

Characteristics

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.

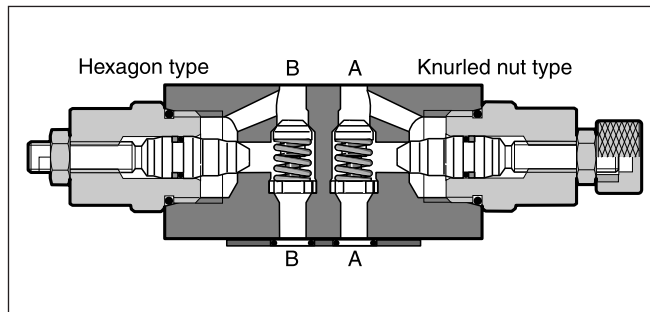
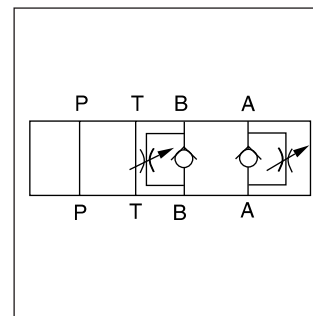
The throttle check valve can also be used to influence the switching time of pilot operated directional valves. In this case, the valve is positioned between the pilot stage (CETOP03, NG06) and the main stage (CETOP05, NG10 up to CETOP10, NG32).

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.
- Sizes:

NG06 / CETOP 3	FM2
NG10 / CETOP 5	FM3
NG16 / CETOP 7	FM4
NG25 / CETOP 8	FM6

Throttle Check Valve Series FM

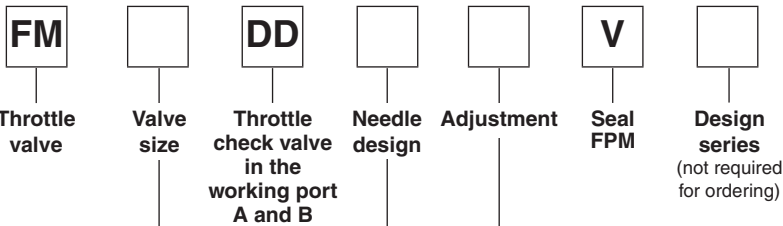


Technical data

General			FM2	FM3	FM4	FM6
Series			FM2	FM3	FM4	FM6
Size			06	10	16	25
Mounting pattern			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 acc.to DIN 51524...525			
Fluid temperature	[°C]		-20...+80			
Viscosity range,	perm.	[cSt][mm ² /s]	10...650			
	rec.	[cSt][mm ² /s]	30			
Filtration			ISO 4406: 18/16/13 (acc. to NAS 1638: 7)			

Throttle Check Valve Series FM

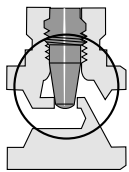
Ordering Code



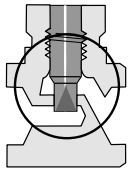
Code	Size
2	NG06
3	NG10

Code	Adjustment
K	Knob
S	Hex. socket

Code	Needle
omit	Standard conical
D	Fine, cylindrical Hollow bored with V notch

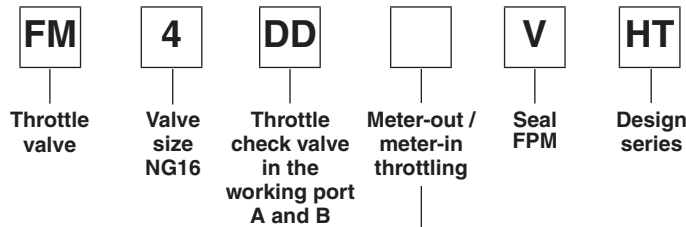


A two-stage needle provides fine adjustment in the lower flow range with 3 adjustment rotations. After 3 more rotations, the valve is completely open.

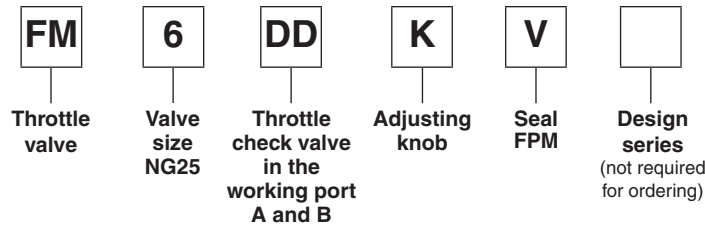


Design "D"
A cylindrical needle with a V notch allows the fine adjustment over the entire setting range.

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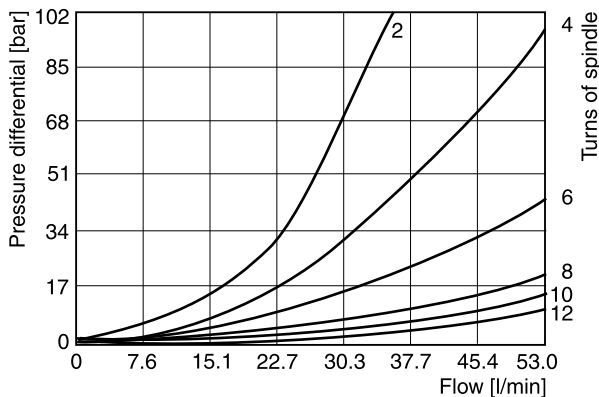


Code	Description
T	Meter-in
F	Meter-out

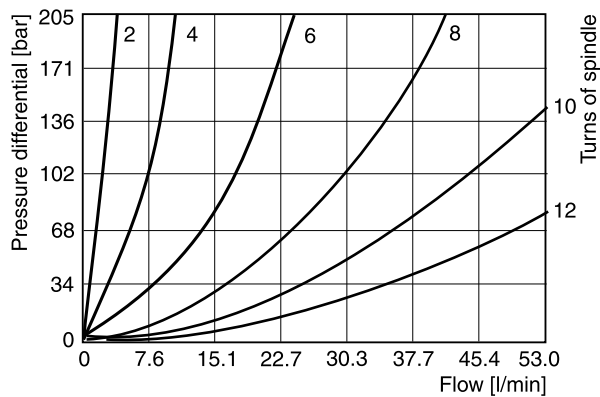


**Bold letters =
Short-term availability**

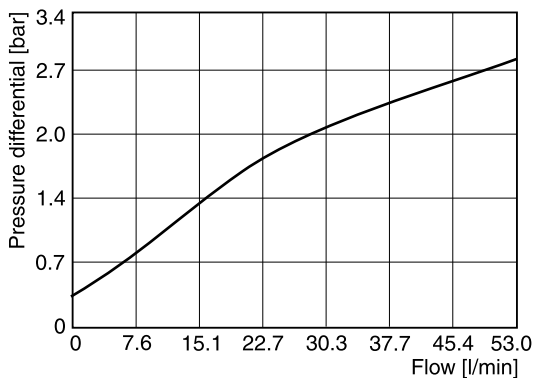
FM2 standard needle



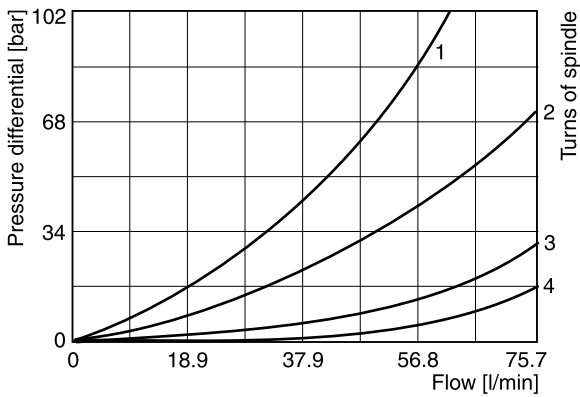
FM2D needle with V notch



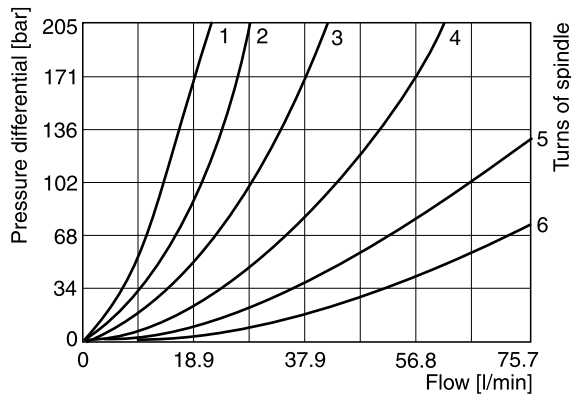
FM2 flow, check valve



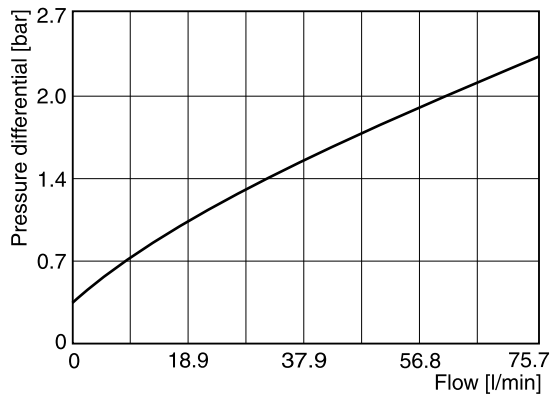
FM3 standard needle



FM3D needle with V notch

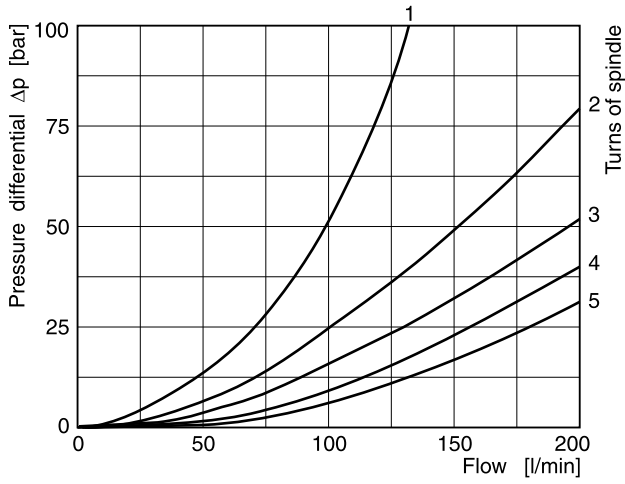


FM3 flow, check valve

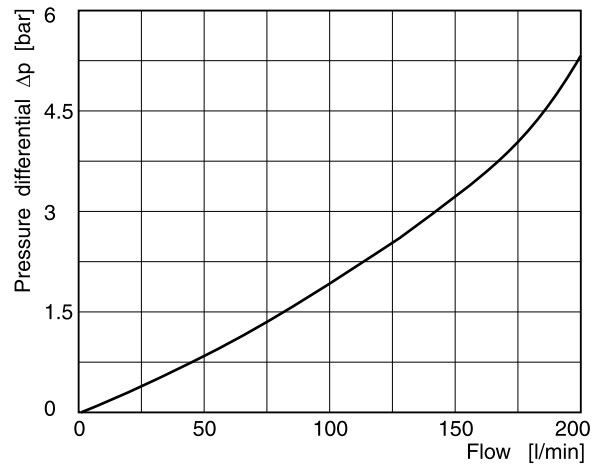


All characteristic curves measured with HLP46 at 50°C.

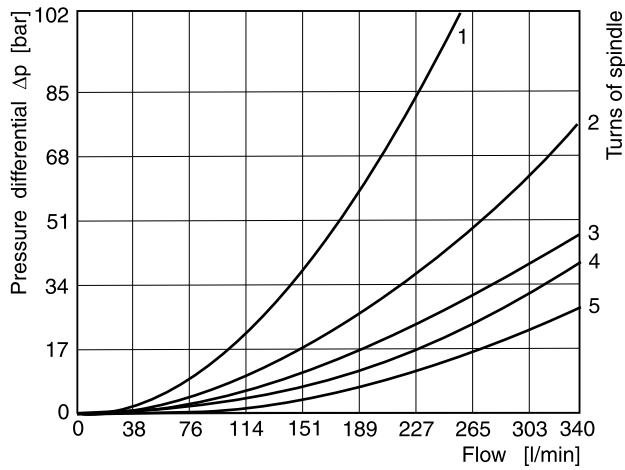
FM4 with standard needle
 1 to 5 number of needle rotations



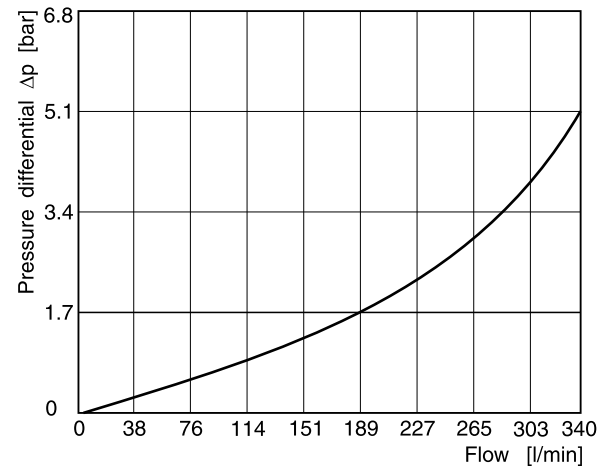
FM4 flow, check valve



FM6 with standard needle
 1 to 5 number of needle rotations



FM6 flow, check valve



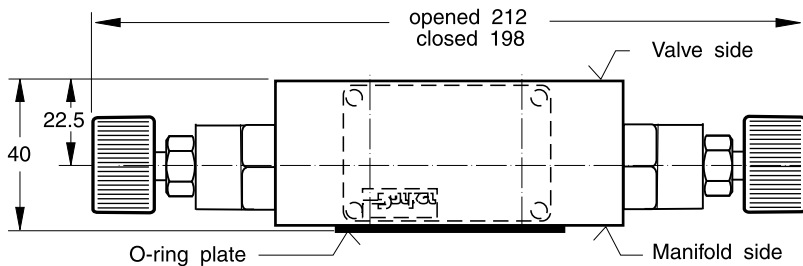
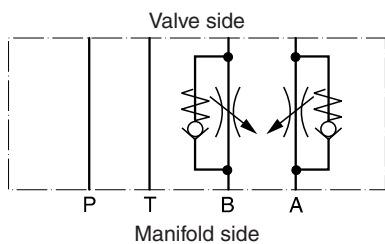
All characteristic curves measured with HLP46 at 50°C.

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Dimensions

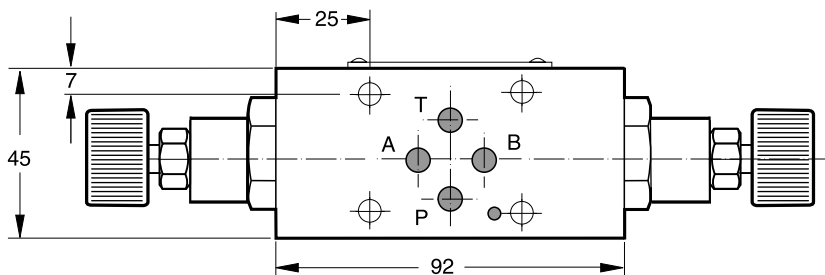
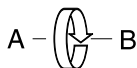
FM2

Meter-in

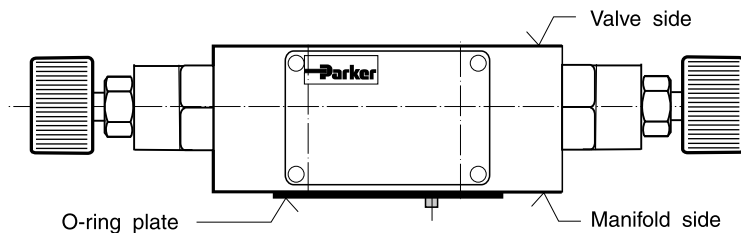
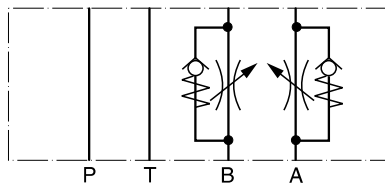


Meter-in or meter-out

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:

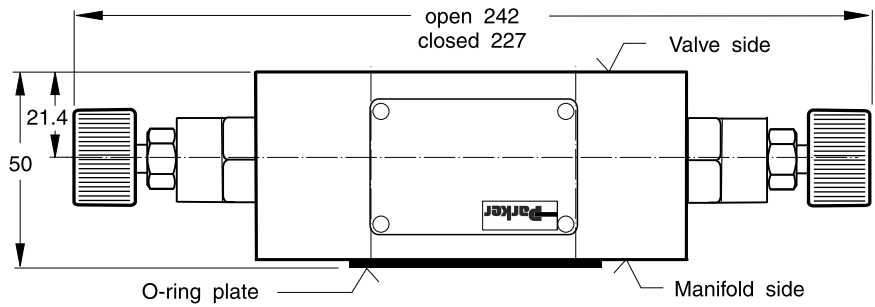
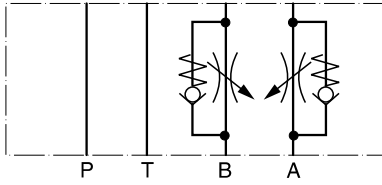
The O-ring plate (with O-rings) for sealing the connecting surface of the manifold side of the manifold side is included. The O-ring and positioning pin are always mounted on the manifold side.



Dimensions

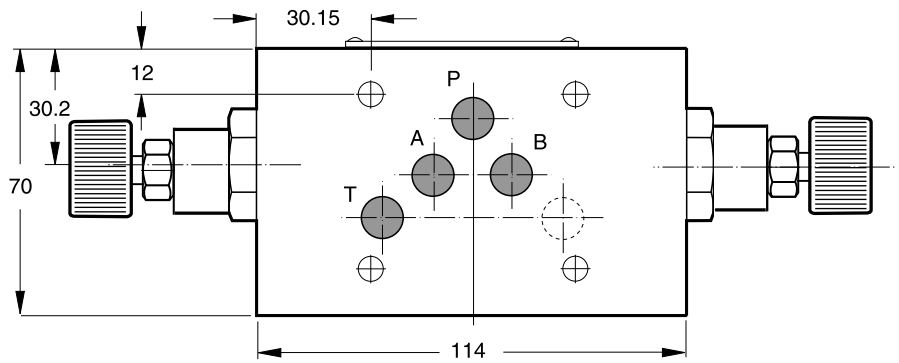
FM3

Meter-in

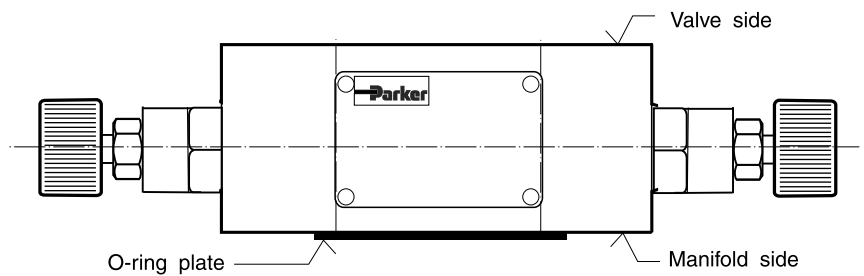
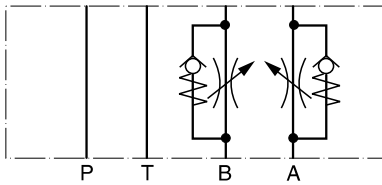


Meter-in or meter-out

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



Meter-out



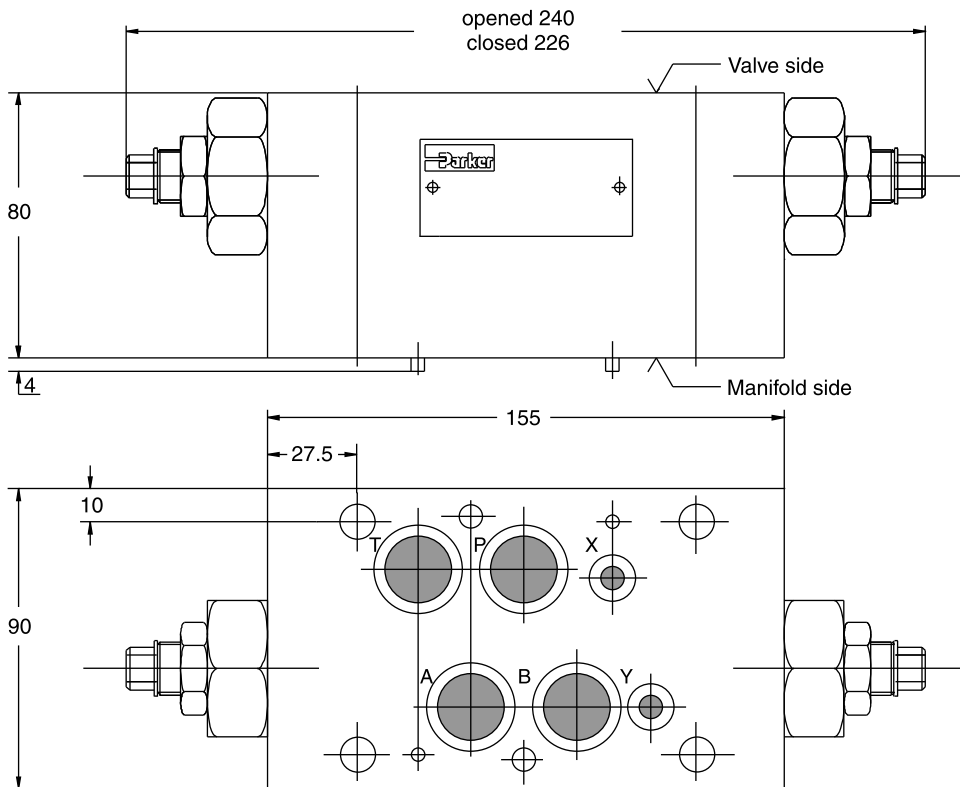
7

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 of the manifold side is included. The O-ring and positioning pin are always mounted on the manifold side.

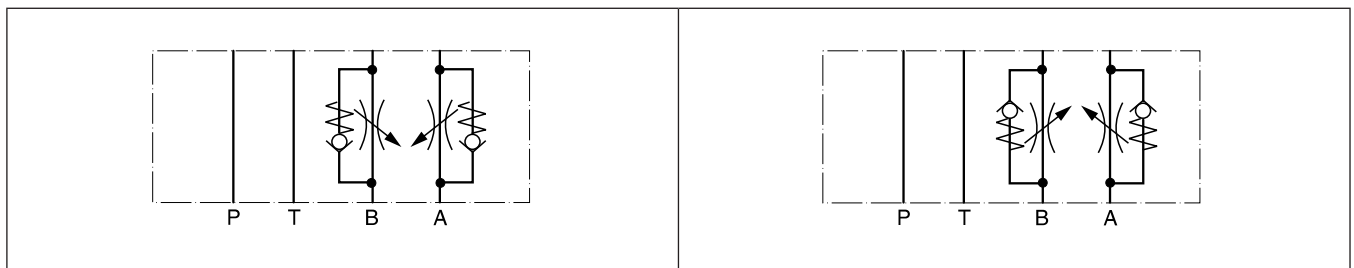
FM4



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Meter-in

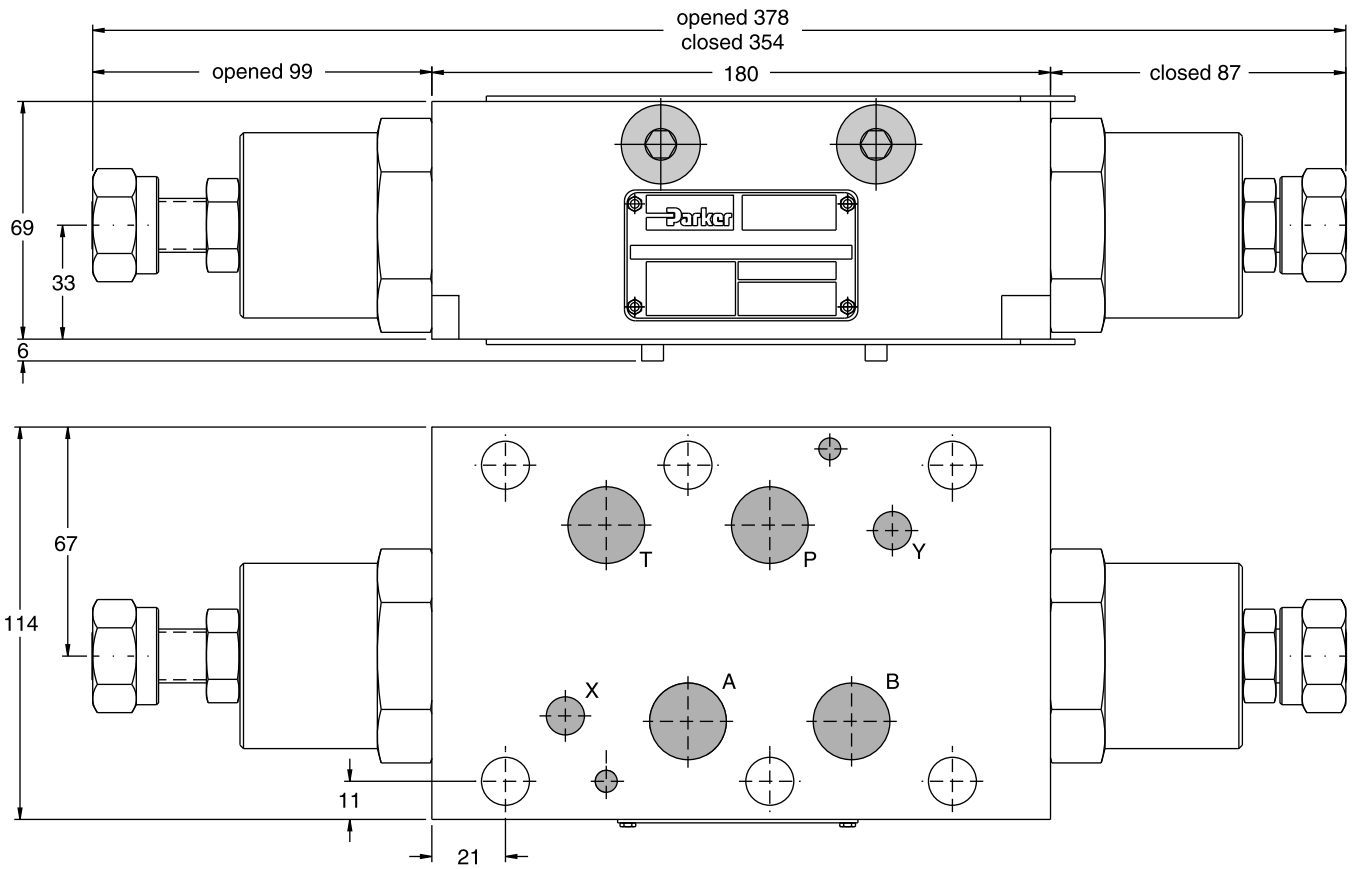
Meter-out



Seal kit FM4	
Seal	Order code
V	SK-FM4VHT

Dimensions

FM6

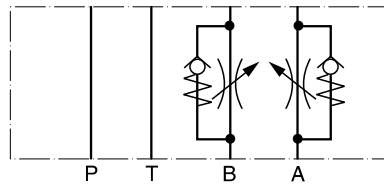


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Meter-out

Adjustment: knob

Meter-in is not available for FM6



Seal kit FM6	
Seal	Order code
V	SK-FM6-V-12

Throttle Valve with Check Series ZRD (Denison)

Characteristics

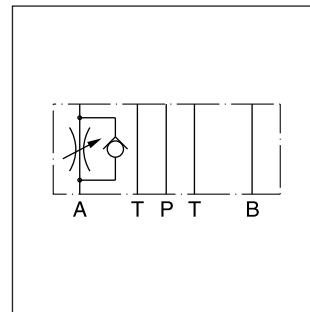
Throttle check valves series ZRD are designed for maximum flow rates.

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.

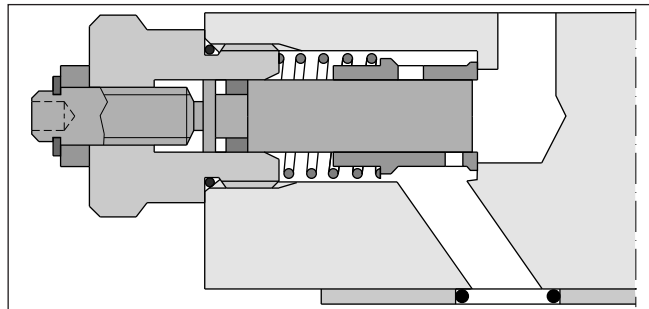
A low flow / high resolution version in NG06 for sensitive shifting time adjustment of pilot operated directional control valves is available on request.



ZRD-ABZ01



ZRD-AA02



ZRD-AA02

Features

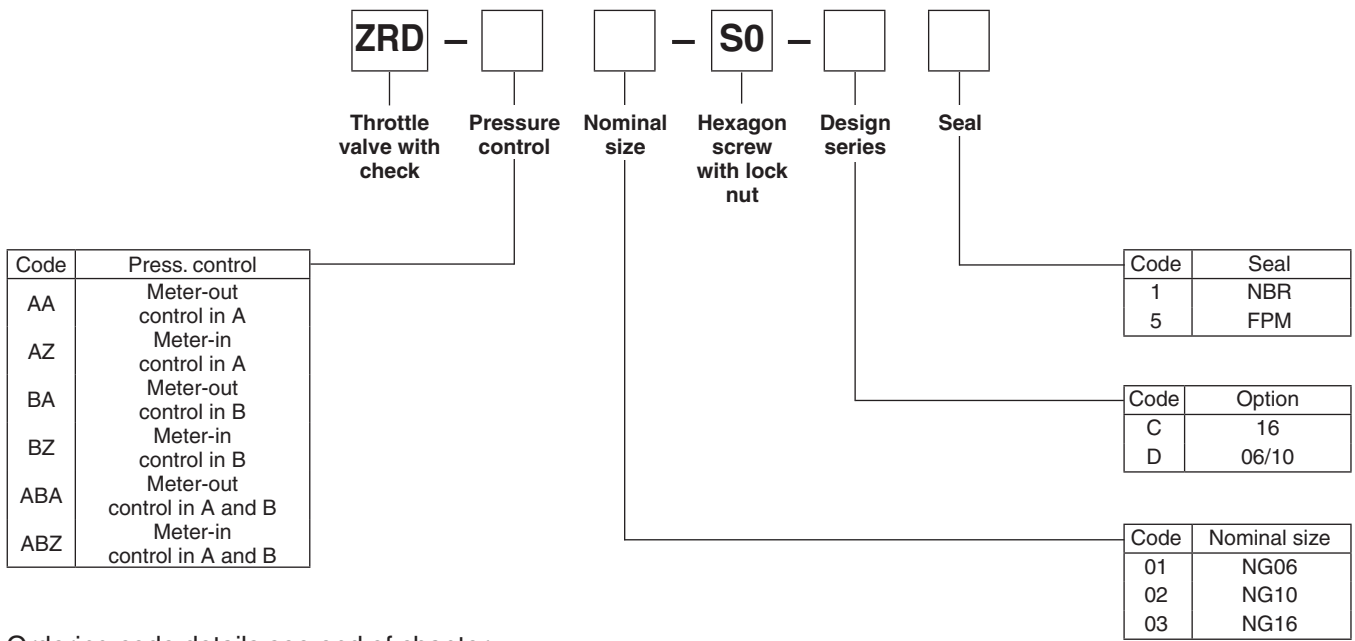
- High flow capacity
- Various functional arrangements
- Sizes
 - ZRD01 - NG06 / CETOP3
 - ZRD02 - NG10 / CETOP5
 - ZRD03 - NG16 / CETOP7

Technical data

General		06	10	16
Size				
Mounting interface		DIN 24340 A6 ISO 4401 NFPA D03	DIN 24340 A10 ISO 4401 NFPA D05	DIN 24340 A16 ISO 4401 NFPA D08
Mounting position		CETOP RP 121 unrestricted		
Ambient temperature	[°C]	-20...+50		
Weight	1 cartridge [kg]	1.2	2.8	7.4
	2 cartridges [kg]	1.3	2.9	7.7
Hydraulic				
Max. operating pressure	[bar]	350	315	350
Nominal flow	[cSt]/[l/min]	80	160	260
Leakage	[cSt]/[l/min]	0.1...0.2 (at closed throttle)	0.1...0.2 (at closed throttle)	0.3...0.5 (at closed throttle)
Opening pressure	[bar]	0.7	0.7	0.8
Fluid		Hydraulic oil as per DIN 51524...525		
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 (acc. NAS 1638: 7)		

Throttle Valve with Check Series ZRD (Denison)

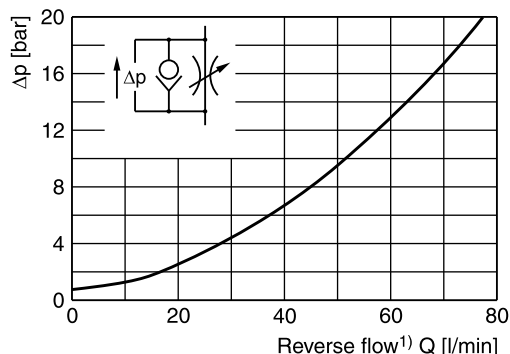
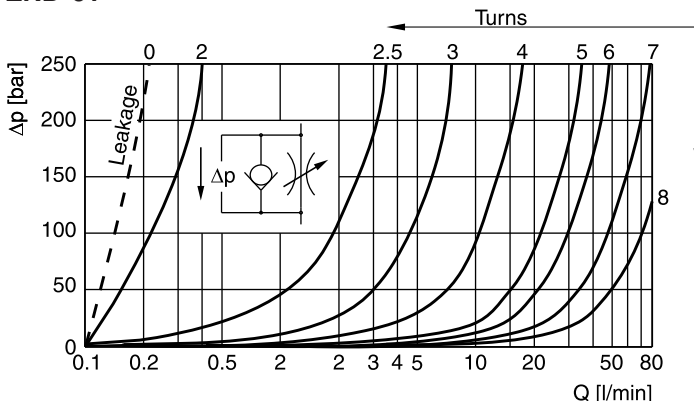
Ordering Code



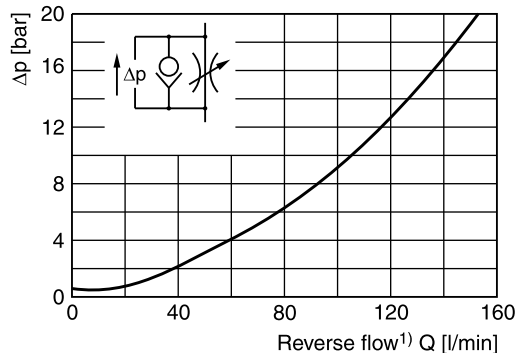
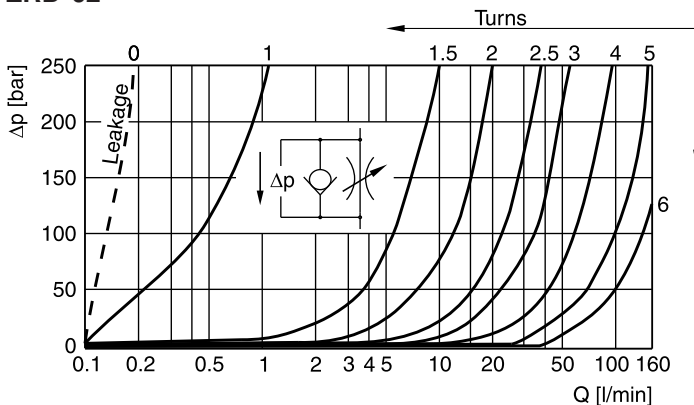
Ordering code details see end of chapter.

p/Q performance curves

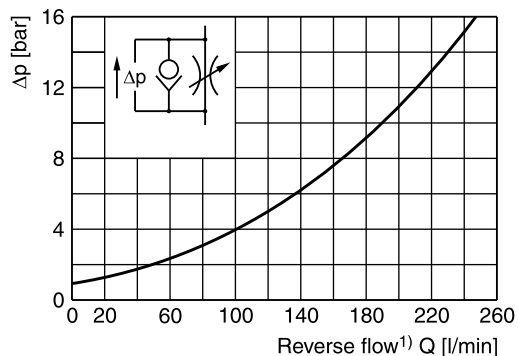
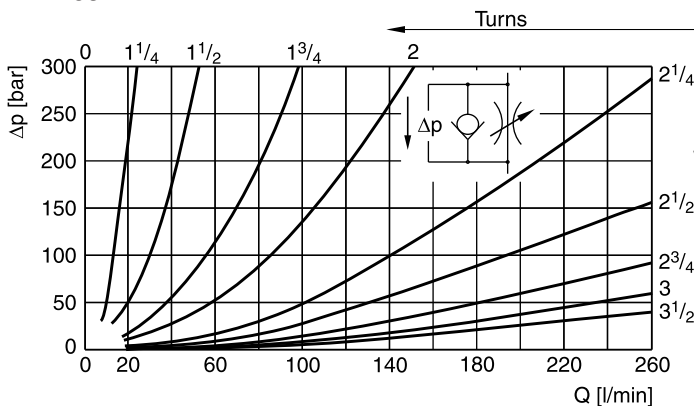
ZRD*01



ZRD*02



ZRD*03

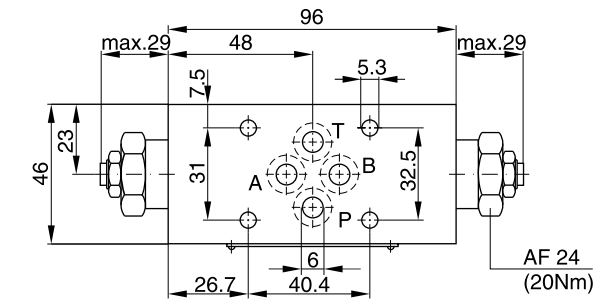


¹⁾ Throttle closed

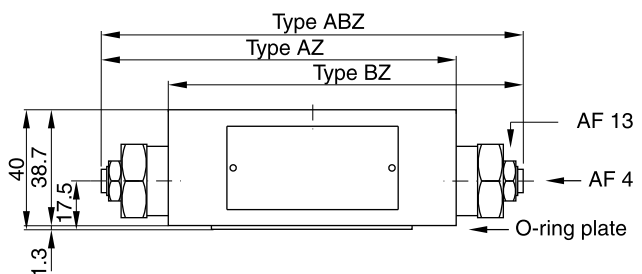
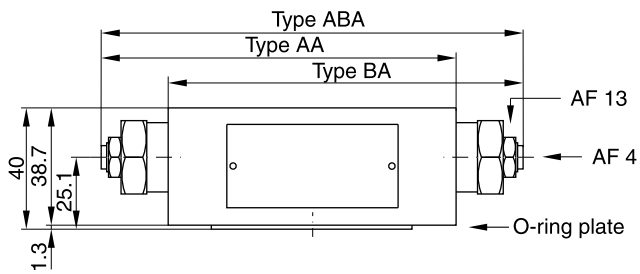
All characteristic curves measured with HLP46 at 50°C.

Dimensions

ZRD*01

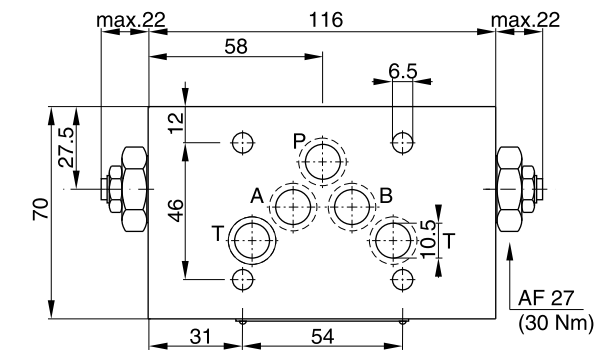


Seal kit	
Seal	Order code
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5	098-91097-0
Complete cartridge	
Order code	
098-91119-0	
O-ring plate	
Order code	
S26-27553-0	

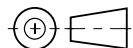
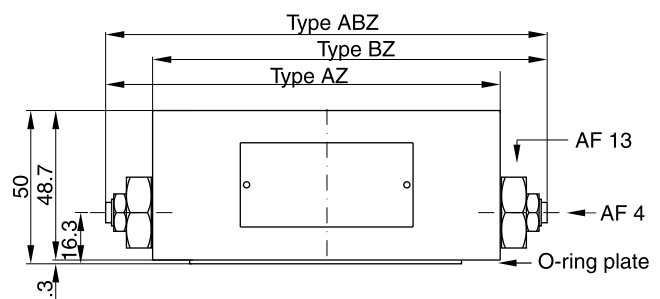
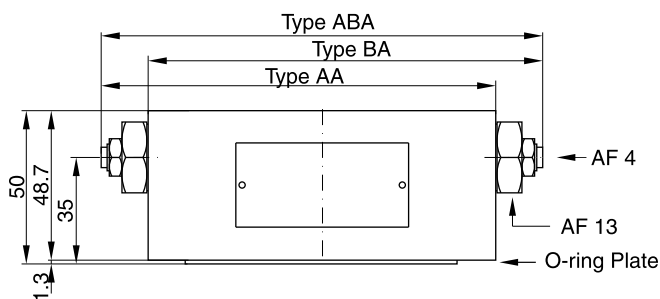


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ZRD*02

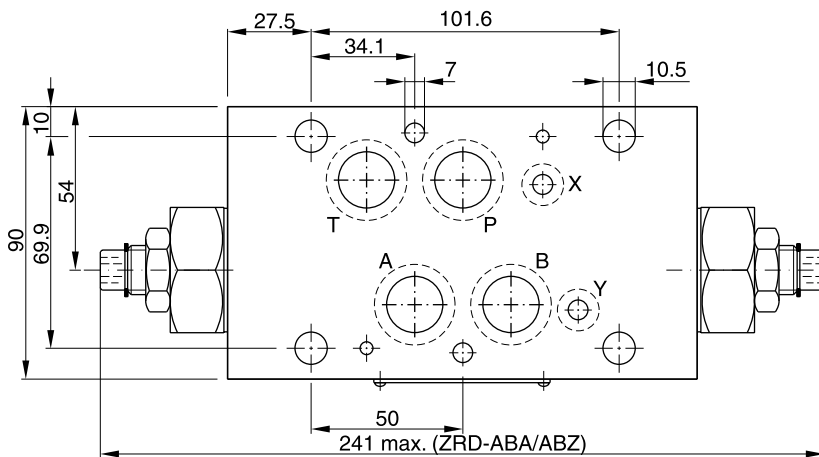


Seal kit	
Seal	Order code
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5	098-91099-0
Complete cartridge	
Order code	
098-91120-0	
O-ring plate	
Order code	
S16-85742-0	

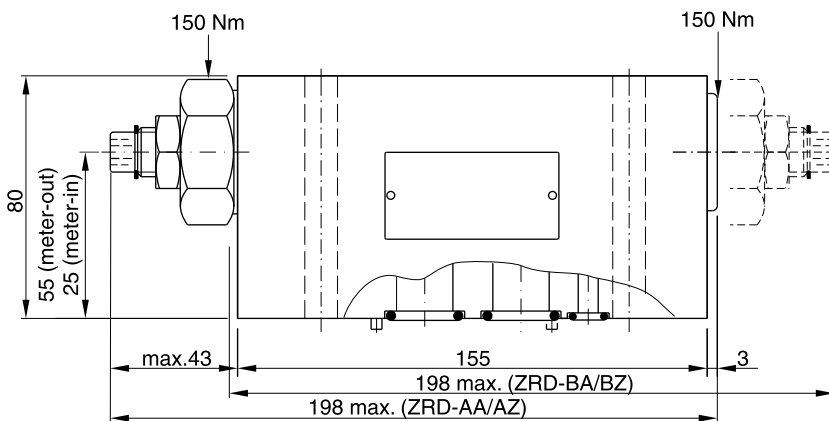


Dimensions

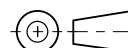
ZRD*03



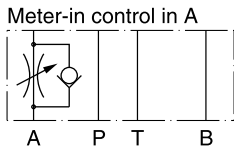
Seal kit	
Seal	Order code
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5	098-91443-0
Complete cartridge	
Order code	
098-91441-0	



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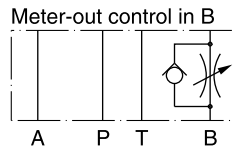


ZRD*01



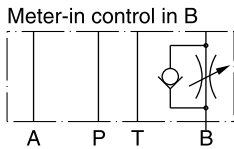
Series
ZRD-AZ01-S0-D1

Order No.
098-91056-0



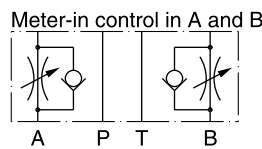
Series
ZRD-BA01-S0-D1

Order No.
098-91013-0



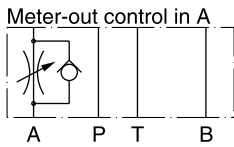
Series
ZRD-BZ01-S0-D1

Order No.
098-91057-0



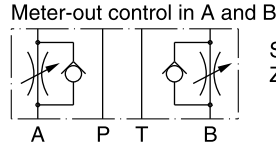
Series
ZRD-ABZ01-S0-D1

Order No.
098-91058-0



Series
ZRD-AA01-S0-D1

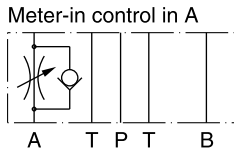
Order No.
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Series
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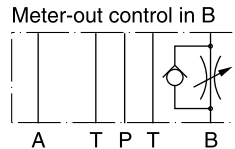
Order No.
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ZRD*02



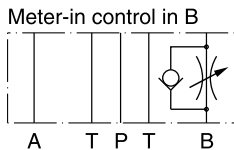
Series
ZRD-AZ02-S0-D1

Order No.
098-91059-0



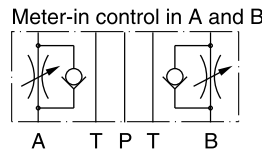
Series
ZRD-BA02-S0-D1

Order no.
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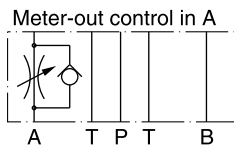
Series
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Order No.
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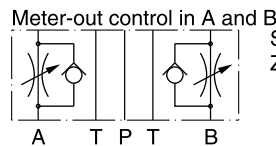
Series
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Order no.
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Series
ZRD-AA02-S0-D1

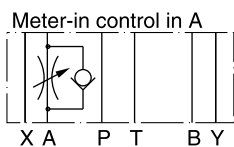
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Series
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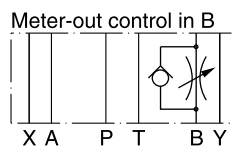
Order no.
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ZRD*03



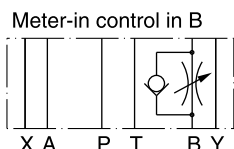
Series
ZRD-AZ03-S0-C1

Order no.
098-91422-0



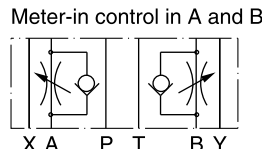
Series
ZRD-BA03-S0-C1

Order no.
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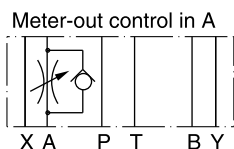
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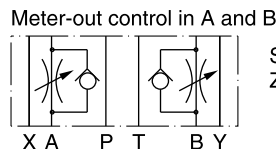
Series
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Order no.
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Series
ZRD-AA03-S0-C1

Order no.
098-91419-0



Series
ZRD-ABA03-S0-C1

Order no.
098-91420-0