

Series		Description	Size				Page
Parker	Denison						
		DIN / ISO	06	10	16	25	
		Pressure relief valves, manual operation					
RDM RM	ZDV	Direct operated	•	•			7-3
		Pilot operated		•	•	•	7-7
		Pilot operated, high precision	•	•	•		7-13
		Pressure reducing valves, manual operation					
PRDM PRM	ZDR	Direct operated, 3-way	•	•			7-17
		Pilot operated, 2-way		•	•	•	7-23
		Pilot operated, 2-way, high precision	•	•	•		7-31
		Pressure reducing valves, proportional operation					
PRPM		Pilot operated, 3-way	•	•			7-35
		Pressure compensators					
LCM	SPC SPC	2-way pressure compensator	•	•			7-39
		2-way pressure compensator	•	•	•	•	7-41
		3-way pressure compensator	•	•	•	•	7-41
		Throttle check valves					
FM	ZRD		•	•	•	•	7-47
		High precision	•	•	•		7-55
		Check valves					
CM	ZRV		•	•			7-59
			•	•			7-65
		Check valves, pilot operated					
CPOM	ZRE		•	•	•	•	7-69
		High precision	•	•	•		7-75
		Counterbalance valves					
	ZNS	Pilot operated	•	•			7-79
		Information					
		Mounting patterns, general information					7-83

7

This image shows a full page of blank graph paper. The grid consists of small, equal-sized squares formed by thin, dark gray lines. There are no margins, text, or other markings on the page.

Pressure relief valves series RDM are direct operated piston type valves with low hysteresis. They can be used as P-T relief or as T-T controlled counter balance valve. The valve body is equipped with a pressure gauge port.

Function

PT... pressure is relieved from P to T at the adjusted value.

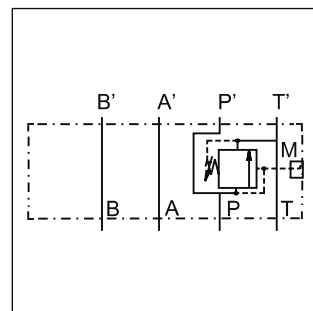
TT... pressure is relieved from T' to T at the adjusted pressure.

Features

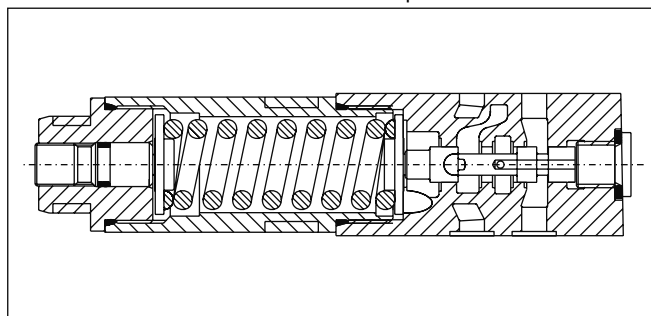
- The direct operated, cushioned piston design results in fast response, low leakage and minimal hysteresis.
- Up to 5 pressure adjustment ranges are available with max. pressure settings of:
bar 25, 64, 160, 210, 350 for RDM2,
bar 19, 50, 100, 150, 210 for RDM3.
- Adjustment modes:
 - Slotted head with lock nut
 - Key lock
 - Turning knob
- RDM2 - NG06 (CETOP3)
RDM3 - NG10 (CETOP5)



RDM2



Example PT



RDM2

Ordering code

RD	M					V		
Pressure relief valve, direct operated	Manapak	Size	Pressure relief	Pressure range	Adjustment	Seal FPM	Gauge port	Design series (not required for ordering)

Code	Size
2	NG06
3	NG10

Code	Pressure relief
PT	P
TT ¹⁾	T

¹⁾ NG06 only, max. 160 bar

Code	Gauge port
G ²⁾	G¹/₄
C	Coupling M16

²⁾ Standard in housing

Code	Adjustment
S	Hexagon socket
L	Key lock
K	Turning knob ³⁾

³⁾ NG06 only

Pressure range			
Code	RDM2	Code	RDM3
02	1.5 to 25 bar	01	1.5 to 19 bar
06	1.5 to 64 bar	05	1.5 to 50 bar
16	3 to 160 bar	10	3 to 100 bar
21	3 to 210 bar	15	3 to 150 bar
35	5 to 350 bar	21	3 to 210 bar

Bold letters =
Short-term availability

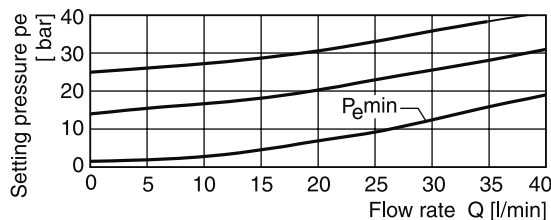
Technical data

General					
Series		RDM2		RDM3	
Size		NG06		NG10	
Mounting interface		ISO 4401			
Weight [kg]		1.3		2.6	
MTTF _D value [years]		150			
Ambient temperature [°C]		-20...+50			
Hydraulic					
Max. operating pressure		P, A, B [bar]	350		315
		T [bar]	50		10
Fluid		Hydraulic oil according to DIN 51524...525			
Fluid temperature [°C]		-20...+80			
Viscosity [cSt] / [mm²/s]		12...230			
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638:7)			
Max. Flow [l/min]		40		80	

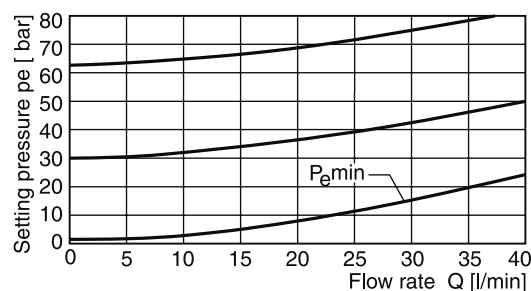
Max. leakage P - A: 5ml/min.

Performance curves

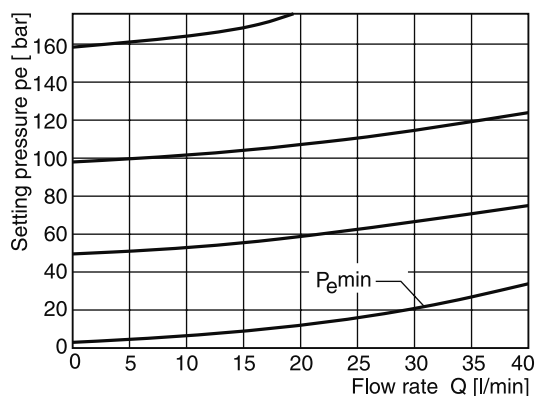
RDM2 02



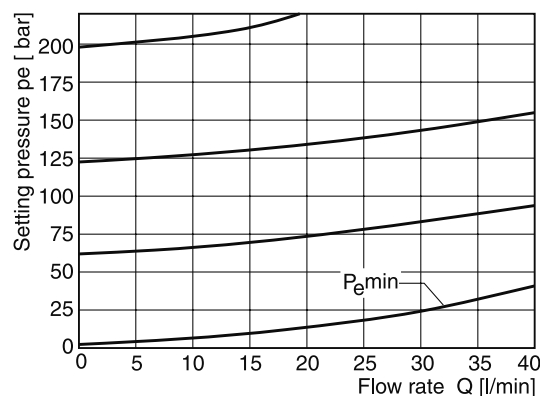
RDM2 06



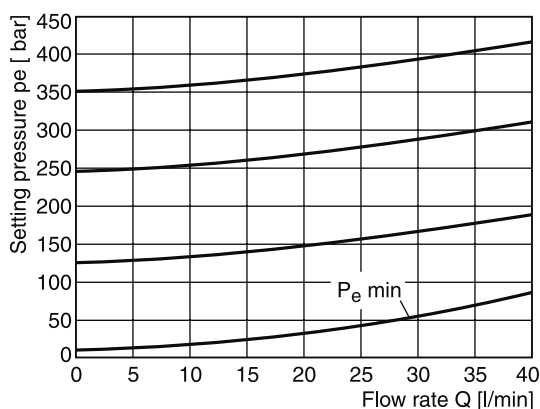
RDM2 16



RDM2 21



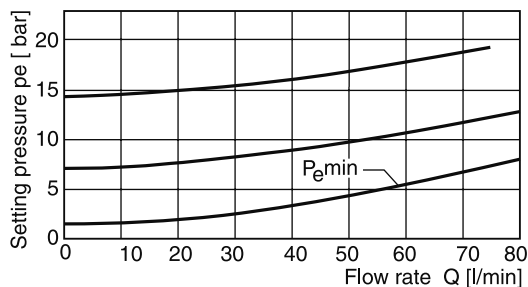
RDM2 35



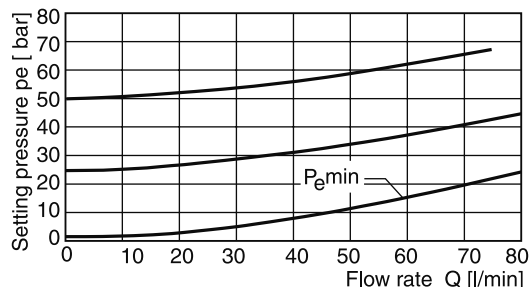
All characteristic curves measured with HLP46 at 50°C.

RDM UK.INDD CM 07.09.11

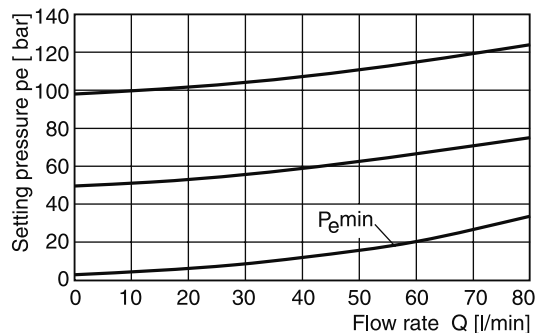
RDM3 01



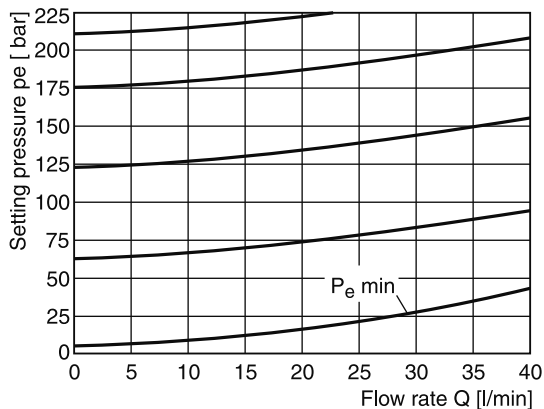
RDM3 05



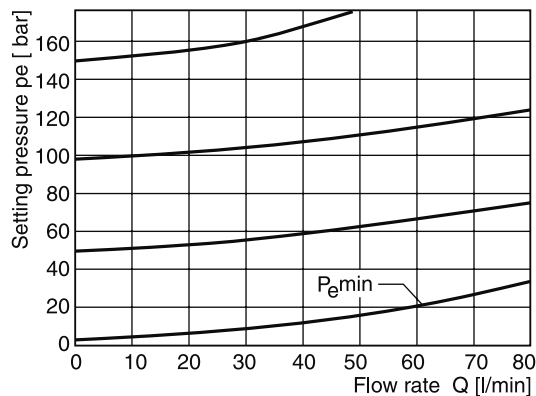
RDM3 10



RDM3 21



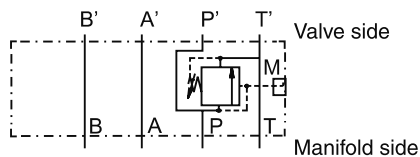
RDM3 15



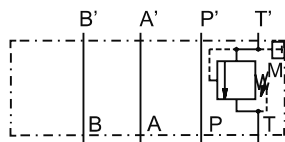
All characteristic curves measured with HLP46 at 50°C.

Schematics

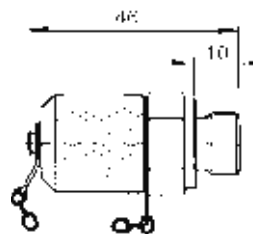
RDM*PT

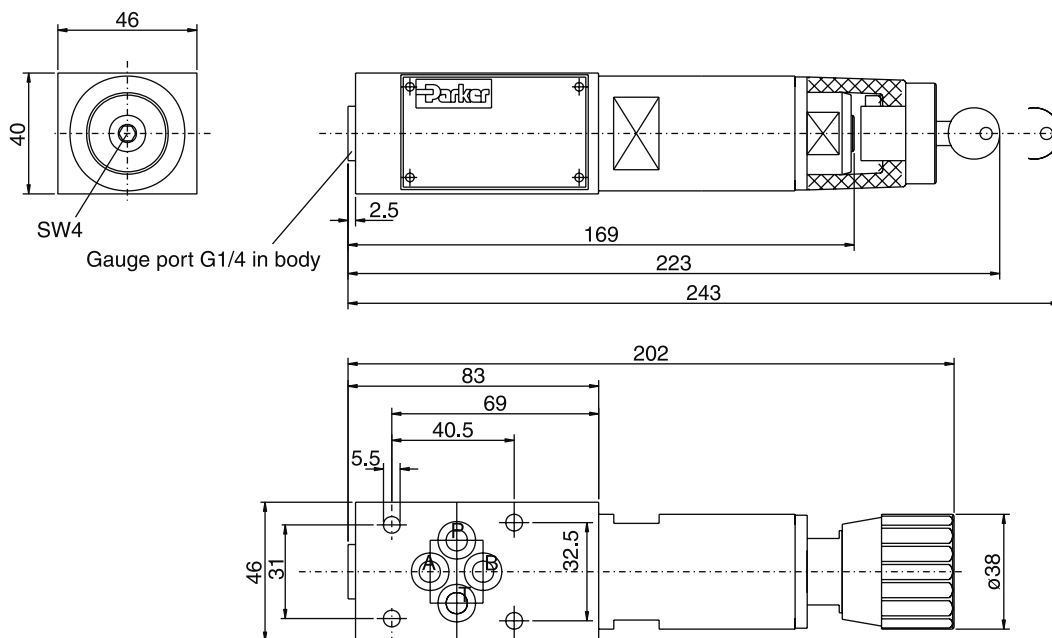
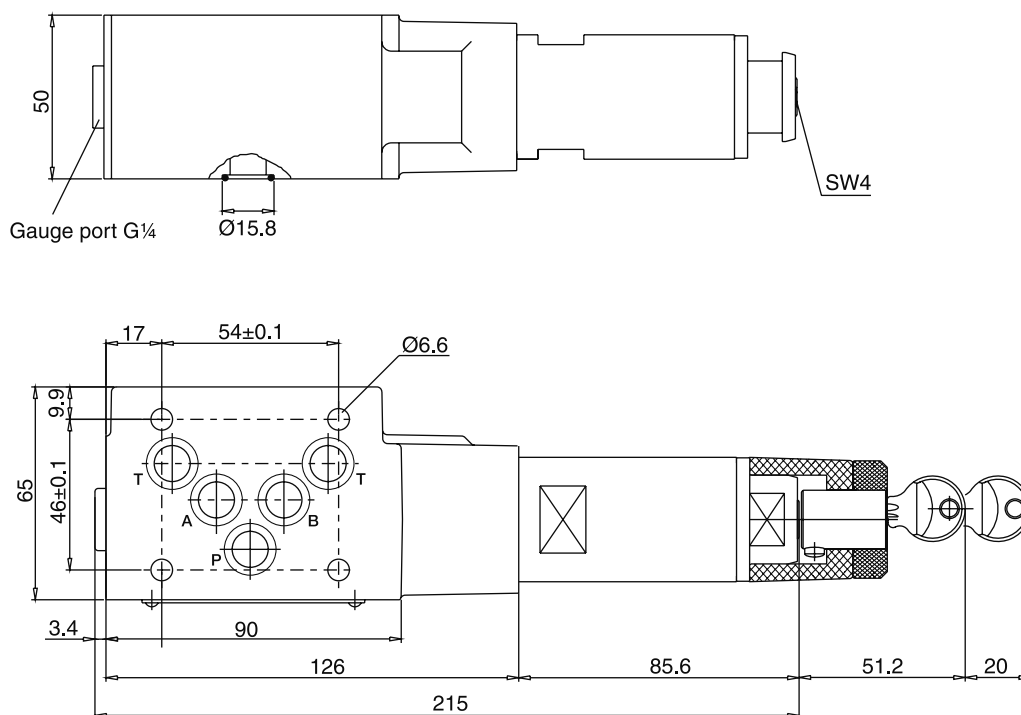


RDM*TT

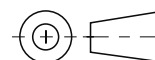


Gauge port option C



RDM2**7****RDM3**

Seal kit order code		
Seal	RDM2	RDM3
V	SK-RDM2-V	SK-RDM3-V



The pilot operated pressure relief valves from the Parker Manapak series RM are in sandwich design for easy configuration of stack systems. Depending on type, pressure limiting can be achieved in ports P, A or B with unloading to port T.

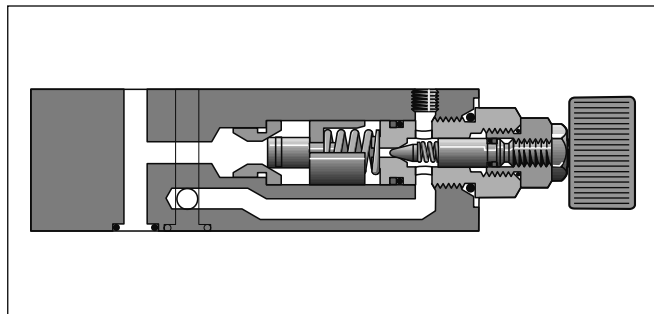
RM valves may only be mounted in the defined mounting position.

Features

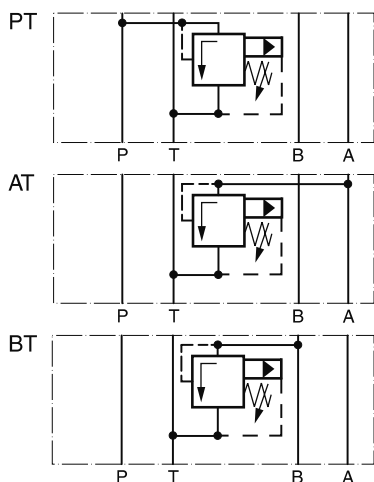
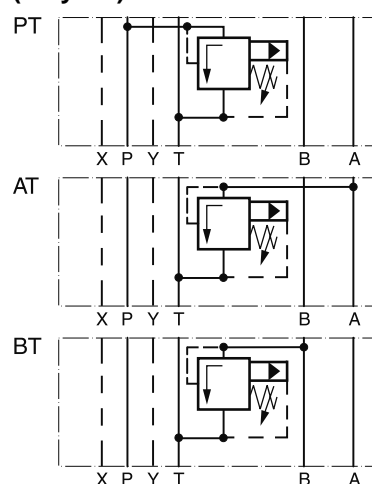
- The valve bodies of the Parker Manapak valve series RM are made of steel.
- The pressure can be set by slotted head screw, knob, or knob with DIN-lock.
- Piloting results in a flat p/Q performance curve.
- The orifices located in the main spool limit the pilot oil flow.



RM6



RM3

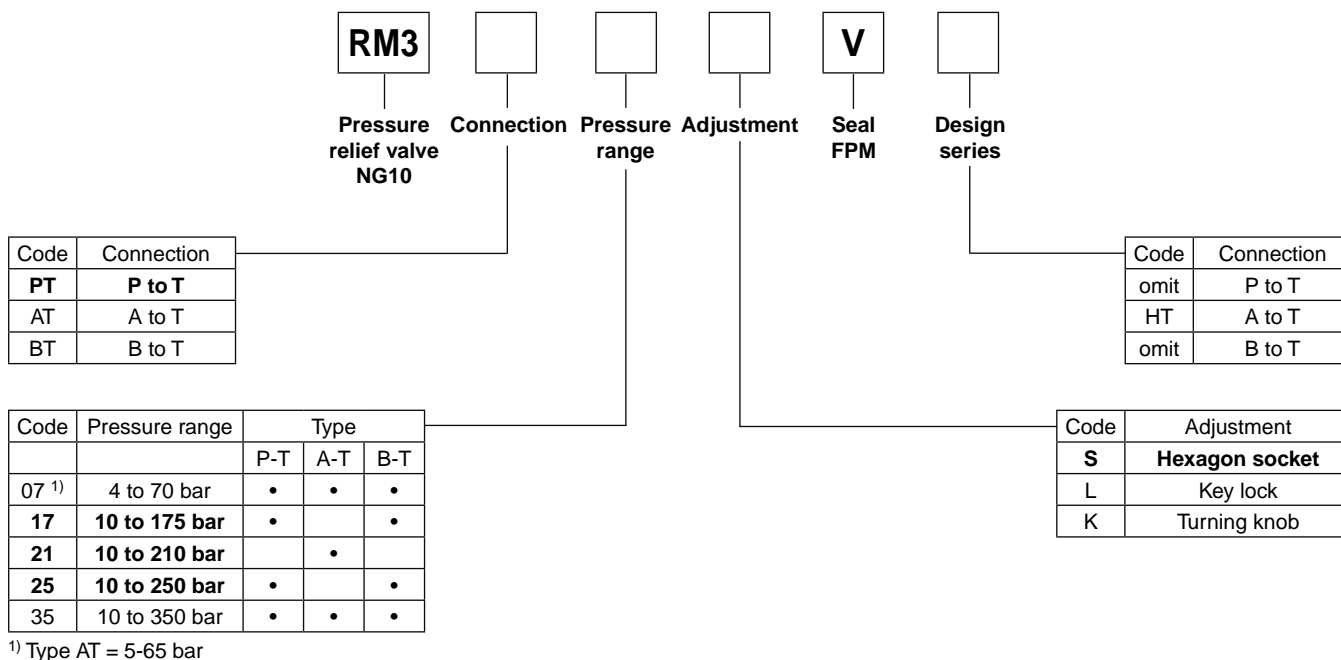
Schematics**RM3-NG10****RM4-NG16****RM6-NG25 (only PT)****Technical data**

General				
Design		Pilot operated pressure relief valve		
Actuation		hydraulic		
Size		NG10	NG16	NG25
Mounting interface		ISO 4401		
Mounting position		unrestricted		
Ambient temperature [°C]		-40...+50		
MTTF _D value [years]		150		
Weight [kg]		3.7	4.9	5.9
Hydraulic				
Max. operating pressue [bar]		350		
Fluid		Hydraulic oil according to DIN 51524...525		
Fluid temperature [°C]		-20...+80		
Viscosity recommended [cSt]/[mm²/s]		30...80		
permitted [cSt]/[mm²/s]		20...380		
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638:7)		

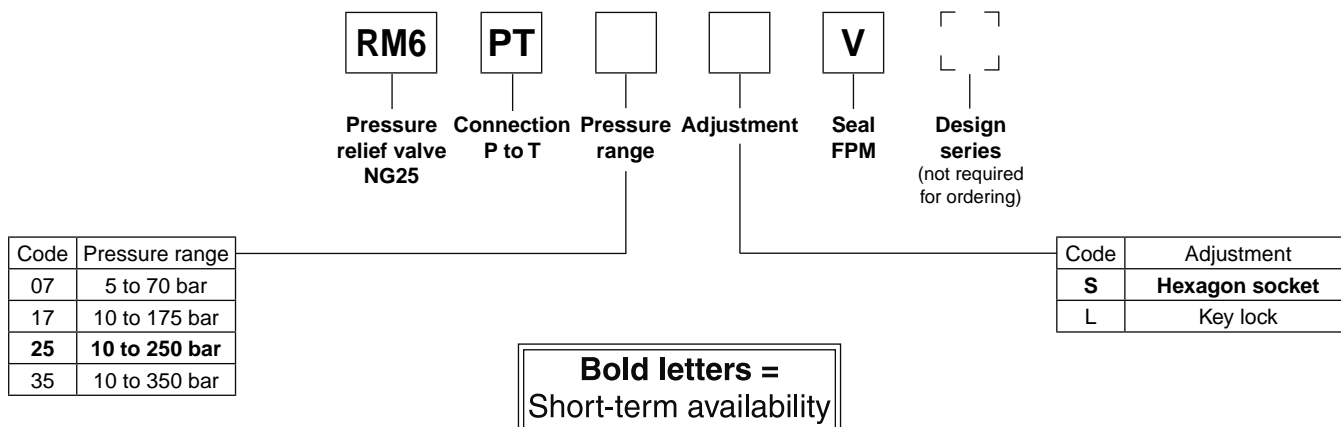
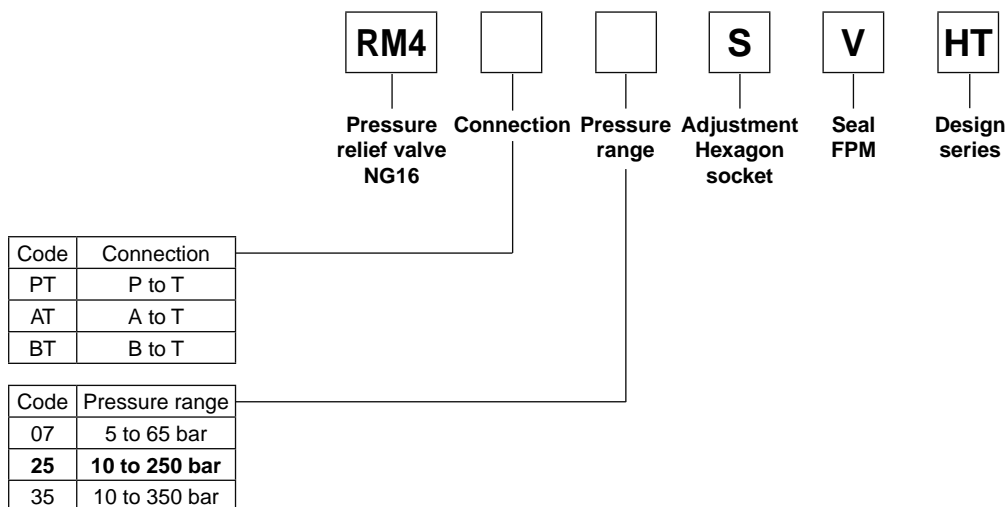
RM UK.INDD CM 07.09.11

Pilot Operated Pressure Relief Valve Series RM

Ordering Code

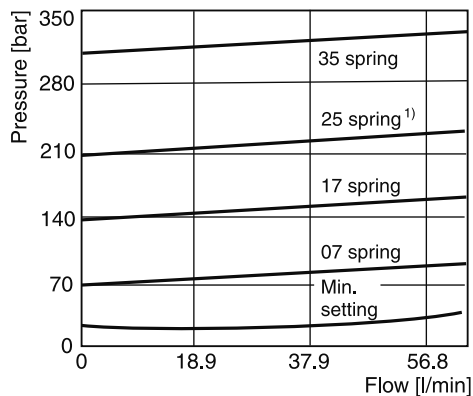


7

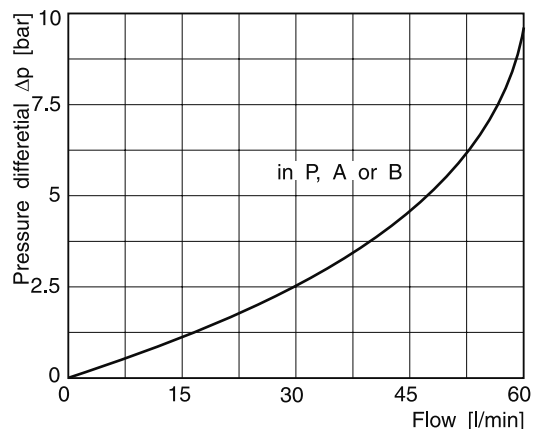


p/Q performance curves

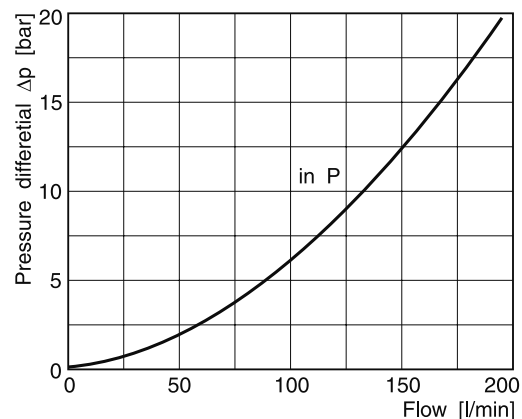
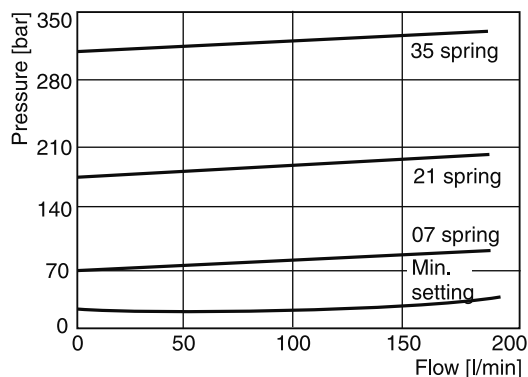
RM3



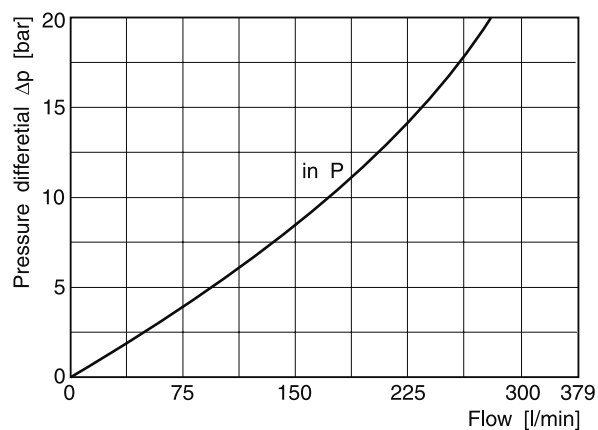
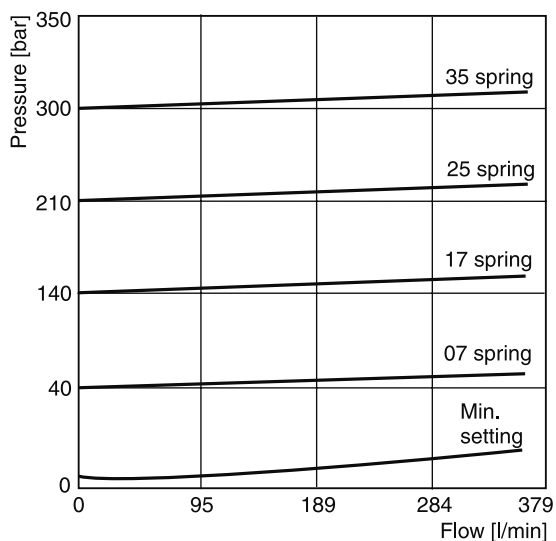
¹⁾ 21 spring for AT



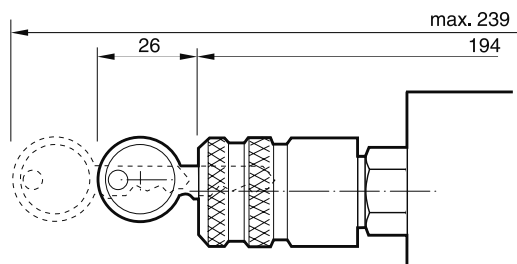
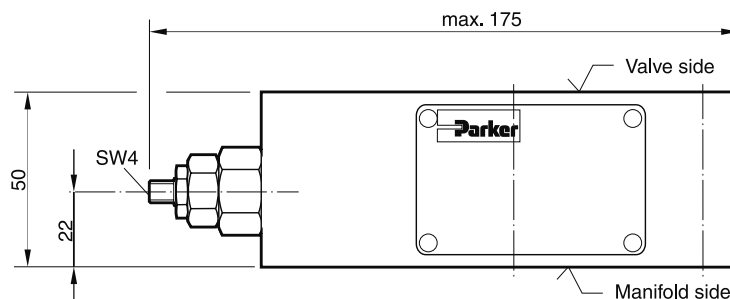
RM4



RM6



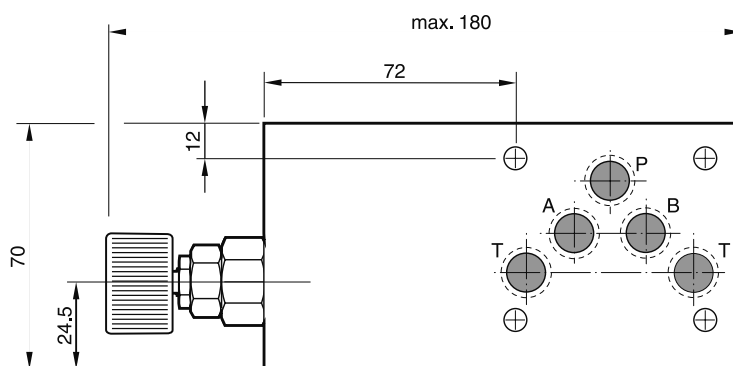
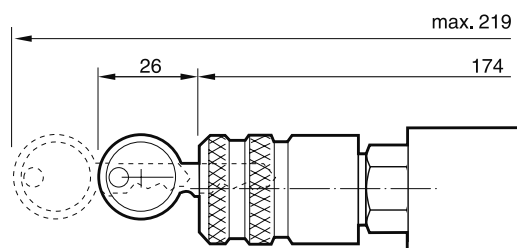
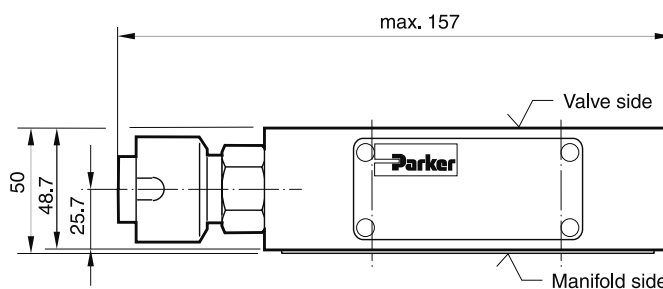
All characteristic curves measured with HLP46 at 50°C.

Dimensions**Pilot Operated Pressure Relief Valve
Series RM****RM3 PT/BT****Adjustment code L****Adjustment code S**

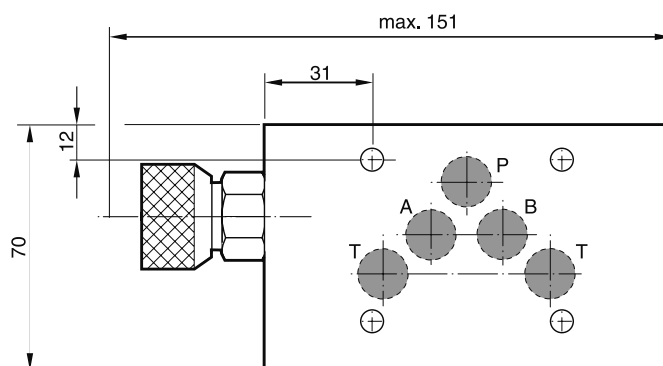
Seal kit RM3	
Seal	Order code
V	SK-RM3-V-11

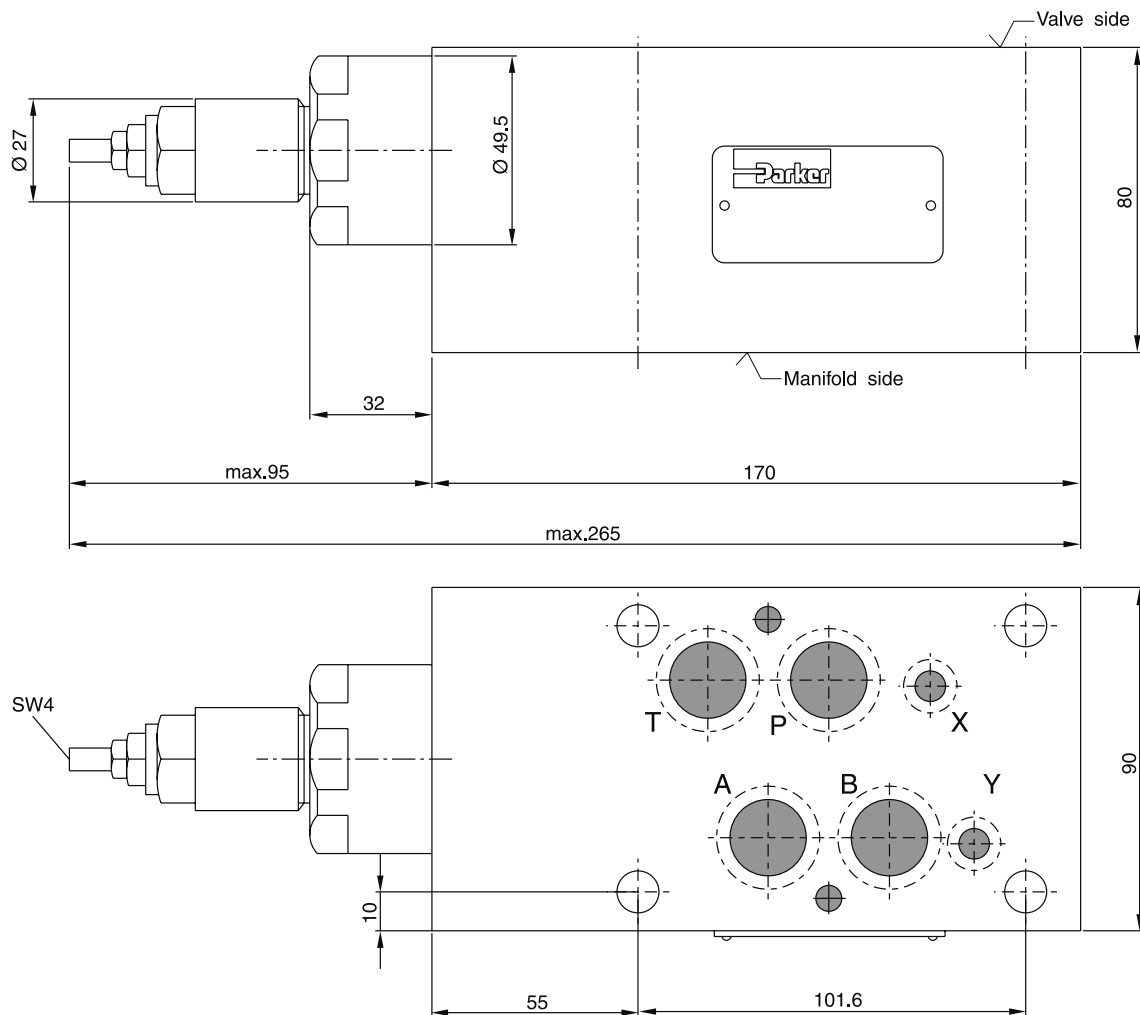
Note:

The O-rings for sealing the connecting surface of the manifold side are included. The O-rings and the positioning pins are always mounted on the manifold side.

Adjustment code K**RM3 AT*HT****Adjustment code L****Adjustment code S****Note:**

The seal plate and the O-rings for sealing the connecting surface of the manifold side are included with the HT model.

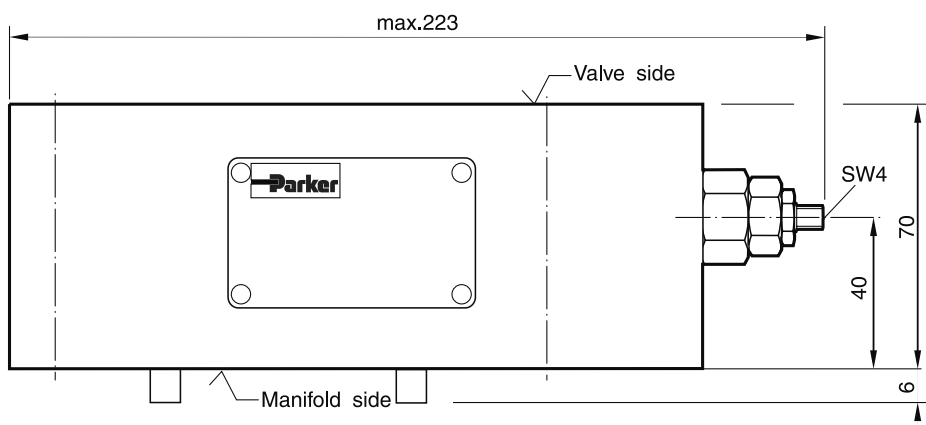
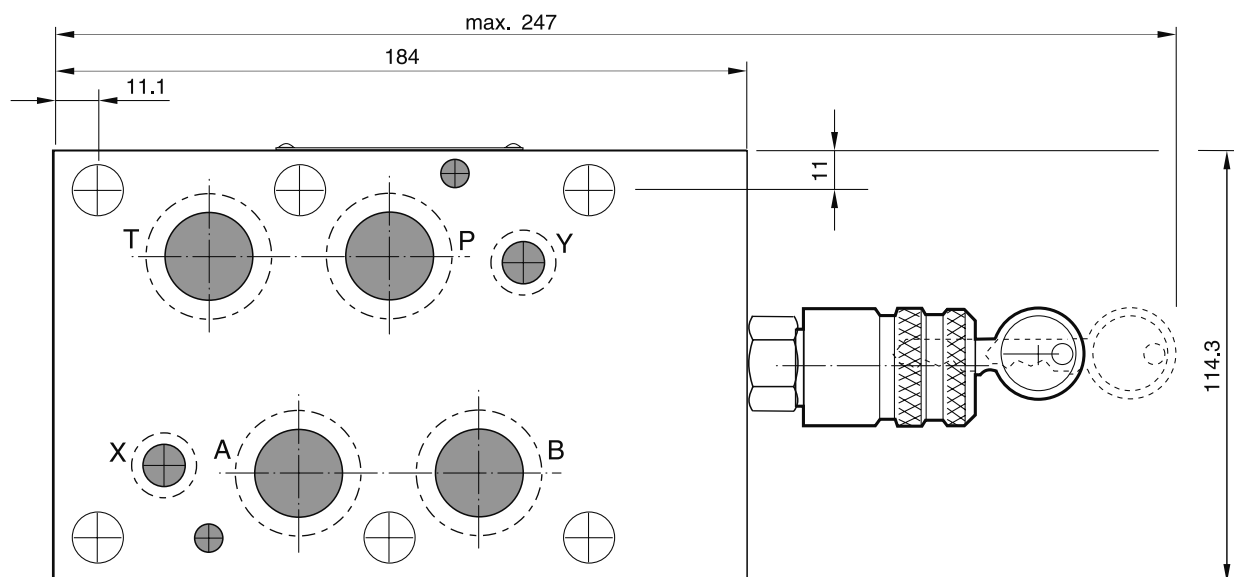
Adjustment code K

RM4**Adjustment code S**

Seal kit RM4	
Seal	Order code
V	SK-RM4-V-10

Note:

The O-rings for sealing the connecting surface of the manifold side are included. The O-rings and the positioning pins are always mounted on the manifold side.

Dimensions**RM6****Adjustment Code S****Adjustment Code L**

Seal kit RM6

Seal	Order code
V	SK-RM6-V-11

Note:

The O-rings for sealing the connecting surface of the manifold side are included. The O-rings and the positioning pins are always mounted on the manifold side.

Pilot operated pressure relief valves series ZDV are designed for maximum flow rates.

The relief function can be located between P and T, A and T, B and T or A and T + B and T for typical pressure relief functions.

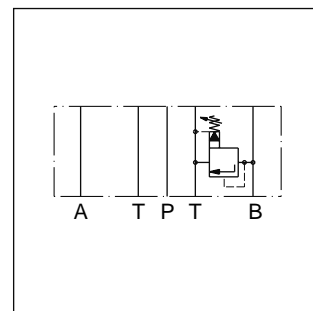
For a pre-charge function the ZDV can be ordered with pressure function between A and B + B and A.

Features

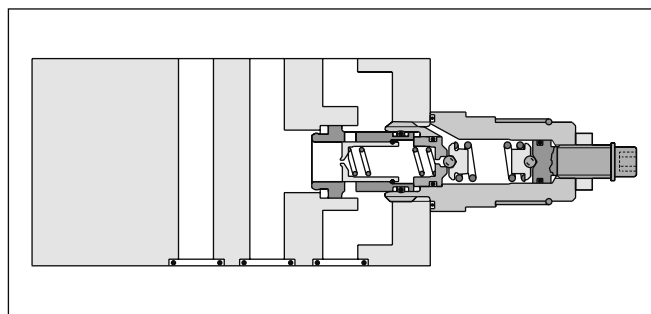
- High flow capacity
- Pressure function in P, A, B or A + B
- Sizes
ZDV01 - NG06 (CETOP3)
ZDV02 - NG10 (CETOP5)



ZDV-P01



ZDV-B02



ZDV-B02

Ordering code

ZDV – **Pressure relief valve** – **Pressure control** – **Nominal size** – **Pressure stages** – **S0** – **Hexagon screw with lock nut** – **D** – **Design series** – **Seal**

Code	Size	Pressure control
P	NG06/10	P - T
A	NG06/10	A - T
B	NG06/10	B - T
AB	NG06/10	A - T & B - T
ABS	NG06/10	A - B & B - A

Code	Nominal size
01	NG06
02	NG10

Code	Seal
1	NBR
5	FPM

Code	Pressure stages
1	up to 70 bar
5 ¹⁾	up to 350 bar

¹⁾ Code ABS and size 10 up to 315 bar

Ordering code details see end of chapter.

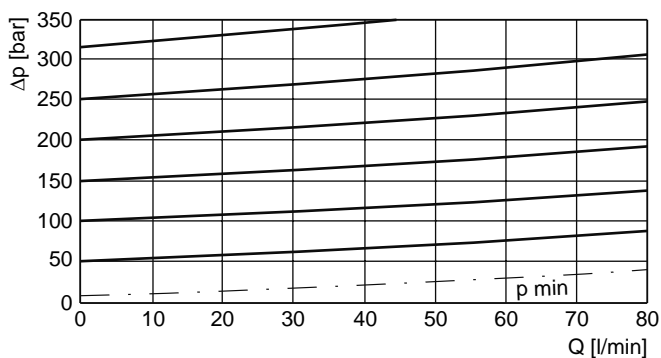
Technical data

General			
Size		NG06	NG10
Mounting interface		DIN 24340 A6 ISO 4401 NFPA D03	DIN 24340 A10 ISO 4401 NFPA D05
		CETOP RP 121	
Mounting position		unrestricted	
Ambient temperature		[°C] -20...+50	
MTTF _D value		[years] 150	
Weight	1 cartridge	[kg] 1.6	3.0
	2 cartridges	[kg] 2.5	3.7
Hydraulic			
Max. operating pressure		350 (ZDV-ABS 315)	315
Nominal flow		[l/min] 80	140
Fluid		Hydraulic oil as per DIN 51524...51525	
Fluid temperature		[°C] -20...+80	
Viscosity	permitted	[cSt]/ [mm ² /s] 10...650	
	recommended	[cSt]/ [mm ² /s] 30	
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638:7)	

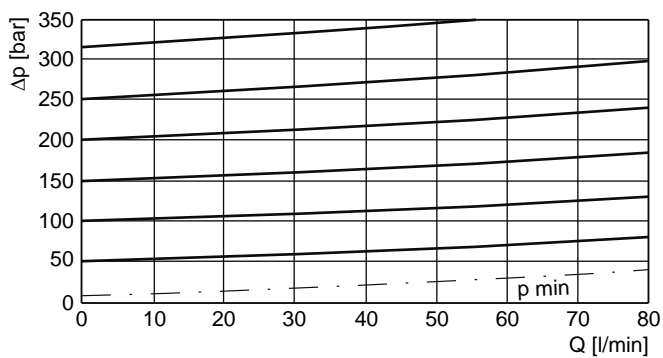
ZDV UK.INDD CM 07.09.11

p/Q performance curves

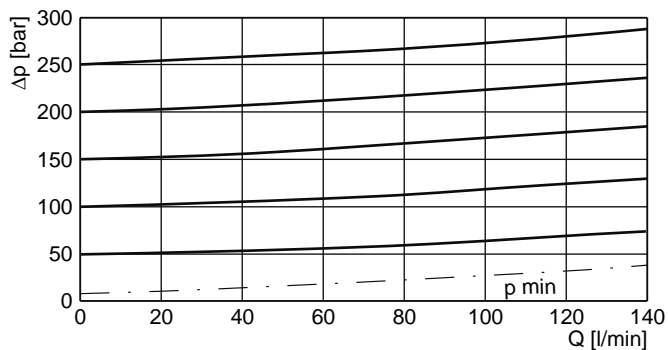
ZDV-P/A/B/ABS01



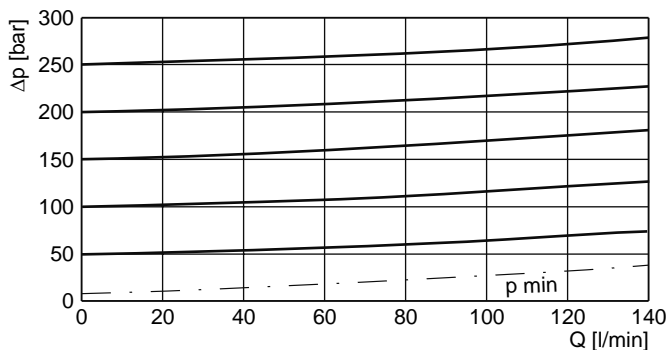
ZDV-AB01



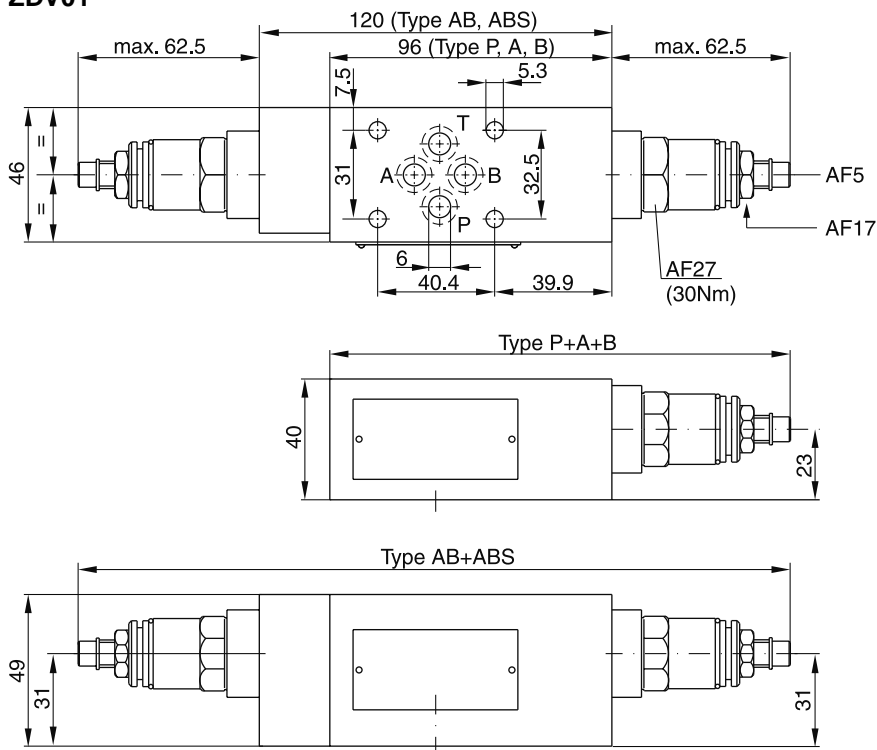
ZDV-P/A/B/AB02



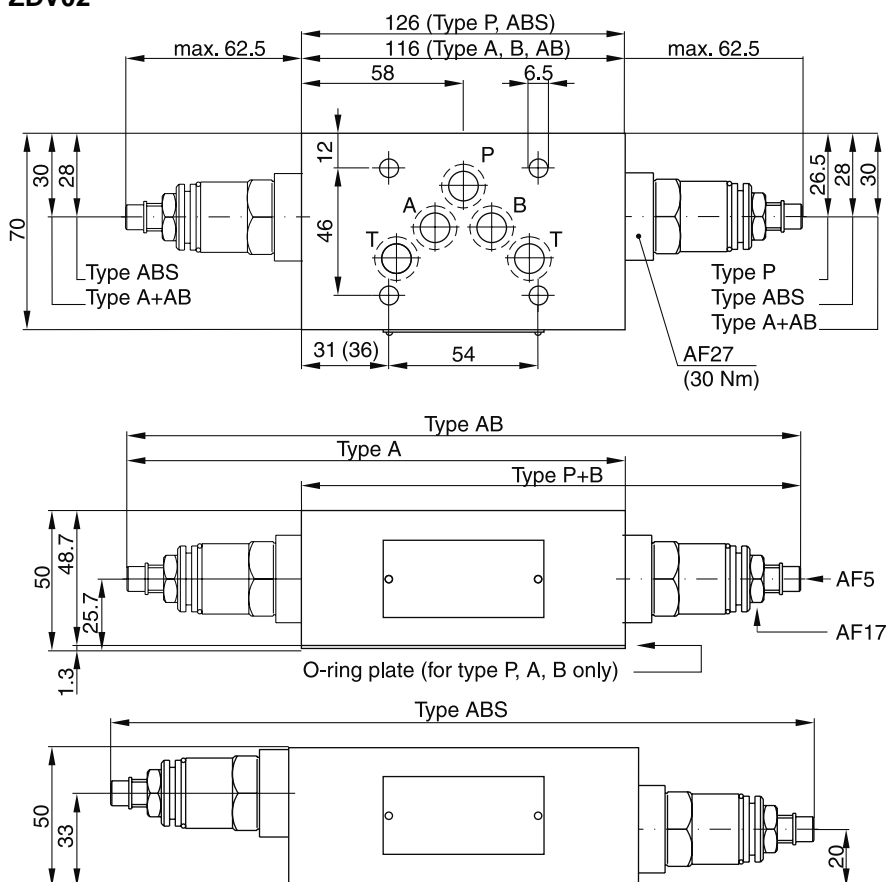
ZDV-ABS02



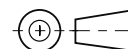
All characteristic curves measured with HLP46 at 50°C.

Dimensions**Pressure Relief Valve
Series ZDV (Denison)****ZDV01**

Seal kit	
Seal	Order code
1	098-91182-0
5	098-91183-0
Complete cartridge	
Pressure stage	Order code
1	098-91116-0
5	098-91117-0

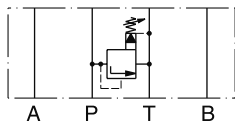
ZDV02

Seal kit	
Seal	Order code
1	098-91076-0
5	098-91077-0
Complete cartridge	
Pressure stage	Order code
1	098-91116-0
5	098-91117-0



ZDV01

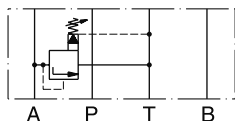
Pressure control P-T



Series
 ZDV-P01-1-S0-D1
 ZDV-P01-5-S0-D1

Order No.
 098-91201-0
 098-91202-0

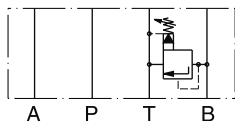
Pressure control A-T



Series
 ZDV-A01-1-S0-D1
 ZDV-A01-5-S0-D1

Order No.
 098-91203-0
 098-91204-0

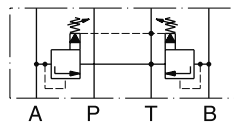
Pressure control B-T



Series
 ZDV-B01-1-S0-D1
 ZDV-B01-5-S0-D1

Order No.
 098-91205-0
 098-91206-0

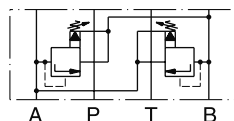
Pressure control A-T & B-T



Series
 ZDV-AB01-1-S0-D1
 ZDV-AB01-5-S0-D1

Order No.
 098-91207-0
 098-91208-0

Pressure control A-B & B-A

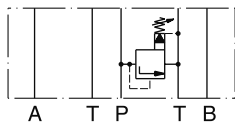


Series
 ZDV-ABS01-1-S0-D1
 ZDV-ABS01-5-S0-D1

Order No.
 098-91209-0
 098-91210-0

ZDV02

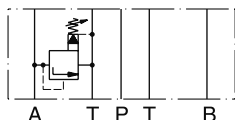
Pressure control P-T



Series
 ZDV-P02-1-S0-D1
 ZDV-P02-5-S0-D1

Order No.
 098-91034-0
 098-91035-0

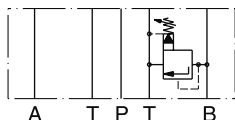
Pressure control A-T



Series
 ZDV-A02-1-S0-D1
 ZDV-A02-5-S0-D1

Order No.
 098-91036-0
 098-91037-0

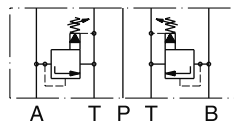
Pressure control B-T



Series
 ZDV-B02-1-S0-D1
 ZDV-B02-5-S0-D1

Order No.
 098-91038-0
 098-91039-0

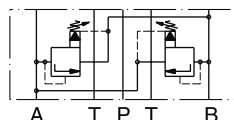
Pressure control A-T & B-T



Series
 ZDV-AB02-1-S0-D1
 ZDV-AB02-5-S0-D1

Order No.
 098-91040-0
 098-91041-0

Pressure control A-B & B-A



Series
 ZDV-ABS02-1-S0-D1
 ZDV-ABS02-5-S0-D1

Order No.
 098-91042-0
 098-91043-0

Characteristics

Series PRDM are direct operated pressure reducing valves to regulate pressure in one area of a hydraulic circuit at a predetermined level below normal system pressure. Additionally, an integral pressure relieving function for the secondary reduced pressure circuit is incorporated into the design.

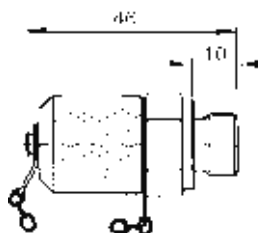
Function

These valves are "normally open" devices that allow fluid to flow through the controlled port during their non-actuated or "at rest" condition. When downstream pressure exceeds the value set by the spring force, the control piston moves off its seat, closing off the flow path and thus reducing the fluid passing through from the main system. The cushioned piston modulates to maintain the preset pressure in this branch of the hydraulic circuit. If, due to external forces, the pressure continues to rise in this branch circuit, the piston will keep moving against the spring force allowing fluid to be drained to the tank, thereby limiting maximum pressure to the valve's setting.

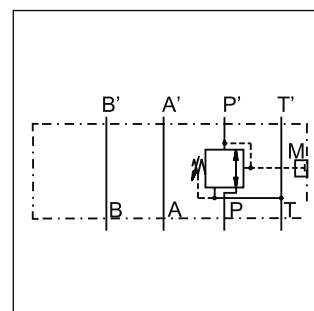
Features

- 3-way design for pressure relieving of the secondary side
- The direct operated, cushioned piston design results in fast response, low leakage and minimal hysteresis.
- Reduced pressure in the 'P', 'A' or 'B' port.
- Pressure settings
- bar 25, 70, 160, 210, 350 for PRDM2,
- bar 19, 50, 100, 150, 210 for PRDM3.
- Gauge port
- PRDM2 - NG06 (CETOP 3)
- PRDM3 - NG10 (CETOP 5)

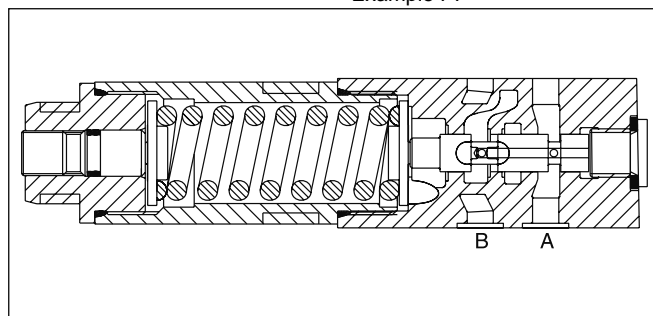
Gauge port option C



Direct Operated Pressure Reducing Valve Series PRDM

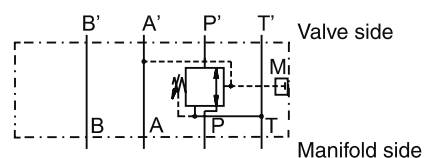


Example PP

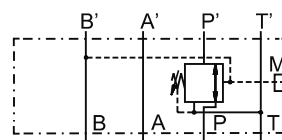


Schematics

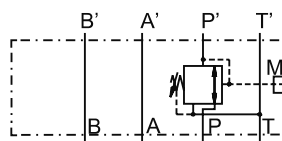
PRDM*AA



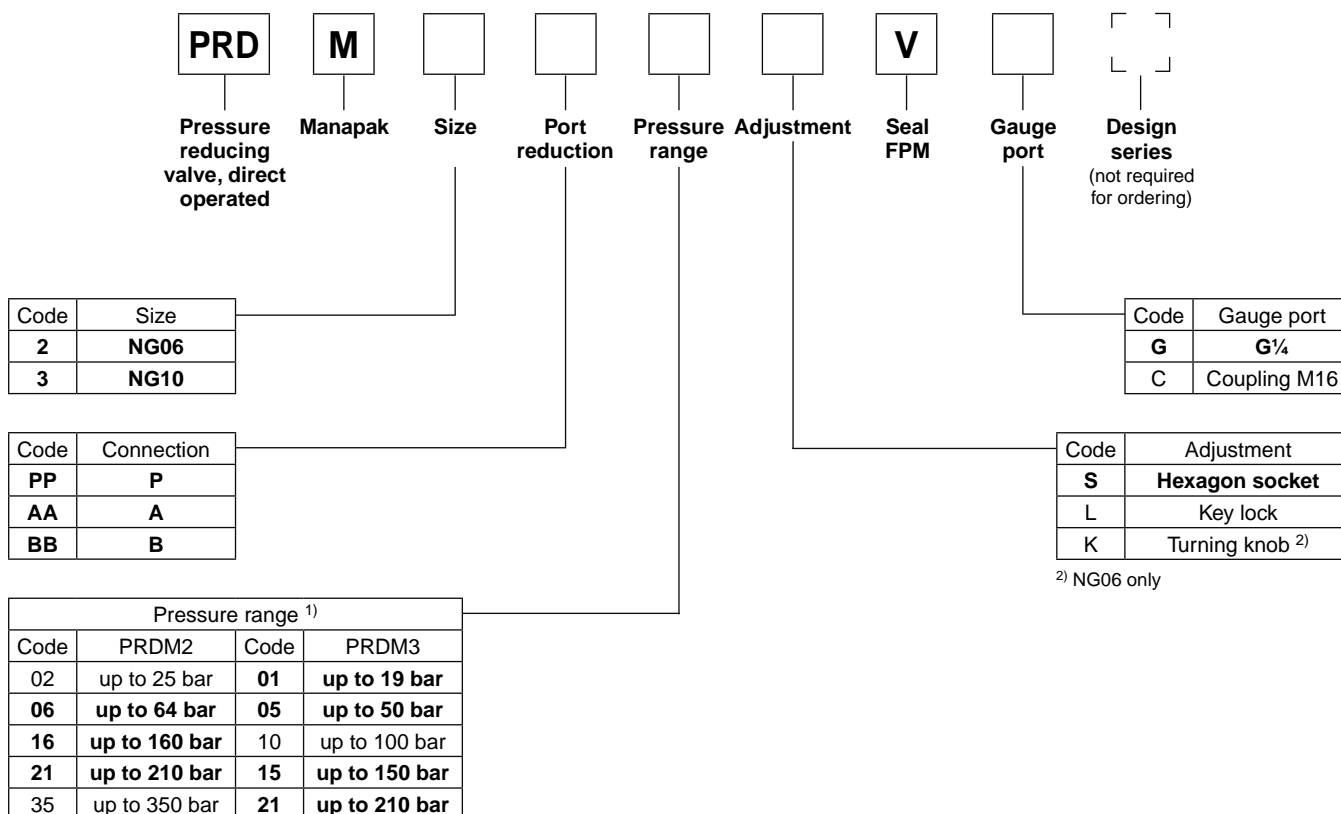
PRDM*BB



PRDM*PP



Ordering code



¹⁾ For optimum performance it is recommended to use the appropriate pressure stage, e.g. for 150 bar reduced pressure use code 16 - 160 bar.

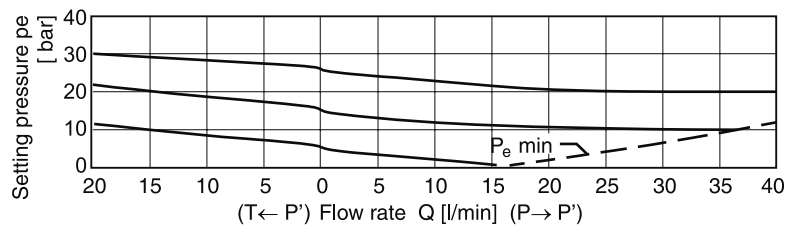
Bold letters =
Short-term availability

Technical data

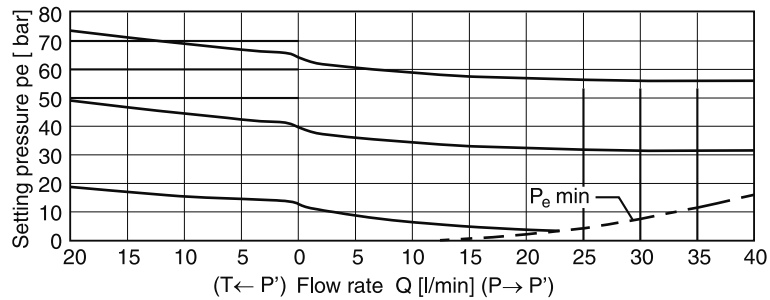
General							
Series		PRDM2		PRDM3			
Size		NG06		NG10			
Mounting interface		ISO 4401					
Ambient temperature		[°C] -20...+50					
Weight		[kg] 1.3		2.6			
MTTF _D value		[years] 150					
Hydraulic							
Max. operating pressure		P, A, B		350		315	
		T		50		50	
Fluid		[bar]					
		Hydraulic oil according to DIN 51524...51525					
Fluid temperature		[°C] -20...+80					
Viscosity range		[cSt] [mm²/s] 12...230					
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638:7)					

Max. leakage P - A: max. 15 ml/min

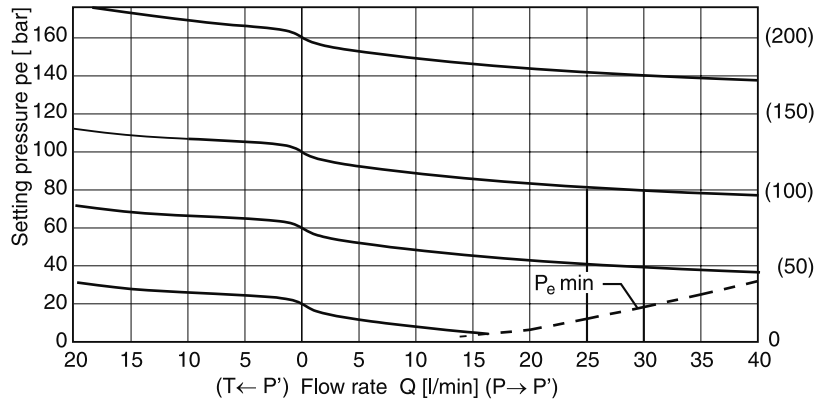
PRDM2 02



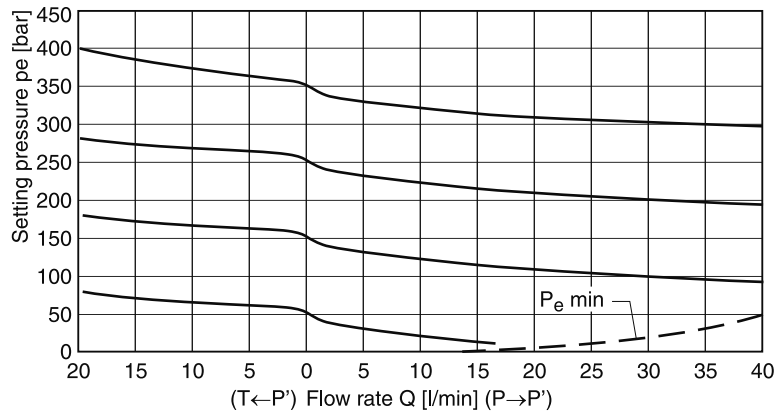
PRDM2 06



PRDM2 16/21

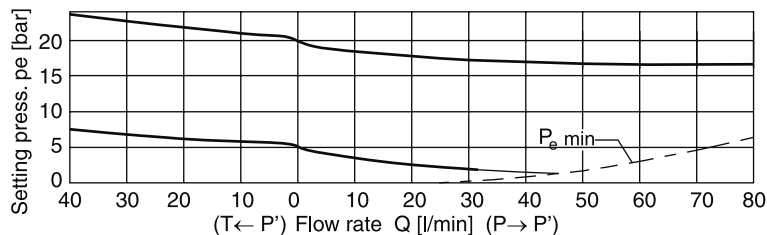


PRDM2 35

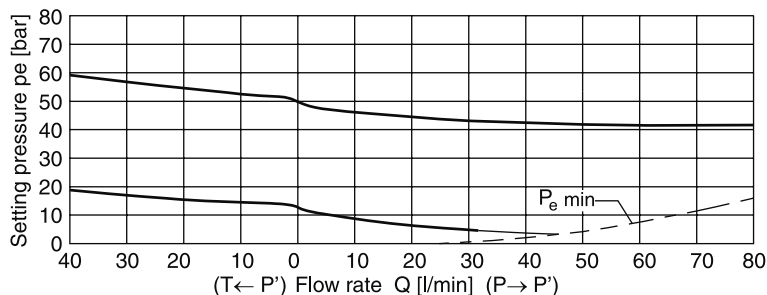


All characteristic curves measured with HLP46 at 50°C.

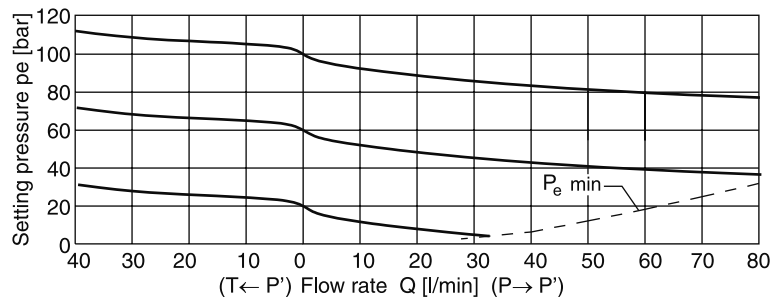
PRDM3 01



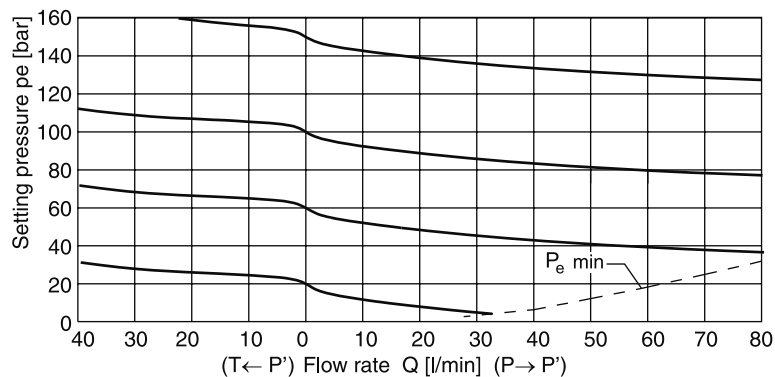
PRDM3 05



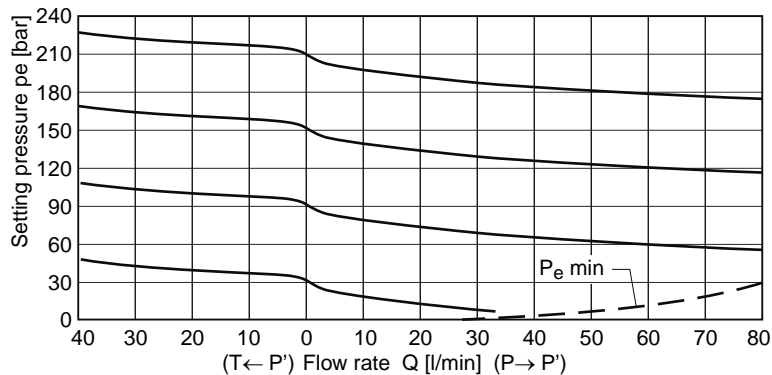
PRDM3 10



PRDM3 15

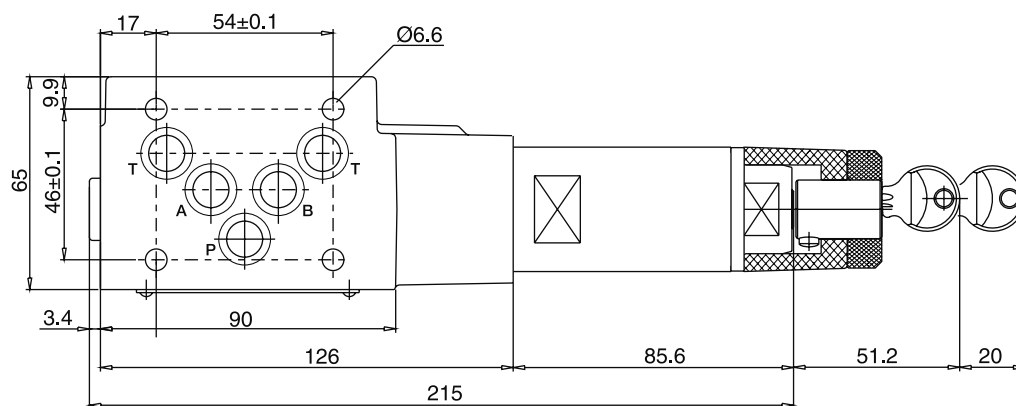
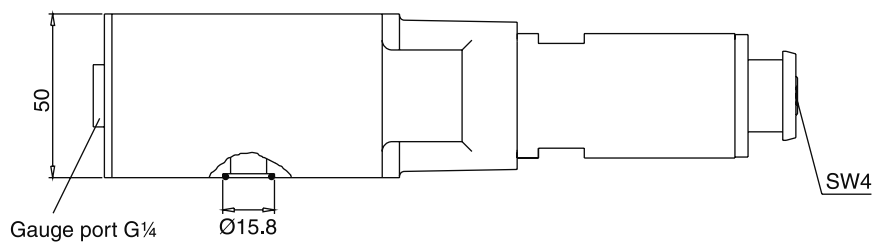


PRDM3 21

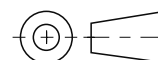


All characteristic curves measured with HLP46 at 50°C.

PRDM3



Seal kit order code		
Seal	PRDM2	PRDM3
V	SK-PRDM2-V	SK-PRDM3-V



This image shows a full page of blank graph paper. The grid consists of small, uniform squares formed by thin, light gray lines. There are no margins, text, or other markings on the page.

Characteristics

The pilot operated pressure relief valves from the Parker Manapak series PRM are in sandwich design for easy configuration of stack systems. The reducing function is located in port P except for size NG10 (PRM3 AA and BB, see ordering code).

The pressure reduction for the desired connecting port is achieved by internal connections of the pilot and drain lines with the corresponding channels.

Features

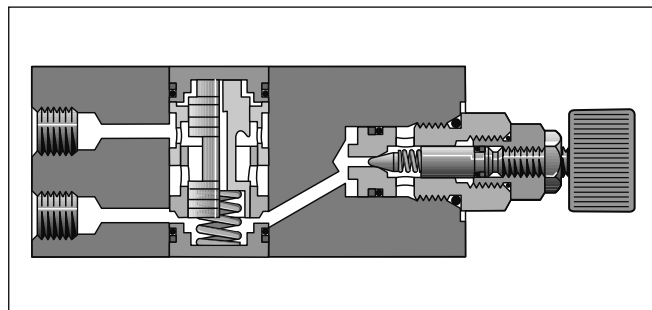
- The valve bodies of the Parker Manapak valve series PRM are made of steel.
- The control pressure range can be set by slotted head screw, knob, or knob with Key lock.
- Pressure gauge/measuring connections are available in the valve body.
- Piloting results in a flat p/Q performance curve.
- PRM3 - NG10 (CETOP 5)
PRM4 - NG16 (CETOP 7)
PRM6 - NG25 (CETOP 8)



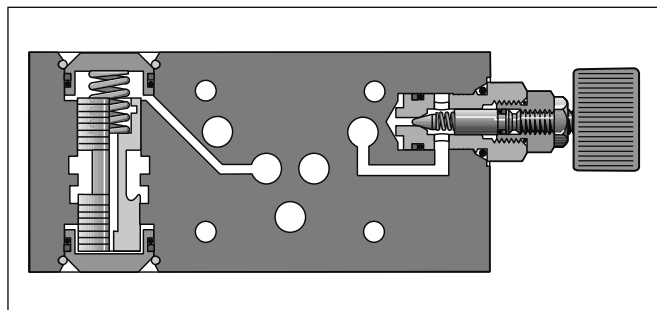
PRM3PP



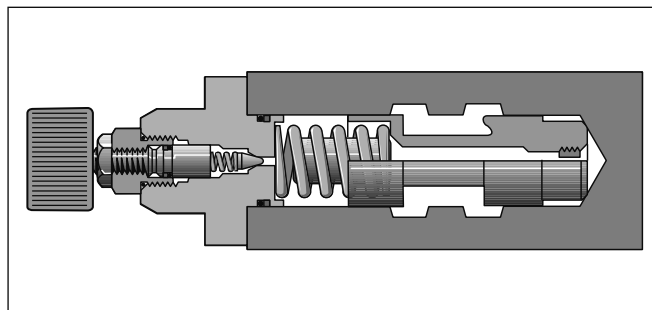
PRM6



PRM3PP



PRM3AA or PRM3BB



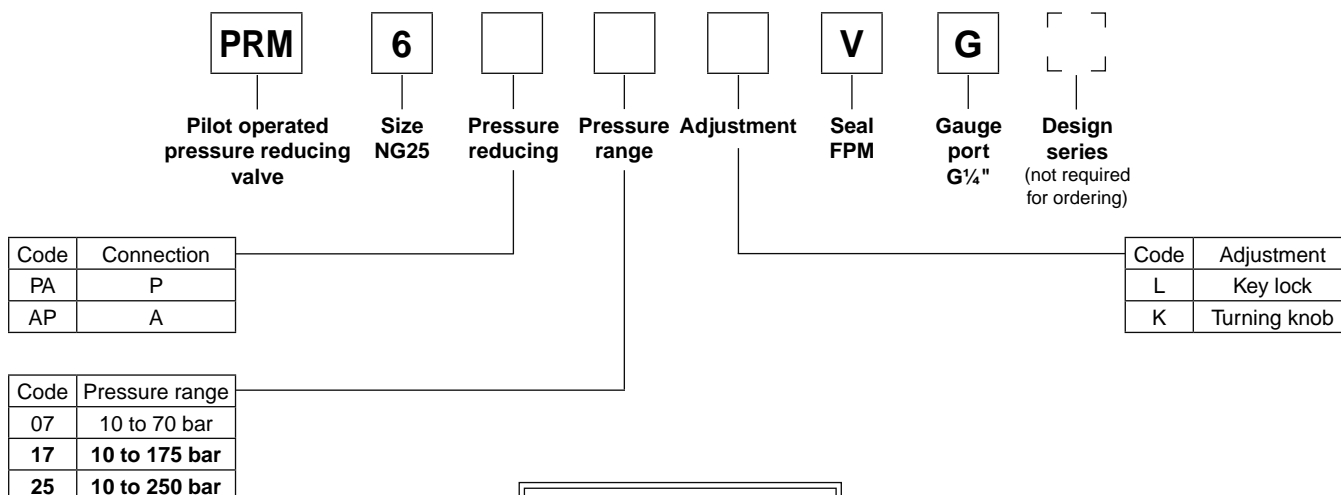
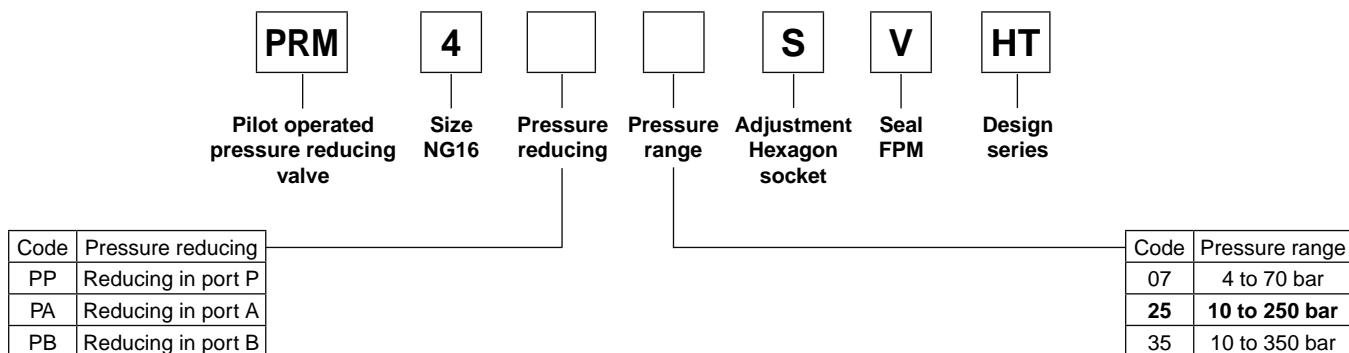
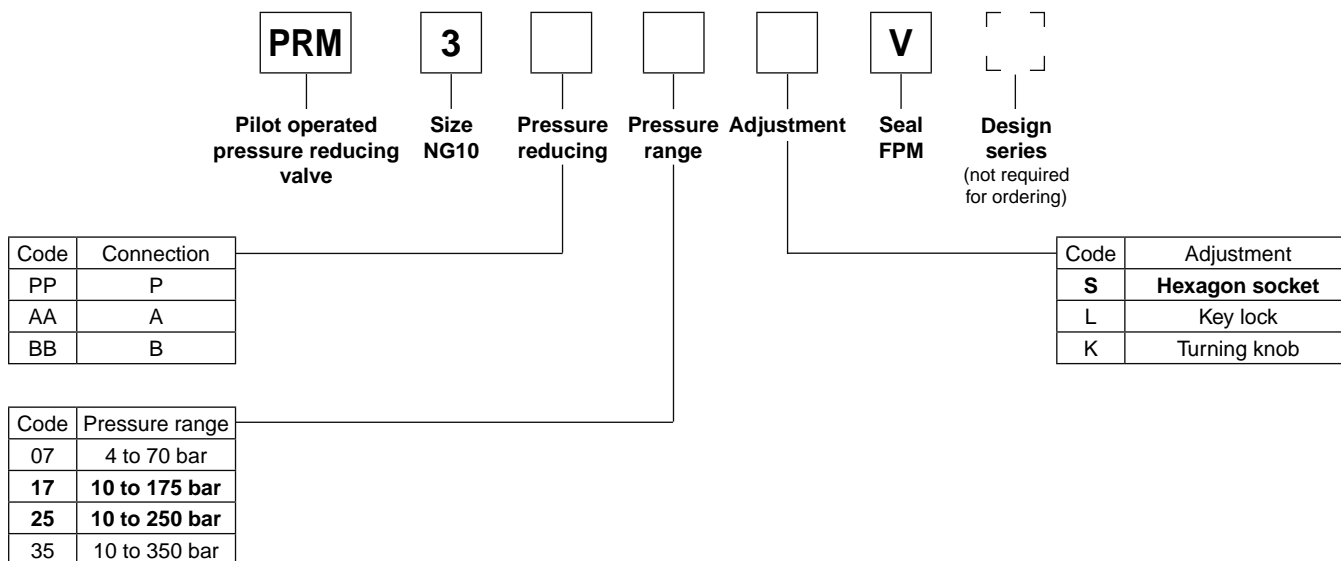
PRM4 and PRM6

Technical data

General				
Series		PRM3	PRM4	PRM6
Size		NG10	NG16	NG25
Mounting interface		ISO 4401		
Ambient temperature	[°C]	-20...+50		
Weight	[kg]	2.7	5.0	5.6
MTTF _D value	[years]	75		
Hydraulic				
Max. operating pressure	[bar]	350	350	250
Pressure reduction in channel		P, A, B	P	P, A
Fluid		Hydraulic oil according to DIN 51524...51525		
Fluid temperature	[°C]	-20...+80		
Viscosity range	[cSt] / [mm²/s]	20...380		
Filtration		ISO 4406 (1999): 18/16/13 (meet NAS 1638:7)		

Pilot Operated Pressure Reducing Valve Series PRM

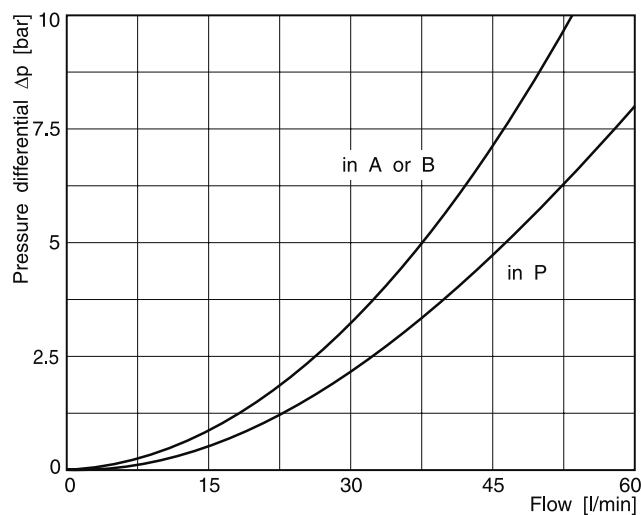
Ordering Code



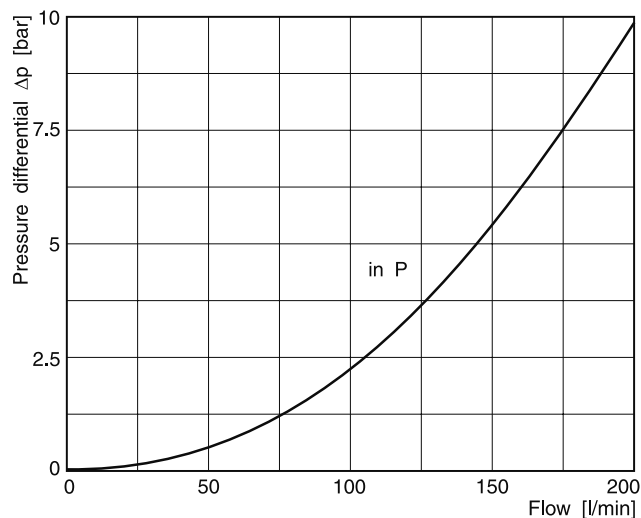
Bold letters =
Short-term availability

$\Delta p/Q$ performance curves

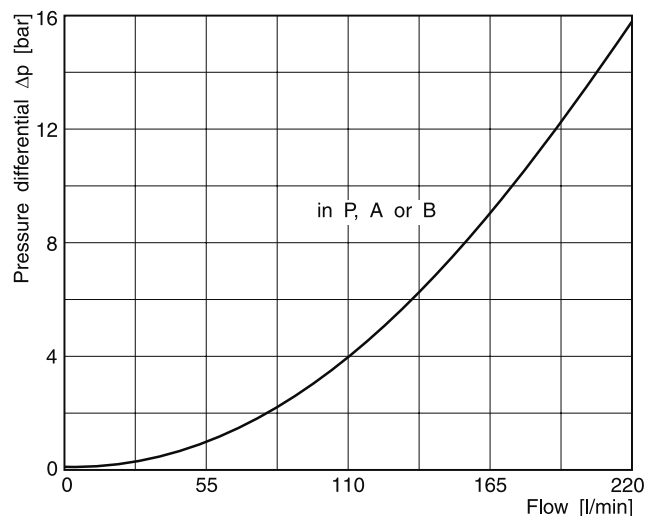
PRM3



PRM4

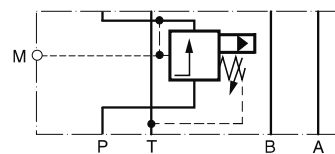


PRM6

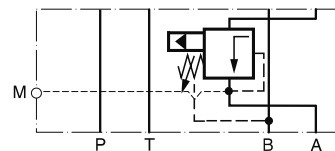


Schematics

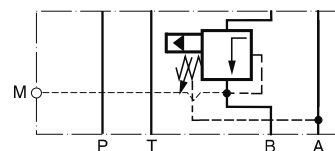
PRM3PP



PRM3AA



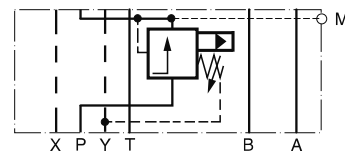
PRM3BB



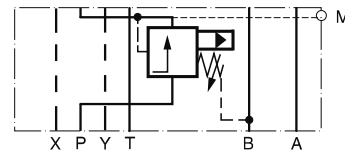
PRM4PP

PRM4PA

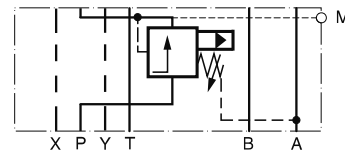
PRM6PA



PRM6AP

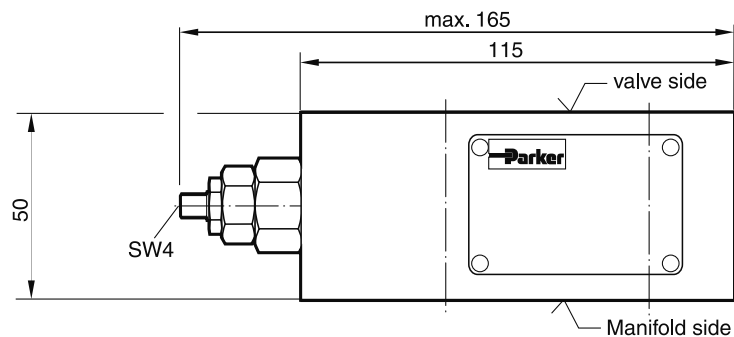
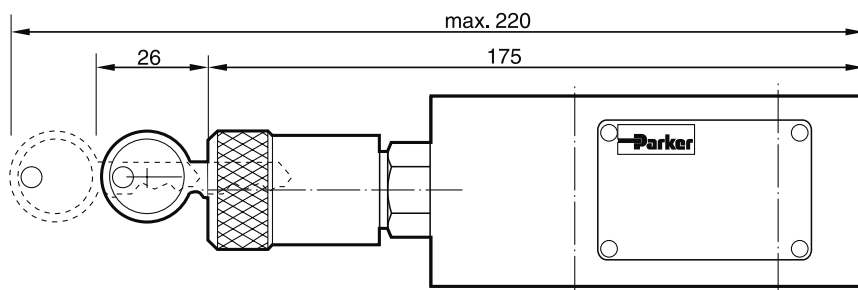
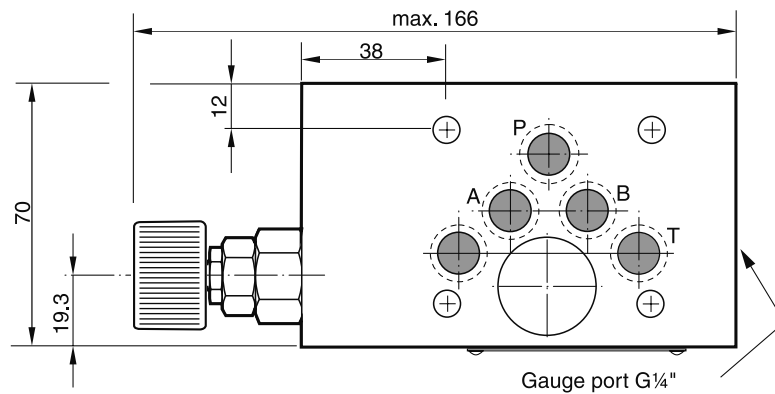


PRM4PB



All characteristic curves measured with HLP46 at 50°C.

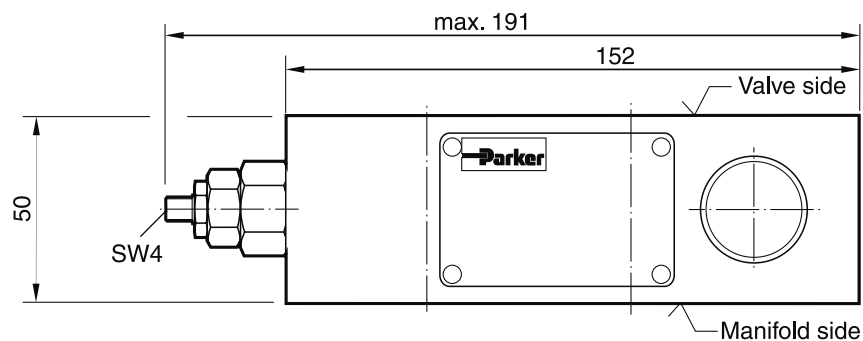
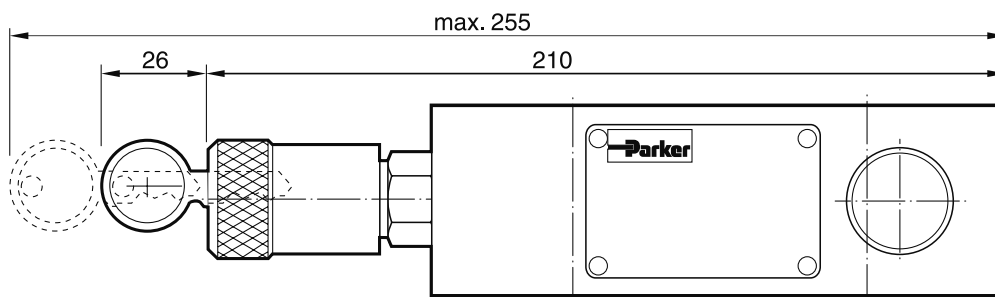
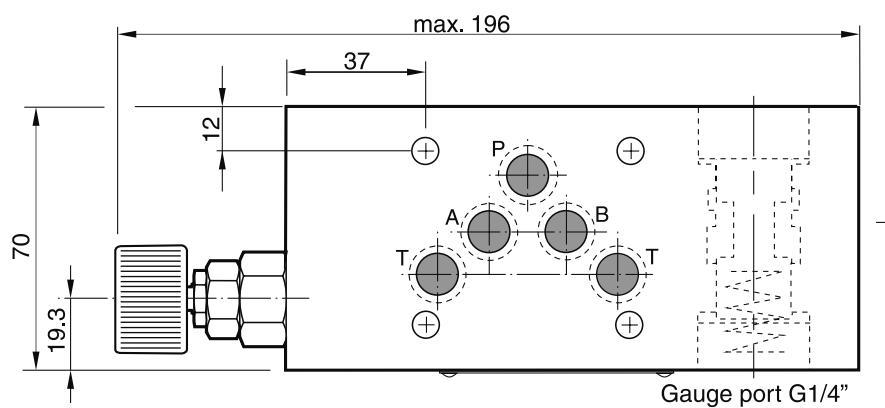
PRM UK.INDD CM 07.09.11

Dimensions**PRM3PP****Adjustment code S****Adjustment code L****Adjustment code K**

Seal kit PRM3PP	
Seal	Order code
V	SK-PRM3-V-30

Note:

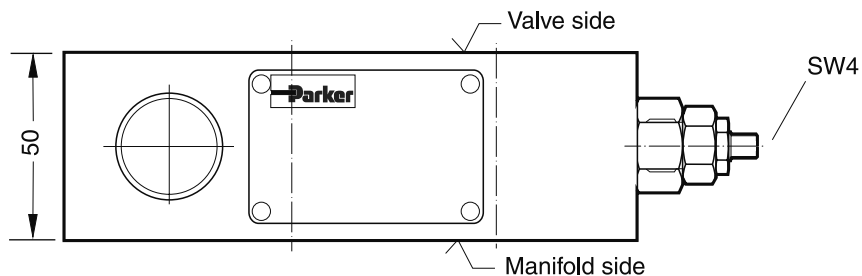
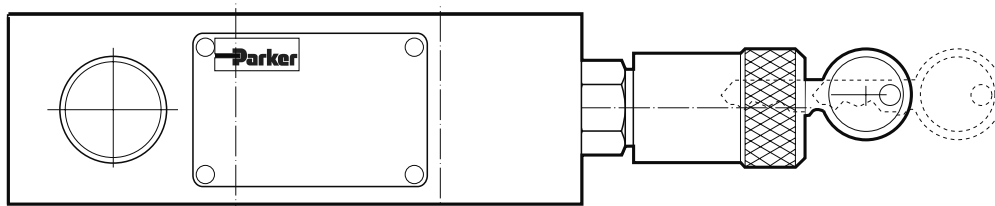
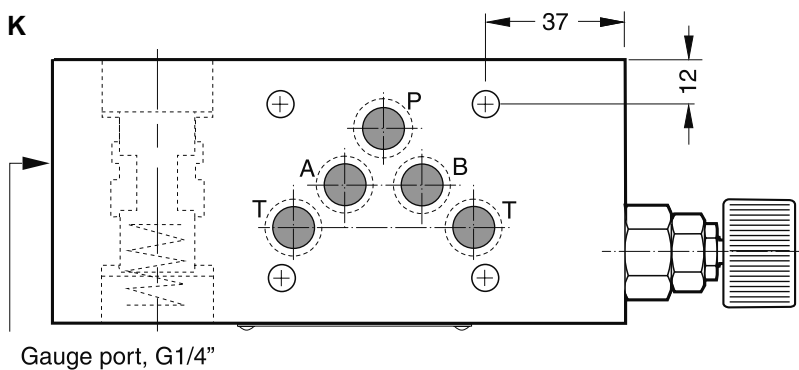
The O-rings for sealing the connecting surface of the manifold side are included. The O-rings and the positioning pins are always mounted on the manifold side.

Dimensions**PRM3AA****Adjustment code S****Adjustment code L****Adjustment code K**

Seal kit PRM3AA	
Seal	Order code
V	SK-PRM3-V-11

Note:

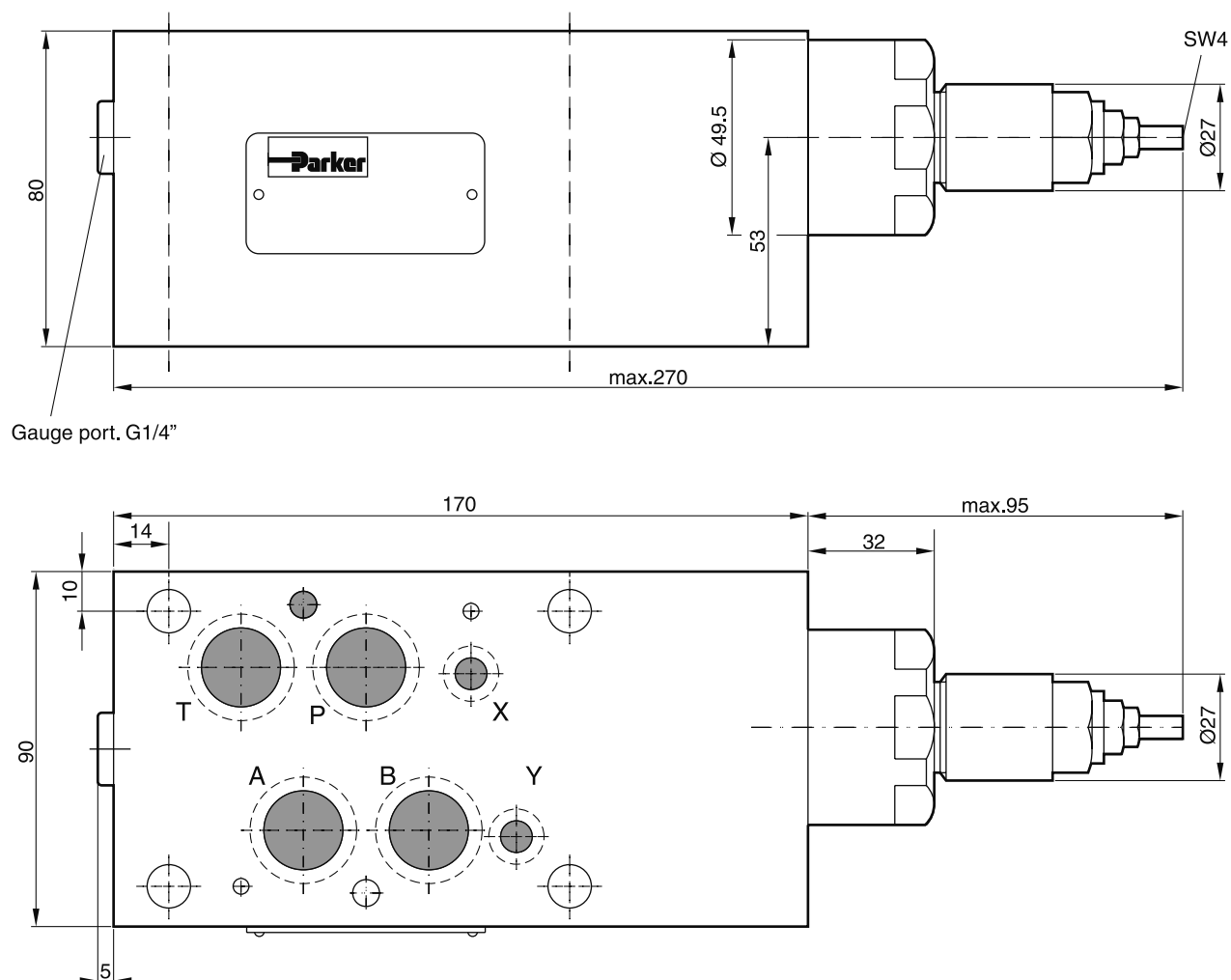
The O-rings for sealing the connecting surface of the manifold side are included. The O-rings and the positioning pins are always mounted on the manifold side.

Dimensions**PRM3BB****Adjustment code S****Adjustment code L****Adjustment code K**

Seal kit PRM3BB	
Seal	Order code
V	SK-PRM3-V-11

Note:

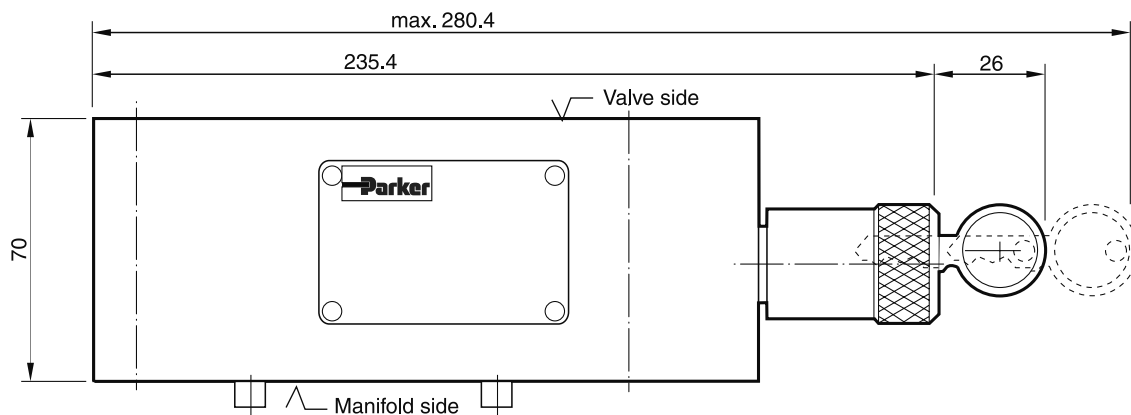
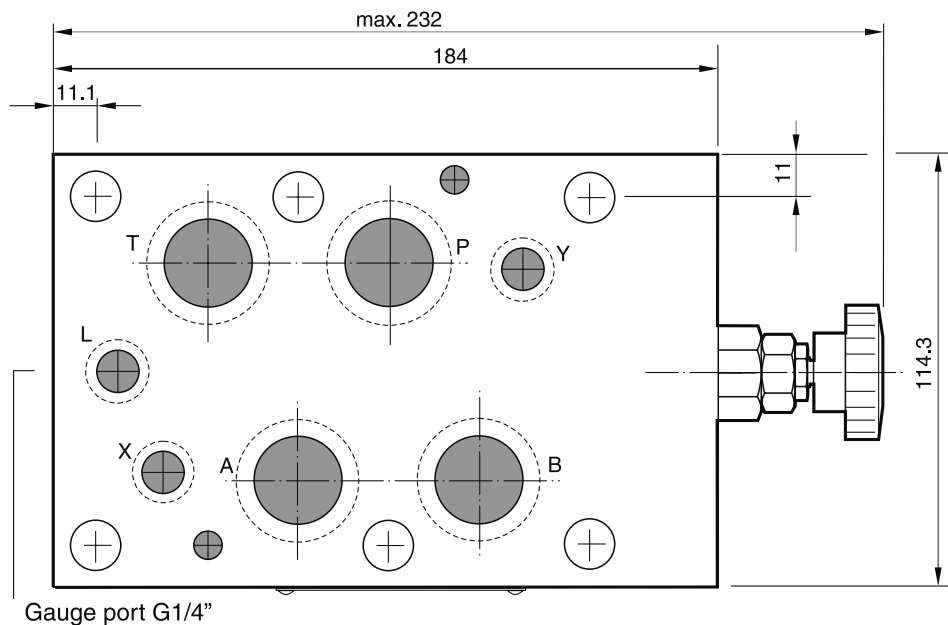
The O-rings for sealing the connecting surface of the manifold side are included. The O-rings and the positioning pins are always mounted on the manifold side.

PRM4PP**Adjustment code S**

Seal kit PRM4	
Seal	Order code
V	SK-PRM4-V-10

Note:

The O-rings for sealing the connecting surface of the manifold side are included. The O-rings and the positioning pins are always mounted on the manifold side.

Dimensions**PRM6****Adjustment code L****Adjustment code K**

Gauge port G1/4"

Seal kit PRM6	
Seal	Order code
V	SK-PRM6-V-25

Note:

The O-rings for sealing the connecting surface of the manifold side are included. The O-rings and the positioning pins are always mounted on the manifold side.

Pilot operated pressure reducing valves series ZDR are designed for maximum flow rates.

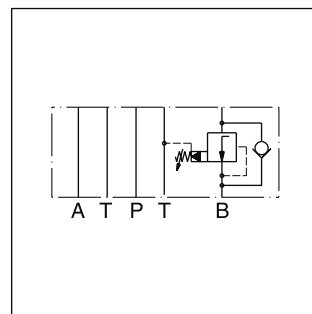
The reducing function can be located in the ports P, A or B. The sizes NG06 and NG10 are equipped with an integral return flow check valve (reducing function in A or B).

Features

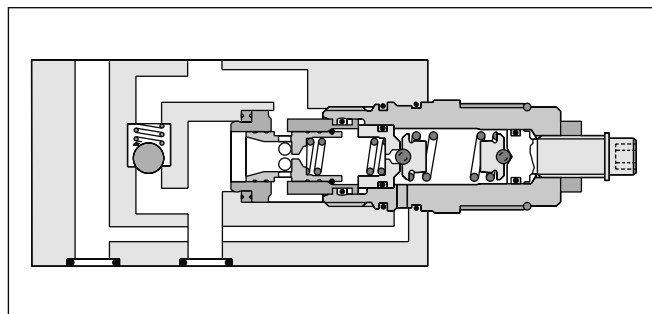
- High flow capacity
- Pressure function in P, A or B
- With integral return flow check valve
- Sizes
ZDR01 - NG06 (CETOP3)
ZDR02 - NG10 (CETOP5)



ZDR-P01



ZDR-B02



ZDR-B02

Ordering code

ZDR — **Pressure control** — **Nominal size** — **Pressure stages** — **S0** — **D** — **Seal**

Pilot operated pressure reducing valve

Code	Size	Pressure control
P	NG06/10	Pressure reducing in P with pressure gauge port M
AR	NG06/10	Pressure reducing in A with check valve
BR	NG06/10	Pressure reducing in B with check valve

Nominal size

Code	Nominal size
01	NG06
02	NG10

Pressure stages

Code	Pressure stages
1	up to 70 bar
5 ¹⁾	up to 350 bar

S0 — **D** — **Seal**

Hexagon screw with lock nut

Design series NG06/10

Code	Seal
1	NBR
5	FPM

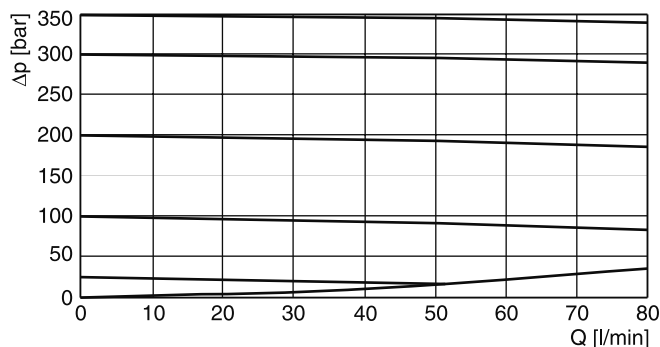
¹⁾ Code AR, BR and size 10 up to 315 bar

Ordering code details see end of chapter.

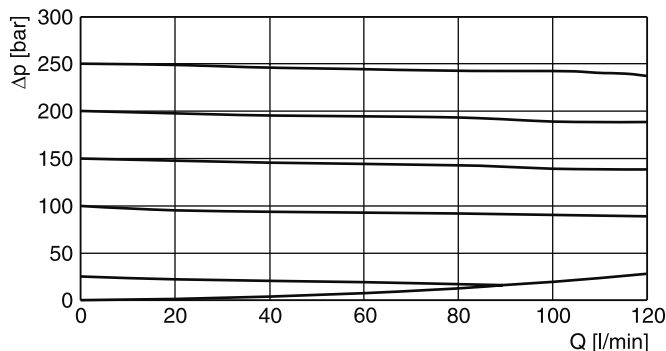
General			
Size		NG06	NG10
Mounting interface		DIN 24340 A6 ISO 4401 NFPA D03	DIN 24340 A10 ISO 4401 NFPA D05
		CETOP RP 121	
Mounting position		unrestricted	
Ambient temperature		[°C] -20...+50	
MTTF _D value		[years] 150	
Weight	ZDR-P	[kg] 1.6	2.9
	ZDR-AR / BR	[kg] 1.8	3.0
Hydraulic			
Max. operating pressure		[bar] 350 (ZDR-AR / BR 315)	
Nominal flow		[l/min] 80	
Pilot oil		[l/min] 0.3	
Fluid		Hydraulic oil according to DIN 51524...51525	
Fluid temperature		[°C] -20...+80	
Viscosity	permitted	[cSt] / [mm ² /s] 10...650	
	recommended	[cSt] / [mm ² /s] 30	
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638:7)	

p/Q performance curves

ZDR-P/AR/BR01

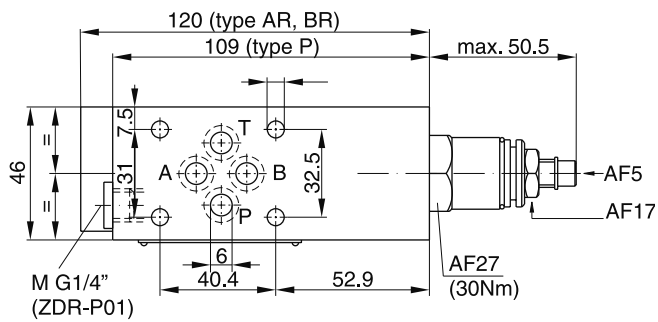


ZDR-P/AR/BR02

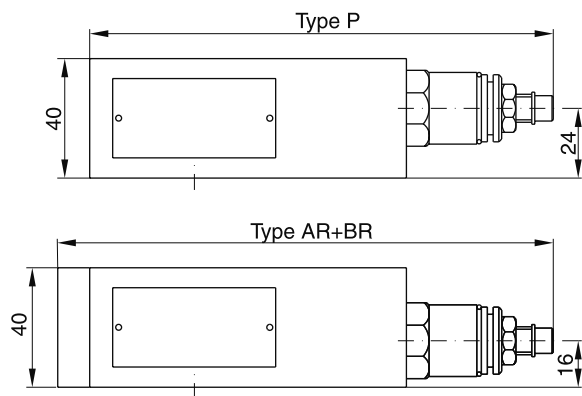


All characteristic curves measured with HLP46 at 50°C.

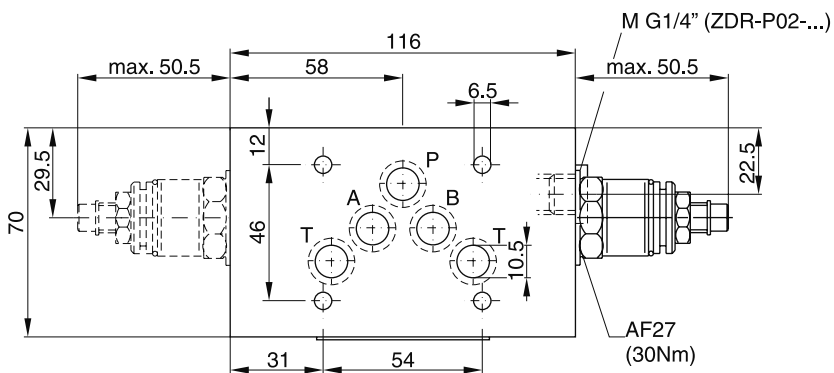
ZDR01



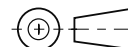
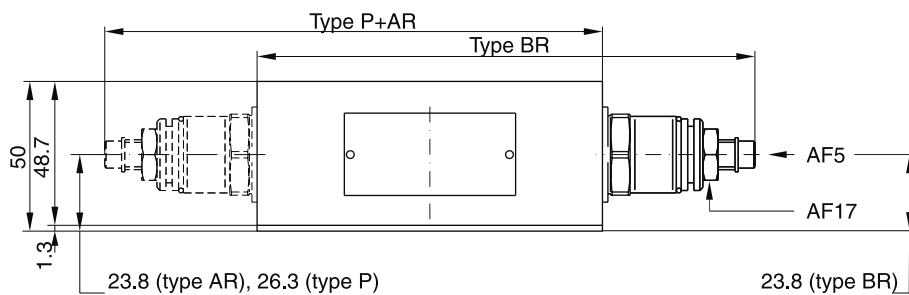
Seal kit	
Seal	Order code
1	098-91184-0
5	098-91185-0
Complete cartridge	
Pressure stage	Order code
1	098-91102-0
5	098-91103-0



ZDR02

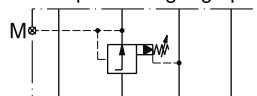


Seal kit	
Seal	Order code
1	098-91182-0
5	098-91183-0
Complete cartridge	
Pressure stage	Order code
1	098-91102-0
5	098-91103-0



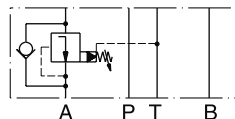
ZDR01

Pressure reducing in P
 with pressure gauge port M



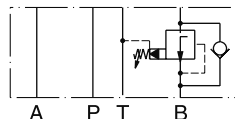
Series	Order No.
ZDR-P01-1-S0-D1	098-91179-0
ZDR-P01-5-S0-D1	098-91211-0

Pressure reducing in A
 with check valve



Series	Order No.
ZDR-AR01-1-S0-D1	098-91212-0
ZDR-AR01-5-S0-D1	098-91213-0

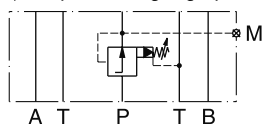
Pressure reducing in B
 with check valve



Series	Order No.
ZDR-BR01-1-S0-D1	098-91214-0
ZDR-BR01-5-S0-D1	098-91215-0

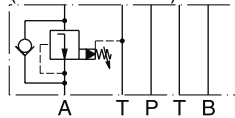
ZDR02

Pressure reducing at P
 (with pressure gauge port M)



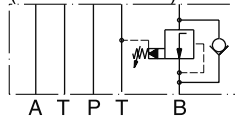
Series	Order No.
ZDR-P02-1-S0-D1	098-91050-0
ZDR-P02-5-S0-D1	098-91051-0

Pressure reducing at A
 (with check valve)



Series	Order No.
ZDR-AR02-1-S0-D1	098-91052-0
ZDR-AR02-5-S0-D1	098-91053-0

Pressure reducing at B
 (with check valve)



Series	Order No.
ZDR-BR02-1-S0-D1	098-91054-0
ZDR-BR02-5-S0-D1	098-91055-0

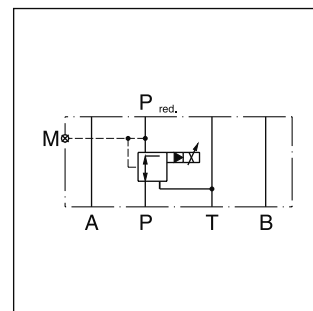
Proportional pressure reducing valves keep a constant pressure p_{red} on the secondary side - independent of pressure fluctuations on the primary side. The integrated pressure relief function obviates the need for an additional pressure relief valve on the secondary side and reliefs to tank, if the reduced pressure rises above the setting pressure.

The proportional pressure reducing valve reduces the pressure in output port p_{red} in proportion to the solenoid current. The PRPM works practically independent of the inlet pressure. In non-activated mode, the connection to the tank is fully open with a min. pressure corresponding to the spring force.

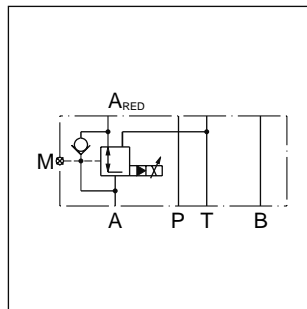
The gauge port is connected to the secondary side. Types A and B have an integrated bypass check valve. The PRPM provides optimum performance in combination with a digital amplifier module PCD00A-400.



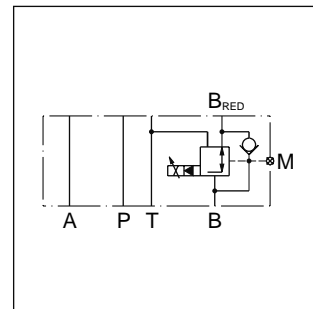
PRPM2PP



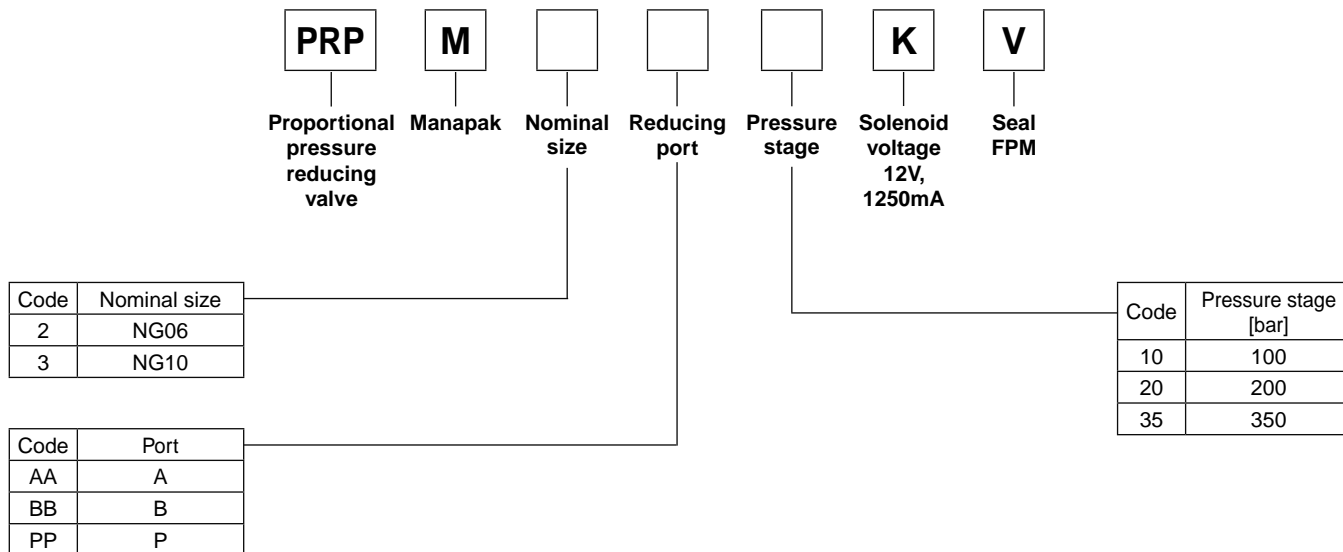
PRPM*PP



PRPM*AA



PRPM*BB

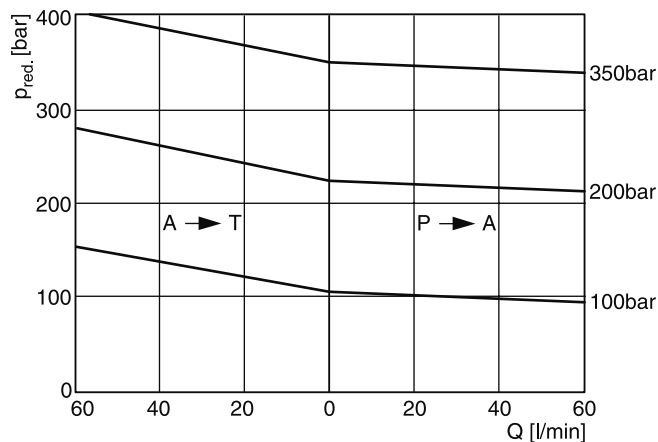
Ordering code

Technical Data

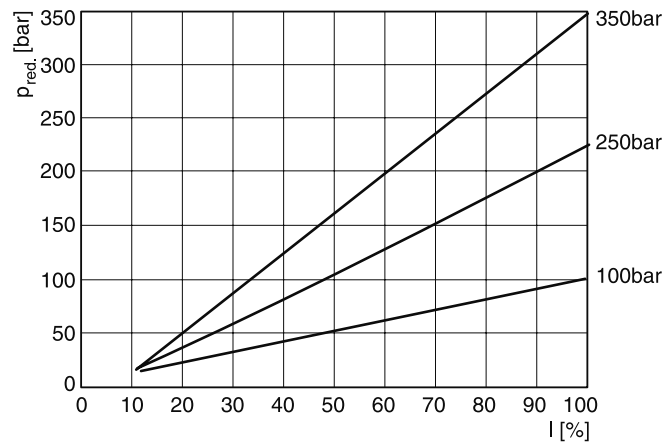
General		
Design	pilot operated proportional pressure reducing valve	
Construction	sandwich type	
Operation	proportional solenoid	
Size	NG06	NG10
Mounting interface	ISO 4401	
Mounting position	unrestricted	
Ambient temperature	[°C]	-20 ... +50
MTTF _D value	[years]	75
Weight	[kg]	2.0 3.2
Hydraulic		
Fluid	Hydraulic oil according to DIN 51524...51525	
Fluid temperature	[°C]	-20 ... +80
Viscosity range	[cSt] / [mm²/s]	12 to 320
Max. operating pressure	[bar]	350
Reduced nom. pressure	[bar]	100; 200; 350
Max. Flow	[l/min]	60 60
Pilot Flow	see performance curves	
Filtration	ISO 4406 (1999); 18/16/13 (meet NAS 1638:7)	
Resolution	[mA]	1 mA
Repeatability	[%]	≤1 (with optimal dither signal)
Hysteresis	[%]	≤4 (with optimal dither signal)
Electrical		
Solenoid	proportional solenoid, wet-pin push type, pressure tight	
Duty ratio	[%]	100 ED
Protection class	IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)	
Supply voltage	[V]	12 (1320mA)
Solenoid connection	Connector as per EN 175301-803	
Amplifier	PCD00A-400	

7

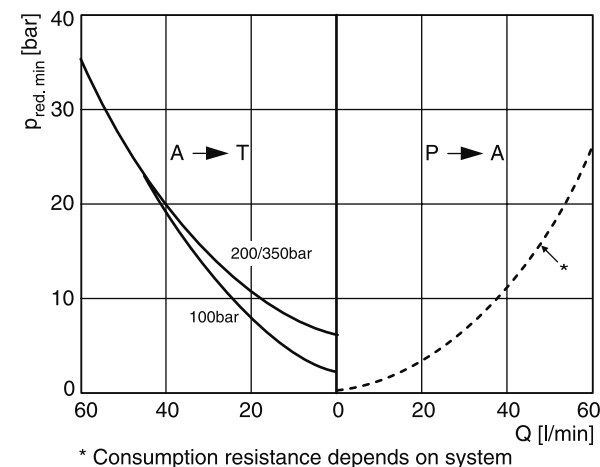
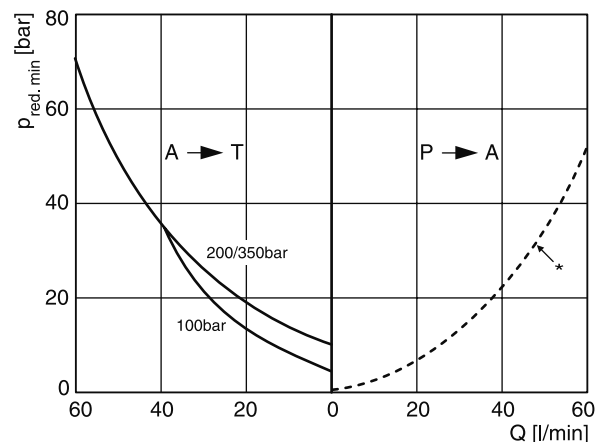
Pressure/flow NG06/NG10



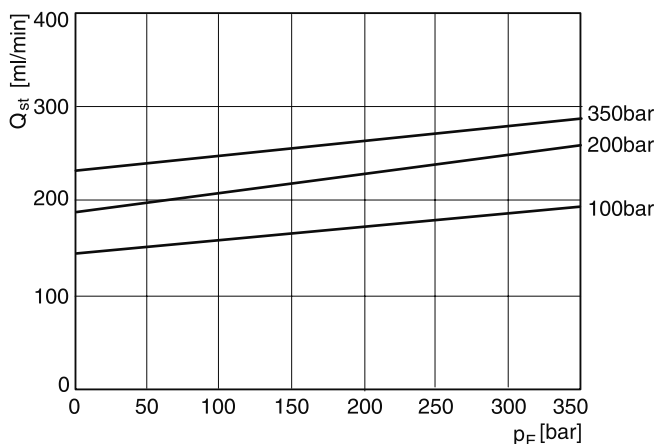
Pressure/adjustment at $Q=0$ /min (static)



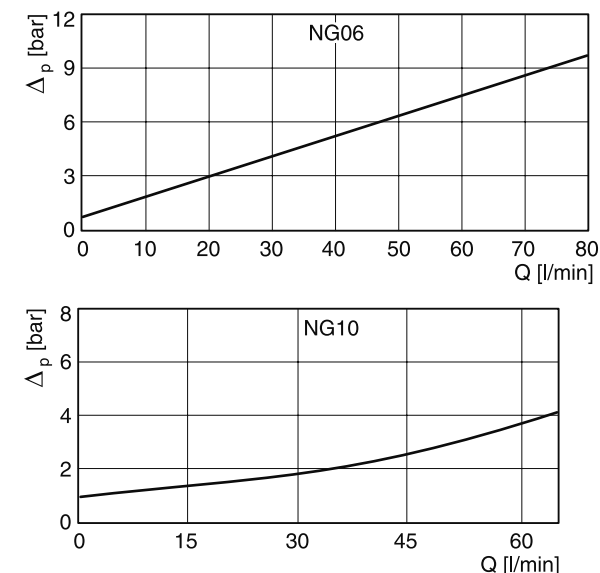
Pressure/flow NG06 (min. adjustable)



Pilot flow NG06/NG10



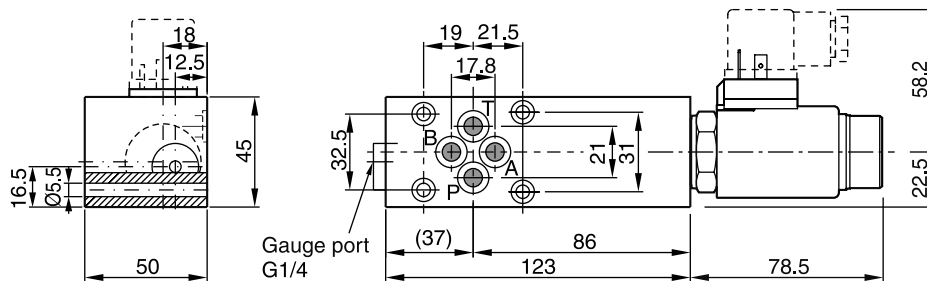
Pressure drop/flow over check valve



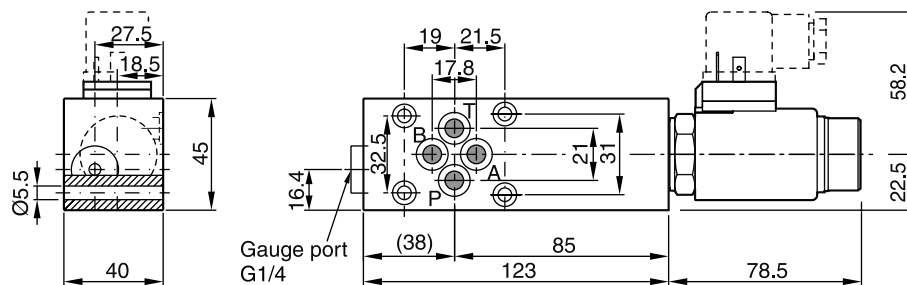
All characteristic curves measured with HLP46 at 50°C.

Dimensions

PRPM2AA*, BB**

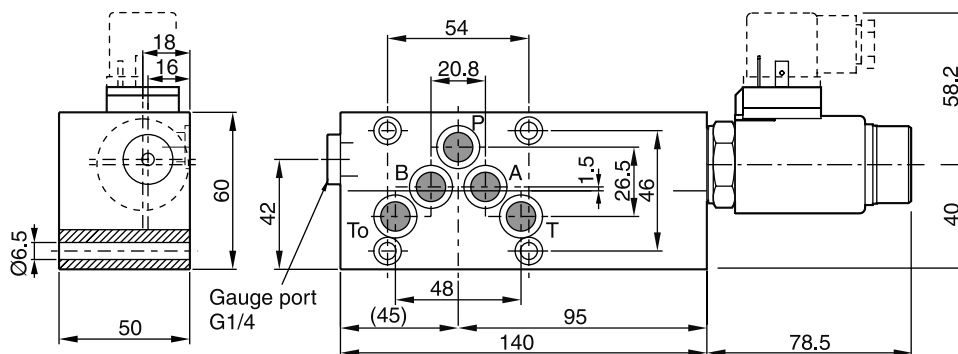


PRPM2PP*

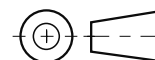
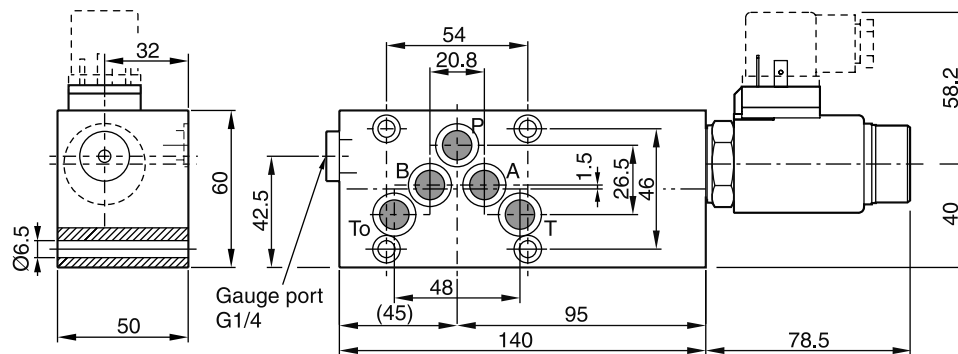


7

PRPM3AA*, BB**



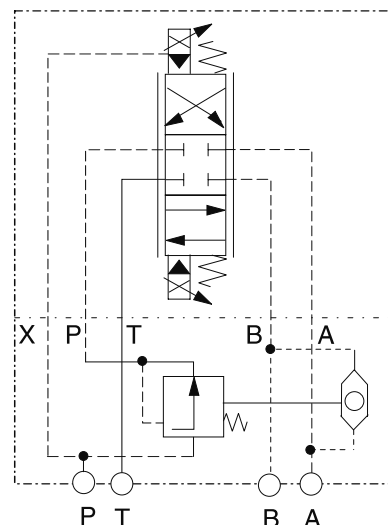
PRPM3PP*



2-way pressure compensators series LCM are sandwich plate valves designed for stacking beneath a proportional directional control valve with a standardised mounting pattern.

The valve maintains a constant pressure differential between ports P and A or P and B across the directional valve. When the cross sectional opening of the directional valves is held steady, a constant flow rate is achieved, regardless of consumer load fluctuations.

The control pressure applied to the spring side of the compensator spool is supplied from port A or B via a shuttle valve. Flow rate regulation is automatically effective in the port with the highest pressure.

Application example

Proportional DC valve model D31FB with 2 way pressure compensator LCM3 maintains a constant flow rate.

The diagram shows the design according to code X.

7**Ordering Code**

LCM		PP		02	V	
Pressure compensator	Size	Control connection	Pilot oil	Differential pressure 10 bar	Seal FPM	Design series (not required for ordering)

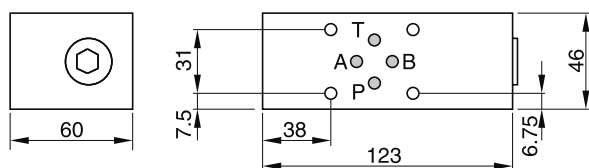
Code	Size
2	NG06
3	NG10

Code	Pilot oil
omit	internal
X ¹⁾	external

¹⁾ NG10 only

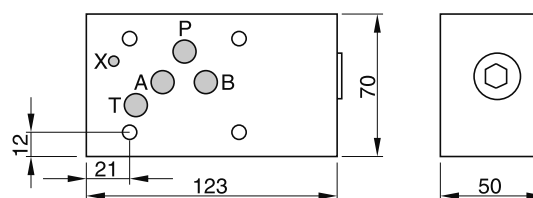
Technical Data / Dimensions**Technical data**

General		
Series	LCM2	LCM3
Size	NG06	NG10
Mounting interface	NFPA D03 CETOP 3	NFPA D05 CETOP 5
Ambient temperature [°C]	-20...+50	
MTTF _D value [years]	150	
Hydraulic		
Max. operating pressure [bar]	350	350
Pressure differential [bar]	10	10
Fluid	Hydraulic oil according to DIN 51524...51525	
Fluid temperature [°C]	-20...+80	
Viscosity range [cSt] / [mm²/s]	12...230	
Filtration	ISO 4406 (1999): 18/16/13 (meet NAS 1638:7)	

Dimensions**LCM2**

Mounting screws: BK 403 (4 x M5 x 90)

For mounting screws connected with the directional valves D1 or D31.

LCM3

Mounting screws: BK 412 (4 x M6 x 90)

The views show the mounting surface for the directional valve.

Characteristics

Pressure Compensator Series SPC (Denison)

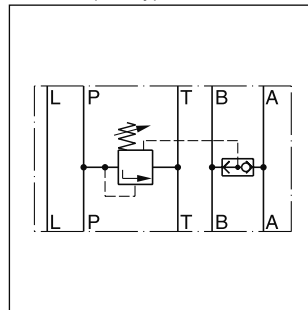
The sandwich type pressure compensators series SPC are typically used in combination with proportional directional control valves. The compensator keeps the pressure drop over the directional valve constant and thus provides load-independent flow to the actuator.

Features

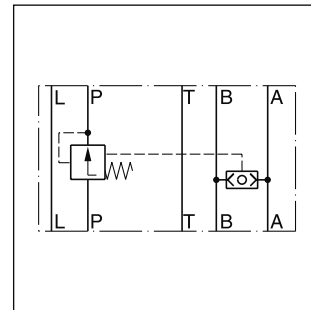
- 2-way or 3-way pressure compensators
- Standard pressure differential 5 bar
- Adjustable differential (2...5 bar) and 10 bar - optional
- SPC01 - NG06 (CETOP 3)
- SPC02 - NG10 (CETOP 5)
- SPC03 - NG16 (CETOP 7)
- SPC06 - NG25 (CETOP 8)



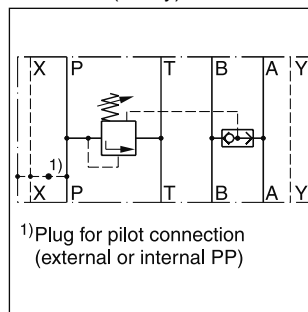
SPC*11 (2-way)



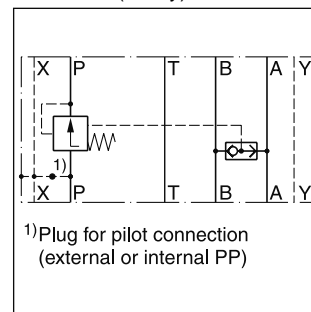
SPC01/02 (3-way)



SPC01/02 (2-way)



SPC03/06 (3-way)



SPC03/06 (2-way)

Technical data

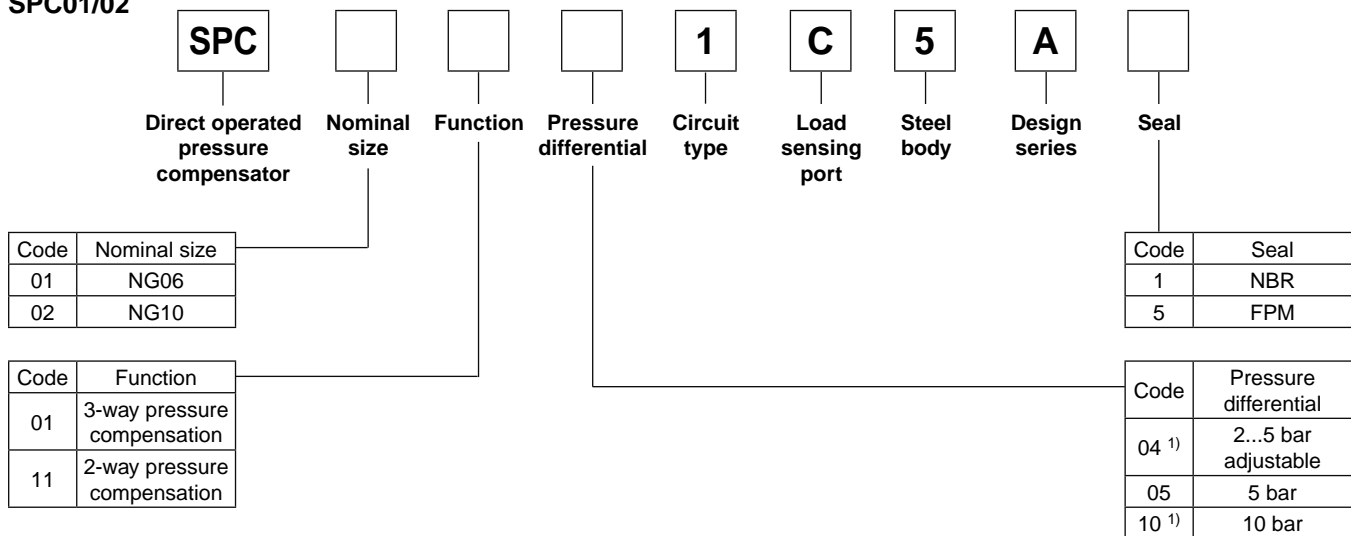
General						
Design			Direct operated pressure compensator			
Size			NG06	NG10	NG16	NG25
Mounting interface			DIN 24340 A6 ISO 4401 NFFA D03 CETOP 03	DIN 24340 A10 ISO 4401 NFFA D05 CETOP 05	DIN 24340 A16 ISO 4401 NFFA D07 CETOP 07	DIN 24340 A25 ISO 4401 NFFA D08 CETOP 08
Mounting position			unrestricted			
Ambient temperature [°C]			-20...+50			
MTTF _D value [years]			150			
Weight	2-way pressure compensator	[kg]	1.5	3.1	8.3	11.9
	3-way pressure compensator	[kg]	1.6	3.5	8.3	11.9
Hydraulic						
Max. operating pressure drain port L connected [bar]			P, A, B: 350; T: 210; L: 10	P, A, B: 315; T: 210; L: 10	–	–
without drain port [bar]			P, A, B: 350; T: 160; L: 160	P, A, B: 315; T: 210; L: 210	P, A, B, X: 350; T, Y: 105	P, A, B, X: 350; T, Y: 105
Nominal flow [l/min]			30	80	200	400
Fluid			Hydraulic oil according to DIN 51524...51525			
Fluid temperature [°C]			-20...+80			
Viscosity	permitted [cSt] / [mm²/s]	10...650				
	recommended [cSt] / [mm²/s]	30				
Filtration			ISO 4406 (1999): 18/16/13 (meet NAS 1638:7)			

SPC UK.INDD CM 14.07.11

Ordering Code

Pressure Compensator
Series SPC (Denison)

SPC01/02

¹⁾ for 3-way compensator only

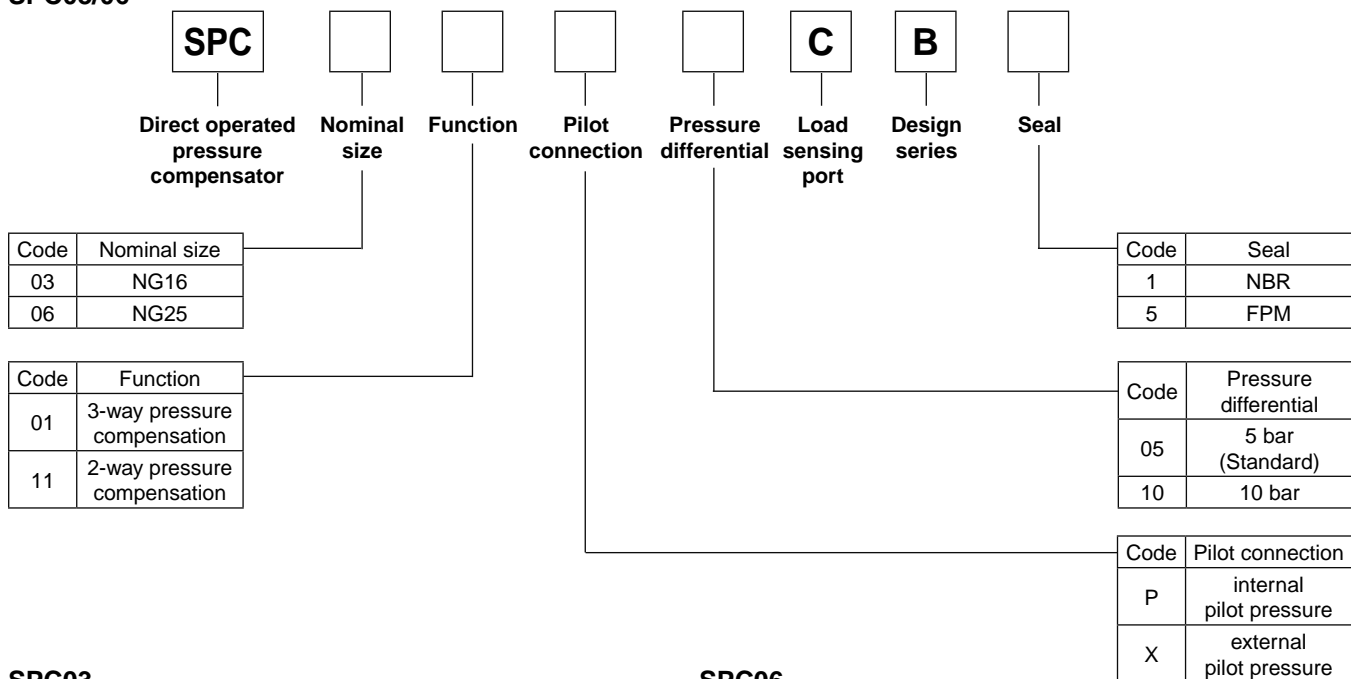
SPC01

Type	Model no.	Order no.
3-way compensators with shuttle valve P-A/B	SPC 01 01 041C5A	026-42583-0
	SPC 01 01 051C5A	026-42584-0
	SPC 01 01 101C5A	026-42585-0
2-way compensators with shuttle valve P-A/B	SPC 01 11 051C5A	026-42560-0

SPC02

Type	Model no.	Order no.
3-way compensators with shuttle valve P-A/B	SPC 02 01 041C5A	026-42589-0
	SPC 02 01 051C5A	026-42590-0
	SPC 02 01 101C5A	026-42591-0
2-way compensators with shuttle valve P-A/B	SPC 02 11 051C5A	026-42566-0

SPC03/06



SPC03

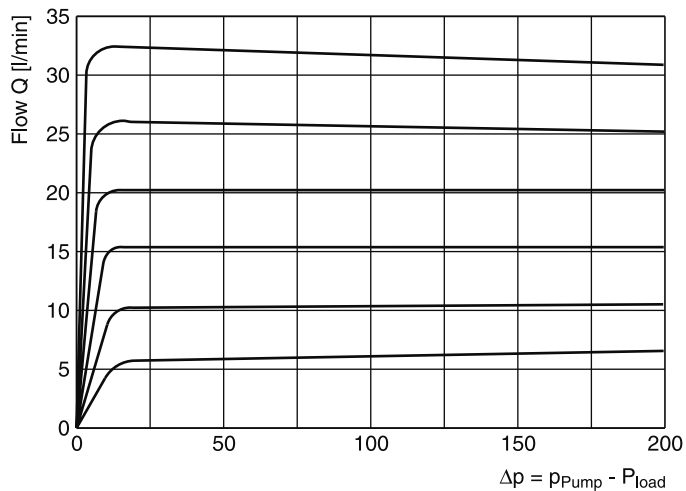
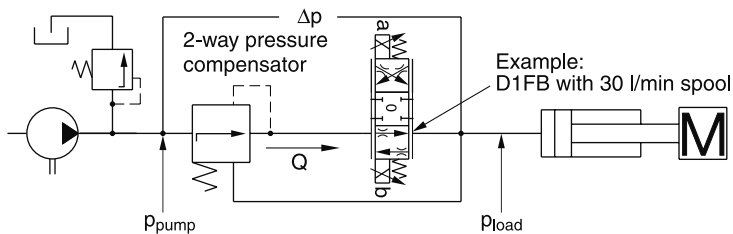
Type	Model no.	Order no.
3-way compensator with shuttle valve P-A/B	SPC 03 01 P05CB1	S26-59683-0
	SPC 03 01 X05CB1	S26-59709-0
2-way compensator with shuttle valve P-A/B	SPC 03 11 P05CB1	S26-59682-0
	SPC 03 11 P10CB1	S26-59677-0
	SPC 03 11 X05CB1	S26-59710-0
	SPC 03 11 X10CB1	S26-59882-0

SPC06

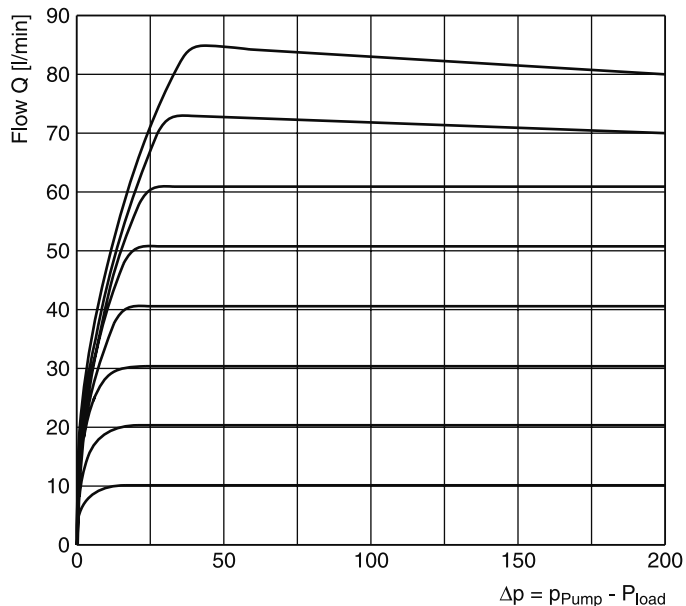
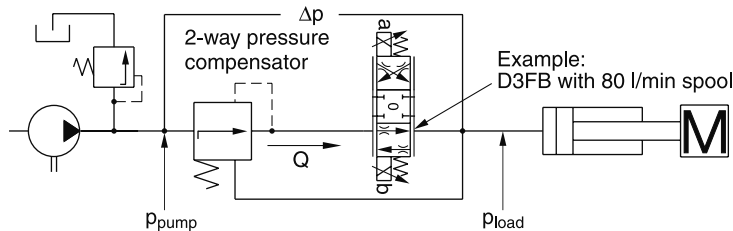
Type	Model no.	Order no.
3-way compensator with shuttle valve P-A/B	SPC 06 01 P05CB1	S26-59685-0
	SPC 06 01 X05CB1	S26-59808-0
2-way compensator with shuttle valve P-A/B	SPC 06 11 P05CB1	S26-59684-0
	SPC 06 11 P10CB1	S26-59678-0
	SPC 06 11 X05CB1	S26-59711-0
	SPC 06 11 X10CB1	S26-59884-0

SPC01

Flow regulation example: 2-way pressure compensator at $\Delta p = 5$ bar

**SPC02**

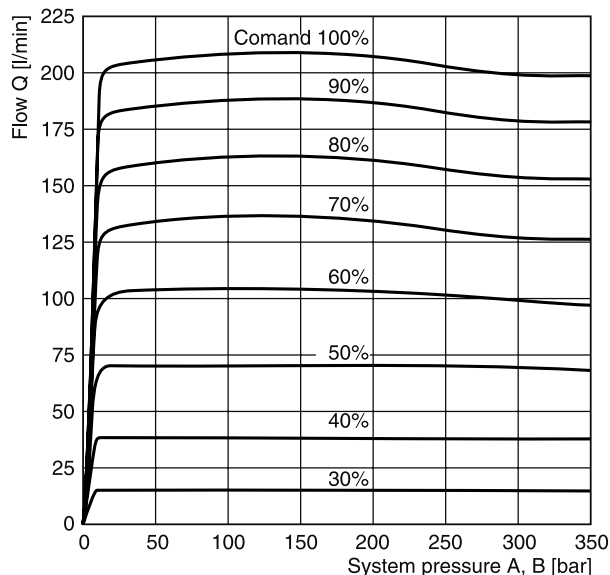
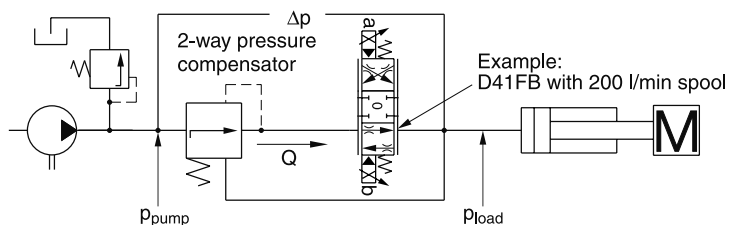
Flow regulation example: 2-way pressure compensator at $\Delta p = 5$ bar



All characteristic curves measured with HLP46 at 50°C.

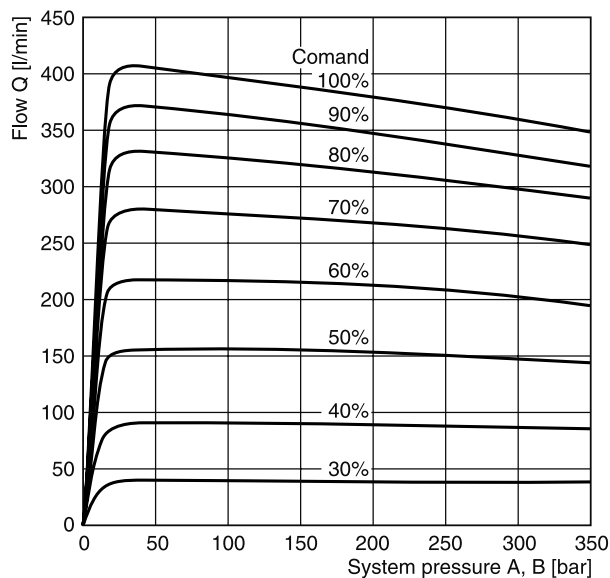
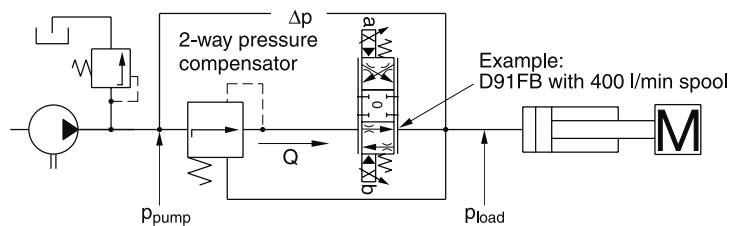
SPC03

Flow regulation example: 2-way pressure compensator at $\Delta p = 5$ bar



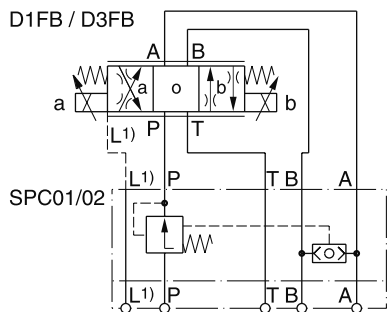
SPC06

Flow regulation example: 2-way pressure compensator at $\Delta p = 5$ bar



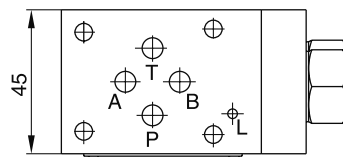
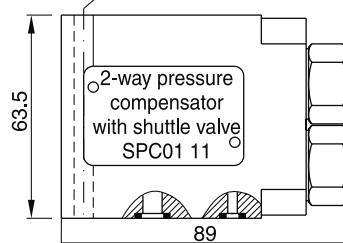
All characteristic curves measured with HLP46 at 50°C.

2-way pressure compensator



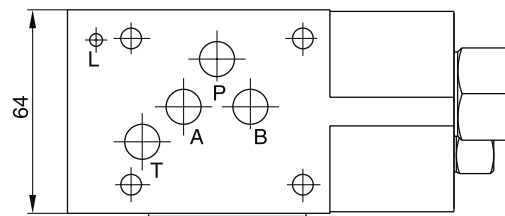
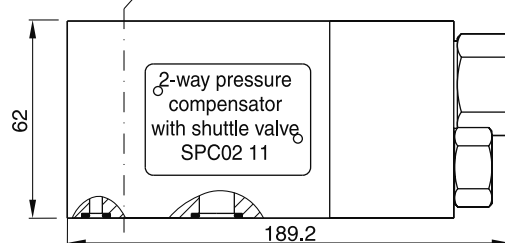
SPC01

4 screws M5 x 95 DIN 912; 12.9
Md = 8.3 Nm
Order no. BK468



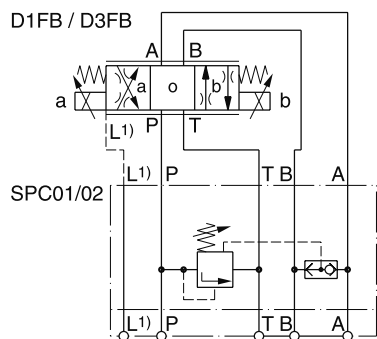
SPC02

4 screws M6 x 100 DIN 912; 12.9
Md = 15 Nm
Order no. BK508



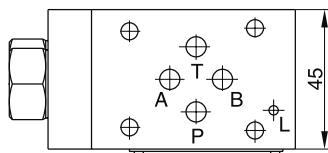
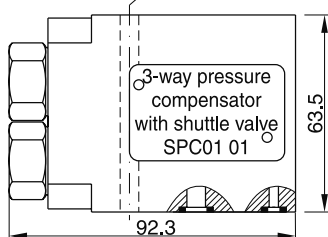
1) Always connect L to tank when
SPC01 T > 160 bar
SPC02 T > 210 bar

3-way pressure compensator



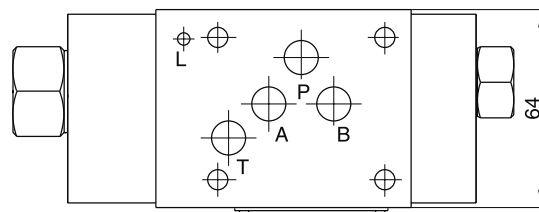
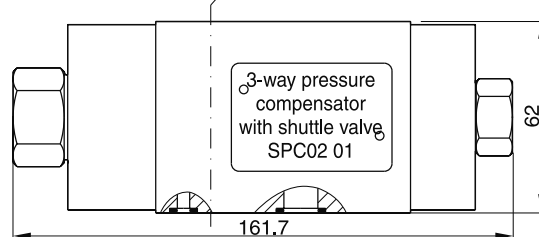
SPC01

4 screws M5 x 95 DIN 912; 12.9
Md = 8.3 Nm
Order no. BK468

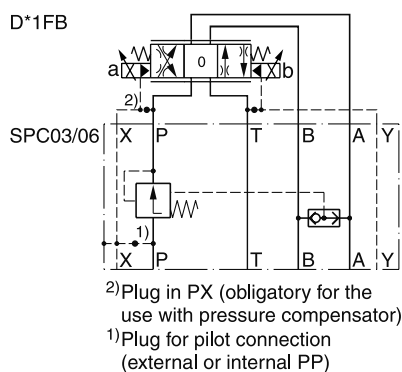
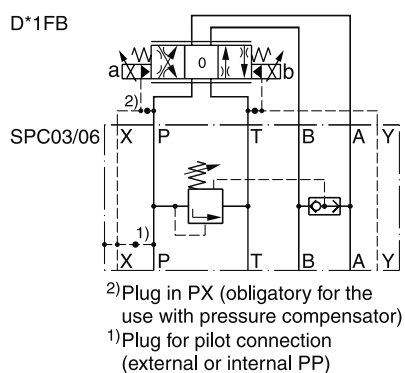


SPC02

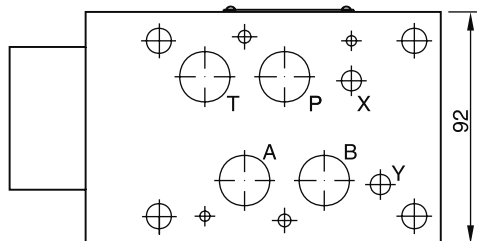
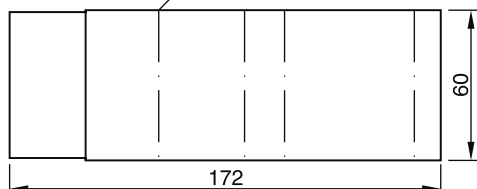
4 screws M6 x 100 DIN 912; 12.9
Md = 15 Nm
Order no. BK508



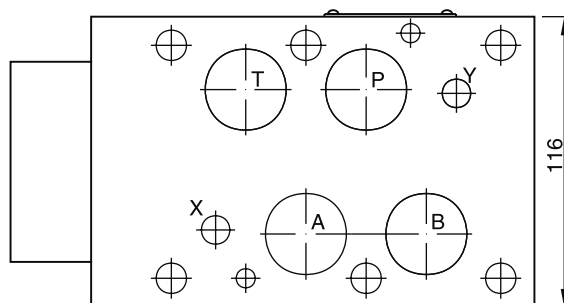
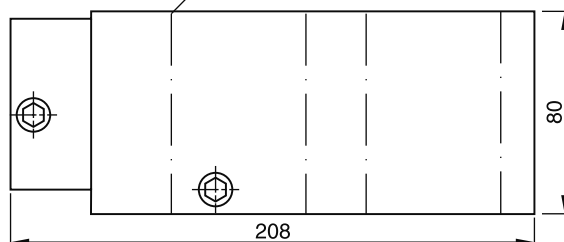
1) Always connect L to tank when
SPC01 T > 160 bar
SPC02 T > 210 bar

2-way pressure compensator**3-way pressure compensator****SPC03**

4 screws M10 x 120 DIN 912, 12.9,
2 screws M6 x 120 DIN 912, 12.9
Order no. BK521

**SPC06**

6 screws M12 x 140 DIN 912, 12.9
Order no. BK522



Double-throttle check valves from the Parker Manapak series FM are in sandwich design for easy configuration of stack systems. Throttle and check valves are located in ports A and B.

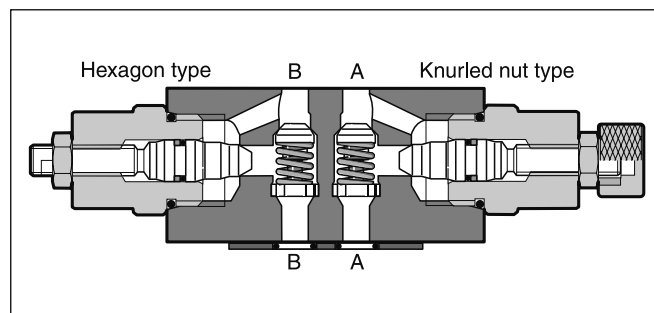
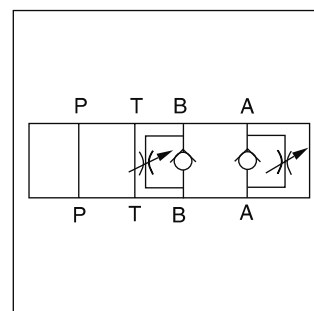
FM2 and FM3 can be used as meter-in or meter-out throttle by changing the mounting position.

FM4 can be selected by ordering code as meter-in or meter-out throttle. FM6 is only available as meter-out control.

The throttle check valve can also be used to influence the switching time of pilot operated directional valves. In this case, the valve is positioned between the pilot stage (CETOP03, NG06) and the main stage (CETOP05, NG10 up to CETOP10, NG32).

Features

- Two types of metering needle design can be selected when ordering FM2 and FM3 valves to achieve the throttle characteristics required to suit the application.
- Large bypass check valves allow high flow at low pressure drop.
- NG06 - FM2 (CETOP 3)
NG10 - FM3 (CETOP 5)
NG16 - FM4 (CETOP 7)
NG25 - FM6 (CETOP 8)

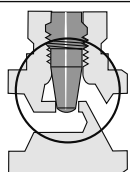
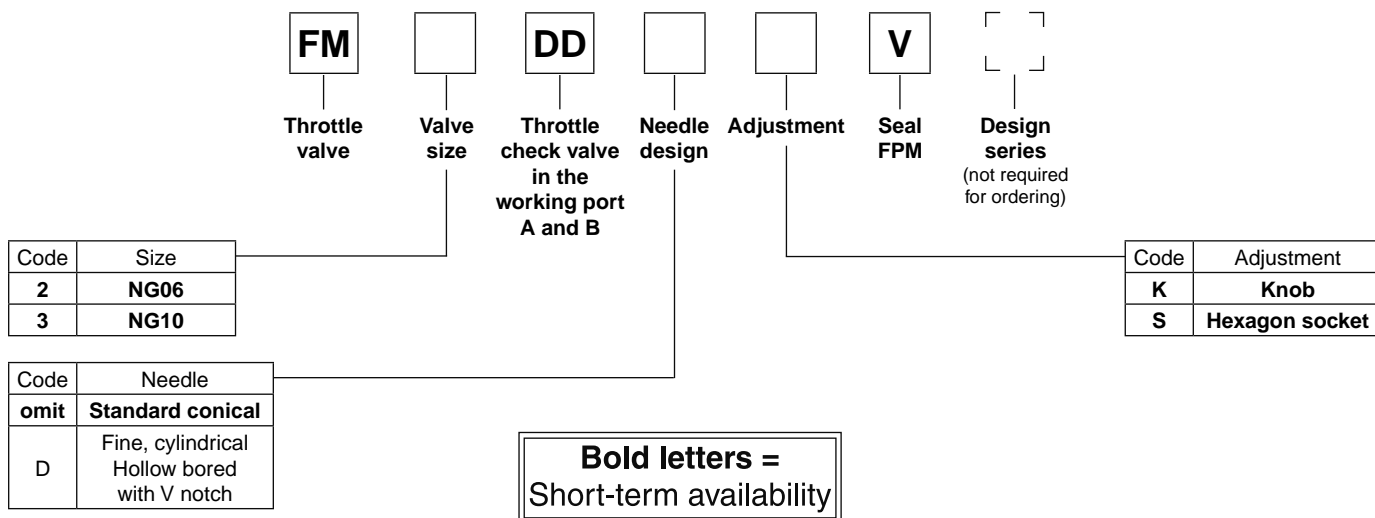


Technical data

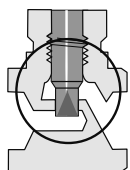
General						
Series		FM2		FM3	FM4	FM6
Size		NG06		NG10	NG16	NG25
Mounting interface		NFPA D03 CETOP 03	NFPA D05 CETOP 05	NFPA D07 CETOP07	NFPA D08 CETOP 08	
Mounting position		unrestricted				
Ambient temperature [°C]		-20...+50				
MTTF _D value [years]		150				
Weight [kg]		1.3	2.4	5.4	7.9	
Hydraulic						
Max. operating pressure [bar]		350	350	350	210	
Max. Flow [l/min]		53	76	200	341	
Opening pressure [bar]		0.3	0.3	0.3	0.3	
Meter-in throttle		•	•	•	—	
Meter-out throttle		•	•	•	•	
Fluid		Hydraulic oil according to DIN 51524...51525				
Fluid temperature [°C]		-20...+80				
Viscosity	permitted	[cSt] / [mm²/s]	10...650			
	recommended	[cSt] / [mm²/s]	30			
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638:7)				

Throttle Check Valve Series FM

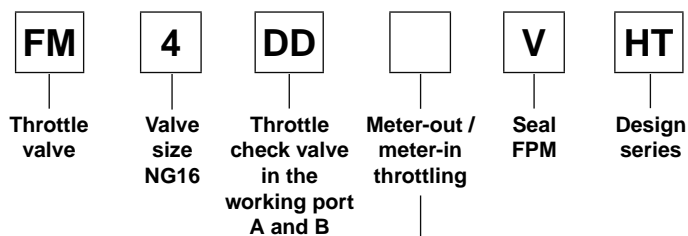
Ordering Code



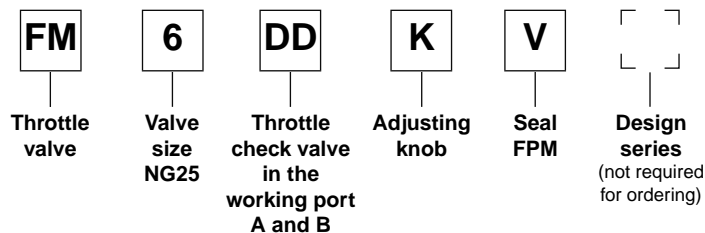
A two-stage needle provides fine adjustment in the lower flow range with 3 adjustment rotations. After 3 more rotations, the valve is completely open.



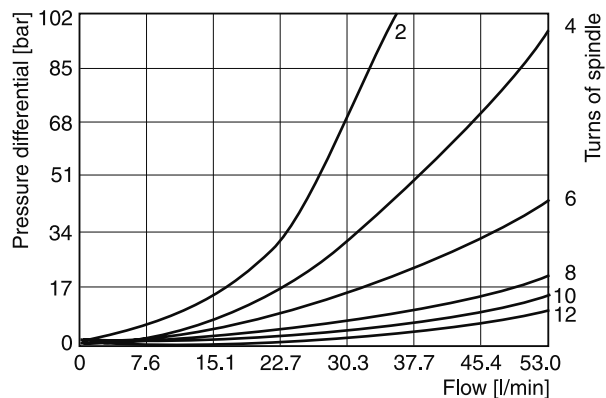
Design "D"
A cylindrical needle with a V notch allows the fine adjustment over the entire setting range.



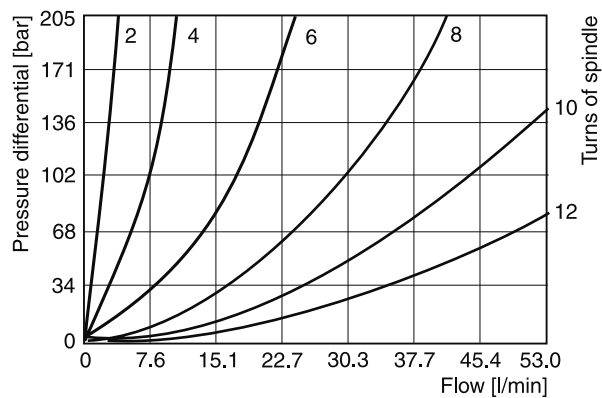
Code	Description
T	Meter-in
F	Meter-out



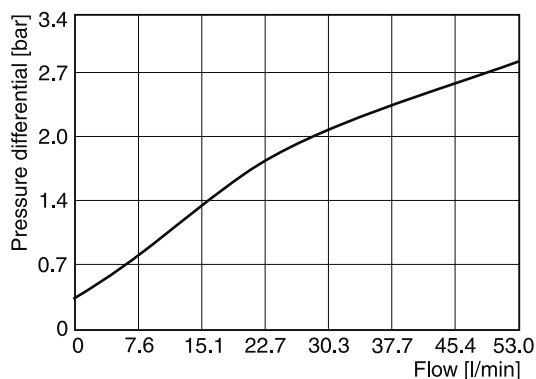
FM2 standard needle



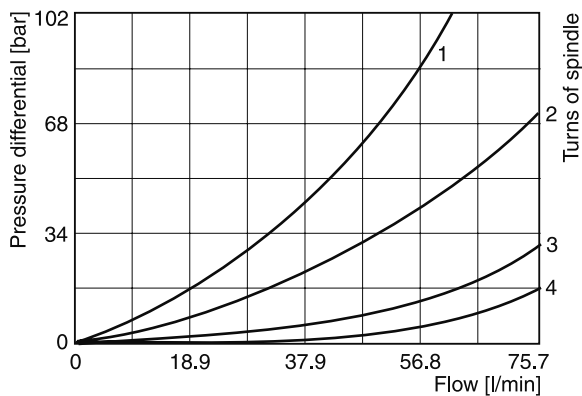
FM2D needle with V notch



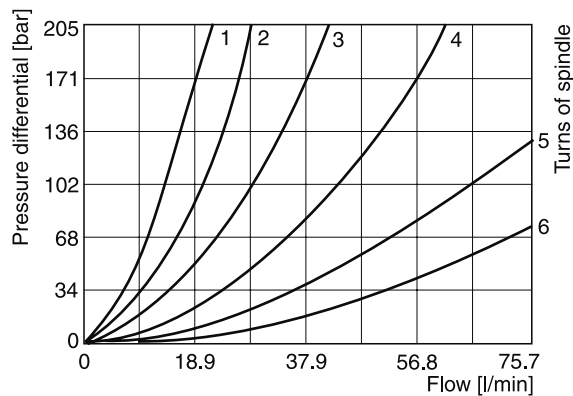
FM2 flow, check valve



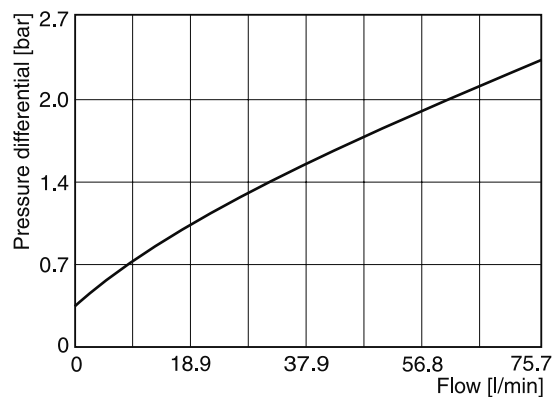
FM3 standard needle



FM3D needle with V notch



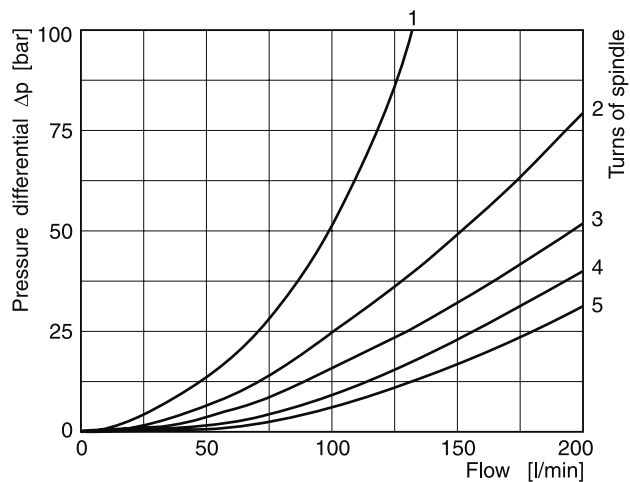
FM3 flow, check valve



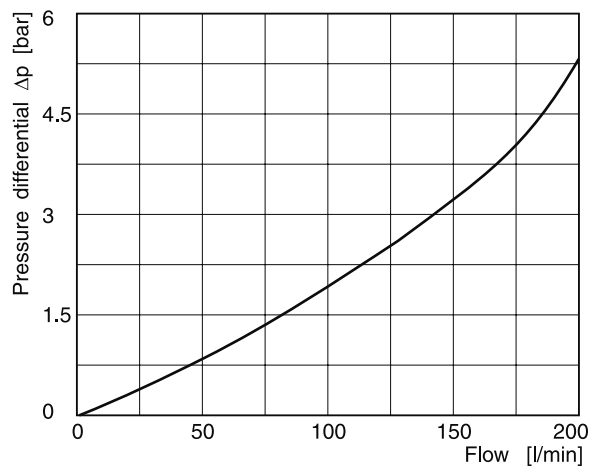
All characteristic curves measured with HLP46 at 50°C.

FM4 with standard needle

1 to 5 number of needle rotations

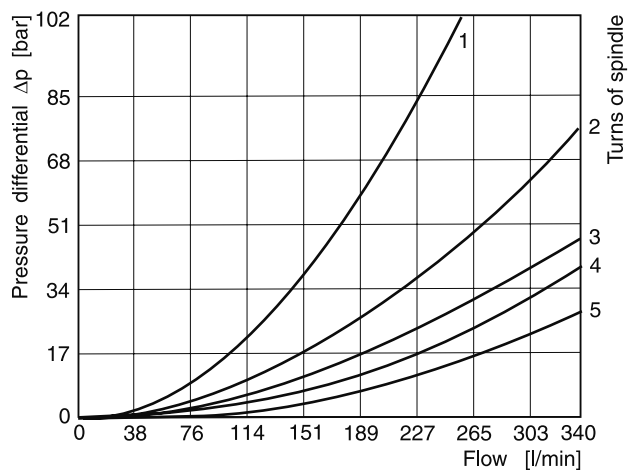


FM4 flow, check valve

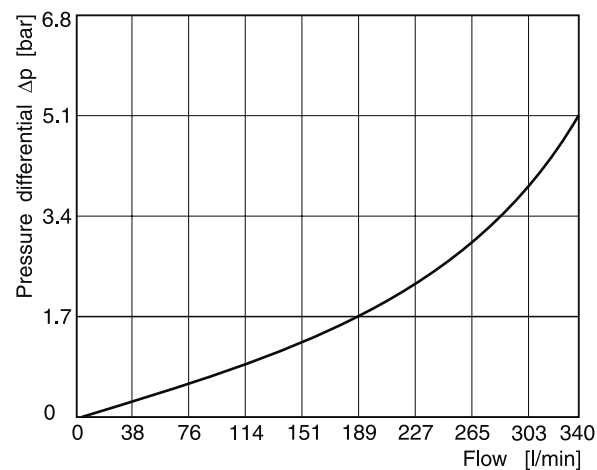


FM6 with standard needle

1 to 5 number of needle rotations

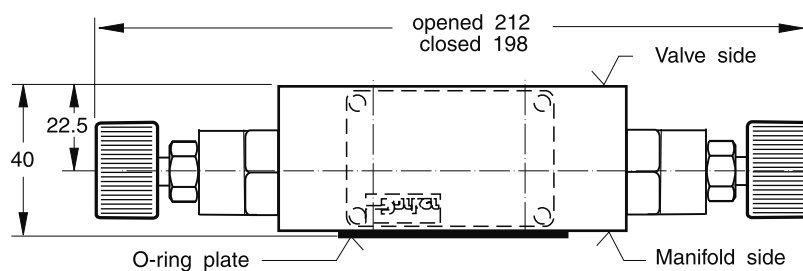
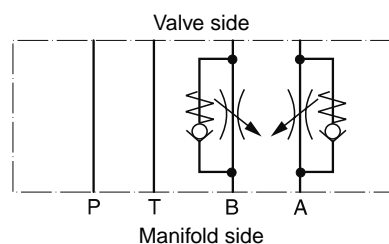


FM6 flow, check valve

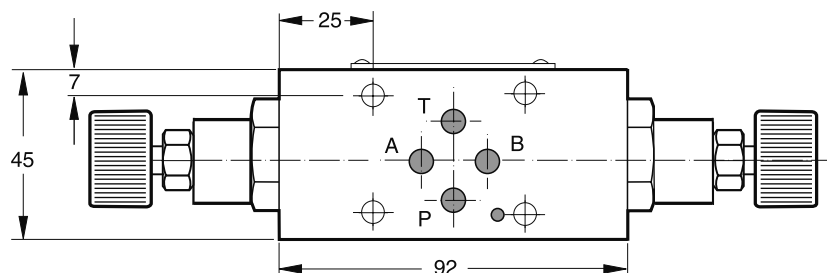
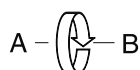
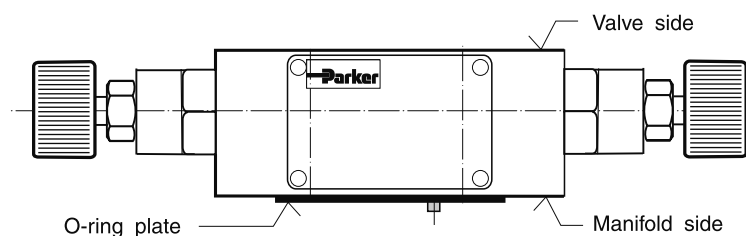
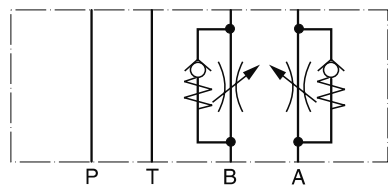


All characteristic curves measured with HLP46 at 50°C.

7

Dimensions**FM2****Meter-in****Meter-in or meter-out**

A functional change is achieved by rotating the mounting position of the valve 180° about the longitudinal axis (A-B).

**Meter-out**

Seal kit FM2	
Seal	Order code
V	SK-FM2-V-20

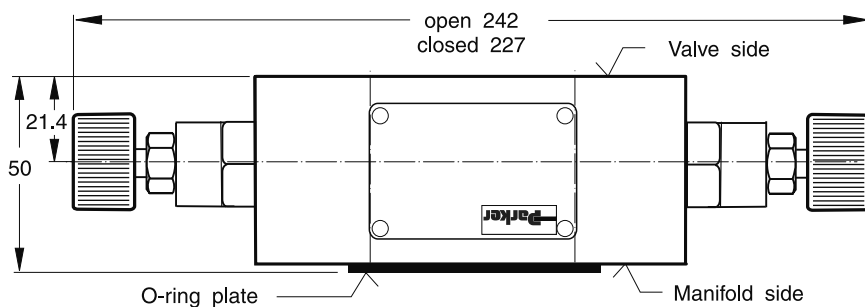
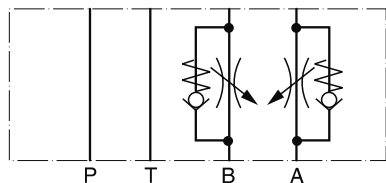
Note:

The O-ring plate (with O-rings) for sealing the connecting surface of the manifold side is included. The O-ring and positioning pin are always mounted on the manifold side.

Dimensions

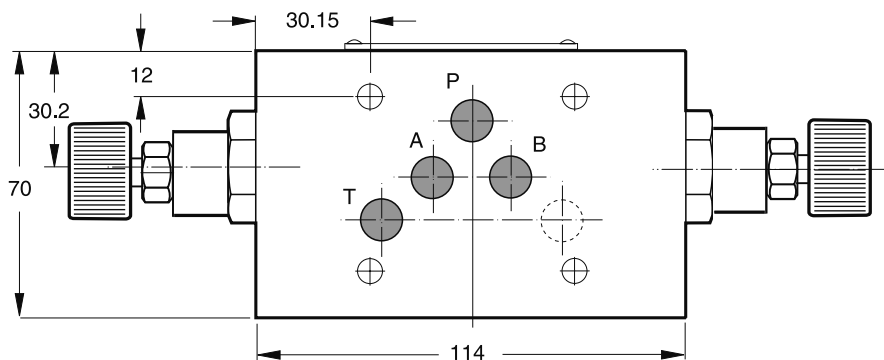
FM3

Meter-in

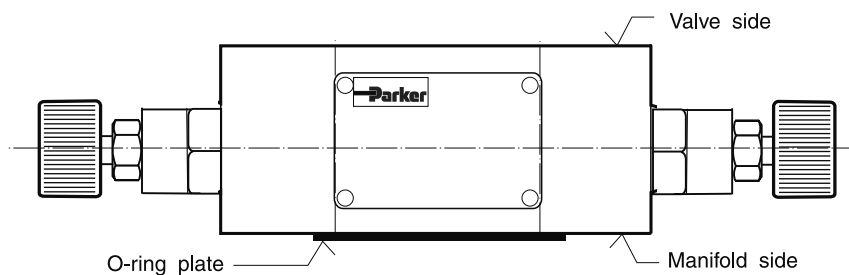
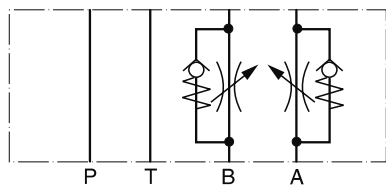


Meter-in or meter-out

A functional change is achieved by rotating the mounting position of the valve 180° about the transverse axis (P).



Meter-out

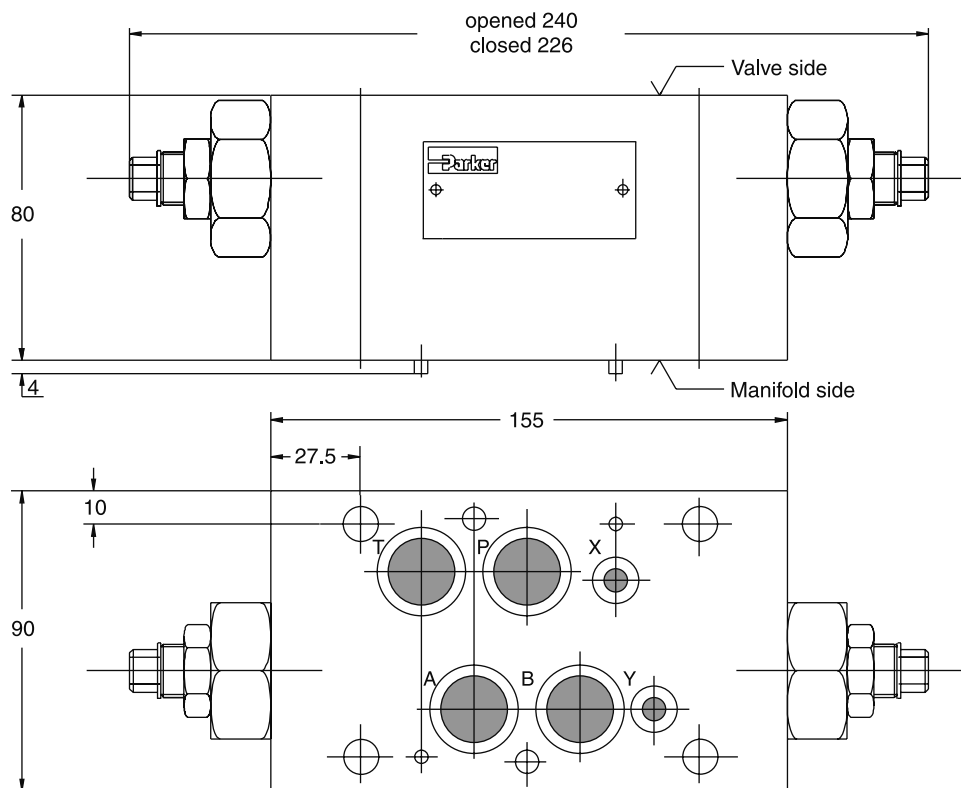
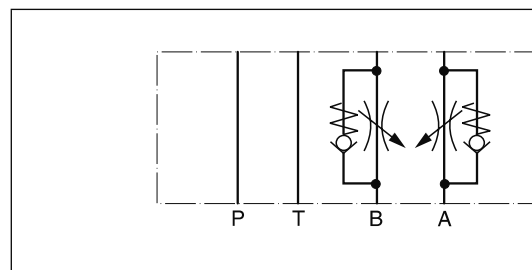
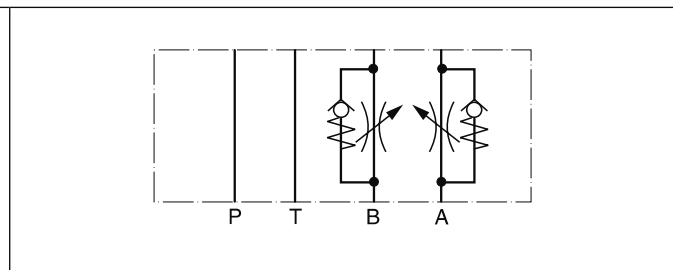


Seal kit FM3

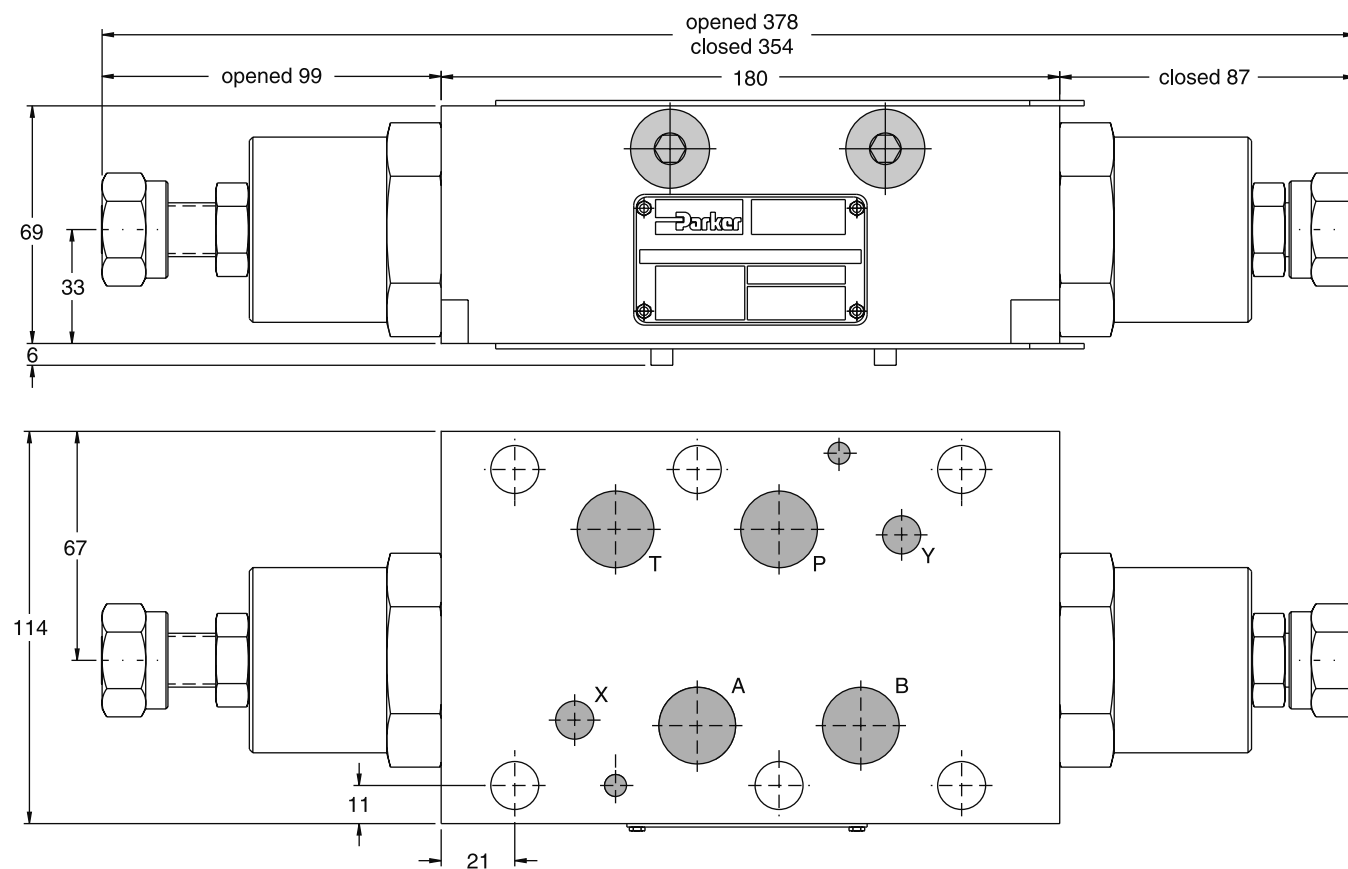
Seal	Order code
V	SK-FM3-V-20

Note:

The O-ring plate (with O-rings) for sealing the connecting surface of the manifold side is included. The O-ring and positioning pin are always mounted on the manifold side.

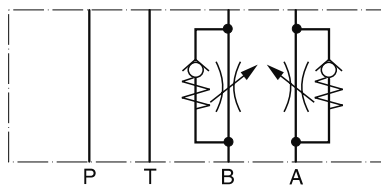
FM4**7****Meter-in****Meter-out****Seal kit FM4**

Seal	Order code
V	SK-FM4VHT

Dimensions**FM6****Meter-out**

Adjustment: knob

Meter-in is not available for FM6

**Seal kit FM6**

Seal	Order code
V	SK-FM6-V-12

Throttle check valves series ZRD are designed for maximum flow rates.

The throttle check function can be located in port A or B as well as in A + B. Meter-in or meter-out functionality can be selected by model code.

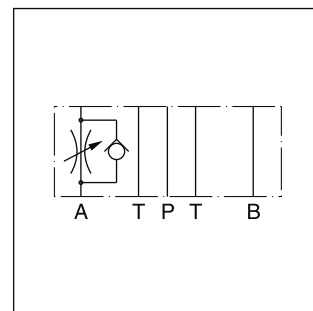
A low flow / high resolution version in NG06 for sensitive shifting time adjustment of pilot operated directional control valves is available on request.

Features

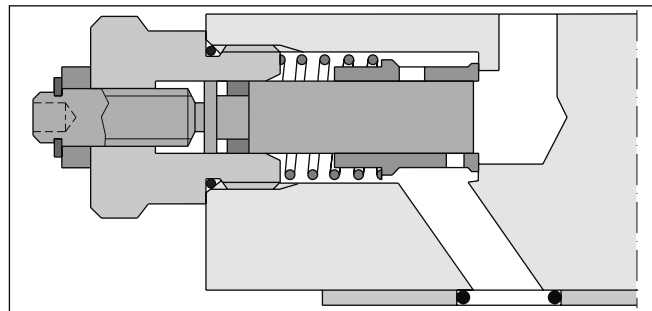
- High flow capacity
- Various functional arrangements
- ZRD01 - NG06 (CETOP3)
ZRD02 - NG10 (CETOP5)



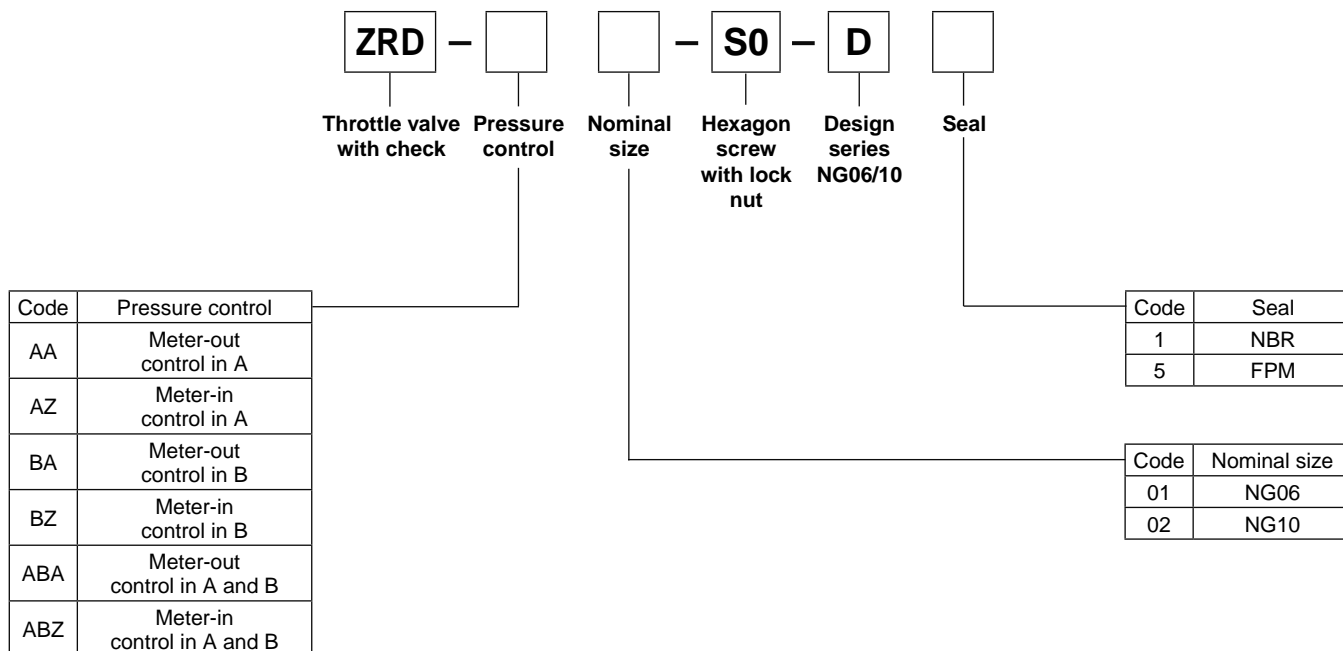
ZRD-ABZ01



ZRD-AA02



ZRD-AA02

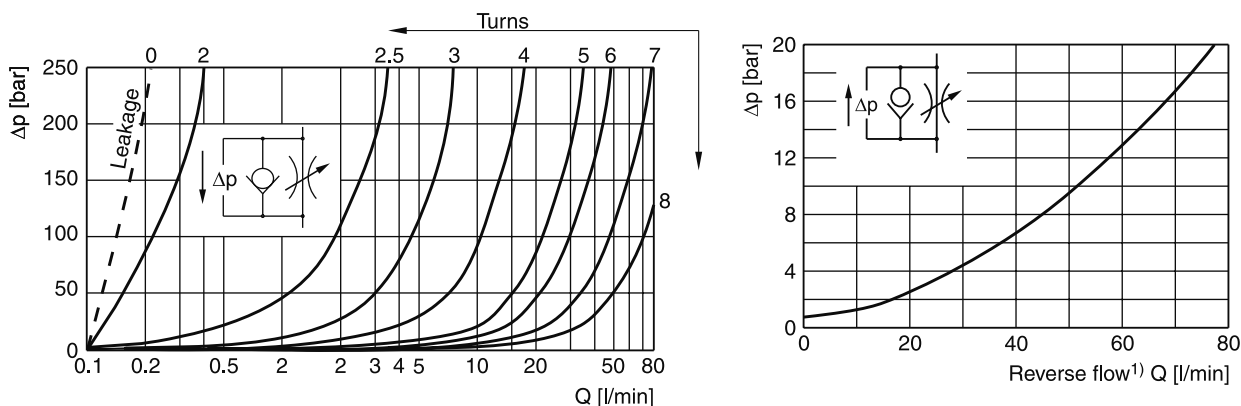
Ordering code

Ordering code details see end of chapter.

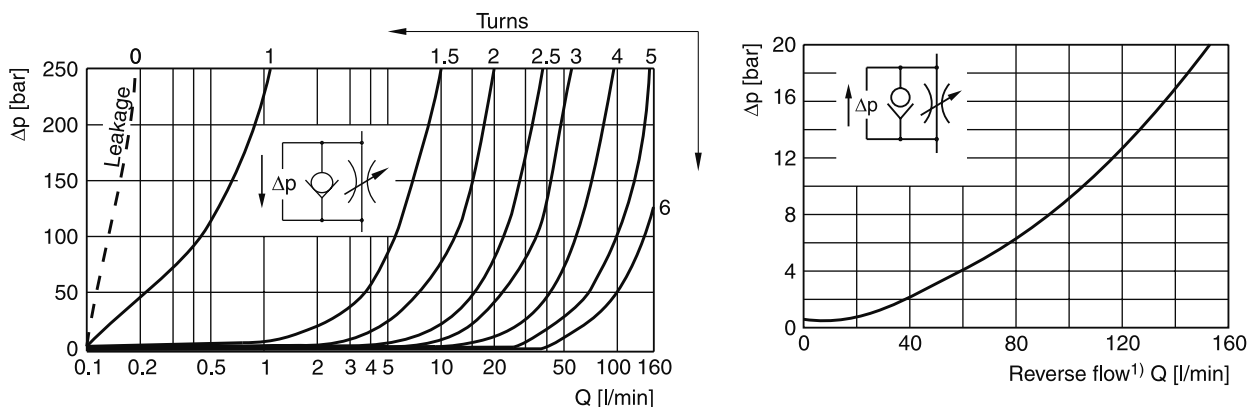
General			
Size		NG06	NG10
Mounting interface		DIN 24340 A6 ISO 4401 NFPA D03	DIN 24340 A10 ISO 4401 NFPA D05
		CETOP RP 121	
Mounting position		unrestricted	
Ambient temperature		[°C] -20...+50	
MTTF _D value		[years] 150	
Weight	1 cartridge	[kg] 1.2	2.8
	2 cartridges	[kg] 1.3	2.9
Hydraulic			
Max. operating pressure		[bar] 350	315
Nominal flow		[cSt] / [l/min] 80	160
Leakage		[cSt] / [l/min] 0.1...0.2 (at closed throttle)	0.1...0.2 (at closed throttle)
Opening pressure		[bar] 0.7	0.7
Fluid		Hydraulic oil according to DIN 51524...51525	
Fluid temperature		[°C] -20...+80	
Viscosity	permitted	[cSt] / [mm ² /s] 10...650	
	recommended	[cSt] / [mm ² /s] 30	
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638:7)	

p/Q performance curves

ZRD*01

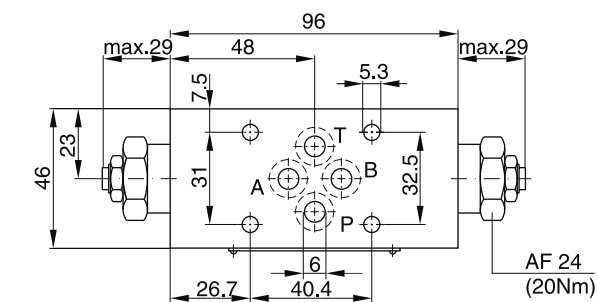


ZRD*02

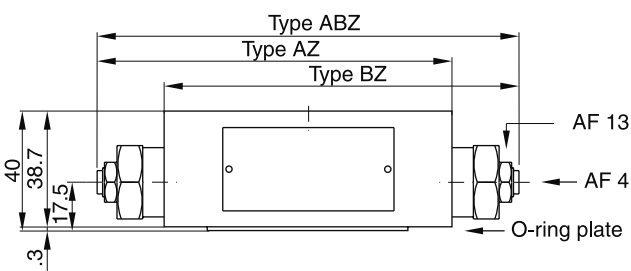
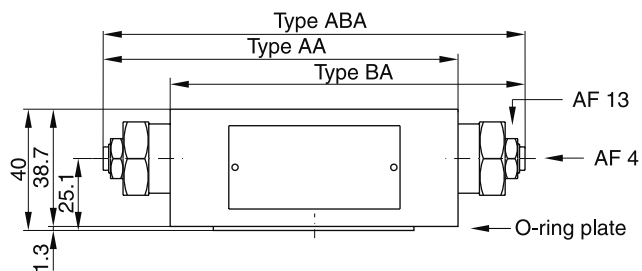
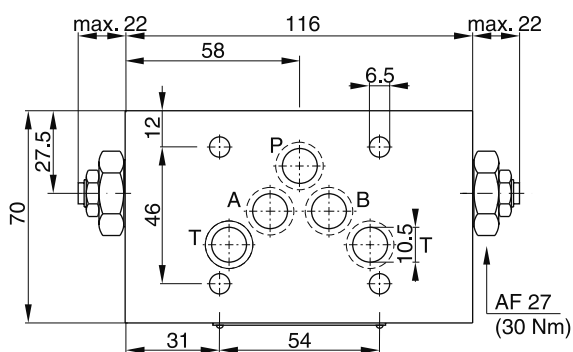


All characteristic curves measured with HLP46 at 50°C.

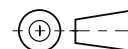
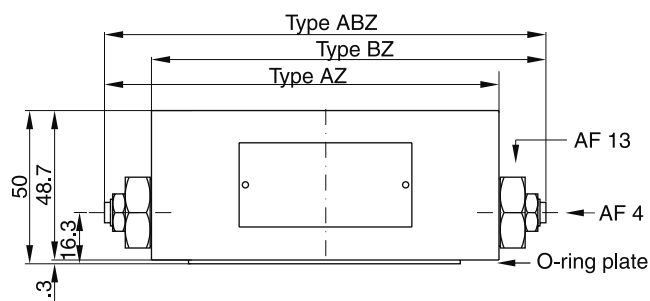
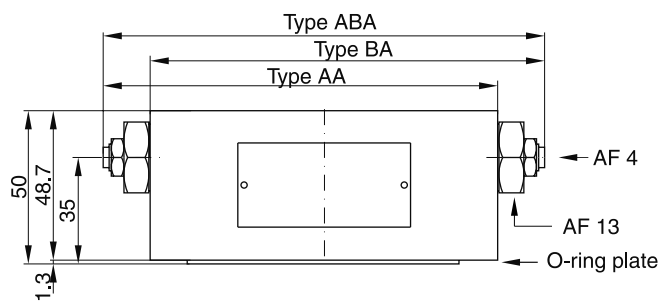
1) Throttle closed

Dimensions**Throttle Valve with Check
Series ZRD (Denison)****ZRD*01**

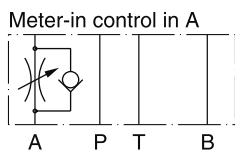
Seal kit	
Seal	Order code
1	098-91096-0
5	098-91097-0
Complete cartridge Order code 098-91119-0	
O-ring plate Order code S26-27553-0	

**ZRD*02**

Seal kit	
Seal	Order code
1	098-91098-0
5	098-91099-0
Complete cartridge Order code 098-91120-0	
O-ring plate Order code S16-85742-0	

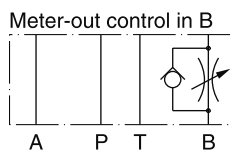


ZRD*01



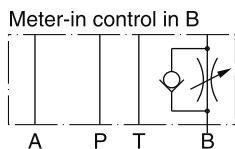
Series
ZRD-AZ01-S0-D1

Order No.
098-91056-0



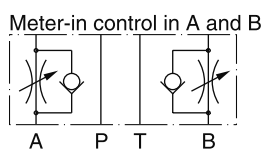
Series
ZRD-BA01-S0-D1

Order No.
098-91013-0



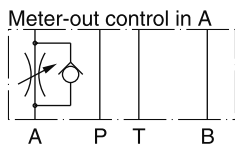
Series
ZRD-BZ01-S0-D1

Order No.
098-91057-0



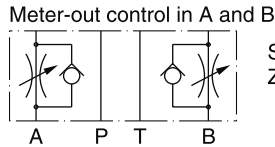
Series
ZRD-ABZ01-S0-D1

Order No.
098-91058-0



Series
ZRD-AA01-S0-D1

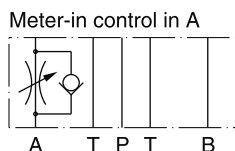
Order No.
098-91012-0



Series
ZRD-ABA01-S0-D1

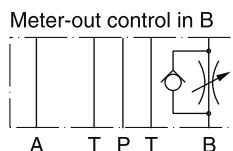
Order No.
098-91014-0

ZRD*02



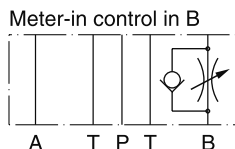
Series
ZRD-AZ02-S0-D1

Order No.
098-91059-0



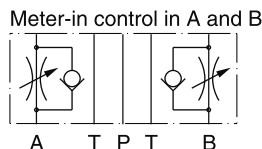
Series
ZRD-BA02-S0-D1

Order no.
098-91016-0



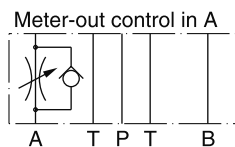
Series
ZRD-BZ02-S0-D1

Order No.
098-91060-0



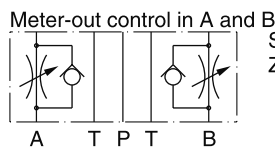
Series
ZRD-ABZ02-S0-D1

Order no.
098-91061-0



Series
ZRD-AA02-S0-D1

Order no.
098-91015-0



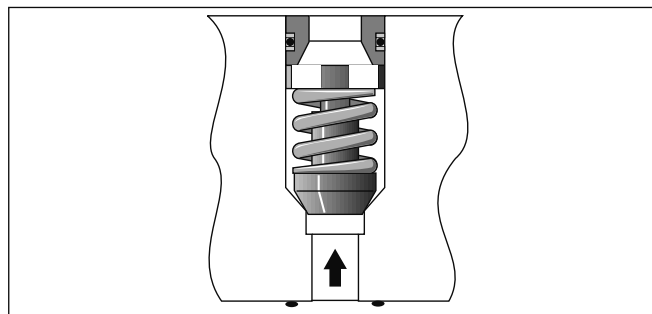
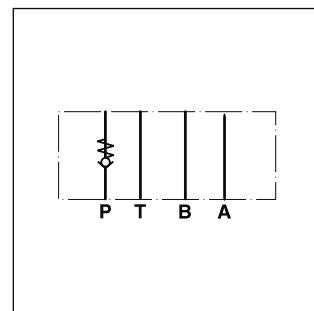
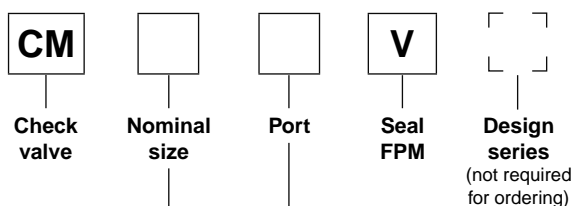
Series
ZRD-ABA02-S0-D1

Order no.
098-91017-0

Check valves from the Parker Manapak series CM are in sandwich design for easy configuration of stack systems. Depending on the function required, one or two check valves are arranged in ports P, T, A, and B. Number and flow direction can be selected from the ordering code.

Features

- The valve bodies of the Parker Manapak valve series CM are made of steel.
- Eight options for the arrangement of the check valve in the body offer a multitude of uses for hydraulic switching.
- The function can be changed by turning the valve.
- CM2 - NG06 (CETOP3)
- CM3 - NG10 (CETOP5)

**Ordering code**

Code	Nominal size
2	Intermediate plate DIN NG06
3	Intermediate plate DIN NG10

Code	Free flow polarity	Check valve in channel
AA	From directional valve to manifold	A
BB	From directional valve to manifold	B
DD	From directional valve to manifold	A and B
PP	From manifold to directional valve	P
TT	From directional valve to manifold	T
AAF	From manifold to directional valve	A
BBF	From manifold to directional valve	B
DDF	From manifold to directional valve	A and B

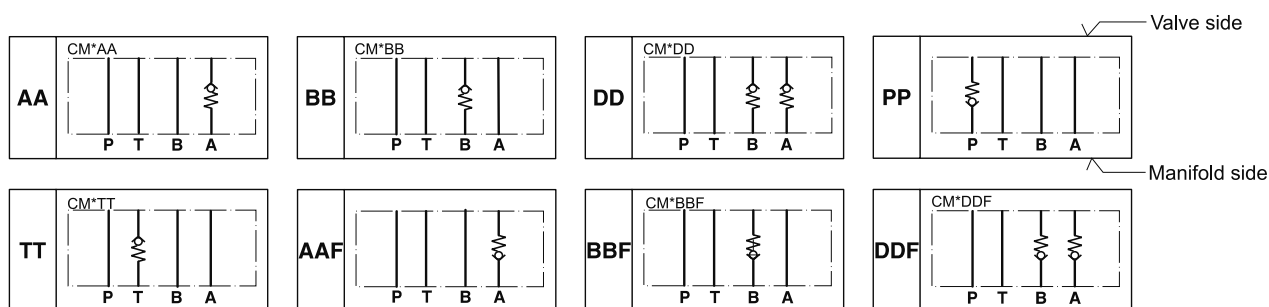
Bold letters =
Short-term availability

Technical data

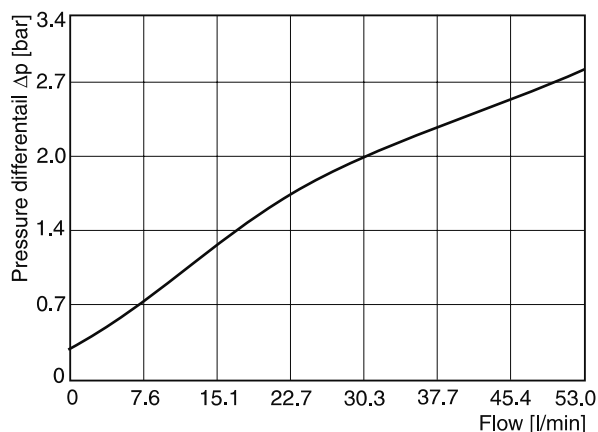
General			
Series		CM2	CM3
Mounting interface		ISO 4401-03-02-0-94	ISO 4401-05-04-0-94
Mounting position		unrestricted	
Ambient temperature [°C]		-20...+50	
MTTF _D value [years]		150	
Weight [kg]		0.9	1.7
Hydraulic			
Max. operating pressure [bar]		350	350
Max. Flow [l/min]		53	76
Opening pressure [bar]		0.3	0.3
Fluid		Hydraulic oil according to DIN 51524...51525	
Fluid temperature [°C]		-20...+80	
Viscosity	permitted	[cSt] / [mm²/s] 10...650	
	recommended	[cSt] / [mm²/s] 30	
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638:7)	

Schematics

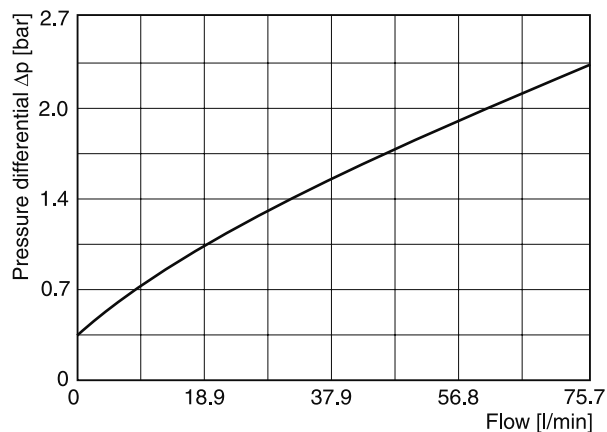
The valve side is shown at the top of the symbols, the manifold side with channel designation is shown on the bottom.

 $\Delta p/Q$ performance curves

CM2



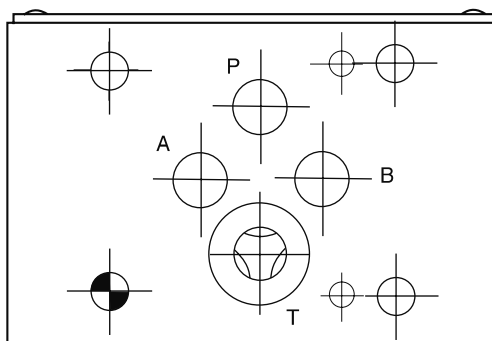
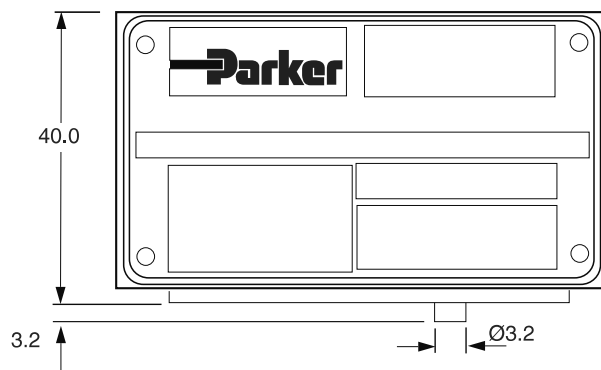
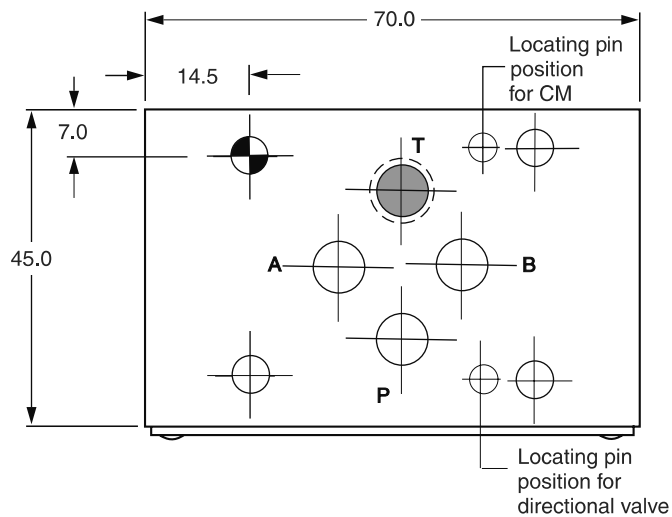
CM3



All characteristic curves measured with HLP46 at 50°C.

CM2**Bottom view***

(manifold side) *O-Ring plate is not shown!
This view shows the TT model.

**Front side****Top view**

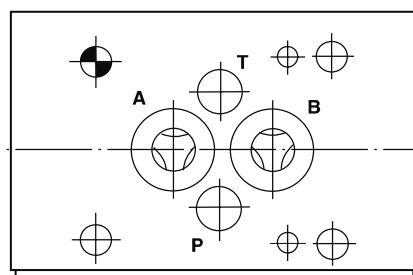
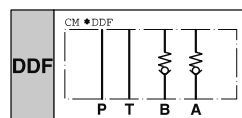
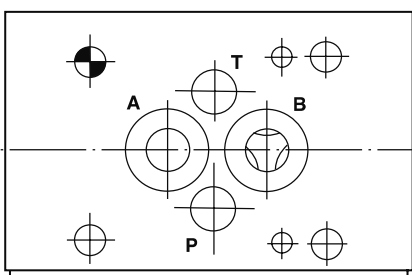
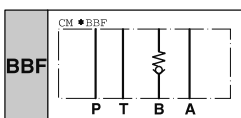
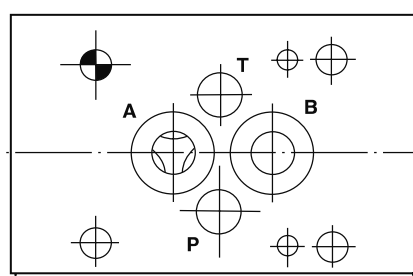
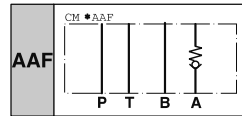
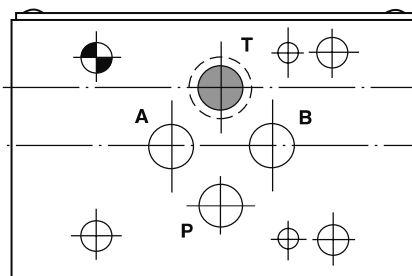
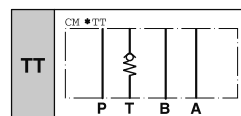
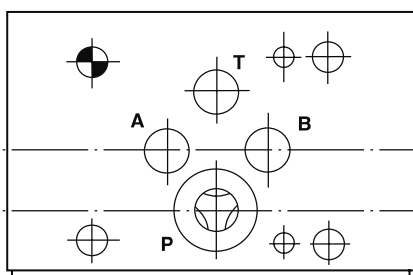
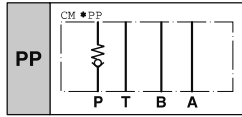
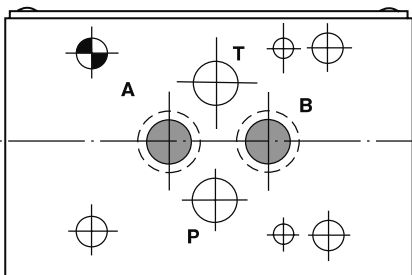
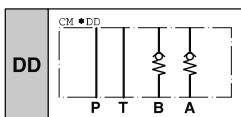
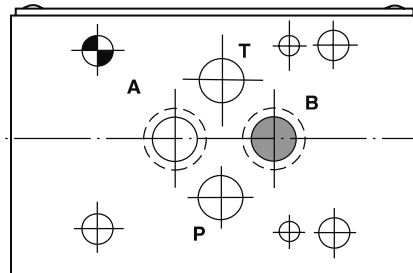
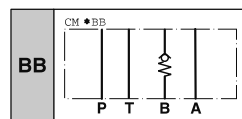
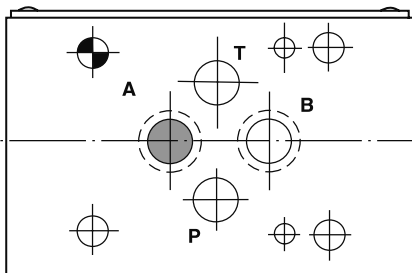
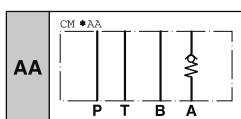
Seal kit CM2	
Seal	Order code
V	SK-CM2-V

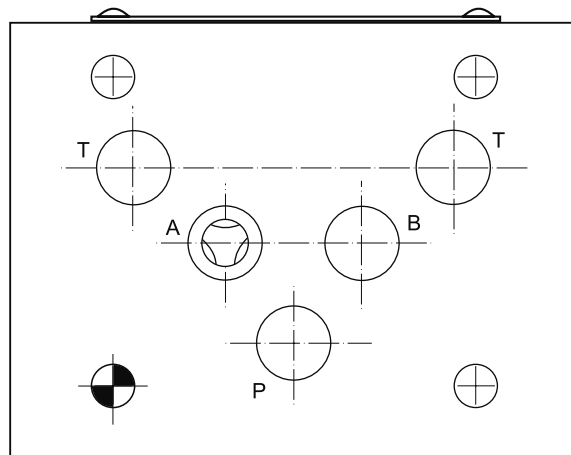
Note:

The O-ring plate for sealing the connecting surface of the manifold side is included. The O-ring plate and the positioning pin are always mounted on the manifold side.

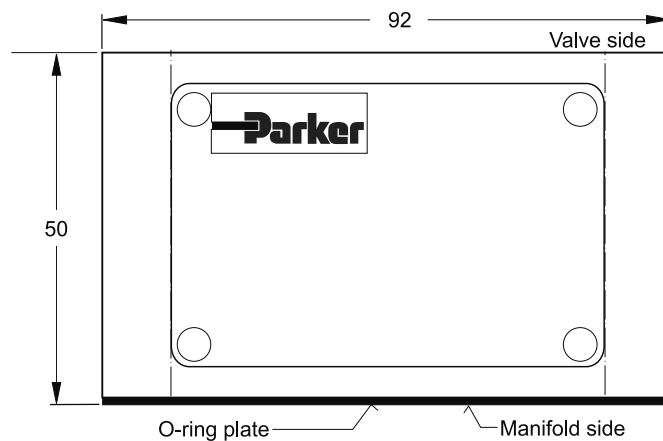
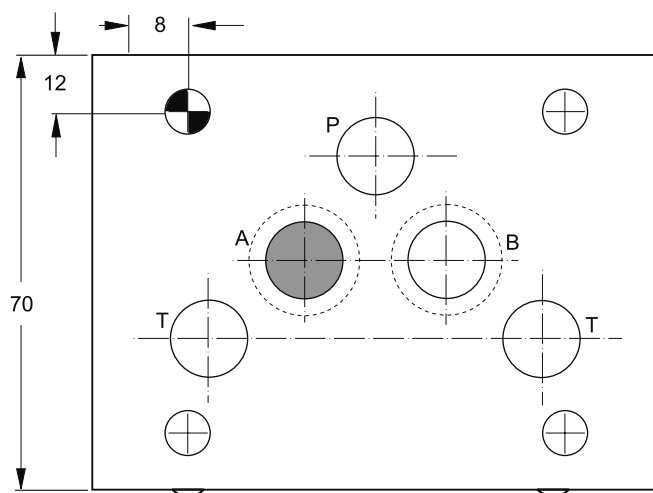
Top Views

CM2 top views (from directional valve side)



CM3**Bottom view***

*O-ring plate is not shown!
This view shows the AA model.

Front side**Top view**

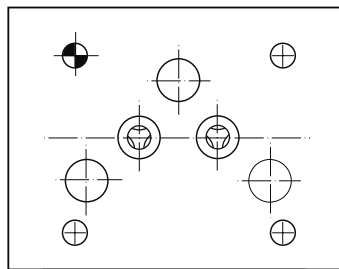
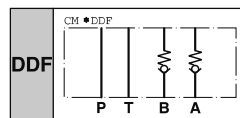
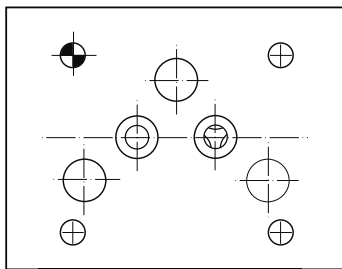
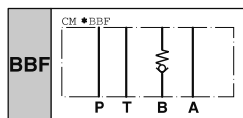
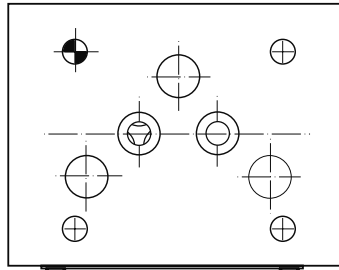
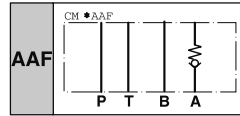
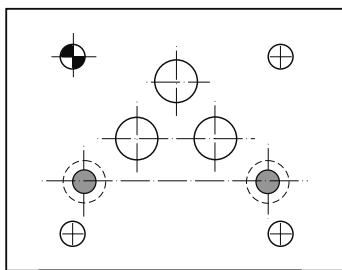
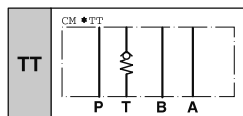
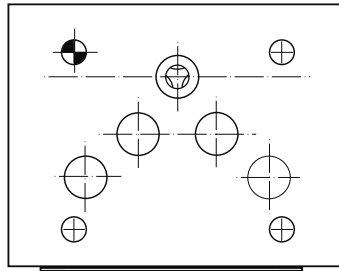
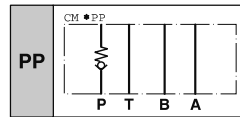
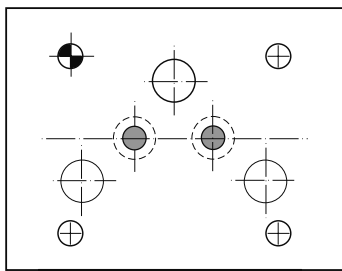
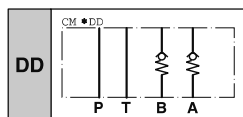
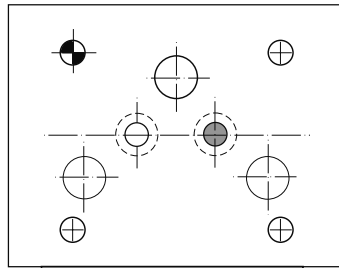
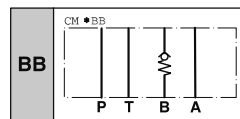
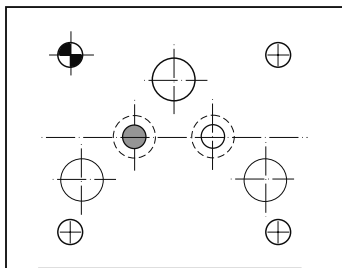
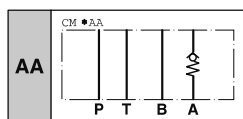
Seal kit CM3	
Seal	Order code
V	SK-CM3-V

Note:

The O-ring plate for sealing the connecting surface of the manifold side is included. The O-ring plate and the positioning pin are always mounted on the manifold side.

Top Views

CM3 top views (from directional valve side)



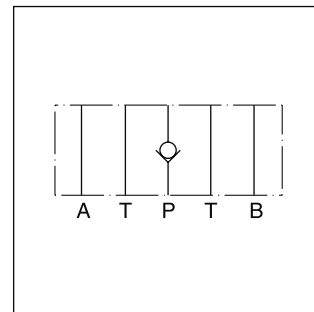
Direct operated check valves series ZRV have a cartridge type insert to provide zero leakage and high life time. The check function can be located in the P- or in the T-port.

Features

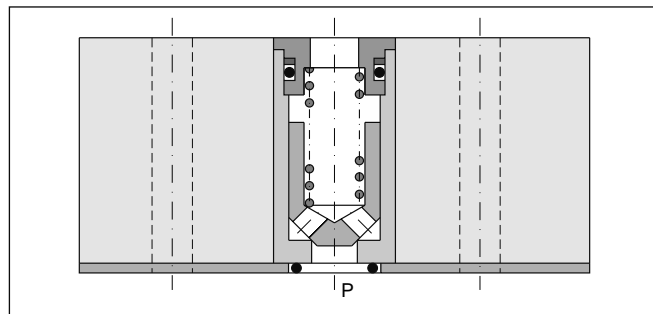
- Leakage-free seat
- High life time
- Opening pressure 0.5 bar
- ZRV01 - NG06 (CETOP3)
- ZRV02 - NG10 (CETOP5)



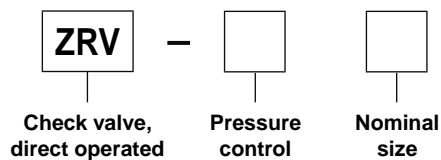
ZRV-P02



ZRV-P02



ZRV-P02

Ordering code

Code	Pressure control
P	Blocked in P
T	Blocked in T

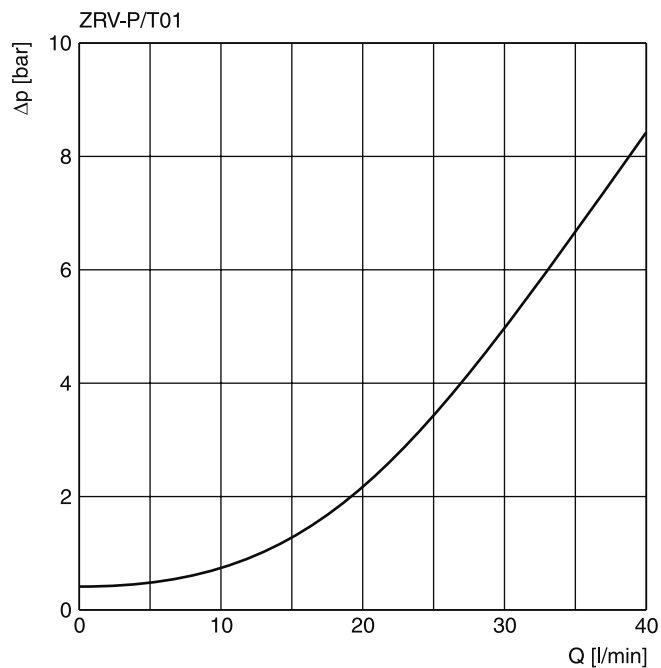
Code	Nominal size
01	NG06
02	NG10

Ordering code details see end of chapter.

Technical data

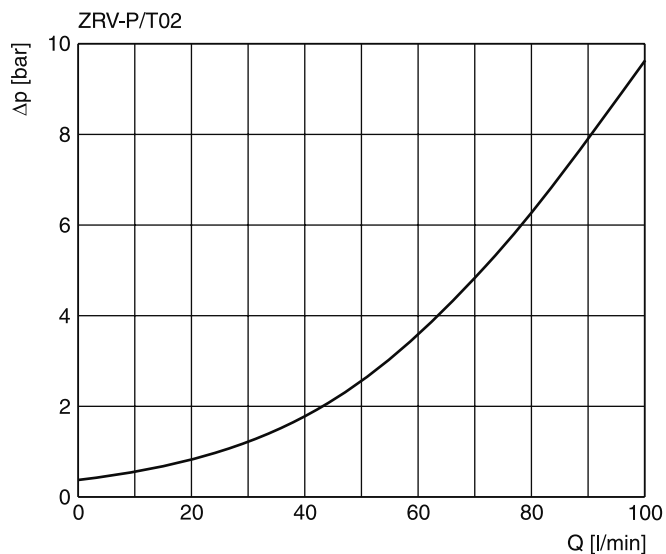
General			
Size		NG06	NG10
Mounting interface		DIN 24340 A6 ISO 4401 NFFPA D03	DIN 24340 A10 ISO 4401 NFFPA D05
		CETOP RP 121	
Mounting position		unrestricted	
Ambient temperature	[°C]	-20...+50	
MTTF _D value	[years]	150	
Weight	[kg]	0.7	2.0
Hydraulic			
Max. operating pressure	[bar]	350	315
Nominal flow	[l/min]	40	100
Opening pressure	[bar]	0.5	0.5
Fluid		Hydraulic oil according to DIN 51524...51525	
Fluid temperature	[°C]	-20...+80	
Viscosity	permitted	[cSt] / [mm²/s]	10...650
	recommended	[cSt] / [mm²/s]	30
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638:7)	

p/Q performance curves
ZRV*01

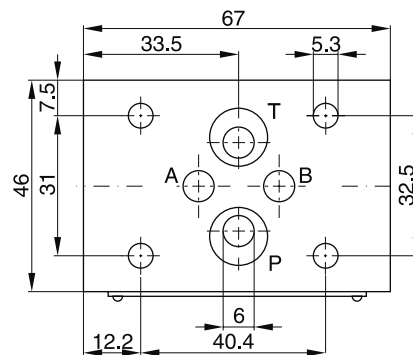


7

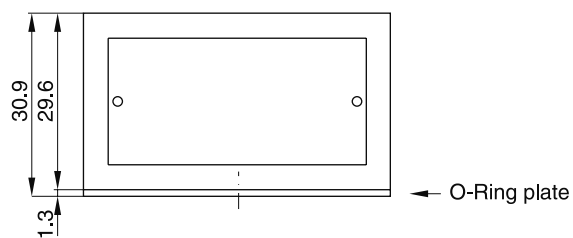
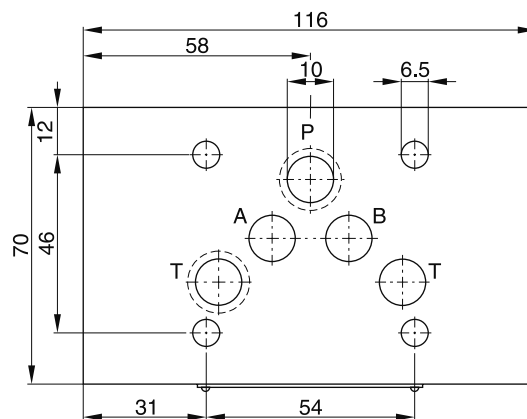
ZRV*02



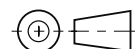
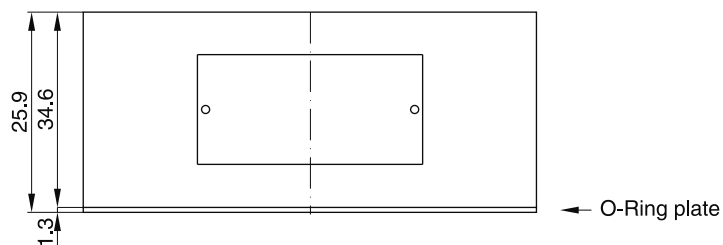
All characteristic curves measured with HLP46 at 50°C.

ZRV01

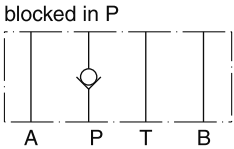
Seal kit	
Seal	Order code
NBR	SK-CM2-10
FPM	SK-CM2-V-10

**ZRV02**

Seal kit	
Seal	Order code
NBR	SK-CM3-10
FPM	SK-CM3-V-50

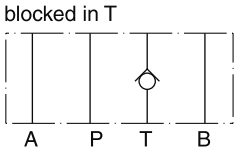


ZRV01



Series
ZRV-P01

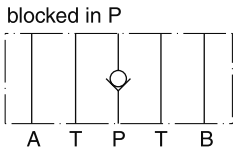
Order No.
098-90025-0



Series
ZRV-T01

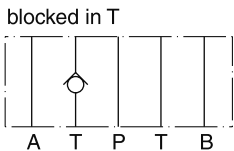
Order No.
098-90026-0

ZRV02



Series
ZRV-P02

Order No.
098-90043-0



Series
ZRV-T02

Order No.
098-90044-0

Pilot operated check valves from the Parker Manapak series CPOM are in sandwich design for easy configuration of stack systems. Depending on the function required, one or two pilot operated check valves are arranged in the ports A and/or B. The free flow direction is always from the valve side to the manifold side.

Function

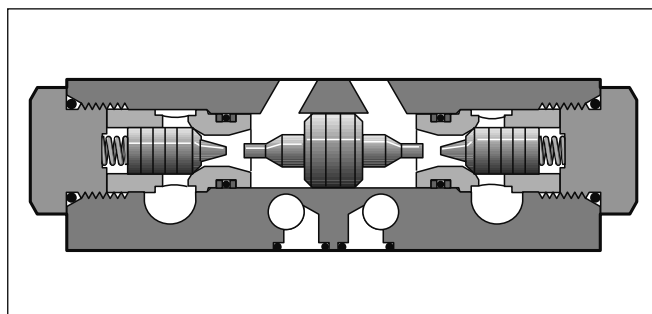
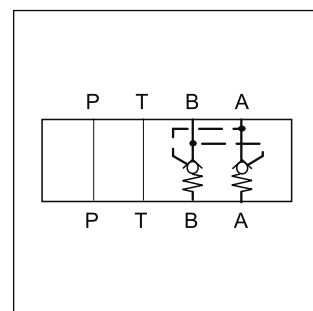
The check valves open when flowing to the consumer side, where the opposing check valve is hydraulically-mechanically pilot operated simultaneously by a control spool, and thus the return flow is enabled from other consumer sides.

Features

- The valve bodies of the Parker Manapak valve series CPOM are made of steel.
- The valve poppet is precisely guided into the steel sleeve and ensures a good seal on the seat.
- When the valve poppet is open, the large cross-section allows high flow rates at low differential pressure.
- Different control ratios can be chosen with the NG6 and NG10 valves.
- Pre-opening for CPOM*HT to achieve smooth opening.



CPOM3

**Ordering code****Without pre-opening**

Without pre-opening

CPOM

Hydraulically operated check valve pilot ratio 3 : 1

Size

Poppet style

Opening pressure

V

Seal FPM

Design series
(not required for ordering)

Code	Size
2	NG06
3	NG10
6	NG25

Code	Pressure	Size
omit	1.0 bar	NG06/10/25
25	2.5 bar	NG06
50	5.0 bar	NG06
70	7.0 bar	NG06

Code	Connection
AA	only A
BB	only B
DD	A and B

With pre-opening

With pre-opening

CPOM

Hydraulically operated check valve

4

Size NG16

Poppet style

HT

Pilot ratio 13:1

V

Seal FPM

Design series
(not required for ordering)

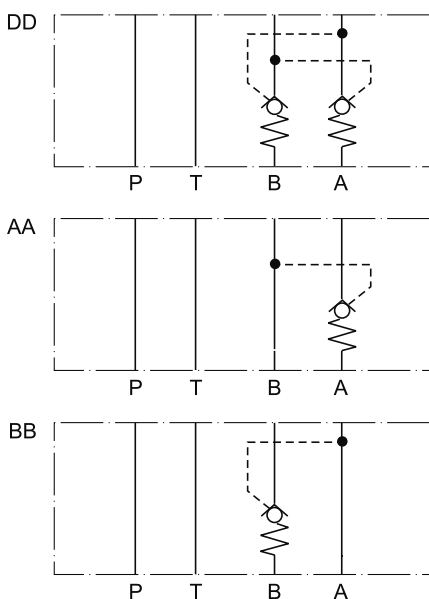
Code	Connection
AA	only A
BB	only B
DD	A and B

Bold letters =
Short-term availability

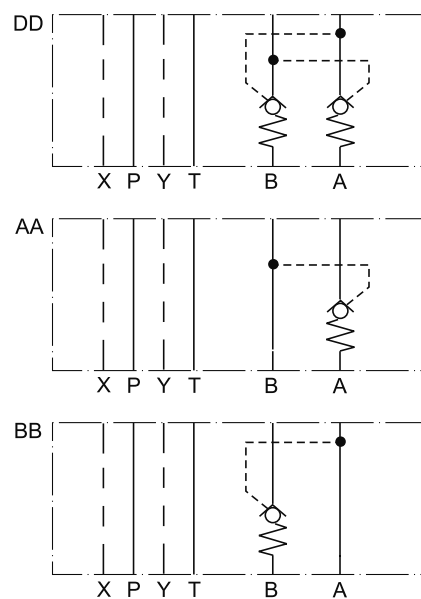
General						
Series			CPOM2	CPOM3	CPOM4	CPOM6
Nominal size			NG06	NG10	NG16	NG25
Mounting interface			ISO 4401			
Ambient temperature [°C]			-20...+50			
MTTF _D value [years]			150			
Weight [kg]			1.8	4.0	7.65	9.5
Hydraulic						
Max. operating pressure [bar]			350	350	350	210
Opening pressure [bar]			1.0	0.8	2.0	0.4
Opening ratio			1 : 3	1 : 3	1 : 13	1 : 3
Leakage			on request			
Fluid			Hydraulic oil according to DIN 51524...51525			
Fluid temperature [°C]			-20...+80			
Viscosity	permitted	[cSt] / [mm²/s]	10...650			
	recommended	[cSt] / [mm²/s]	30			
Filtration			ISO 4406 (1999); 18/16/13 (meet NAS 1638:7)			

Schematics

CPOM2 / CPOM3

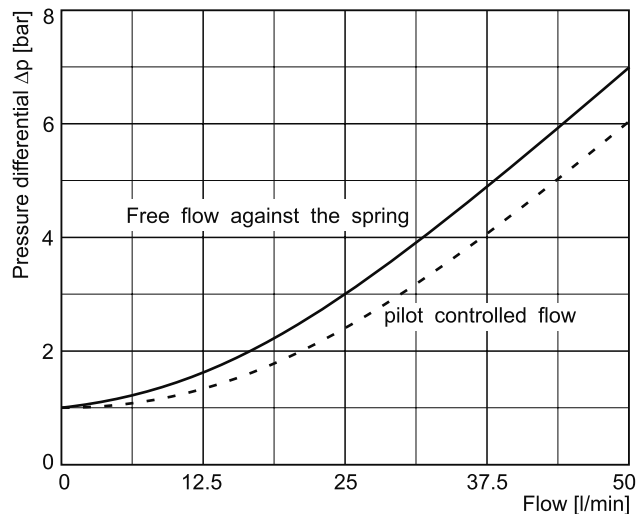


CPOM4 / CPOM6

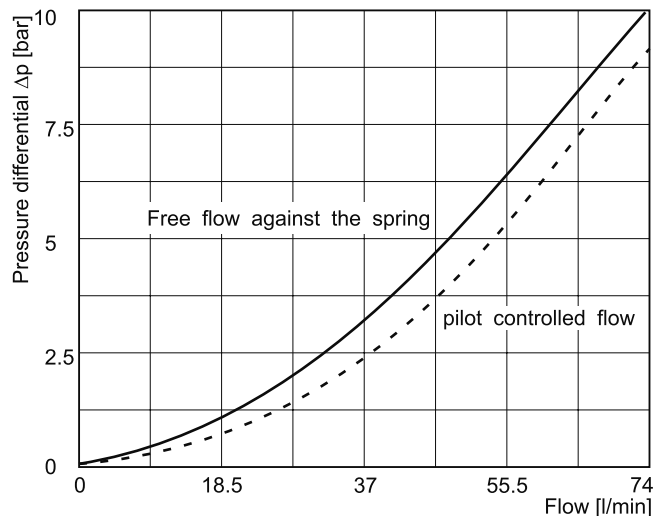


$\Delta p/Q$ performance curves

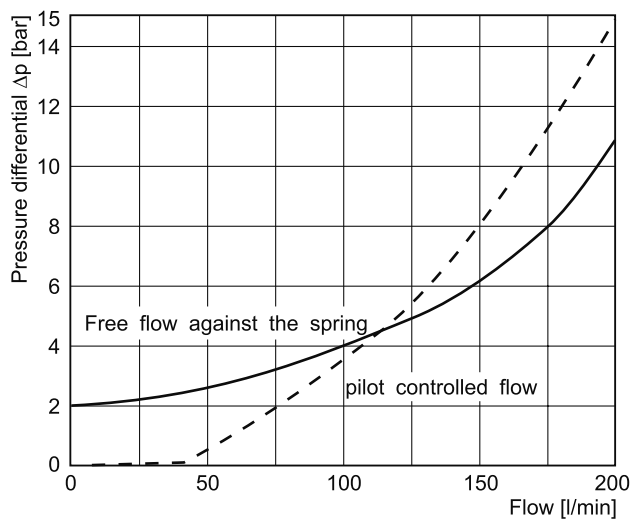
CPOM2



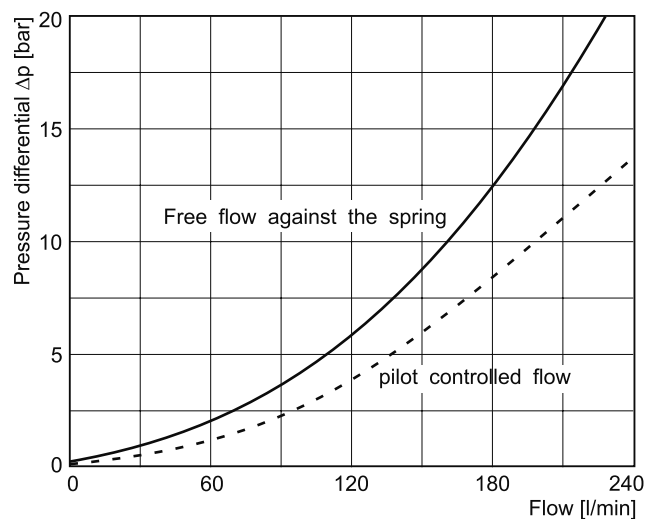
CPOM3



CPOM4 (type HT)



CPOM6

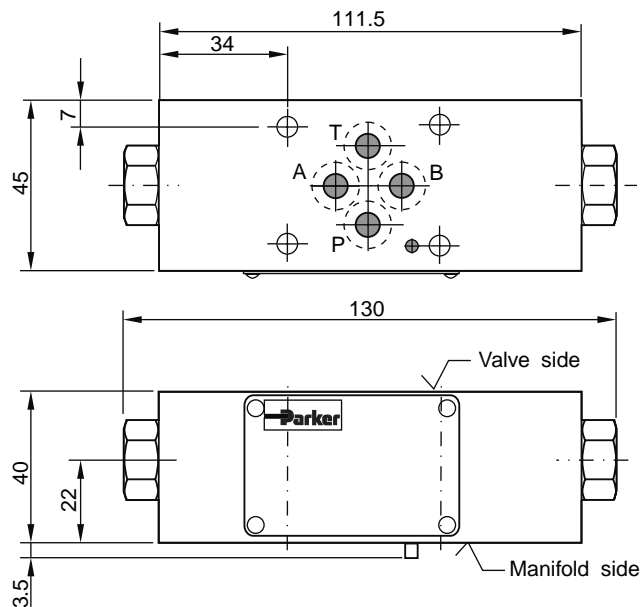


All characteristic curves measured with HLP46 at 50°C.

Dimensions

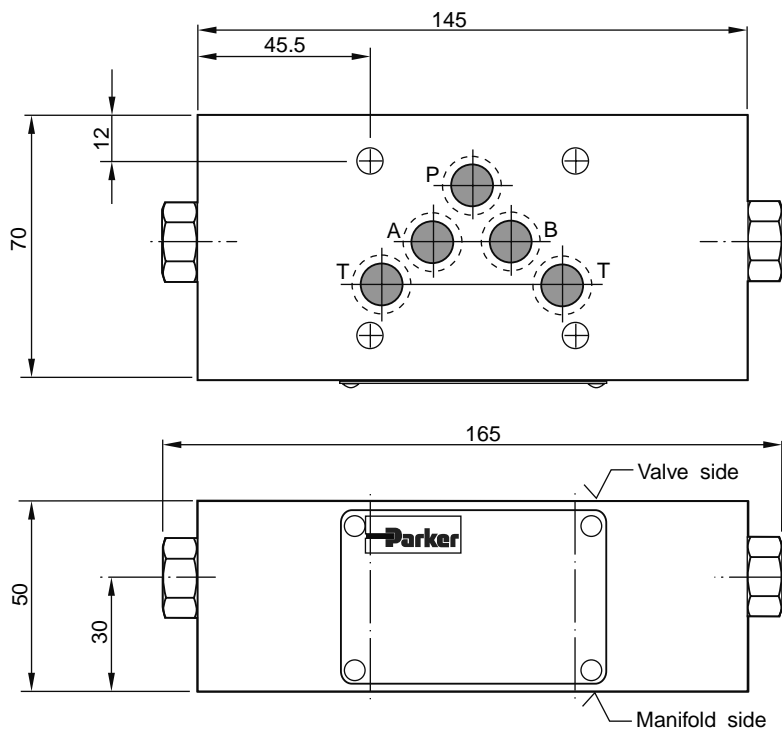
Pilot Operated Check Valve Series CPOM

CPOM2



Seal kit CPOM2	
Seal	Order code
V	SK-CPOM2-V-11

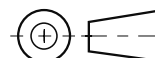
CPOM3

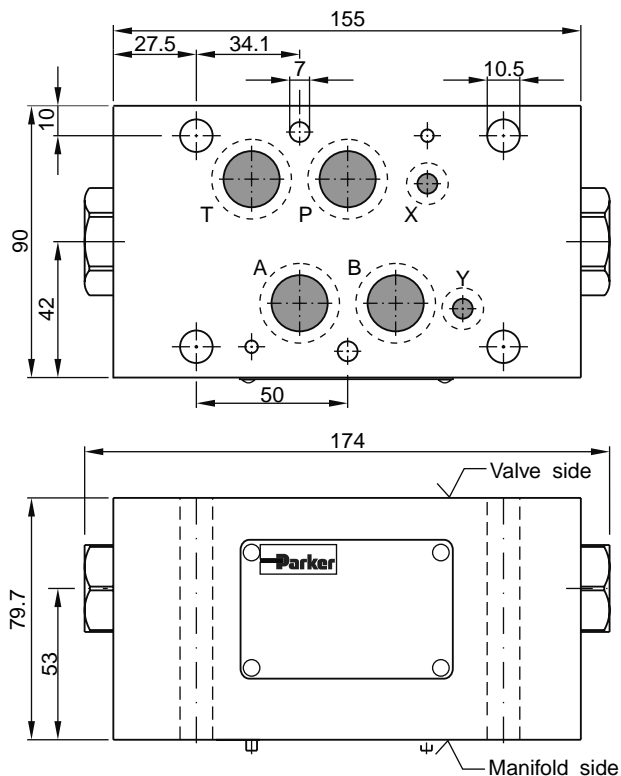


Seal kit CPOM3	
Seal	Order code
V	SK-CPOM3-V-11

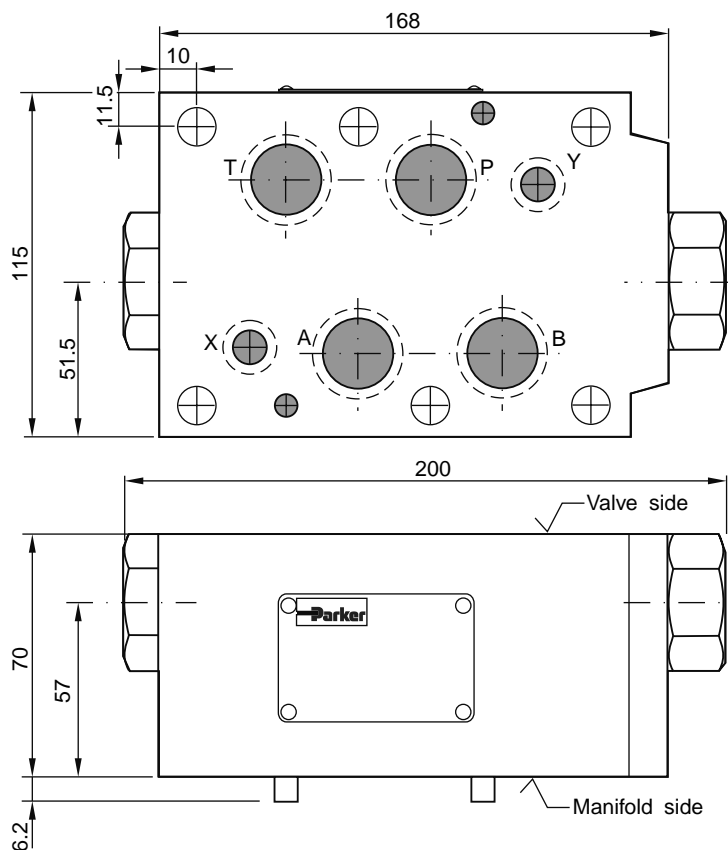
Note:

The O-ring plate for sealing the connecting surface of the manifold side is included. The O-ring plate and the positioning pin are always mounted on the manifold side.



Dimensions**Pilot Operated Check Valve****Series CPOM****CPOM4**

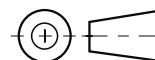
Seal kit CPOM4	
Seal	Order code
V	SK-CPOM4HTV

CPOM6

Seal kit CPOM6	
Seal	Order code
V	SK-CPOM6-V-20

Note:

The O-ring plate for sealing the connecting surface of the manifold side is included. The O-ring plate and the positioning pin are always mounted on the manifold side.



7

This image shows a full page of blank graph paper. The grid consists of small, equal-sized squares formed by thin, dark gray lines. There are no margins, text, or other markings on the page.

Pilot operated check valves series ZRE are designed for maximum flow rates and long life time.

The valves are typically used in combination with spool type directional control valves to ensure nearly leak free positioning of the actuator.

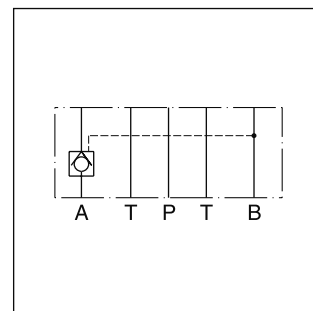
The inlet flow is free while the outlet flow is blocked. Pressure in the inlet line opens the check valve and allows free outlet flow.

Features

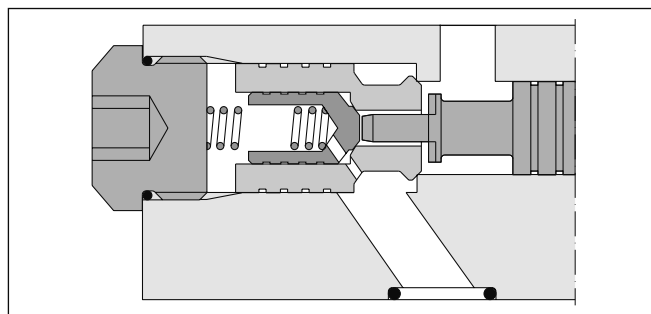
- High flow capacity
- High life time
- Check function in A, B or A + B
- ZRE01 - NG06 (CETOP3)
- ZRE02 - NG10 (CETOP5)



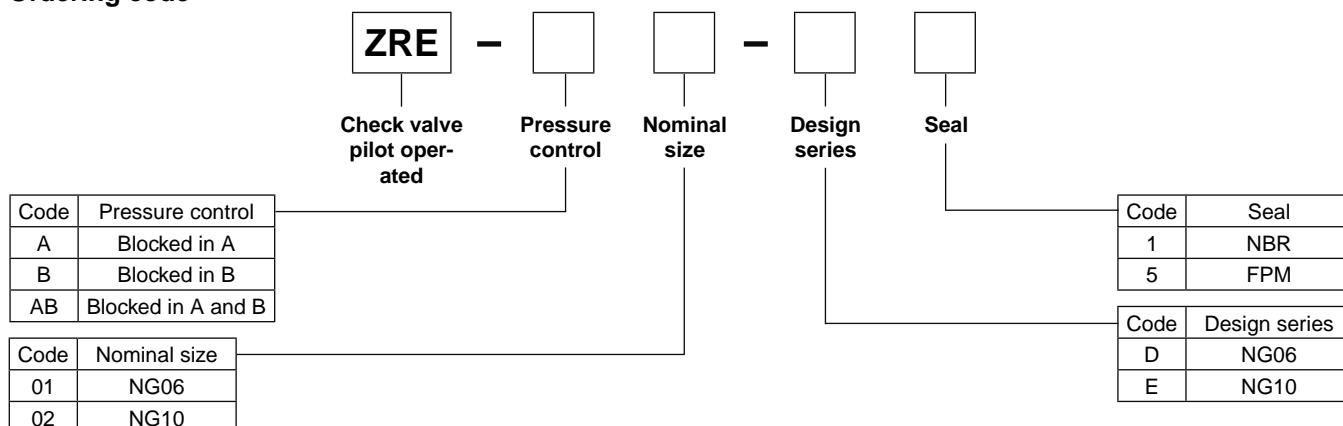
ZRE-B01



ZRE-A02



ZRE-A02

Ordering code

Ordering code details see end of chapter.

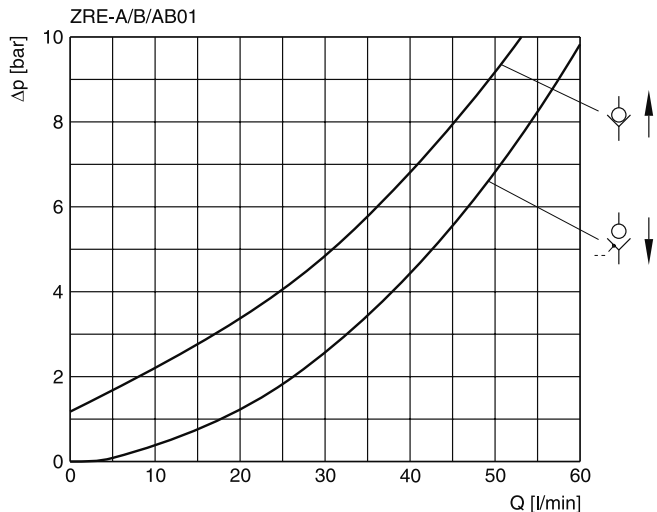
Technical data

General			
Size		NG06	NG10
Mounting interface		DIN 24340 A6 ISO 4401 NFPA D03	DIN 24340 A10 ISO 4401 NFPA D05
		CETOP RP 121	
Mounting position		unrestricted	
Ambient temperature	[°C]	-20...+50	
MTTF _D value	[years]	150	
Weight	[kg]	1.2	3.1
Hydraulic			
Max. operating pressure	[bar]	up to 350	315
Nominal flow	[l/min]	60	120
Opening ratio (pilot cone / main cone)		1:6	1:6
Opening pressure	[bar]	1.2	2.0
Leakage		on request	
Fluid		Hydraulic oil according to DIN 51524...51525	
Fluid temperature	[°C]	-20...+80	
Viscosity permitted	[cSt]/[mm²/s]	10...650	
Viscosity recommended	[cSt]/[mm²/s]	30	
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638:7)	

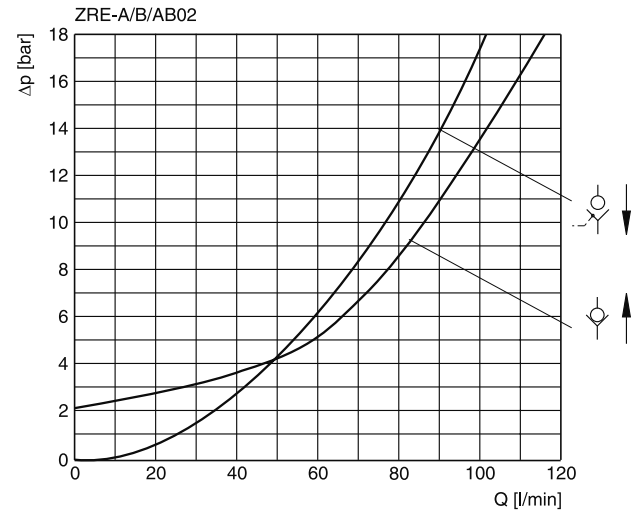
ZRE UK.INDD CM 15.07.11

p/Q performance curves

ZRE*01



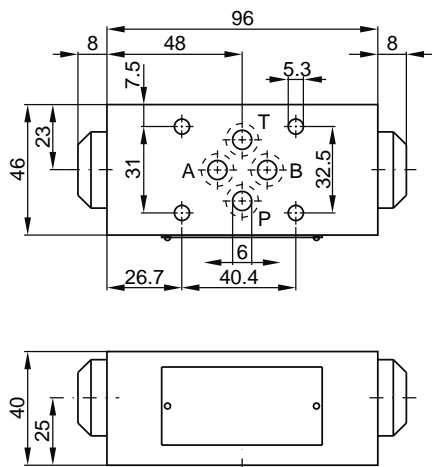
ZRE*02



All characteristic curves measured with HLP46 at 50°C.

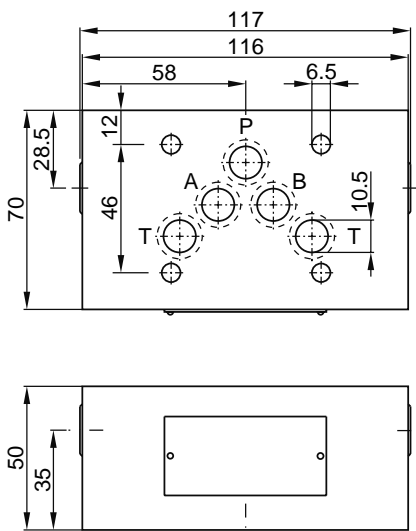
Dimensions

ZRE*01

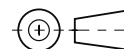


Seal kit	
Seal	Order code
1	098-91088-0
5	098-91089-0

ZRE*02

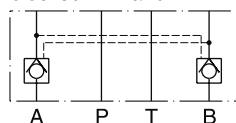


Seal kit	
Seal	Order code
1	098-91090-0
5	098-91091-0



ZRE*01

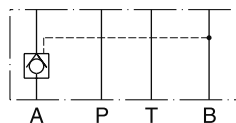
blocked in A and B



Series
ZRE-AB01-D1

Order No.
098-91020-0

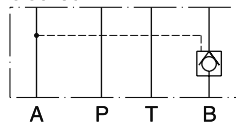
blocked in A



Series
ZRE-A01-D1

Order No.
098-91018-0

blocked in B

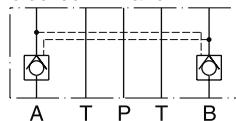


Series
ZRE-B01-D1

Order No.
098-91019-0

ZRE*02

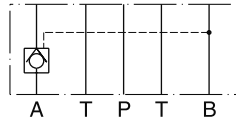
blocked in A and B



Series
ZRE-AB02-E1

Order No.
098-91300-0

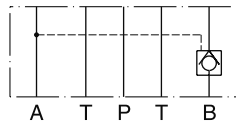
blocked in A



Series
ZRE-A02-E1

Order No.
098-91298-0

blocked in B



Series
ZRE-B02-E1

Order No.
098-91304-0

7

This image shows a full page of blank graph paper. The grid consists of small, equal-sized squares formed by thin, dark gray lines. There are 20 columns and 20 rows of these squares, creating a total of 400 square units. The margins are consistent on all sides, and there are no markings, text, or drawings on the paper.

The counterbalance valve series ZNS controls the actuator movement at overrunning loads.

The return flow from the actuator is piloted and controlled by the inlet flow to the actuator, ensuring a cavitation-free lowering of the load.

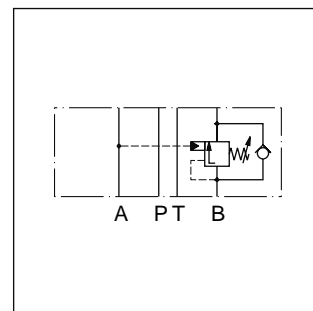
The counter balance valve operates as a pressure relief valve. The setting pressure is lowered by the pressure in the inlet line. To ensure safe load holding the setting pressure should be approximately 30% higher than the max. load pressure.

Features

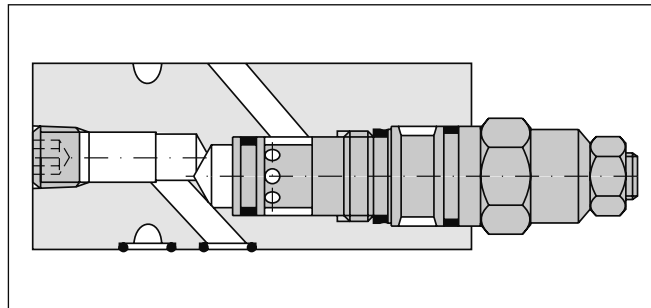
- Controlled movement loads
- Load holding via leak-free poppet valve
- Secondary relief protection for the actuator
- ZNS*01 – NG06 (CETOP3)
- ZNS*02 – NG10 (CETOP5)



ZNS-AB01



ZNS-B01



ZNS-B01

Ordering code

Ordering code

ZNS				S0	D	
Counterbalance valve	Pressure control	Nominal size	Pressure stages	Hexagon-screw with lock nut	Design series	Seal

Code	Pressure control
A	in A
B	in B
AB	in A and B

Code	Nominal size
01	NG06
02	NG10

Code	Seal
1	NBR
5	FPM

Code	Pressure stages
2	70 - 175 bar
5 ¹⁾	140 - 350 bar

Ordering code details see end of chapter

¹⁾ NG10 to 315 bar

Ordering code details see end of chapter.

¹⁾ NG10 to 315 bar

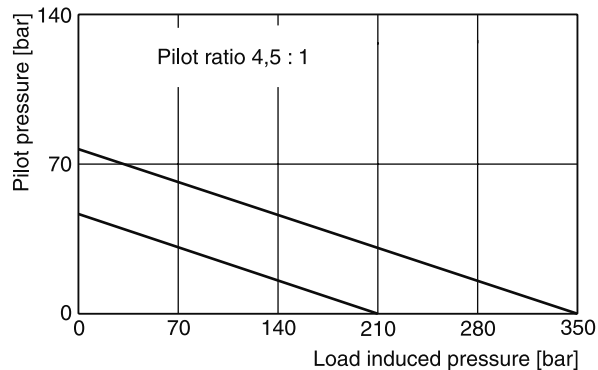
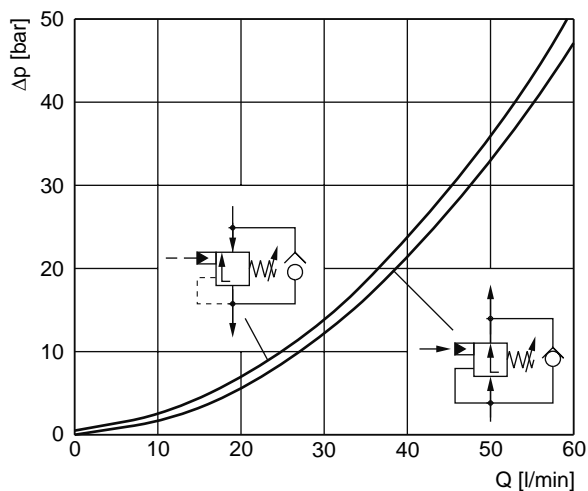
Technical data

General			
Size		NG06	NG10
Mounting interface		DIN 24340 A6 ISO 4401 NFA D03	DIN 24340 A10 ISO 4401 NFA D05
Mounting position		unrestricted	
Ambient temperature	[°C]	-20...+50	
Weight			
1 cartridge	[kg]	1.3	1.6
2 cartridges	[kg]	3.0	3.9
Hydraulic			
Max. operating pressure	[bar]	350	315
Pressure stages	[bar]	175, 350	
Pilot ratio		4.5 : 1	
Leakage		on request	
Nominal flow	[l/min]	60	120
Opening pressure	[bar]	0.3	0.3
Fluid		Hydraulic oil according DIN 51524...51525	
Fluid temperature	[°C]	-20...+80	
Viscosity			
permitted	[cSt] / [mm²/s]	10...650	
recommended	[cSt] / [mm²/s]	30	
Filtration		ISO 4406 (1999); 18/16/13 (meet NAS 1638:7)	

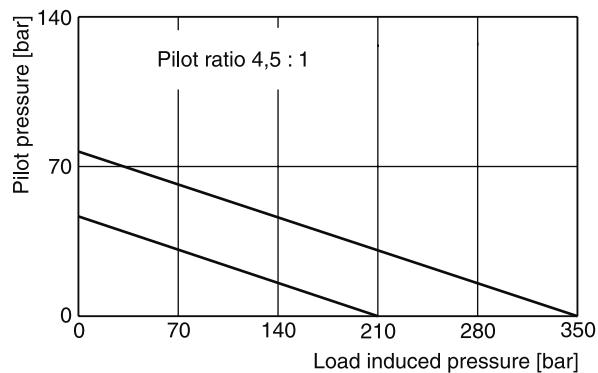
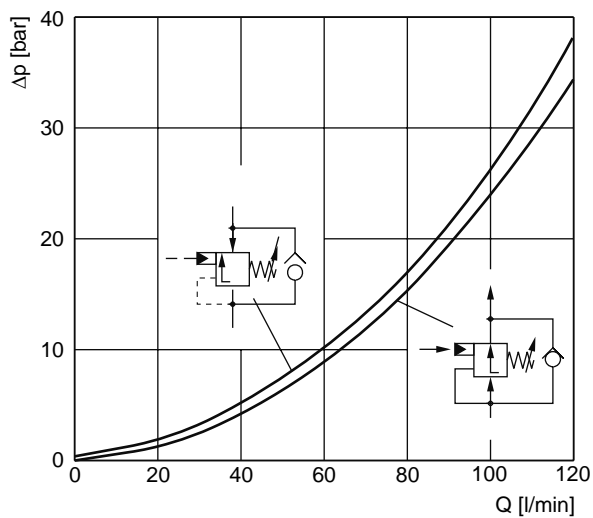
ZNS UK.INDD CM 15.07.11

p/Q performance curves

ZNS*01



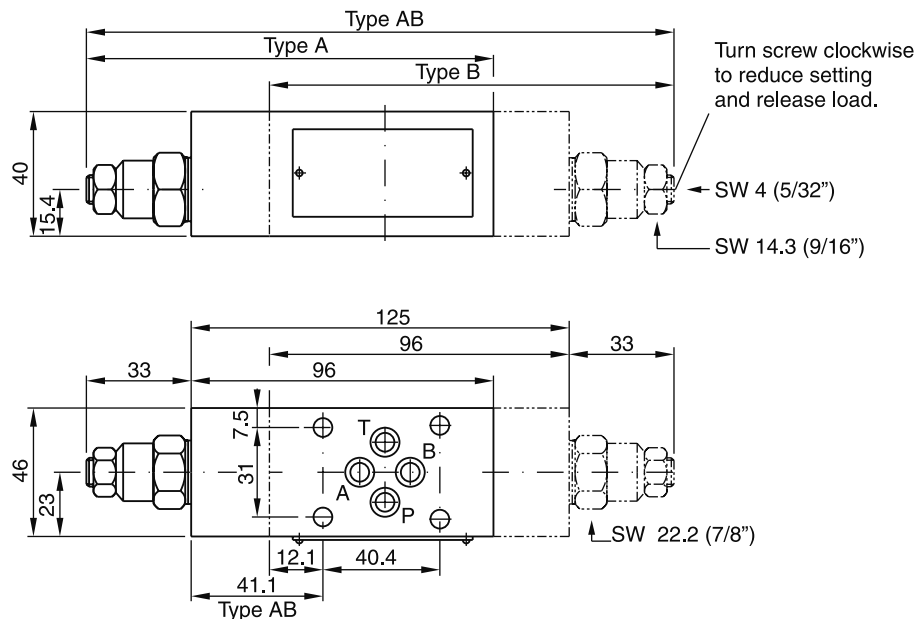
ZNS*02



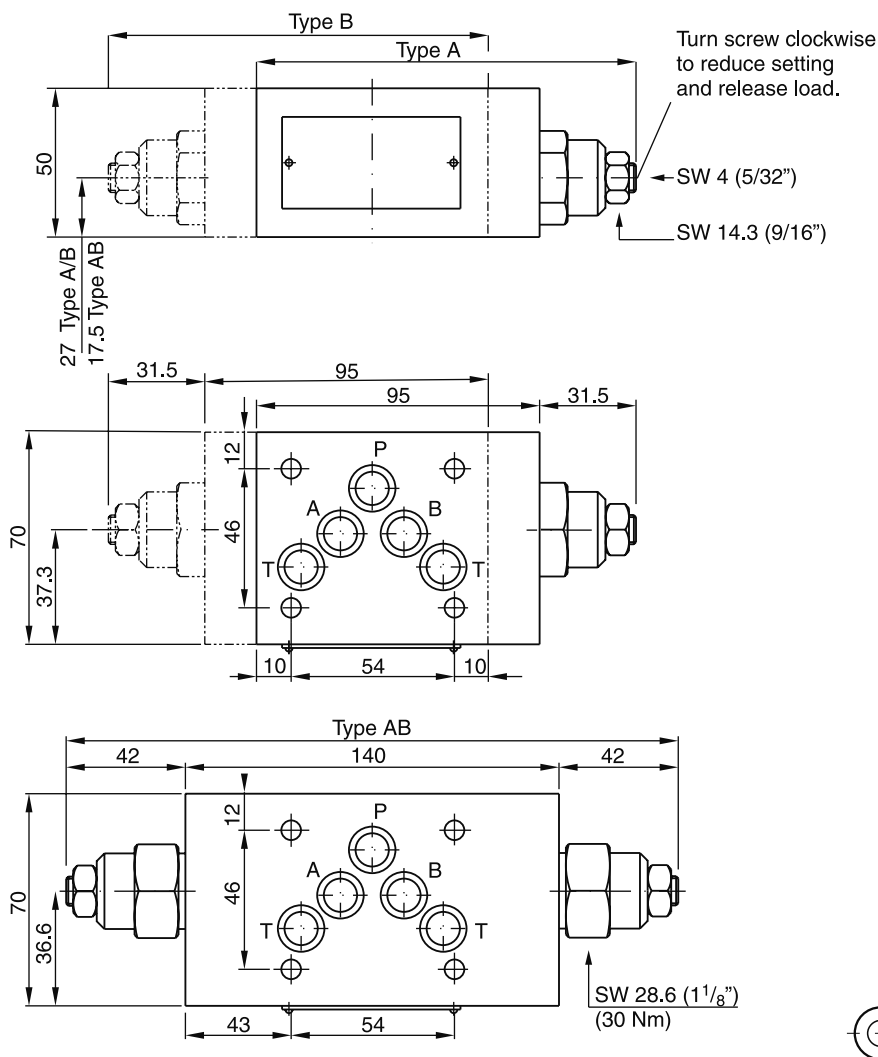
All characteristic curves measured with HLP46 at 50°C.

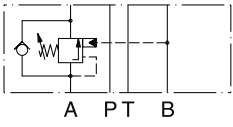
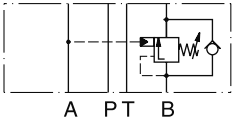
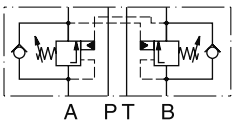
Dimensions**Counterbalance Valve
Series ZNS (Denison)****ZNS*01**

Seal kit ZNS*01	
Seal	Order code
NBR	098-91153-0
FPM	098-91154-0
Complete cartridge ZNS*01	
Pressure stage	Order code
2	517-01017-2
5	517-00448-8

**ZNS*02**

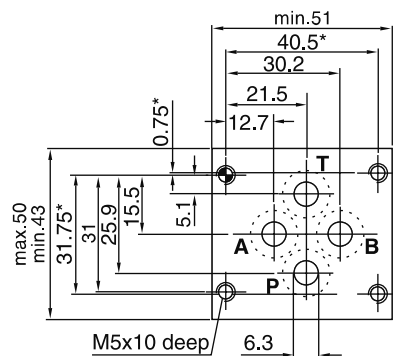
Seal kit ZNS*02	
Seal	Order code
NBR	098-91155-0
FPM	098-91156-0
Complete cartridge ZNS*02	
Pressure stage	Order code
2	517-00449-8
5	517-00450-8



	ZNS*01		ZNS*02	
Counterbalance in A	Series	Order no.	Series	Order no.
	ZNS-A01-2-S0-D1	098-91126-0	ZNS-A02-2-S0-D1	098-91132-0
A P T B	ZNS-A01-5-S0-D1	098-91127-0	ZNS-A02-5-S0-D1	098-91133-0
Counterbalance in B	Series	Order no.	Series	Order no.
	ZNS-B01-1-S0-D1	098-91128-0	ZNS-B02-1-S0-D1	098-91134-0
A P T B	ZNS-B01-5-S0-D1	098-91129-0	ZNS-B02-5-S0-D1	098-91135-0
Counterbalance in A and B	Series	Order no.	Series	Order no.
	ZNS-AB01-1-S0-D1	098-91130-0	ZNS-AB02-1-S0-D1	098-91136-0
A P T B	ZNS-AB01-5-S0-D1	098-91131-0	ZNS-AB02-5-S0-D1	098-91137-0
		2 = 70 ... 175 bar		2 = 70 ... 175 bar
		5 = 140 ... 350 bar		5 = 140 ... 315 bar

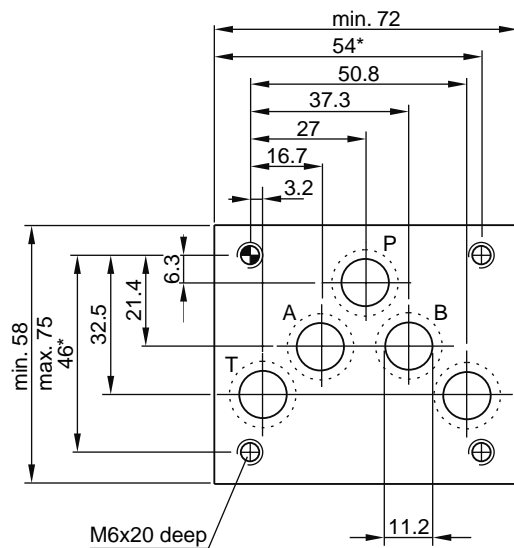
NG06

Code: ISO 4401-03-02-0-94



NG10

Code: ISO 4401-05-05-0-94

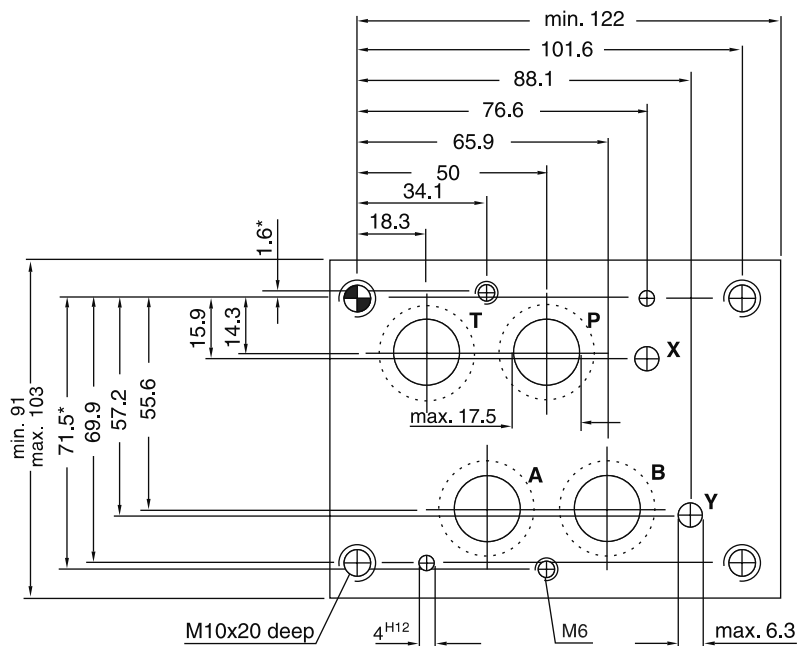


Dimensions marked with*: $\pm 0.1\text{mm}$.
All other dimensions: $\pm 0.2\text{mm}$.

Information07.INDD CM 07.09.11

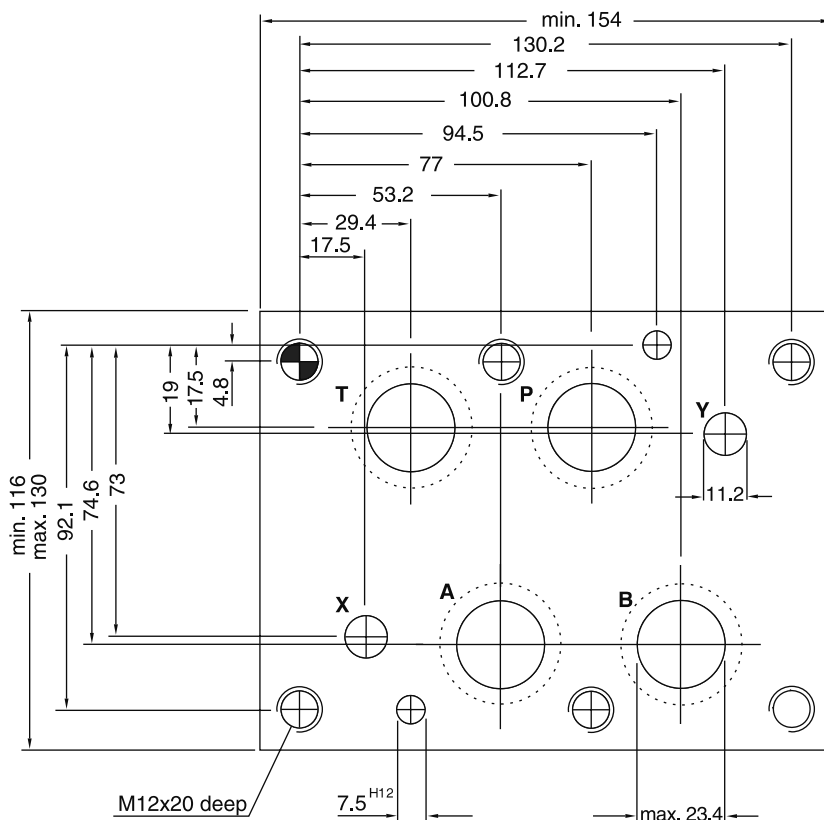
NG16

Code: ISO 4401-07-06-0-94



NG25

Code: ISO 4401-08-07-0-94 (Port diameter acc. to NFPA)



Mounting

Parker and Denison sandwich valves can be installed as desired. Each has a mounting pattern, whose dimensions correspond to the following standards.

ISO 4401
DIN 24430
CETOP RP121
NFPA

Mounting screws

Cylinder head bolts as per DIN 912/12.9, or studs as per DIN 835 10.9 with cylindrical nuts are used to mount the height stacking Manapak sandwich valves.

Bolt kits and tie rods see chapter 12, "Accessories".

Length of the mounting screws

The screw length is the sum of the engagement depth plus the stacking length. The stud length is the sum of the stacking length plus the thread depth of the nut.

Torques

The mounting screws or studs must be tightened with the prescribed tightening torque so that safety and proper seal are ensured.

See chapter 12 "Accessories" for BK bolt kits and TK tie rod kits.

Threads length

Threads	M5	M6	M10	M12
thread length	1.5 x Ø thread			