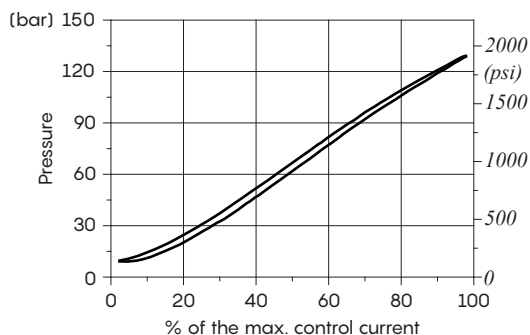
8 Connector

TYPE	CODE	DESCRIPTION
ISO4400	4CN1009995B	Connector

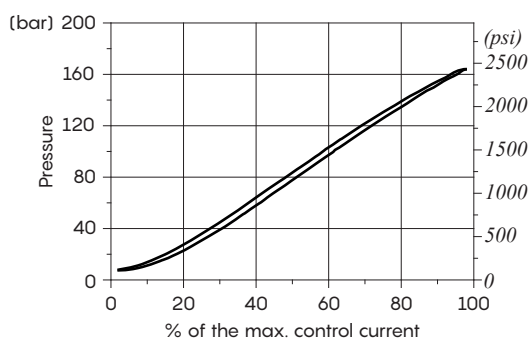
For complete connectors list see from page 201

Rating diagrams

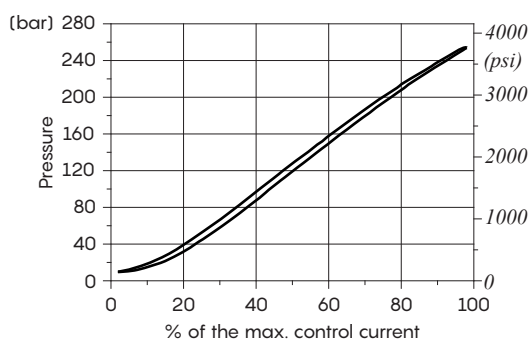
MP10X pressure setting vs. % max. control current
at 5 l/min (1.32 US gpm)



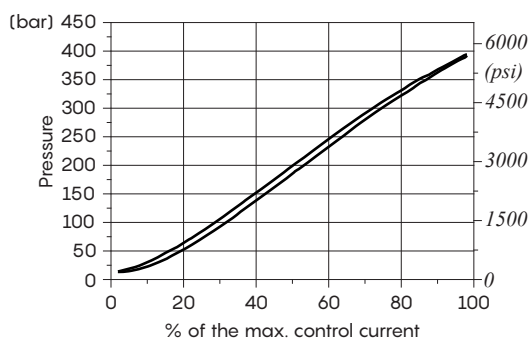
MP10X pressure setting vs. % max. control current
at 5 l/min (1.32 US gpm)



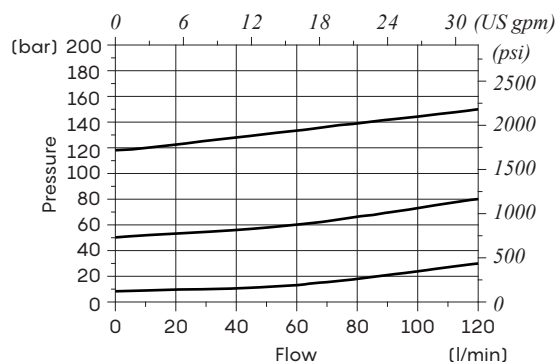
MP10X pressure setting vs. % max. control current
at 5 l/min (1.32 US gpm)



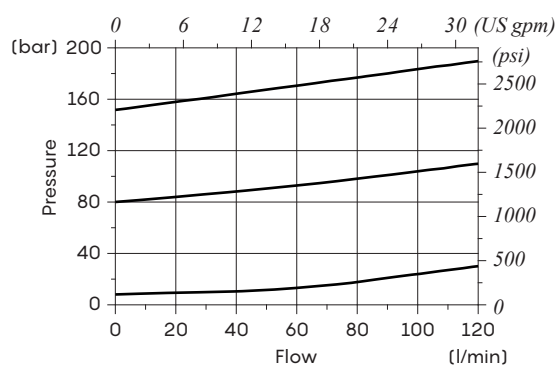
MP10X pressure setting vs. % max. control current
at 5 l/min (1.32 US gpm)



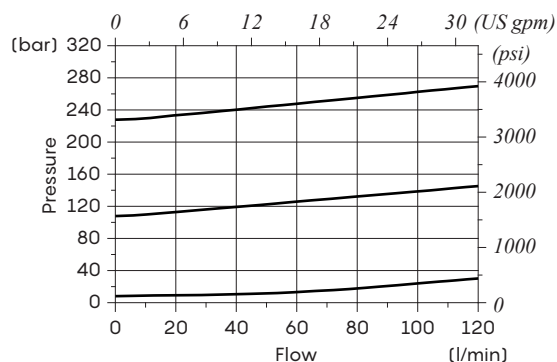
MP10X pressure vs. flow 1->2
for % of control current - Pressure range 1



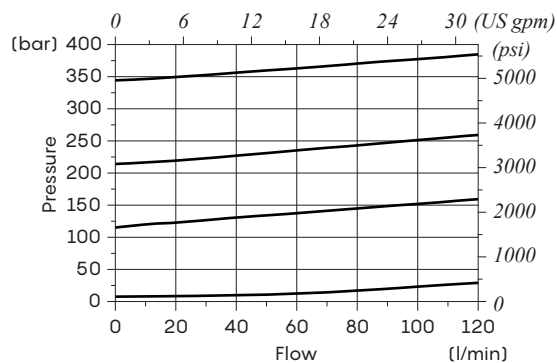
MP10X pressure vs. flow 1->2
for % of control current - Pressure range 2



MP10X pressure vs. flow 1->2
for % of control current - Pressure range 3

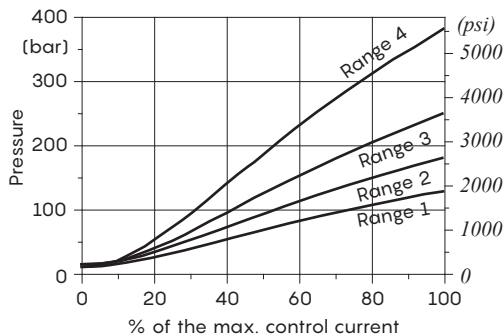


MP10X pressure vs. flow 1->2
for % of control current - Pressure range 4

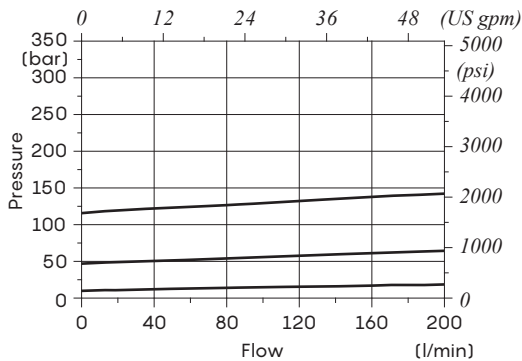


Rating diagrams

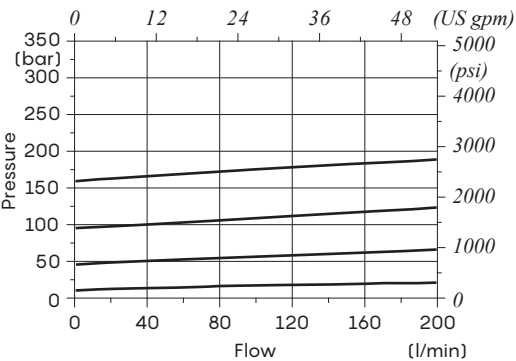
MP12X pressure setting vs. % max. control current
at 10 l/min (2.64 US gpm)



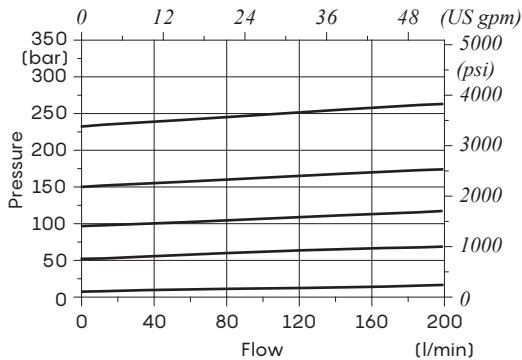
MP12X pressure vs. flow 1->2
for % of control current - Pressure range 1



MP12X pressure setting vs. flow 1->2
for % of control current - Pressure range 2



MP12X pressure vs. flow 1->2
for % of control current - Pressure range 3



MP12X pressure setting vs. flow 1->2
for % of control current - Pressure range 4

