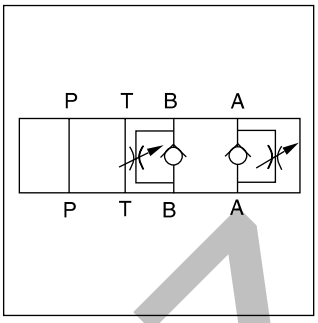
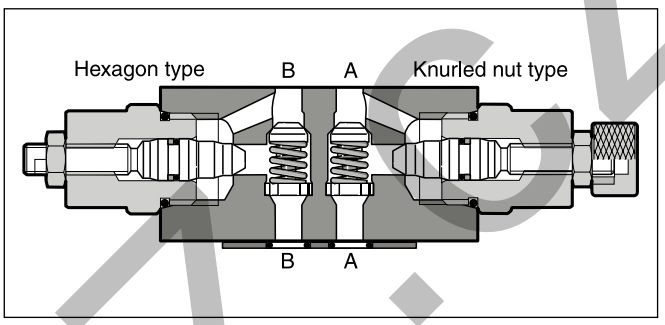
Double-throttle check valves from the Parker Manapak series FM are in sandwich design for easy configuration of stack systems. Throttle and check valves are located in ports A and B.

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 (CETOP 03, NG06) and the main stage (CETOP 05, NG10 up to CETOP 10, 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 03)
  NG10 - FM3 (CETOP 05)
  NG16 - FM4 (CETOP 07)
  NG25 - FM6 (CETOP 08)

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### Technical data

| **General** | | | | | |
|---|---|---|---|---|---|
| Series | | **FM2** | **FM3** | **FM4** | **FM6** |
| Size | | **NG06** | **NG10** | **NG16** | **NG25** |
| Mounting interface | | NFPA D03<br>CETOP 03 | NFPA D05<br>CETOP 05 | NFPA D07<br>CETOP07 | NFPA D08<br>CETOP 08 |
| Mounting position | | unrestricted | | | |
| Ambient temperature | [°C] | -20...+60 | | | |
| $MTTF_D$ 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 | | | |
| Fluid temperature | [°C] | -20...+70 | | | |
| Viscosity permitted | [cSt] / [mm²/s] | 20...400 | | | |
| Viscosity recommended | [cSt] / [mm²/s] | 30...80 | | | |
| Filtration | | ISO 4406 (1999); 18/16/13 | | | |

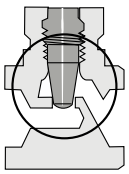
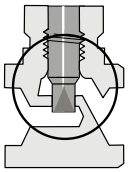
| FM | | DD | | | V | |
|---|---|---|---|---|---|---|
| **Throttle valve** | **Valve size** | **Throttle check valve in the working port A and B** | **Needle design** | **Adjustment** | **Seal FPM** | **Design series** (not required for ordering) |

| Code | Size |
|---|---|
| **2** | **NG06** |
| **3** | **NG10** |

| Code | Adjustment |
|---|---|
| **K** | **Knob** |
| **S** | **Hexagon socket** |

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

**Bold letters =**
Short-term availability

| | |
|---|---|
|  | 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"<br>A cylindrical needle with a V notch allows the fine adjustment over the entire setting range. |

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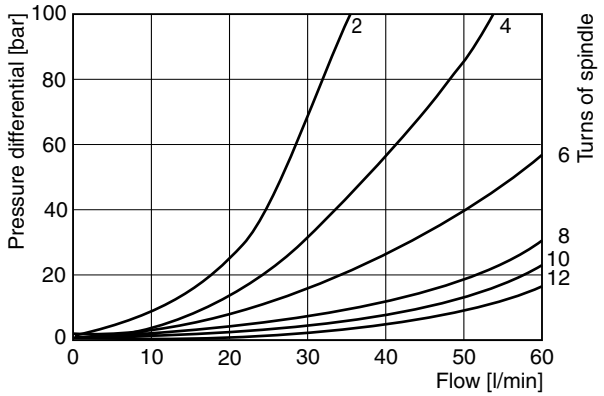
| FM | 4 | DD | | V | HT |
|---|---|---|---|---|---|
| **Throttle valve** | **Valve size NG16** | **Throttle check valve in the working port A and B** | **Meter-out / meter-in throttling** | **Seal FPM** | **Design series** |

| Code | Description |
|---|---|
| T | Meter-in |
| F | Meter-out |

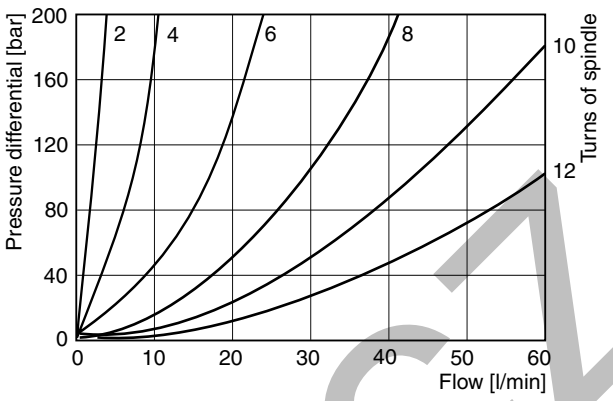
| FM | 6 | DD | K | V | |
|---|---|---|---|---|---|
| **Throttle valve** | **Valve size NG25** [1] | **Throttle check valve in the working port A and B** | **Adjusting knob** | **Seal FPM** | **Design series** (not required for ordering) |

[1] Only meter-out available.

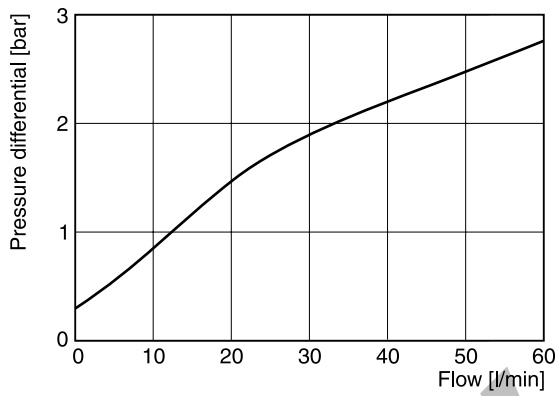
### FM2 standard needle



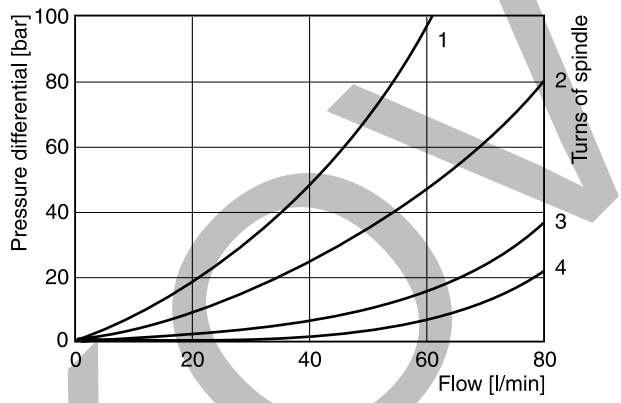

### FM2D needle with V notch



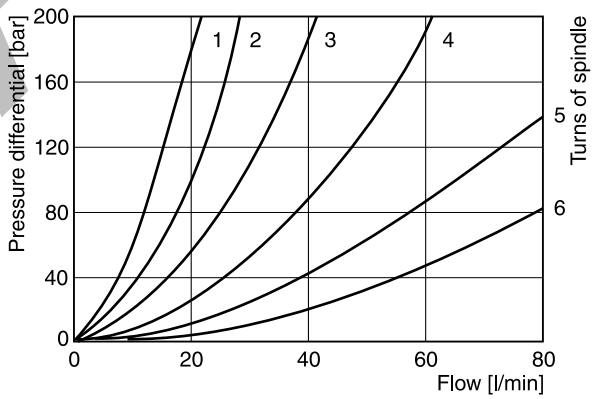

### FM2 flow, check valve



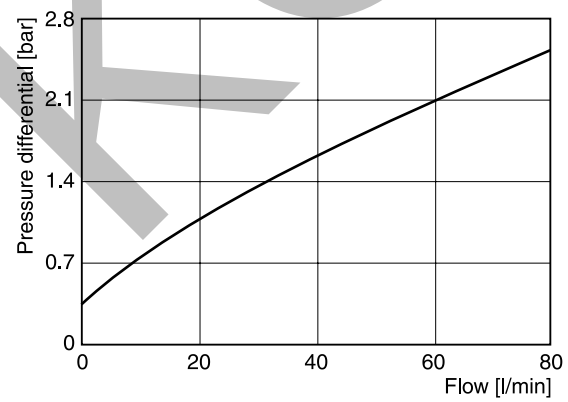

### FM3 standard needle




### FM3D needle with V notch



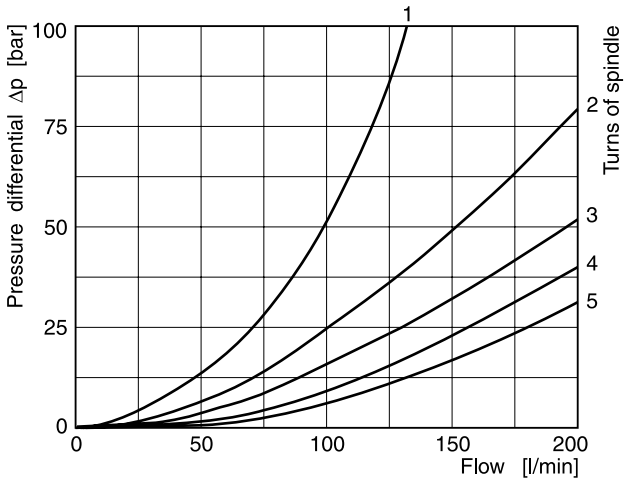

### FM3 flow, check valve



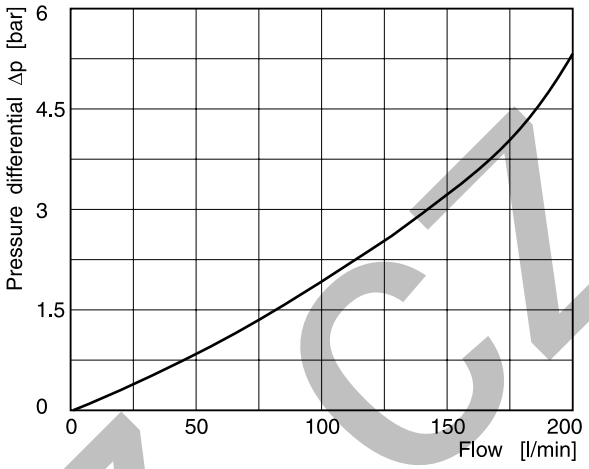

All characteristic curves measured with HLP46 at 50 °C.

### FM4 with standard needle

1 to 5 number of needle rotations

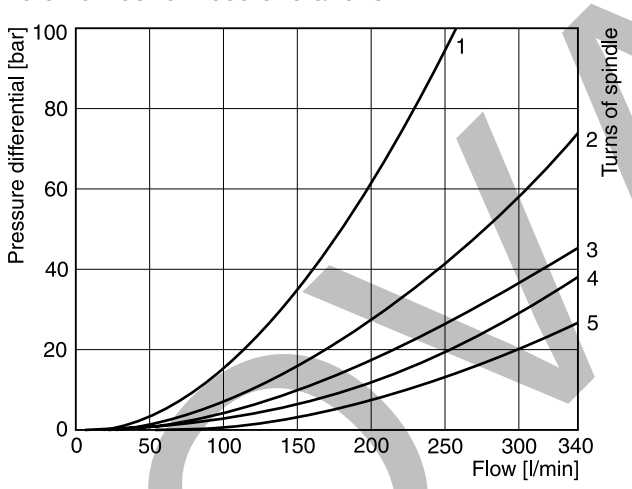



### FM4 flow, check valve

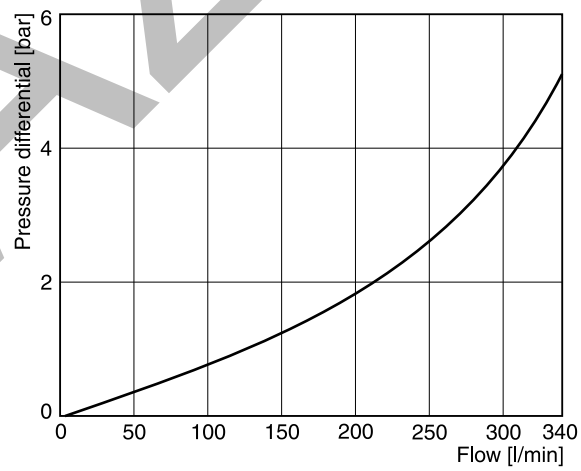



### FM6 with standard needle

1 to 5 number of needle rotations




### FM6 flow, check valve

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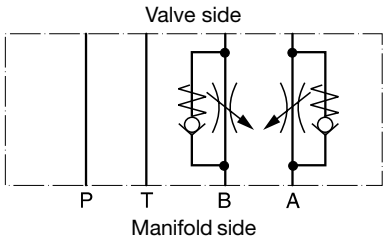
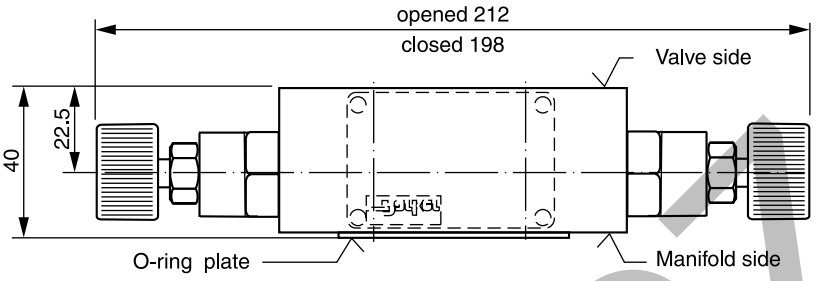
All characteristic curves measured with HLP46 at 50 °C.

## FM2

### Adjustment code K

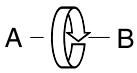
#### Meter-in

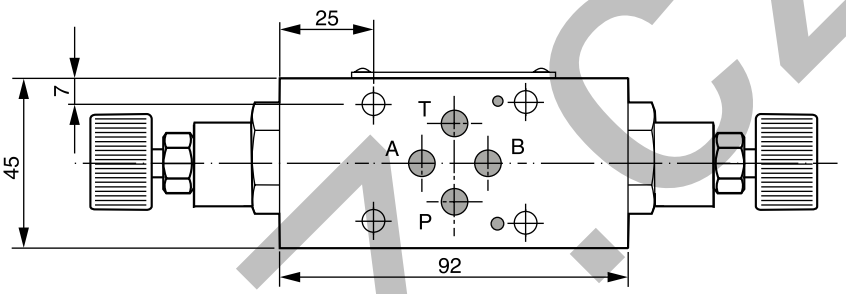


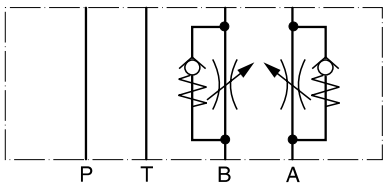

#### Meter-in or meter-out

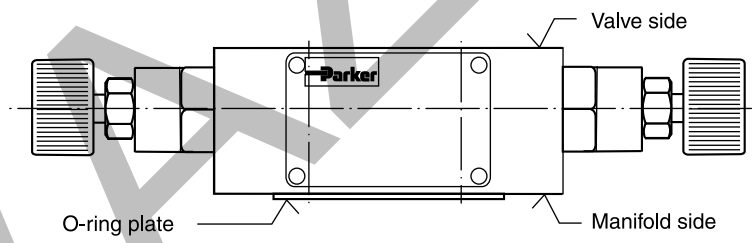
A functional change is achieved by rotating the mounting position of the valve 180° about the longitudinal axis (A-B).



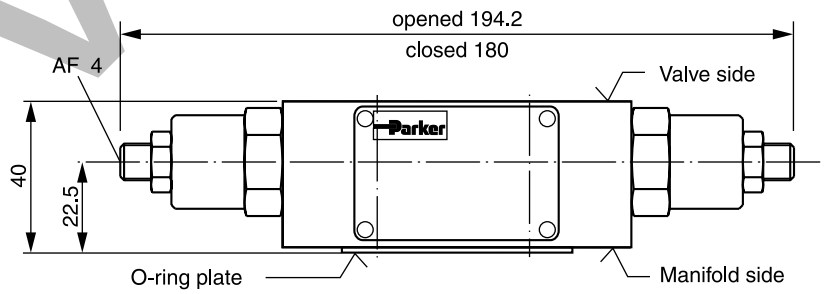

#### Meter-out




### Adjustment code S

(Meter-out shown)




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

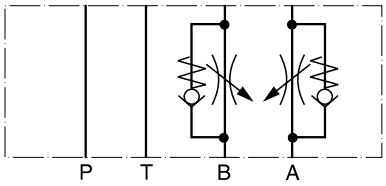
**Note:**

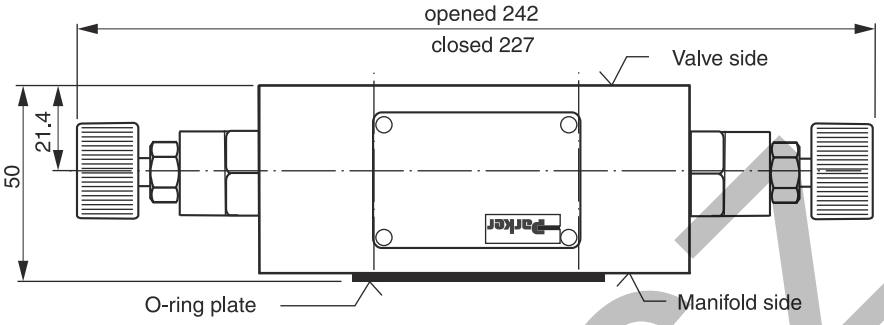
The O-ring plate (with O-rings) for sealing the connecting surface of the manifold side is included. The O-ring plate is always mounted on the manifold side.

## FM3

### Adjustment code K

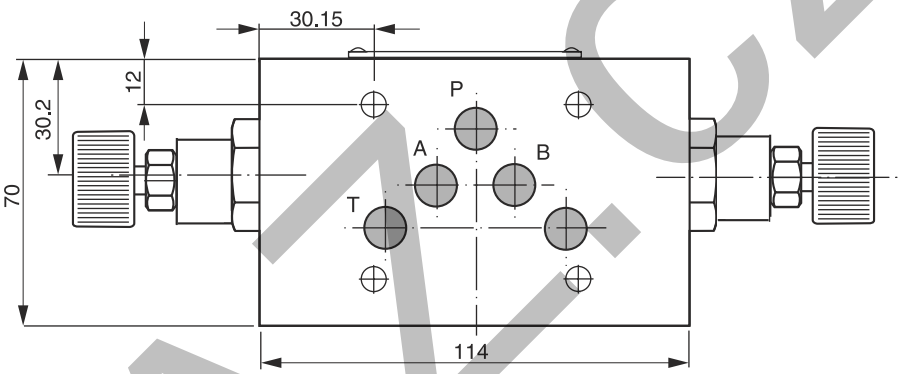
#### Meter-in



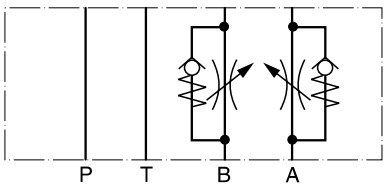



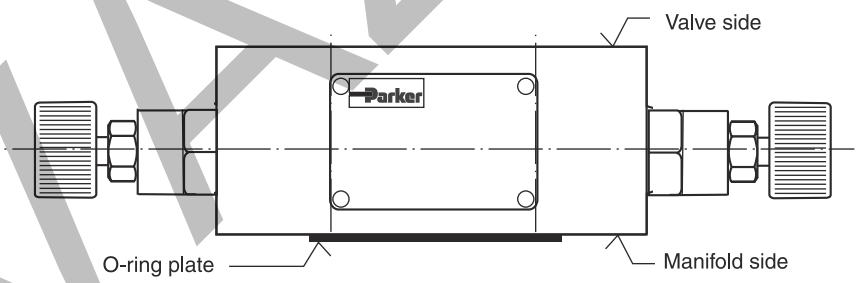

#### Meter-in or meter-out

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



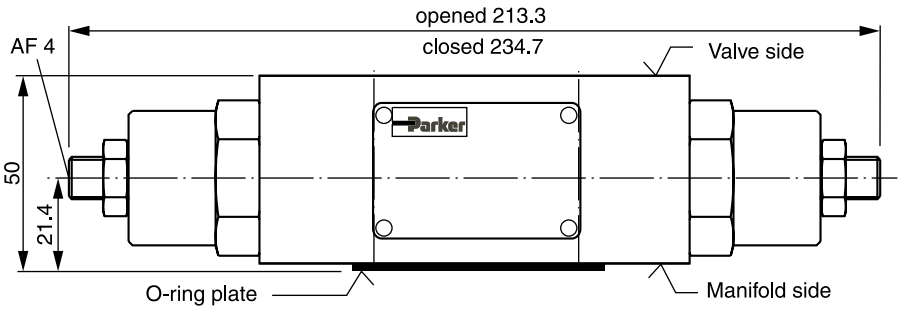

#### Meter-out




### Adjustment code S

(Meter-out shown)

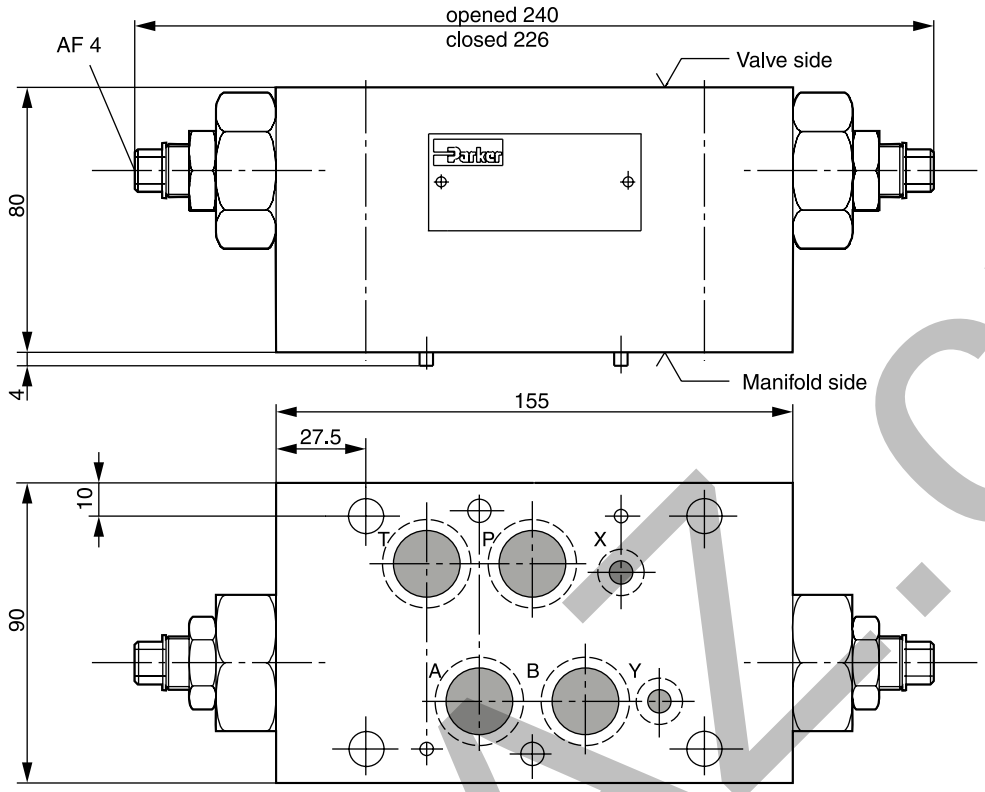



| Seal kit FM3 | |
|---|---|
| **Seal** | **Order code** |
| V | SK-FM3-V-20 |

**Note:**

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

**FM4**

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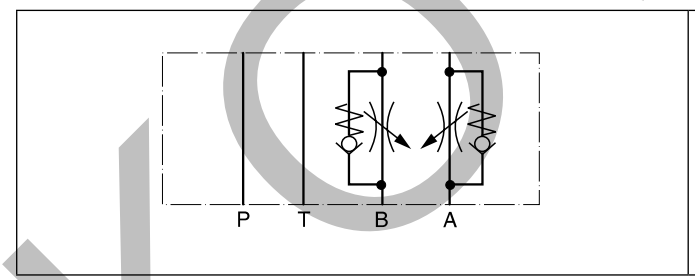
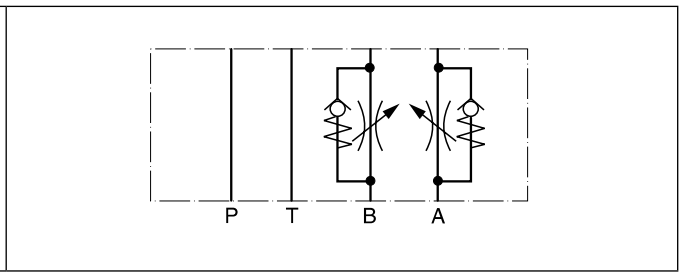
**Meter-in**

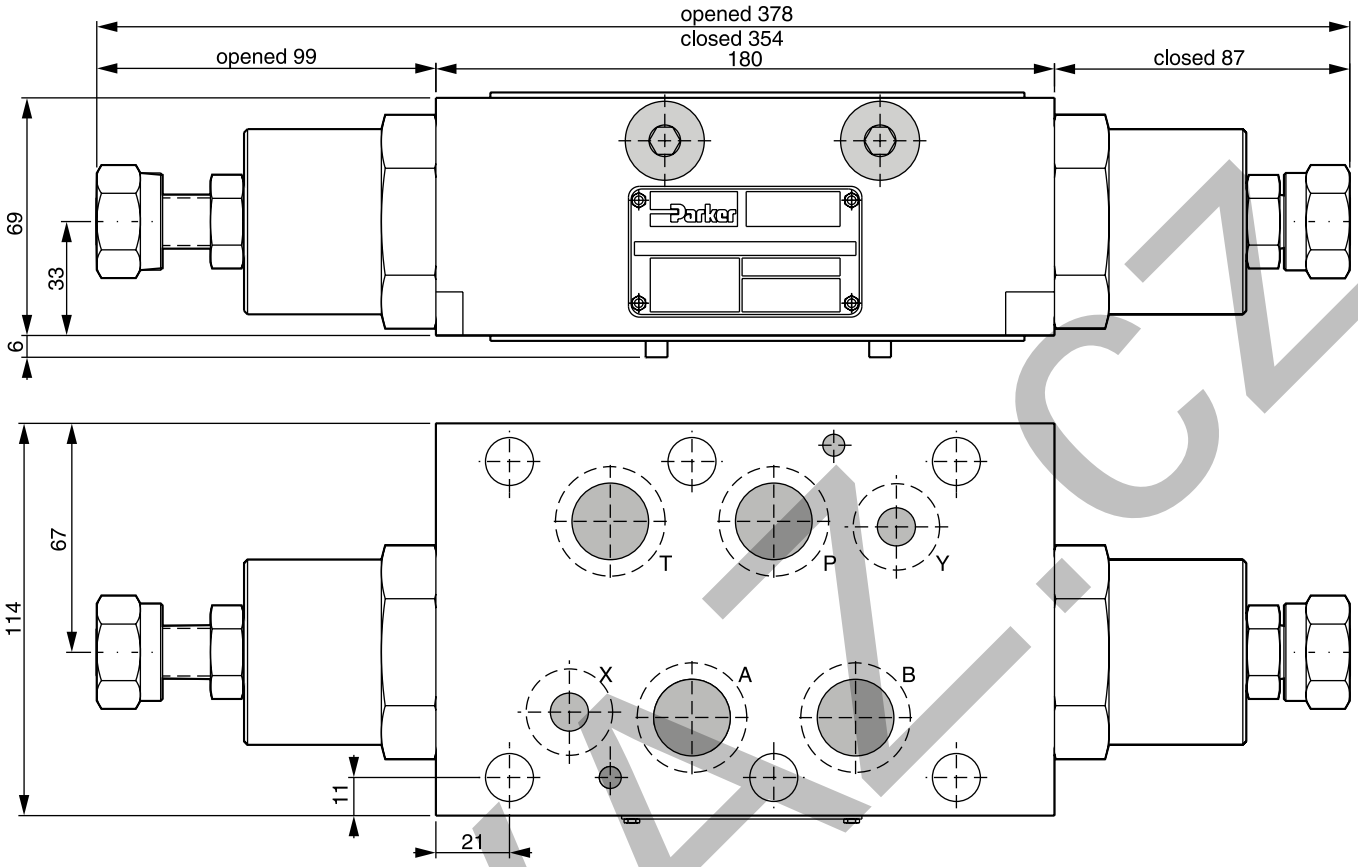



**Meter-out**




| Seal kit FM4 | |
|---|---|
| **Seal** | **Order code** |
| V | SK-FM4VHT |

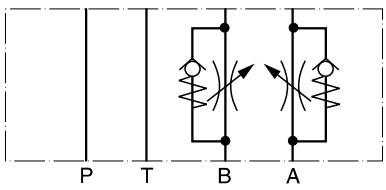
### FM6




### Meter-out

Adjustment: knob

Meter-in is not available for FM6




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