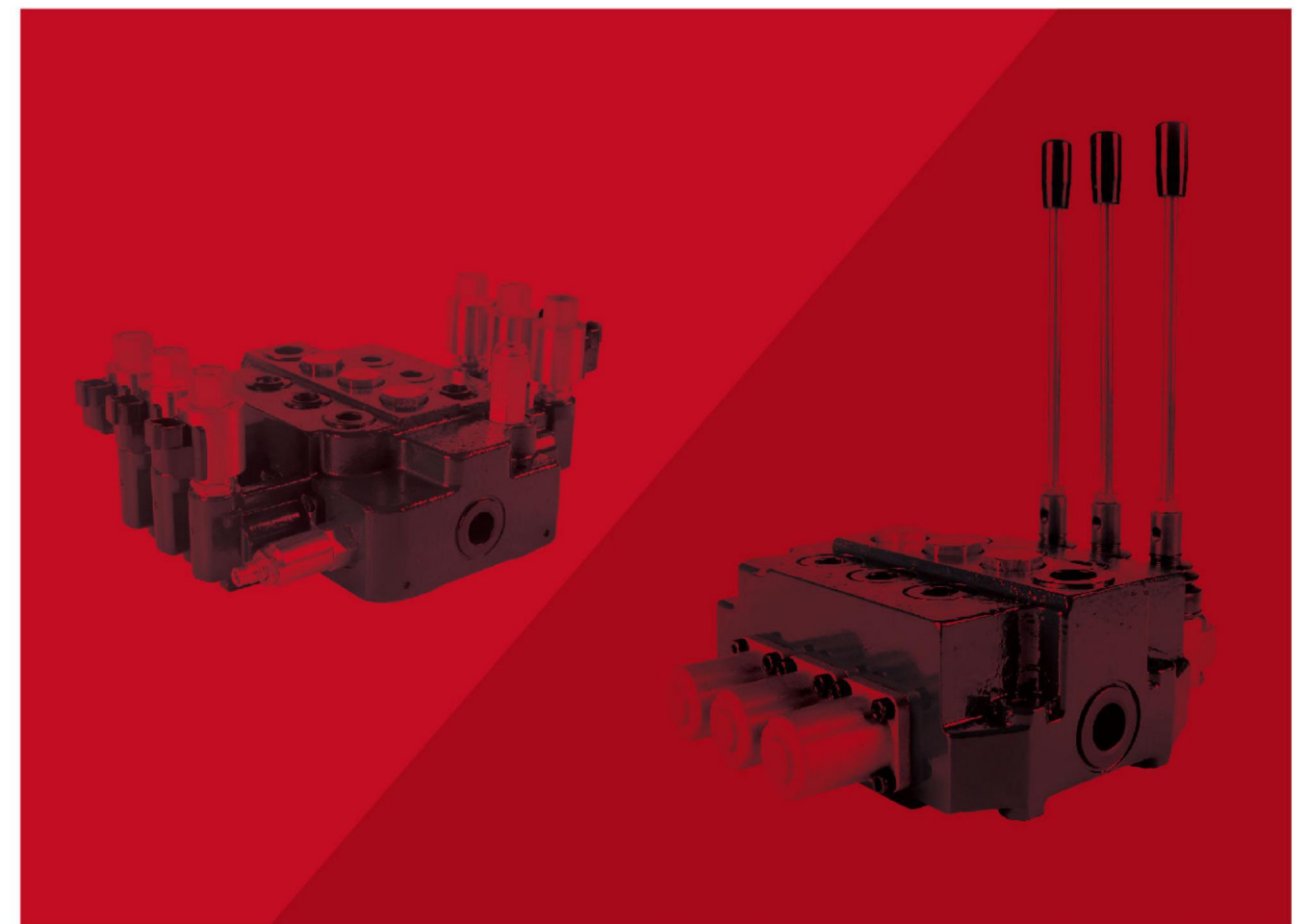




## MONOBLOCK VALVES

GDV25 / GDV45 / GDV70 / GDV80 / GDV120 / GDV160



**JIANGSU GUORUI HYDRAULIC MACHINERY CO.,LTD**

Add: No.666 West Shuanghu Road Hi-tech Zone Jianhu Jiangsu

China Tel: +86-400-188 1986

Email: [info@grhpro.com](mailto:info@grhpro.com)

Website: [www.grhpro.com](http://www.grhpro.com)

P.C: 224700



**GUORUI HYDRAULIC**

Keep the concept seeking excellence, GRH try our best  
to create more value for you with products and service



## Ryan Hydraulics

### Supplier of the Whole Hydraulic System

GRH manufacture was established in 1986, focusing on R&D, manufacture and sales of hydraulic products. GRH owns world top level R&D team, as well as invention patents, sales covers global market. Targeting at vision of Excellence, GRH keeps creating more value for customers by quality products, professional technology and experienced service.

### 645,835 sq.ft Modern Manufacture

Since the opening of 3rd generation modern manufacture in 2015, the total area covers 1,291,669 sq.ft, while the construction area covers 645,835 sq.ft, there are IT machining equipment, test and inspection equipment, meets various requirement of global customers.

### Customer First

With leading technology, quality product, and professional service, GRH has covered the global market with more than 60 countries and regions, become the strategic partner of many international famous OEM enterprises.

### Instant Efficient Service

Technical Team offers accurate solutions to the service, including the product model selection, product test, installation and commissioning, debugging etc., so as to keep in touch with right department of each customer in time and respond to the customer's requirement.



### 9 Series Products

#### Covers the Whole Hydraulic Business

As a supplier of hydraulics, our business covers: hydraulic motors, hydraulic control valves, hydraulic gear pumps, power units and hydraulic systems, etc. Products are widely used in construction machinery, agricultural machinery, industry equipment.





# Contents

## GRH Monoblock Valve Series

	<b>05-13</b>	└ GDV25 Series
GDV45 Series ┘	<b>15-24</b>	
	<b>26-35</b>	└ GDV70 Series
GDV80 Series ┘	<b>37-48</b>	
	<b>50-57</b>	└ GDV120 Series
GDV160 Series ┘	<b>59-66</b>	
	<b>67</b>	└ LS-TW-20F Series
LKF Series ┘	<b>68</b>	

## GDV25 Series Monoblock Valves

	<b>05</b>	└ Main Features
Technical Data ┘	<b>05</b>	
	<b>06</b>	└ Performance Data
Basic Operating Principle ┘	<b>07</b>	
	<b>08-09</b>	└ Dimensions
Inlet Port Options ┘	<b>10</b>	
	<b>10</b>	└ Return Port Options
Power Beyond Options ┘	<b>10</b>	
	<b>11</b>	└ Typical Spool Functions
Drive Options ┘	<b>12</b>	
	<b>13</b>	└ Ordering Code
Ordering Example ┘	<b>13</b>	



## GDV25 Series Monoblock Valves

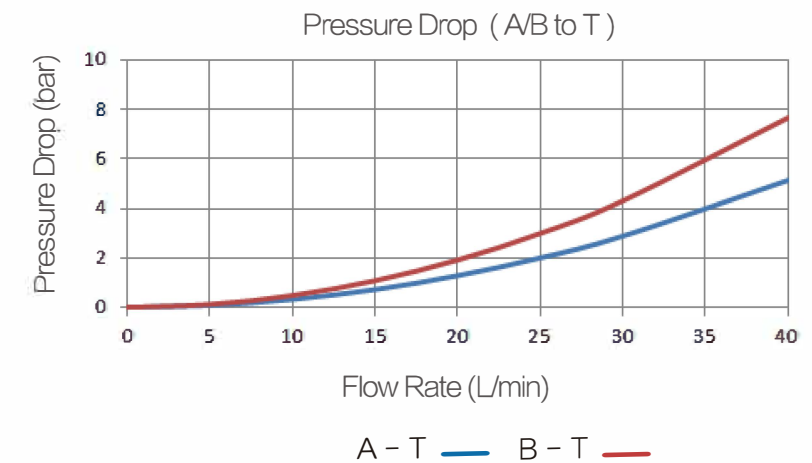
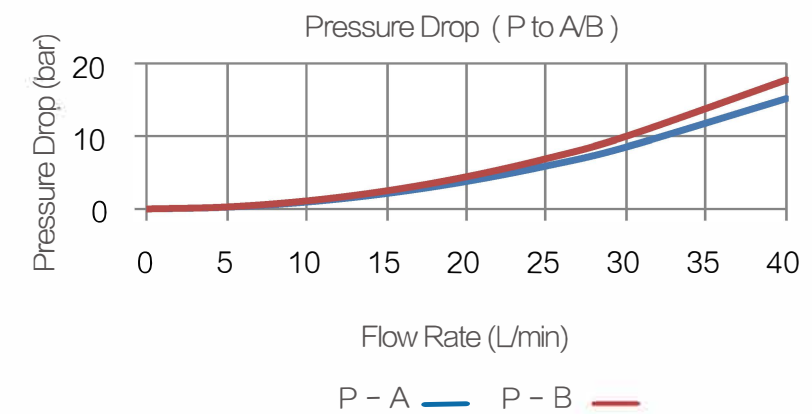
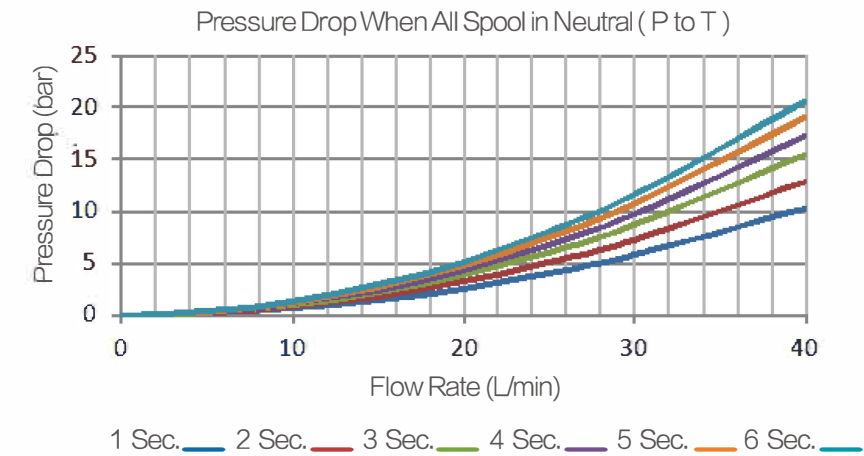
### Main Features

- Cast iron body.
- Spring cap, mechanical detent cap, as well as electrol or hydraulic pilot controlled module body are made by cast aluminum or die cast aluminum.
- Parallel circuit. Inlet passage has a load check valve.
- Provides manual control and wire pulling control modules.
- Provides power beyond options.
- Provides mechanical detent.
- Provides different spool functions to satisfy with the needs for customers to control double and single cylinders, as well as to control hydraulic motors.
- Provide excellent flow characteristics and small operating force.
- Provides 6 different assemblies from 1 spool to 6 spools.

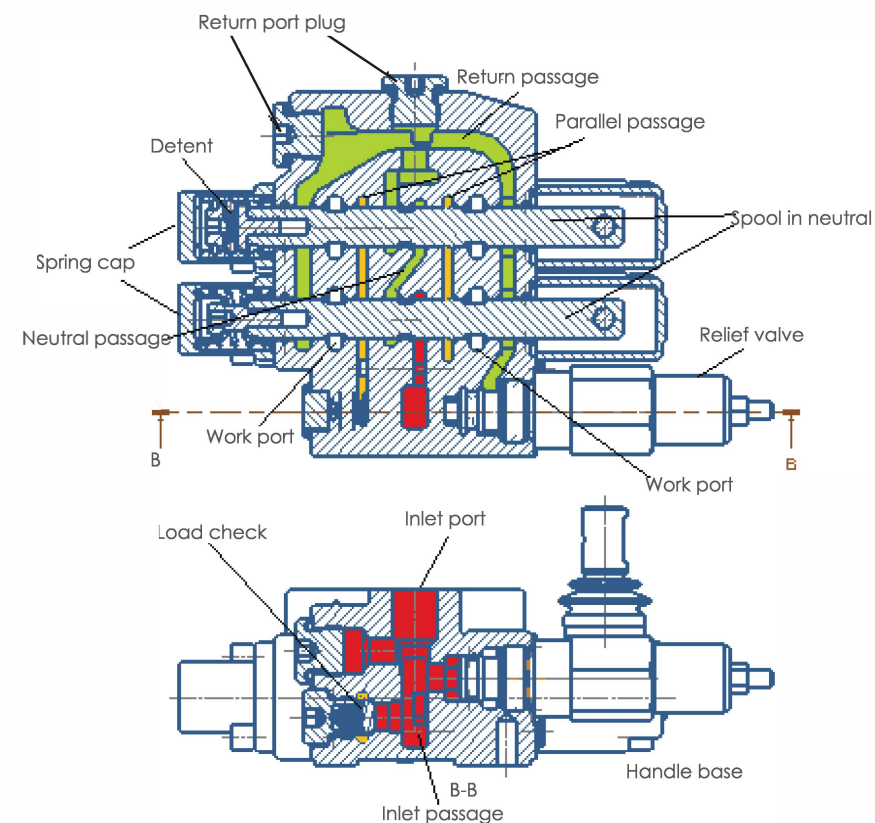
### Technical Data

Rated flow rate	25 L/min	With NBR (BUNA--N) seals	-20C° - 80C°
Maximum flow rate	30 L/min	With FPM (VITON) seals	-20C° - 100C°
Maximum pressure at P port	250 bar	Spool stroke(1、 2 position)	+5.5 -5.5mm
Maximum pressure at A、 B port	250 bar	With floating function(1、 2 、 F position)	+5.5 -5.5 -8mm
Maximum pressure at T port	25 bar	Recommend hydraulic oil viscosity range	15-75mm <sup>2</sup> /s
Internal leakage(@70 bar)	A、 B to T 30-35cc/min	Recommend temperature range	-40C° - 60C°

### Performance Data



## Basic Operating Principle

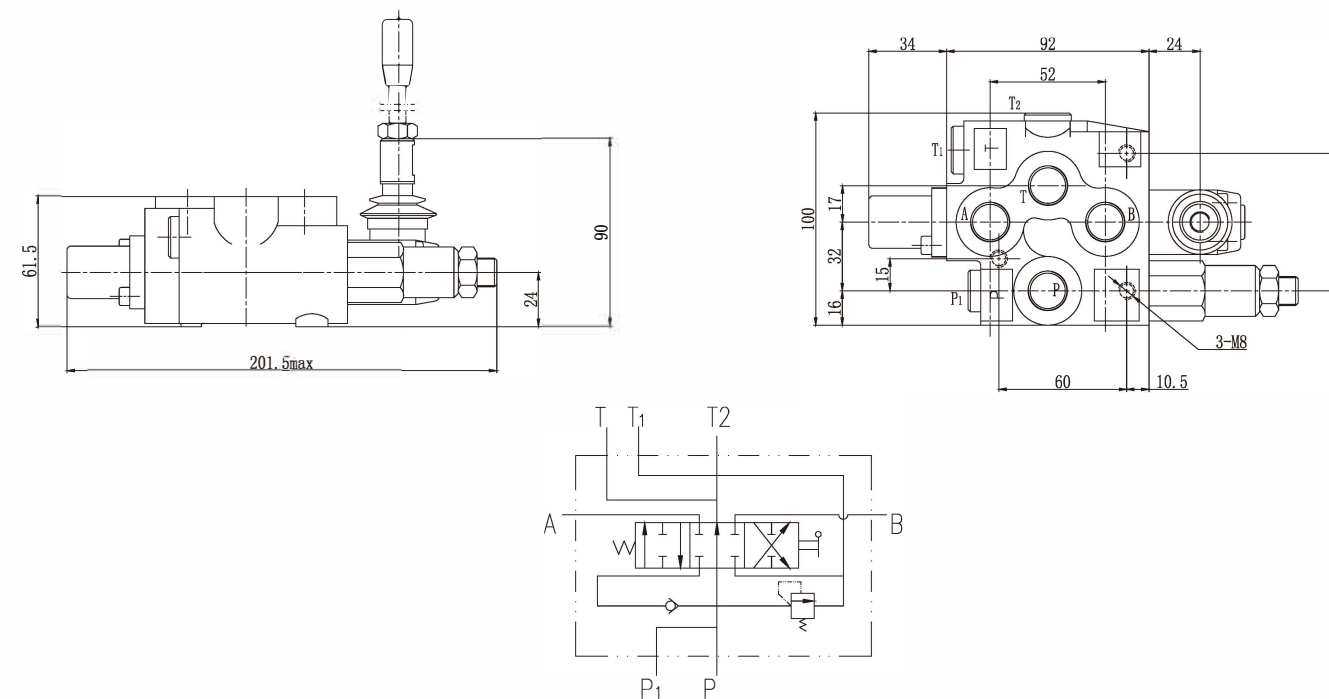


GDV25 series monoblock valve is an open center, 3-position 4-way valve. Flow from pump passes through inlet port and enters to inlet passage. The inlet passage connects two passages: one is through the load check into the parallel passage to supply flow to metering spool. Another is to neutral passage. When spool is in neutral position, spool metering with parallel passage is blocked. The oil from pump has to pass through neutral passage. When all spools are in neutral position, parallel passage for each spool is blocked, and neutral passage is wide open. Therefore, oil from pump is directly passing through the neutral passage to return passage to tank. It produces small pressure drop from P to T. When one of the spools is moved to 1 or 2 position, the spool blocked the neutral passage. The flow from pump has to pass load check to parallel passage, then through valve opening between parallel passage and spool to work port A or B.

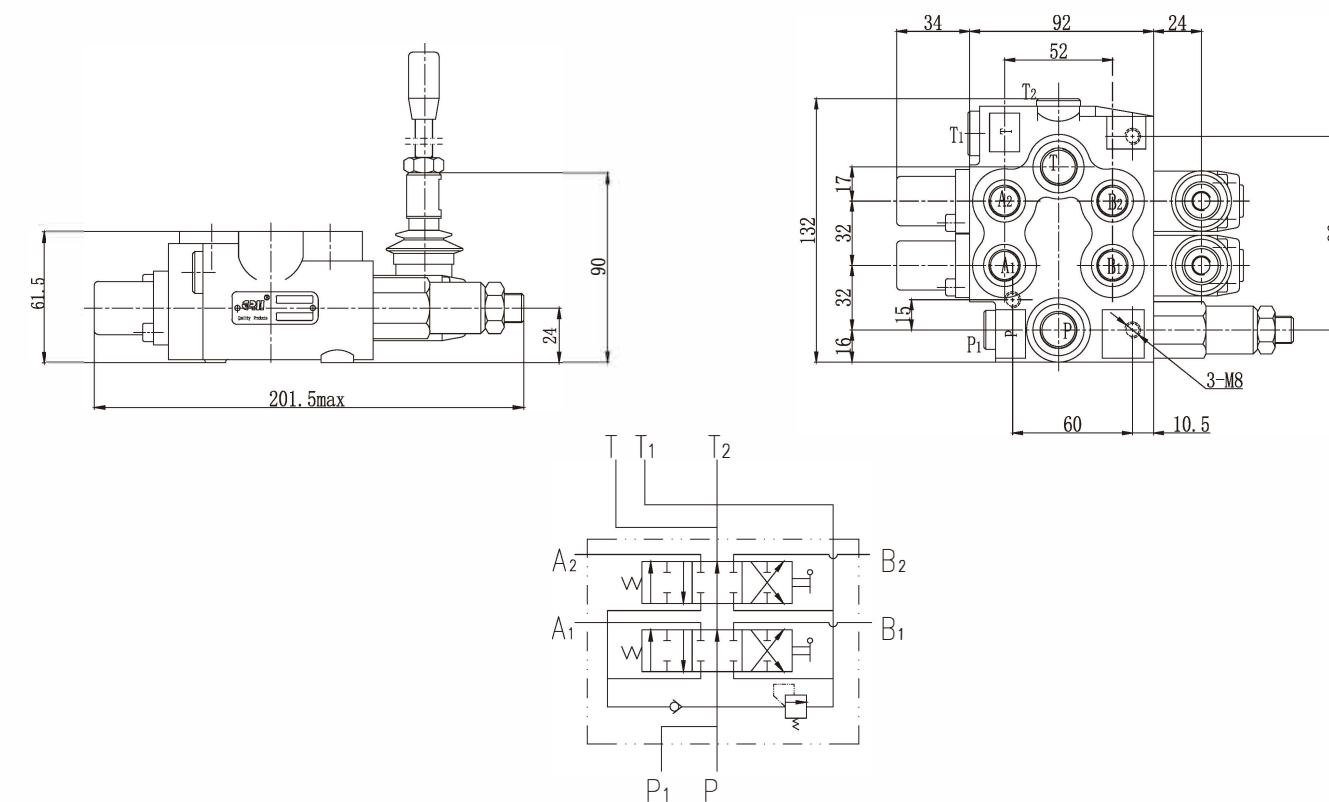
For multi-spool monoblock valve, when one of its spools is in 1 or 2 position, its downstream of the neutral passage has no flow. The operator can operate more than one spools at a time, but the speed of the controlled device will be dependent on the magnitude of the load.

## Dimensions

GDV25-1: 1 Spool Valve

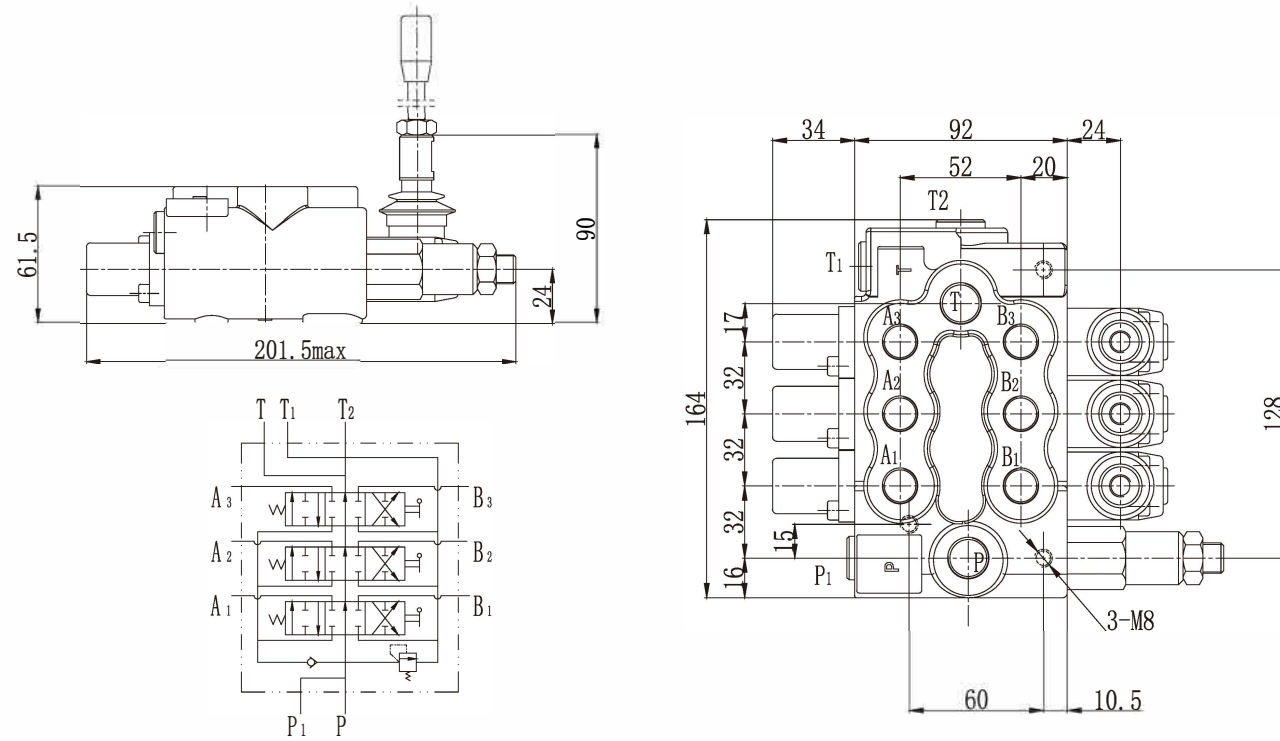


GDV25-2: 2 Spools Monoblock Valve

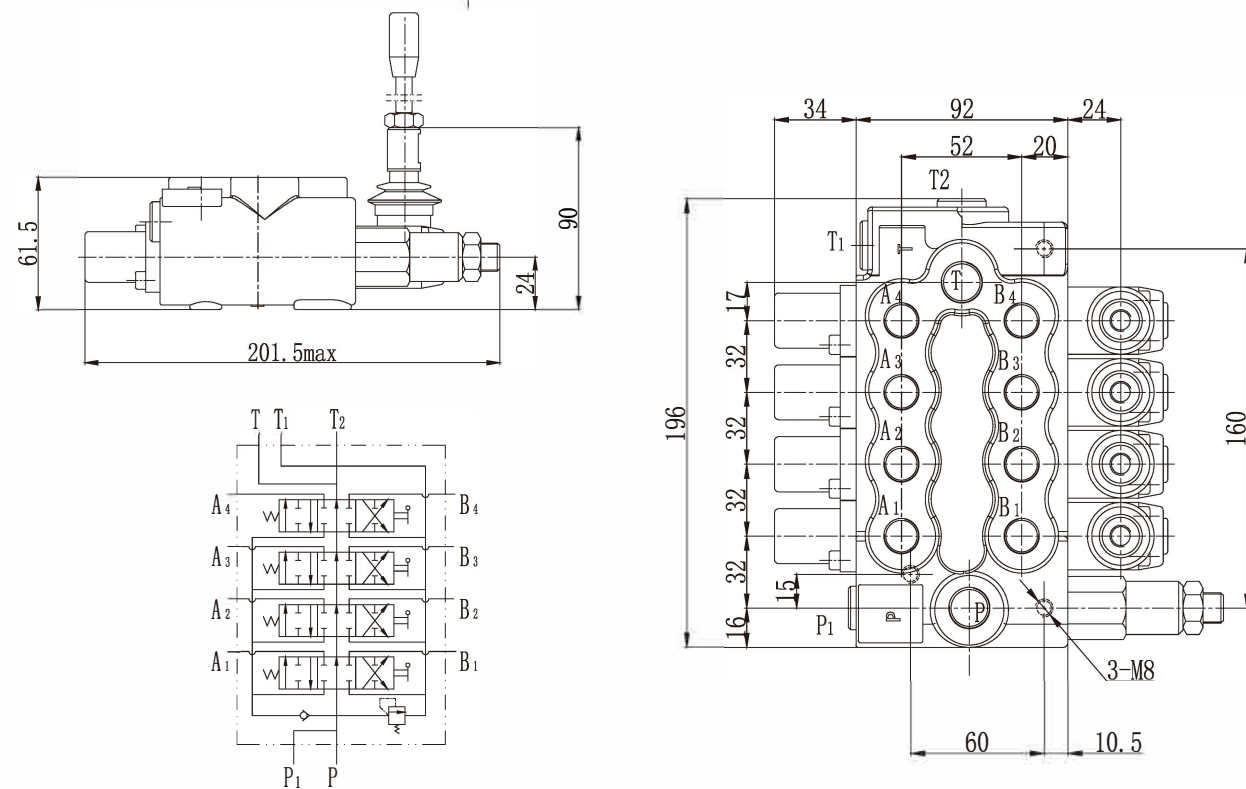




**GDV25-3: 3 Spools Monoblock Valve**

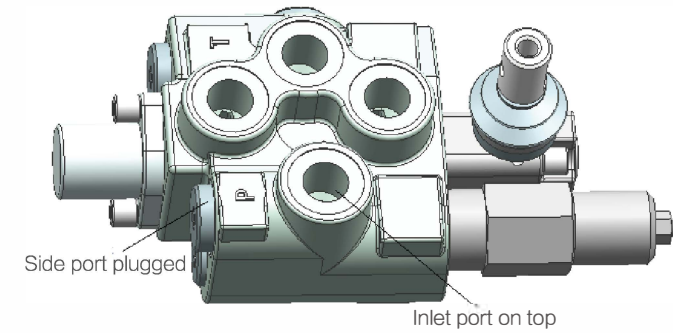


**GDV25-4: 4 Spools Monoblock Valve**

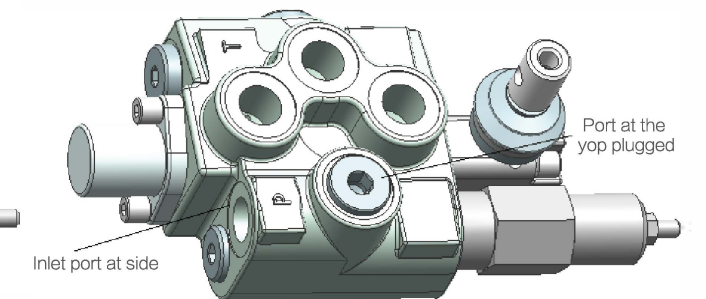


**Inlet Port Options**

Option Code: P1 (Port on top)

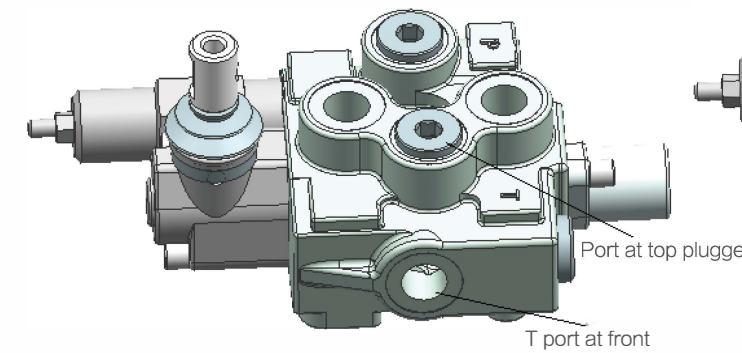


Option Code: P2 (Port on side)

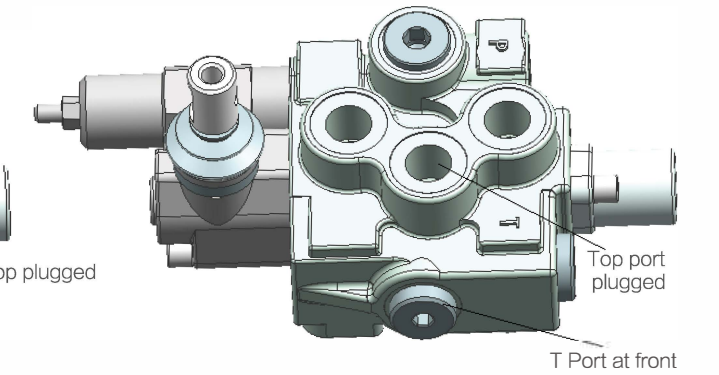


**Return Port Options**

Port T Option Code: T1 (T at the Front)

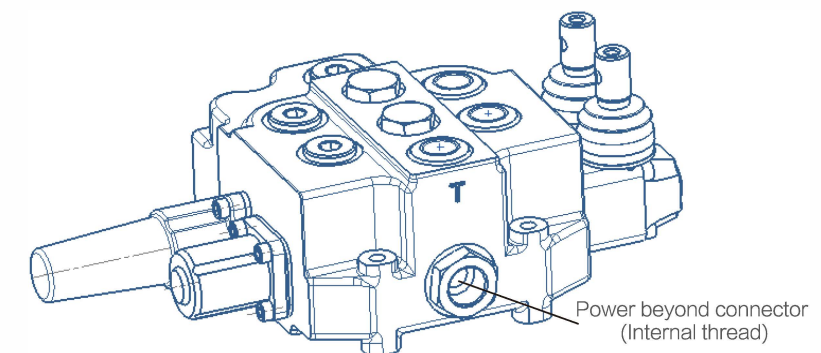


Port T Option Code: T2 (T at the Top)

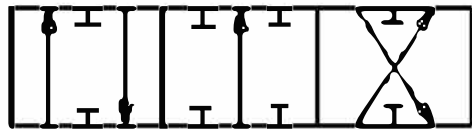
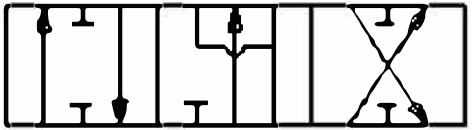
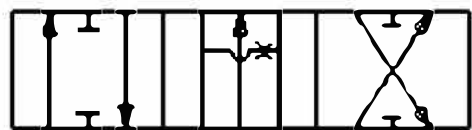
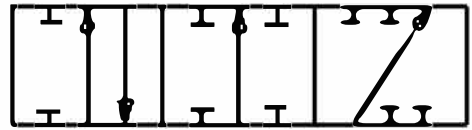
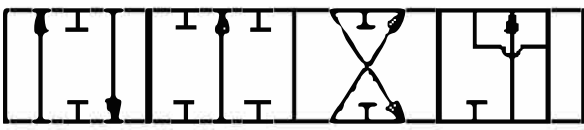
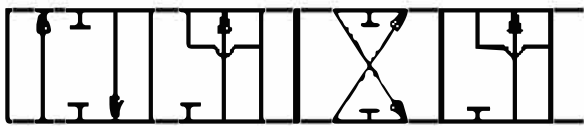


**Power Beyond Options**

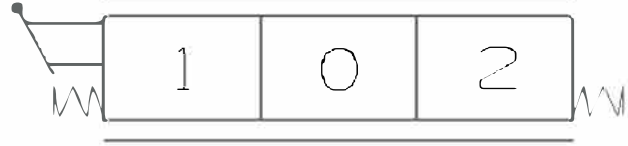
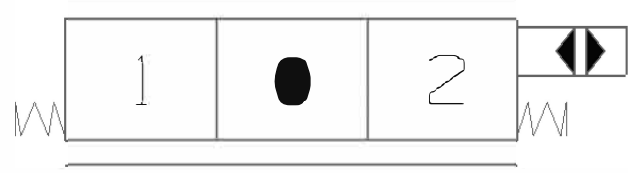
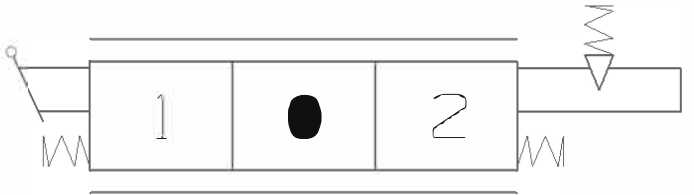
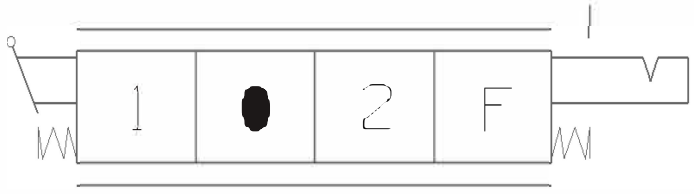
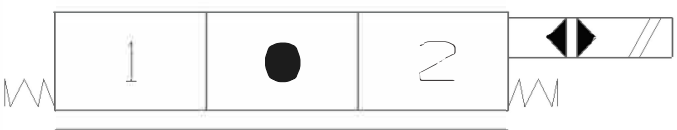
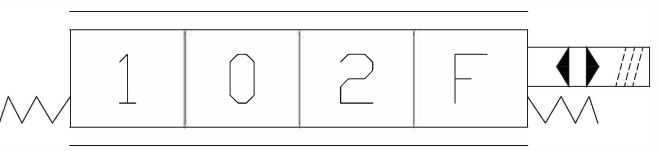
Power Beyond Option Code: D1 (T port at the top, power beyond port connector at front)  
D0 (Without Power Beyond)



## Typical Spool Functions

Spool Function	Spool Type	Function	Notes
FG1		3-position 4-way At neutral: P、T、A、B are all blocked	Double acting cylinder applications
FG2		3-position 4-way At neutral: P blocked, T、A Bconnected	Hydraulic motor applications
FG3		3-position 4-way At neutral: P、A、B and T all connected	Hydraulic motor applications
FG4		3-position 3-way At neutral: P、T、A、B all blocked	Single acting cylinder applications
FG5		4-position 4-way At neutral: P、T、A、 and B are all blocked 4th position floating	Double acting cylinder applications
FG6		4-position 4-way At neutral: P blocked, T、A and B are connected 4th position floating	Double acting cylinder or hydraulic motor applications

## Drive Options

Drive Style Code	Hydraulic Schematic	Function
KQ1		Standard manual control
KQ2		Hydraulic remote
KQ3		Manual control with mechanical detent
KQ4 (not available)		Manual control with 4th position floating and detent
KQ5 (not available)		Electrical actuated ( on/off )
KQ6 (not available)		Electrical actuated with floating function



## Ordering Code

**GDV25 -\* -P\* /\*\*\* -T\* -D\* -O1 -FG\* KQ\* -DC/\*\*-O2 .....**

a | b | c | d | e | f | g | h | i | j | k | l

- |                             |                                |
|-----------------------------|--------------------------------|
| Ⓐ Model                     | Ⓜ Spool function               |
| Ⓑ Number of spools          | FG1、FG2、FG3、FG4、FG5、FG6        |
| Ⓒ Inlet port code           | ① Drive code                   |
| Ⓓ Inlet relief setting(bar) | KQ1、KQ2、KQ3、KQ4、KQ5、KQ6        |
| Ⓔ Return port code          | ① Electrical option            |
| Ⓣ Power beyond              | 12VDC、24VDC、00=none electrical |
| Ⓤ First spool               | Ⓚ Second spool                 |
|                             | ① .....                        |

## Ordering Example

**GDV25 -3 -P1 /210 -T1 -D1 -O1 -FG1 KQ1 -DC/00**

a | b | c | d | e | f | g | h | i | j

- |                                |                           |
|--------------------------------|---------------------------|
| Ⓐ Model                        | Ⓣ Power beyond            |
| Ⓑ Three Spools                 | Ⓤ First spool function    |
| Ⓒ Inlet port on top            | Ⓜ Spool function          |
| Ⓓ Inlet relief setting(210bar) | ① Standard manual control |
| Ⓔ Return port on top           | ① Not electrical          |

**-O2 -FG2 -KQ5 -DC/24 -O3 -FG2 -KQ2 -DC/00**

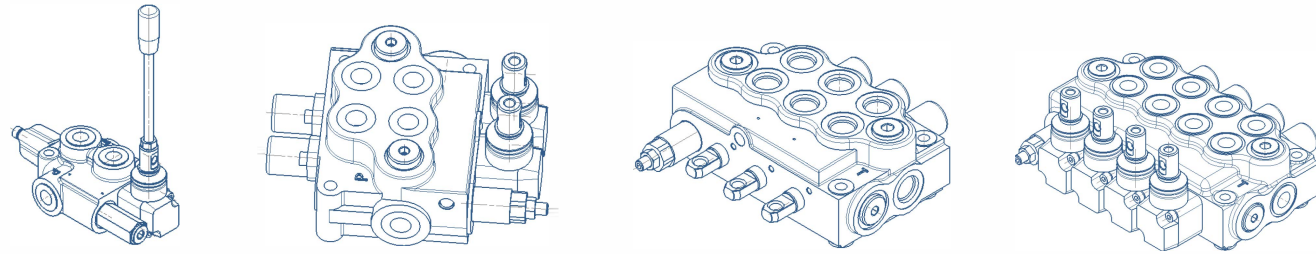
k | l | m | n | o | p | q | r

- |                                  |                    |
|----------------------------------|--------------------|
| Ⓚ Second spool                   | Ⓚ Third spool      |
| ① Spool function                 | Ⓚ Spool function   |
| Ⓜ Electrical control with detent | Ⓓ Hydraulic remote |
| Ⓝ 24VDC                          | Ⓣ Not electrical   |

## GDV45 Series Monoblock Valves

	<b>15</b>	↳ Main Features
Technical Data	<b>15</b>	
	<b>16</b>	↳ Performance Data
Basic Operating Principle	<b>17-18</b>	
	<b>19-20</b>	↳ Dimensions
Inlet Port Options	<b>21</b>	
	<b>21</b>	↳ Return Port Options
Power Beyond Options	<b>21</b>	
	<b>22</b>	↳ Typical Spool Functions
Drive Options	<b>23</b>	
	<b>24</b>	↳ Ordering Code
Ordering Example	<b>24</b>	

## GDV45 Series Monoblock Valves



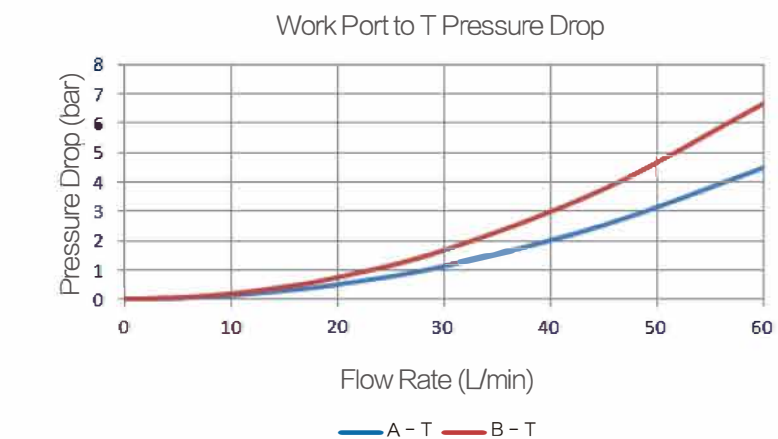
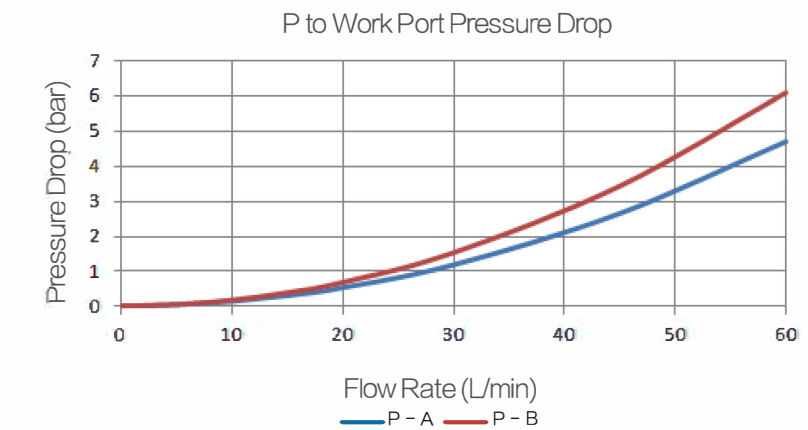
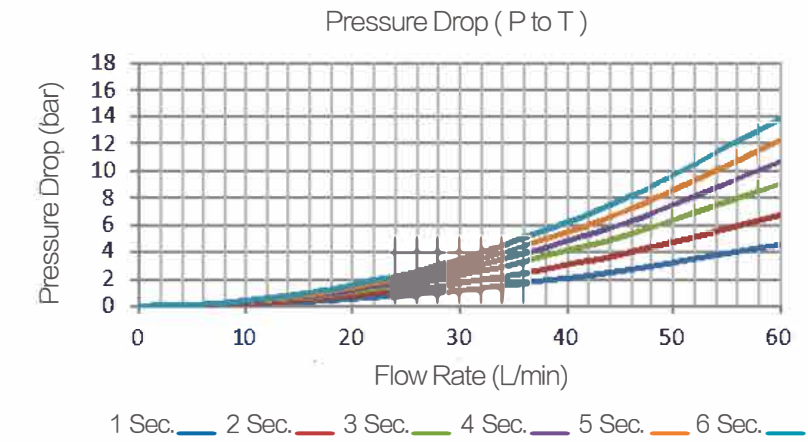
### Main Features

- Cast iron body
- Spring cap and mechanical detent cap are made in die cast aluminum.
- Parallel circuit. Inlet passage has a load check valve.
- Provides manual control and wire pulling control modules.
- Provides power beyond options.
- Provides mechanical detent.
- Provides different spool functions to satisfy with the needs for customers to control double and single cylinders, as well as to control hydraulic motors.
- Provide excellent flow characteristics and small operating force.
- Provides 6 different assemblies from 1 spool to 6 spools.

### Technical Data

Rated flow rate	45 L/min	With NBR(BUNA--N) seals	-20C° - 80C°
Maximum flow rate	55 L/min	With FPM(VITON)seals	-20C° - 100C°
Maximum pressure at P port	310 bar	Spool stroke(1、 2 position)	+7 -7 mm
Maximum pressure at A、 B port	310 bar	With floating function (1、 2、 F position)	+7 -7 -9 mm
Maximum pressure at T port	25 bar	Recommend hydraulic oil viscosity range	15-75 mm <sup>2</sup> /s
Internal leakage(@70 bar)	A、 B to T 30-35cc/min	Recommend temperature range	-40C° - 60C°

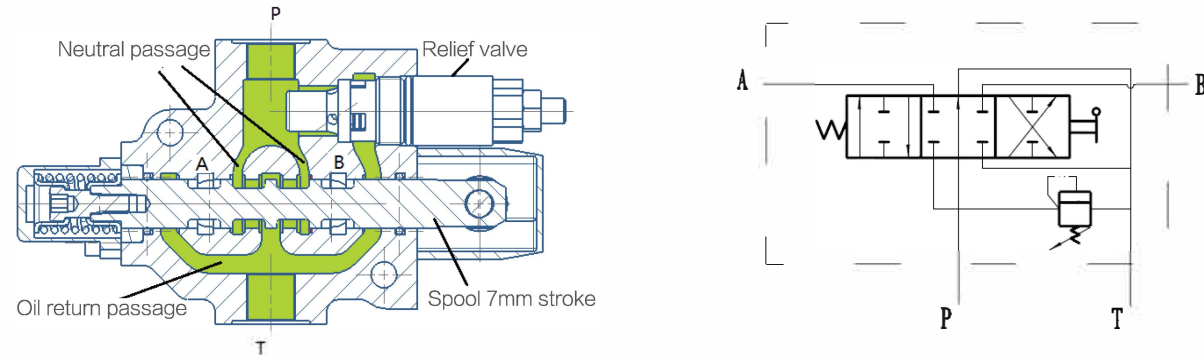
## Performance Data





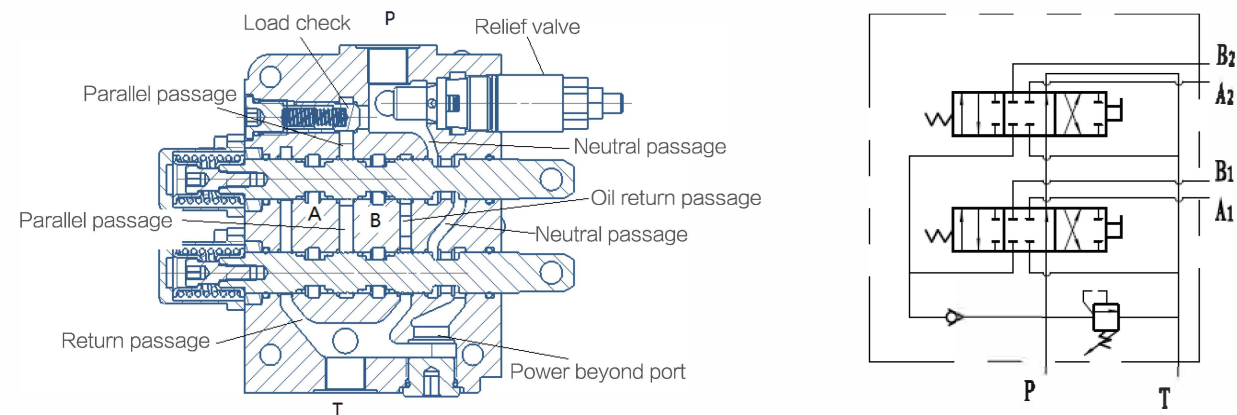
## Basic Operating Principle

### GDV45-1: 1 Spool Monoblock Valve



GDV45-1 is an one spool valve. It is also an open center , 3-position 4-way valve. When spool is in neutral, flow from pump passes through neutral passage to tank. Produces very little pressure drop. When spool is moved to 1 or 2 position, the neutral passage is blocked by spool. The flow from pump has to pass thogh the parallel passage to provide flow to spools metering to work port. The spool stroke is 7 mm. For ZD45-1 mono-block valve, it cannot provide power beyond function.

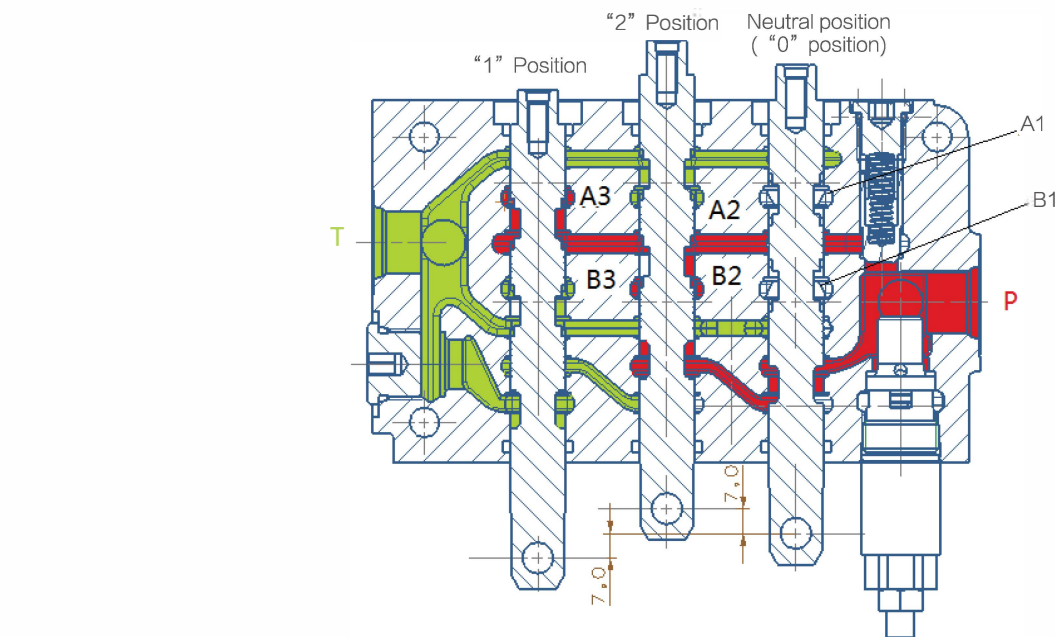
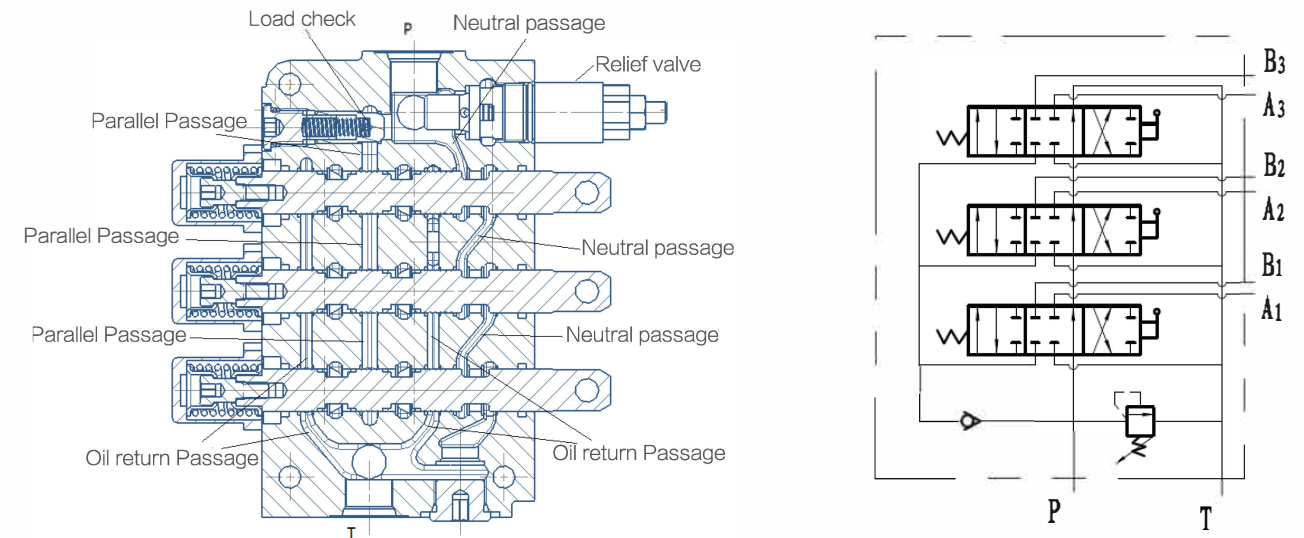
### GDV45-2: 2 Spools Monoblock Valve



GDV45-2, two spool monoblock valve is also an open center, 3-position 4-way valve. When spools are all in neutral, flow from pump passes through neutral passage to tank., and produces very little pressure drop. When one of the spools is moved to 1 or 2 position, the neutral passage is blocked by the spool. The flow from pump has to pass though the parallel passage to provide flow to spools metering to work port. There are options to choose for location of the inlet port and return port. There is also an option to have power beyond port. If first spool is moved to 1 or 2 position, then, the second spools neutral passage has no flow. The operator can operate two spools at the same time, but the speed of the controlled device is dependent on the load of the device.

## Basic Operating Principle

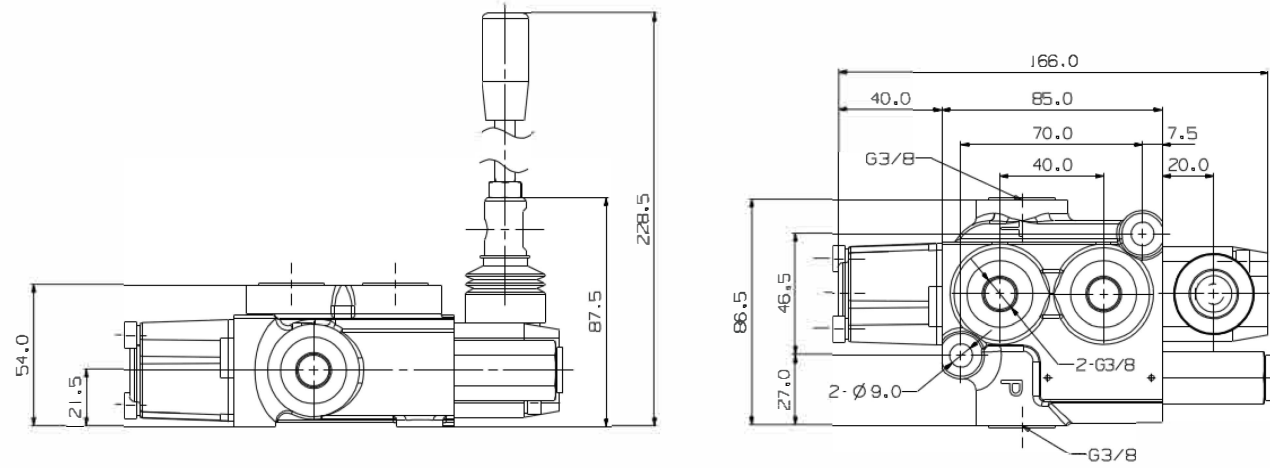
### GDV45-3: 3 Spools Monoblock Valve



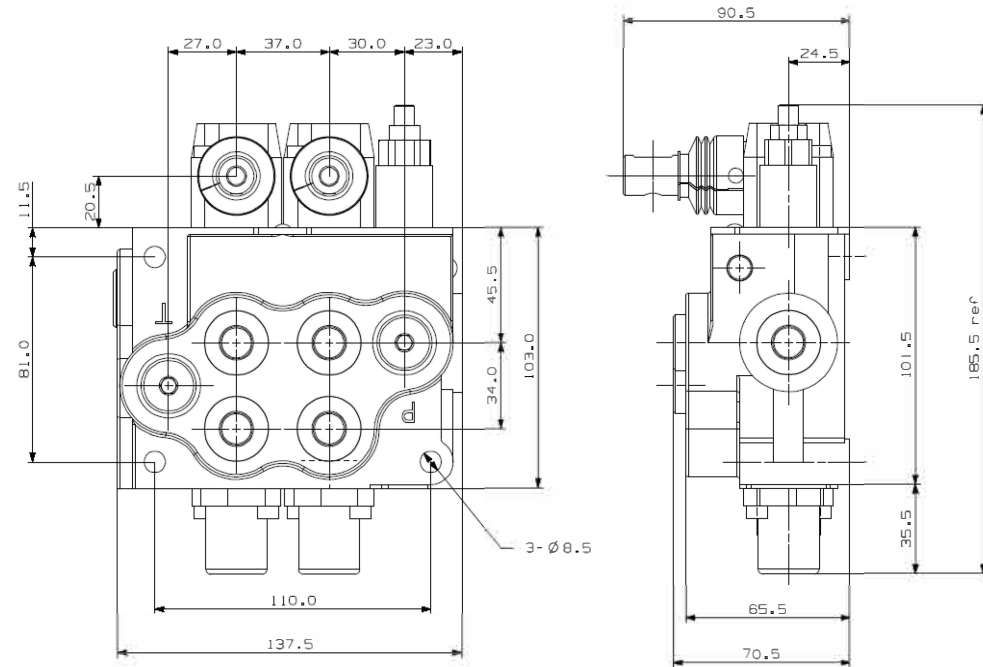
GDV45-3 is a three spool mono-block valve. It is also an open center, 3-position 4-way valve. Assuming the three spools were moved as shown in above picture. The first spool is in neutral (O position). The spool metering to A1 and B1 are all blocked. The second spool is moved to 2 position, Flow from parallel passage flows through spool opening to B2 port, flow from A2 port return passage through spools another opening. The third spool is moved to 1 position, flow from parallel passage flows to A3 through spool opening. Flow in B3 port flows to return passage through the spools another opening.

## Dimensions

### GDV45-1: 1 Spool Valve

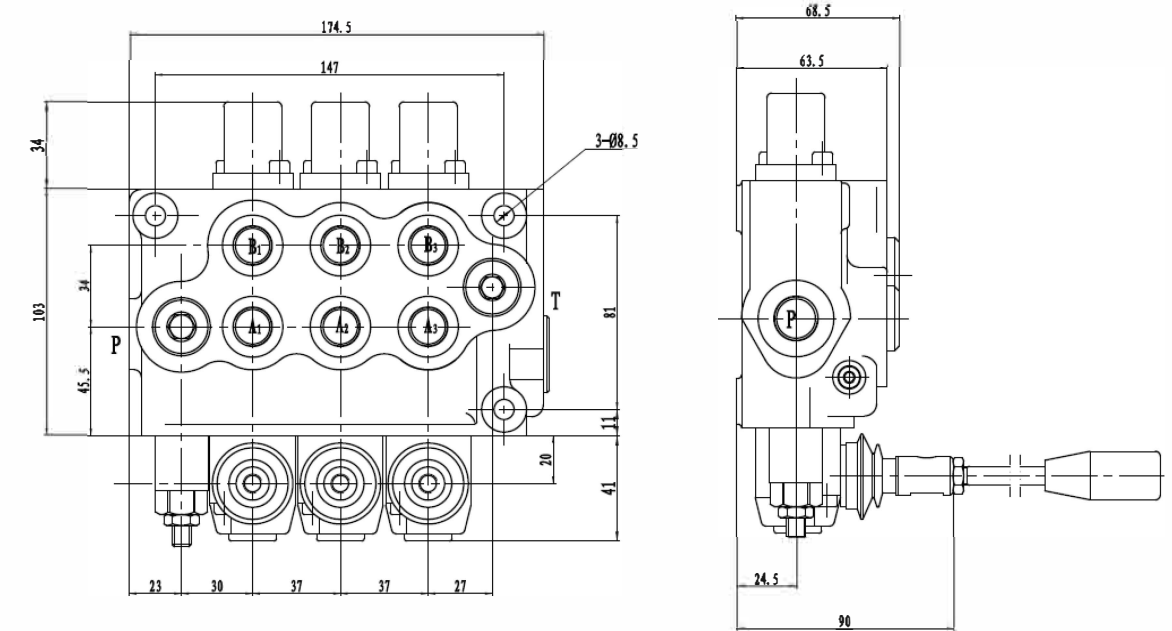


### GDV45-2: 2 Spools Monoblock Valve

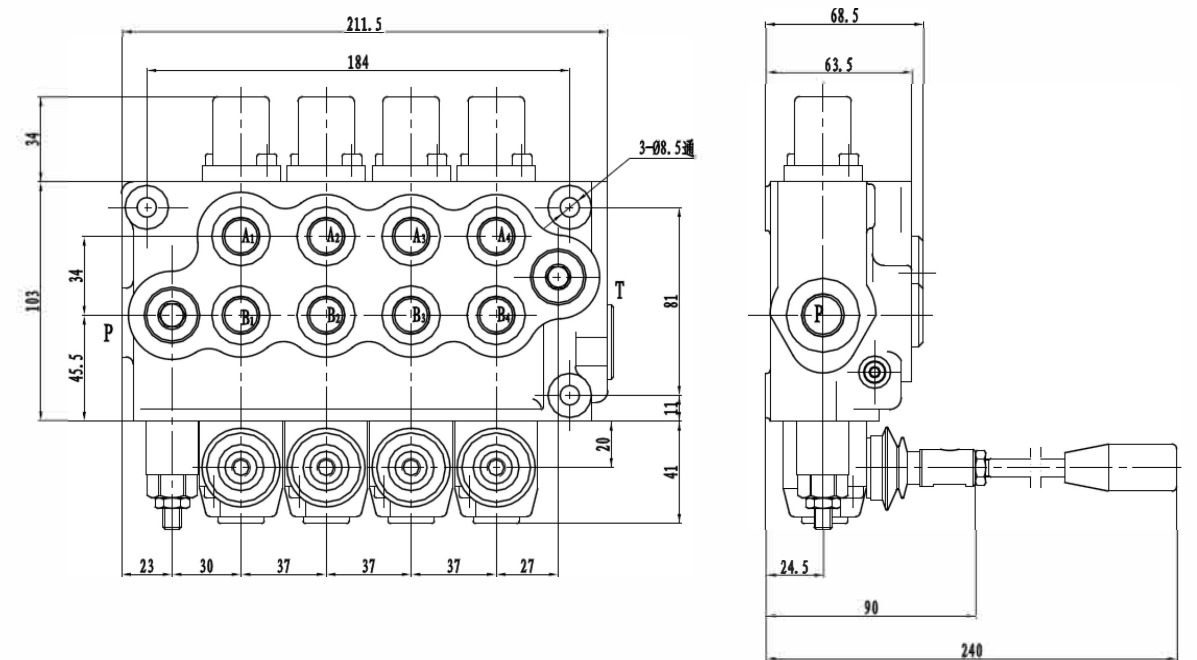


## Dimensions

### GDV45-3: 3 Spools Monoblock Valve



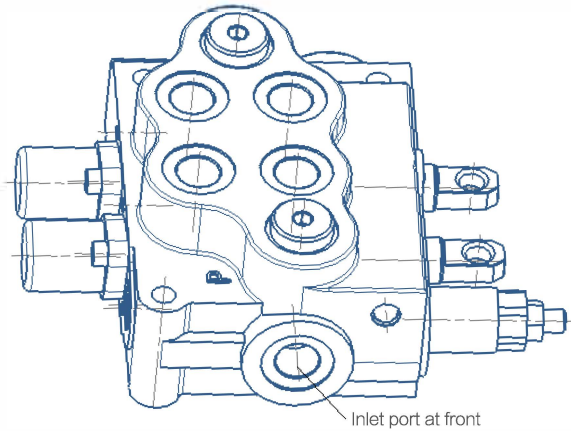
### GDV45-4: 4 Spools Monoblock Valve



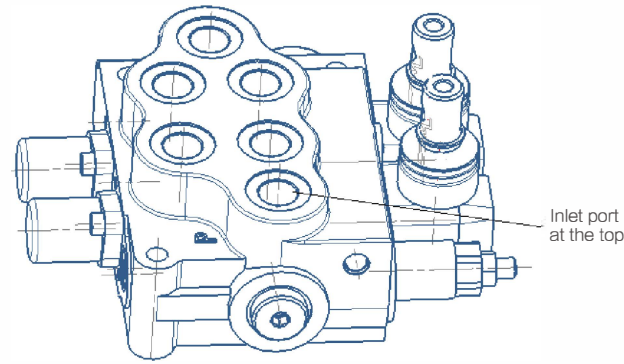


## Inlet Port Options

Inlet Option Code: P1(Inlet port at front)

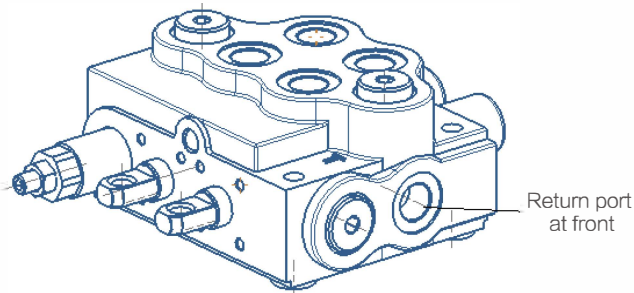


Inlet Port Option Code: P2(Inlet port at the top)

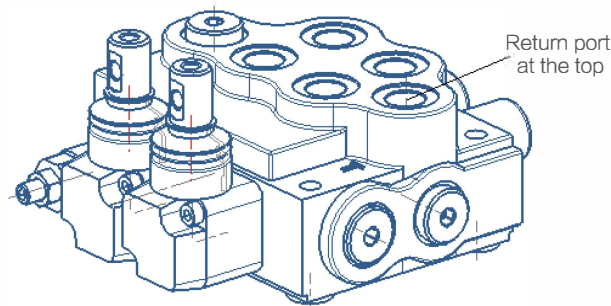


## Return Port Options

Return Port Option Code: T1(Return port at front)

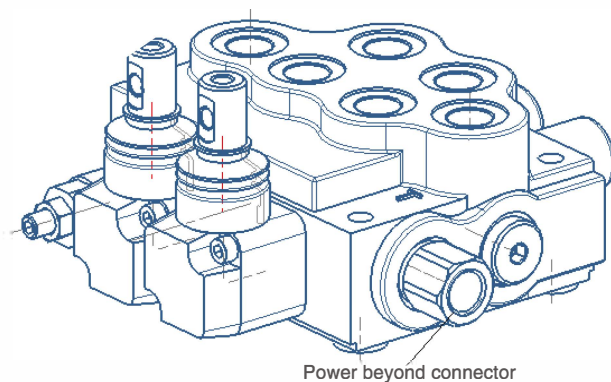


Return Port Option Code: T2(Return port at the top)



## Power Beyond Options

Power Beyond Option Code: D1(Pump flow output to a power beyond connector)  
D0(Without Power Beyond)



## Typical Spool Functions

Spool Function	Spool Type	Function	Notes
FG1		3-position 4-way At neutral: P、T、A、B are all blocked	Double acting cylinder applications
FG2		3-position 4-way At neutral: P blocked,T、A、Bconnected	Hydraulic motor applications
FG3		3-position 4-way At neutral: P、A、B and T all connected	Hydraulic motor applications
FG4		3-position 3-way At neutral: P、T、A、B all blocked	Single acting cylinder applications
FG5 (not available)		4-position 4-way At neutral: P、T、A、 and B are all blocked 4th position floating	Double acting cylinder applications
FG6 (not available)		4-position 4-way At neutral: P blocked,T、A and B are connected 4th position floating	Double acting cylinder or hydraulic motor applications

## Drive Options

Drive Style Code	Hydraulic Schematic	Function
KQ1		Standard manual control
KQ2 (not available)		Hydraulic remote
KQ3		Manual control with mechanical detent
KQ4 (not available)		Manual control with 4th position floating and detent
KQ5 (not available)		Electrical actuated ( on/off )
KQ6 (not available)		Electrical actuated with floating function

## Ordering Code

**GDV45 -\* -P\* /\*\*\* -T\* -D\* -O1 -FG\* KQ\* -DC/\*\*-O2 .....**  
 a | b | c | d | e | f | g | h | i | j | k | l

- Ⓐ Model
- Ⓑ Number of spools
- Ⓒ Inlet port code
- Ⓓ Inlet relief setting(bar)
- Ⓔ Return port code
- Ⓕ Power beyond
- Ⓖ First spool
- Ⓜ Spool function  
FG1、FG2、FG3、FG4、FG5、FG6
- Ⓨ Drive code  
KQ1、KQ2、KQ3、KQ4、KQ5、KQ6
- Ⓛ Electrical option  
12VDC、24VDC、00=none electrical
- Ⓚ Second spool
- Ⓛ .....

## Ordering Example

**GDV45 -3 -P1 /210 -T1 -D1 -O1 -FG1 KQ1 -DC/00**  
 a | b | c | d | e | f | g | h | i | j

- Ⓐ Model
- Ⓑ Three Spools
- Ⓒ Inlet port on top
- Ⓓ Inlet relief setting(210bar)
- Ⓔ Return port on top
- Ⓕ Power beyond
- Ⓖ First spool
- Ⓜ First spool function
- Ⓨ Standard manual control
- Ⓛ Not electrical

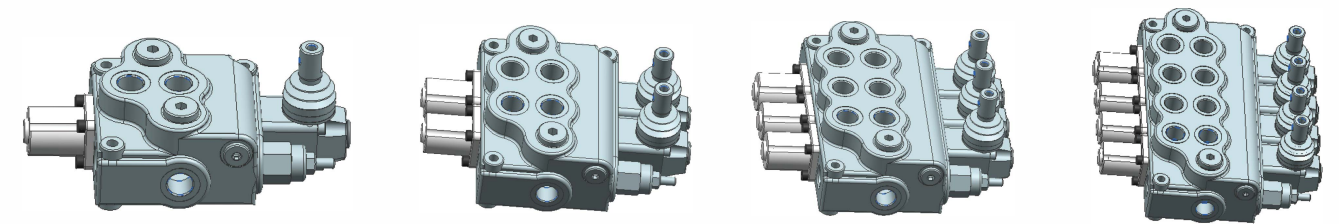
**-O2 -FG2 -KQ5 -DC/24 -O3 -FG2 -KQ2 -DC/00**  
 k | l | m | n | o | p | q | r

- Ⓚ Second spool
- Ⓛ Spool function
- Ⓜ Electrical control with detent
- Ⓨ 24VDC
- Ⓚ Third spool
- Ⓛ Spool function
- Ⓨ Hydraulic remote control
- Ⓛ Not electrical

## GDV70 Series Monoblock Valves

	26	└ Main Features
Technical Data ┘	26	
	27	└ Performance Data
Basic Operating Principle ┘	28	
	29–30	└ Dimensions
Inlet Port Options ┘	31	
	31	└ Return Port Options
Power Beyond Options ┘	31	
	32	└ Typical Spool Functions
Drive Options ┘	33	
	34	└ Ordering Code
Ordering Example ┘	35	

## GDV70 Series Monoblock Valves



### Main Features

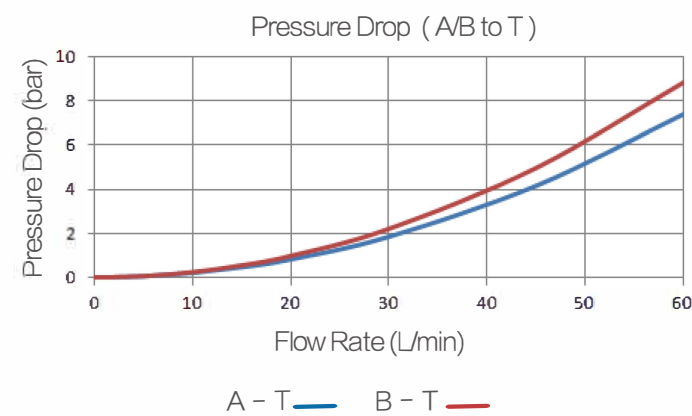
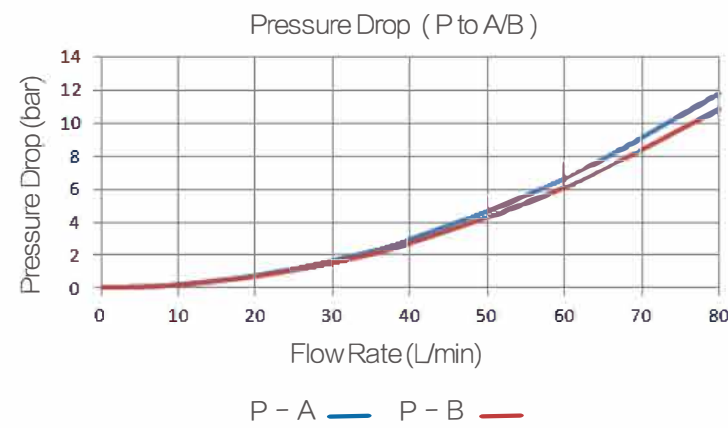
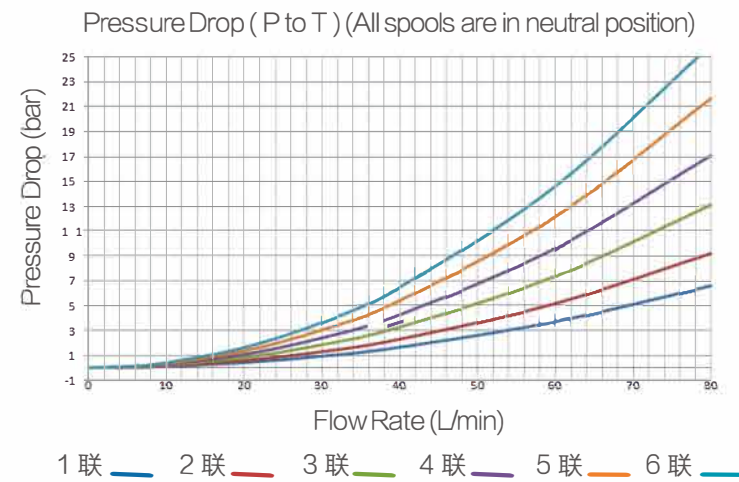
- Cast iron body.
- Spring cap and mechanical detent cap are made in die cast aluminum.
- Parallel circuit. Inlet passage has a load check valve.
- Provides manual control and wire pulling control modules.
- Provides power beyond options.
- Provides mechanical detent.
- Provides different spool functions to satisfy with the needs for customers to control double and single cylinders, as well as to control hydraulic motors.
- Provide excellent flow characteristics and small operating force.
- Provides 6 different assemblies from 1 spool to 6 spools.

### Technical Data

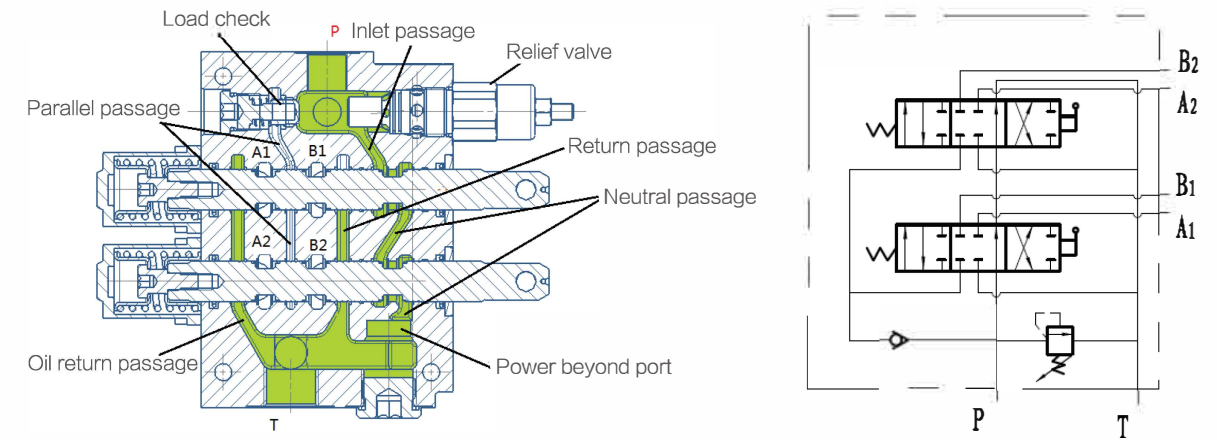
Rated flow rate	70 L/min	Temperature range of the hydraulic oil	
Maximum flow rate	80 L/min	With NBR(BUNA--N) seals	-20C° - 80C°
Maximum pressure at P port	310 bar	With FPM (VITON) seals	-20C° - 100C°
Maximum pressure at A、B port	310 bar	Spool stroke(1、2 position)	+7 -7mm
Maximum pressure at T port	25 bar	With floating function(1、2、F position)	+7 -7 -9mm
Internal leakage(@70 bar)	A、B to T 30-35 cc/min	Recommend hydraulic oil viscosity range	15-75 mm <sup>2</sup> /s
		Recommend temperature range	-40C° - 60C°



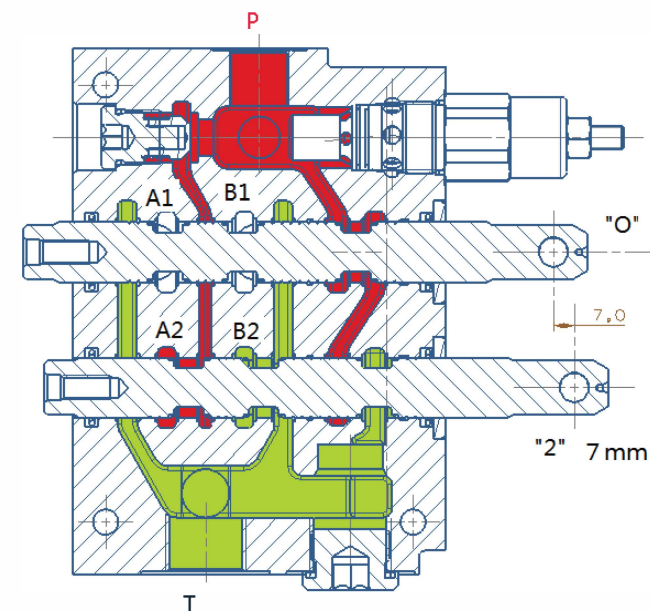
## Performance Data



## Basic Operating Principle



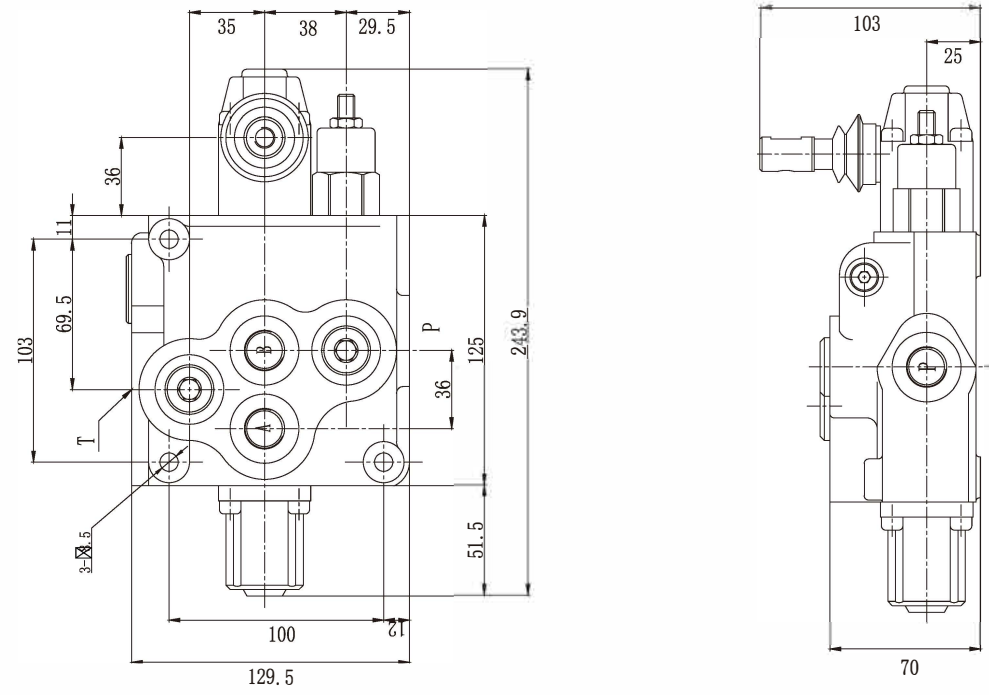
GDV-70 series monoblock valve is an open centered, 3-position 4-way valve. When spool is in its neutral position, the flow from pump passes through the neutral passage to tank, with very low pressure drop. When one of the spool is moved to 1 or 2 position, the neutral passage is blocked. The flow from pump can only pass through load check to parallel passage, then through the spool opening to work port A or B.



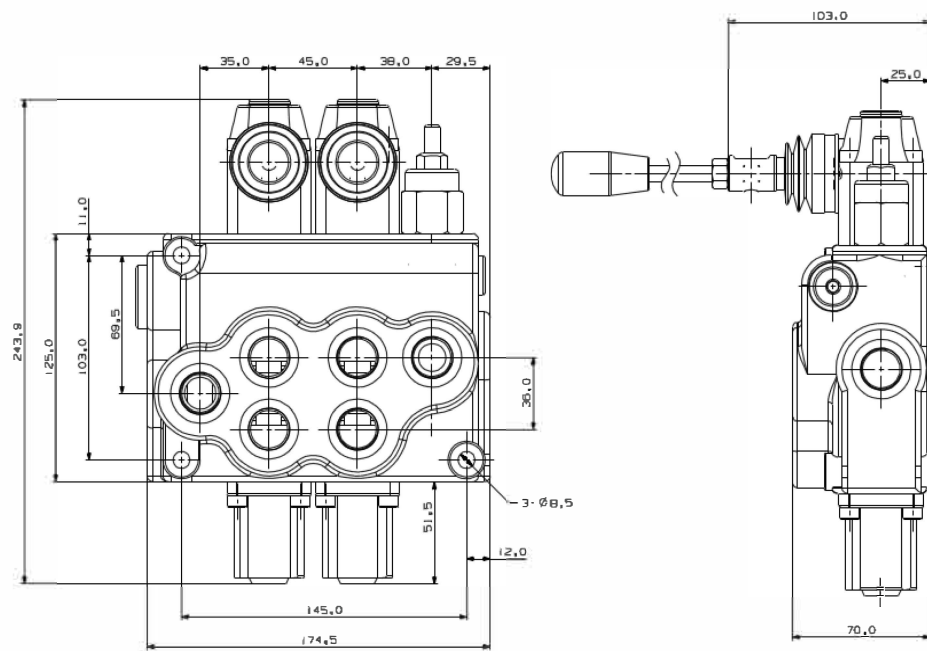
As shown in above picture, when first spool is in neutral, flow from pump passes through load check valve and enters the parallel passage to supply flow to both spools. Due to second spool is moved to 2 position, the flow from parallel passage flows to A2 through the spool opening. The flow from B2 flows to return passage through the spool's another opening. Neutral passage is blocked by the second spool.

### Dimensions

GDV70-1: 1 Spool Monoblock Valve

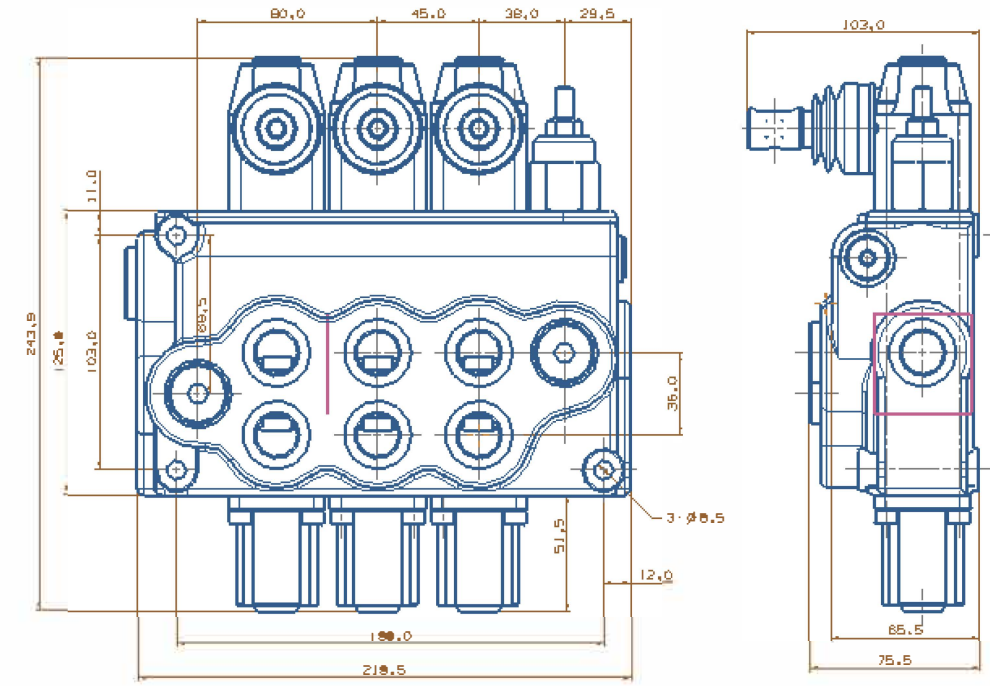


GDV70-2: 2 Spools Monoblock Valve

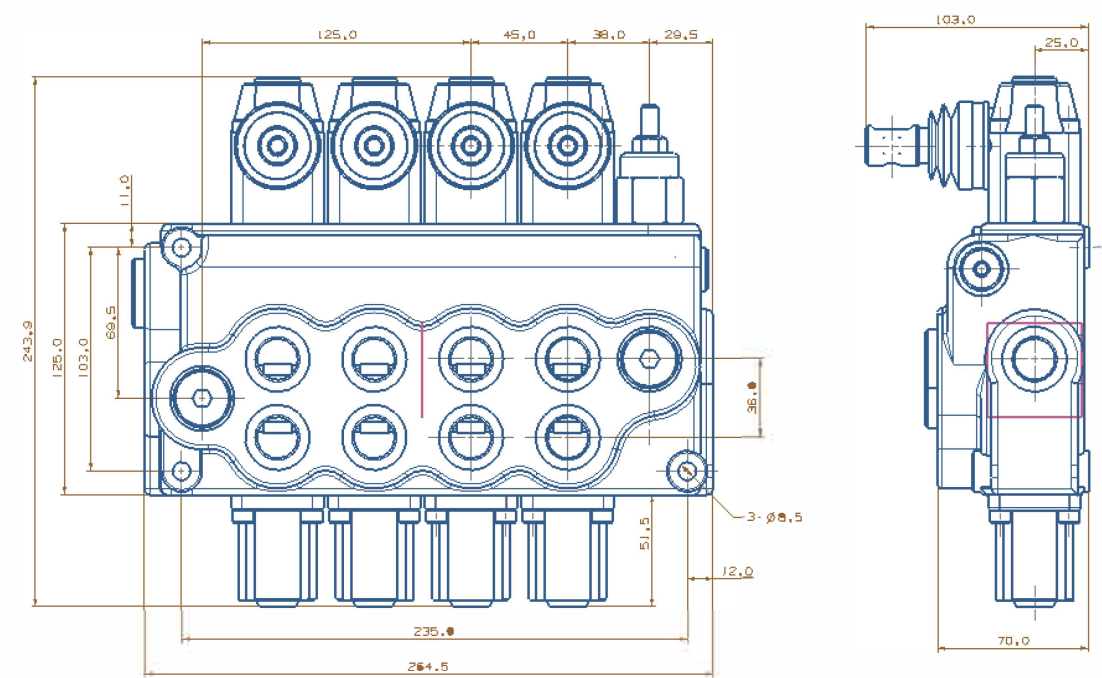


### Dimensions

GDV70-3: 3 Spools Monoblock Valve

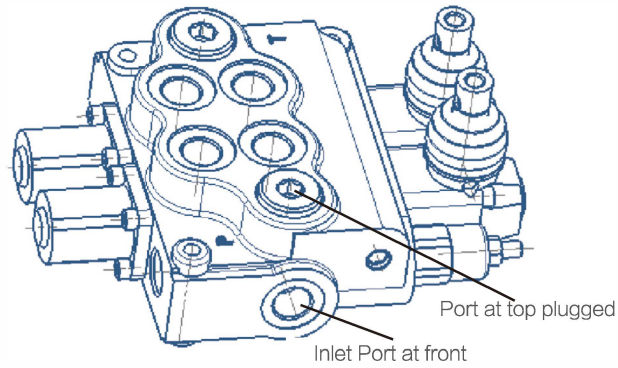


GDV70-4: 4 Spools Monoblock Valve

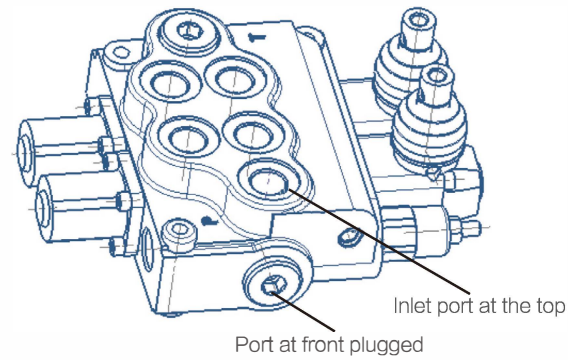


## Inlet Options

Inlet Option Code: P1(Port at front)

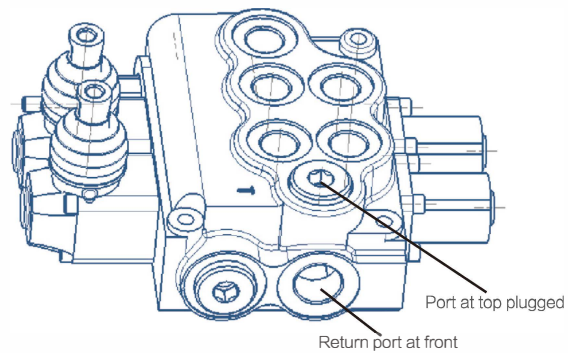


Inlet Port Code: P2(Port at the top)

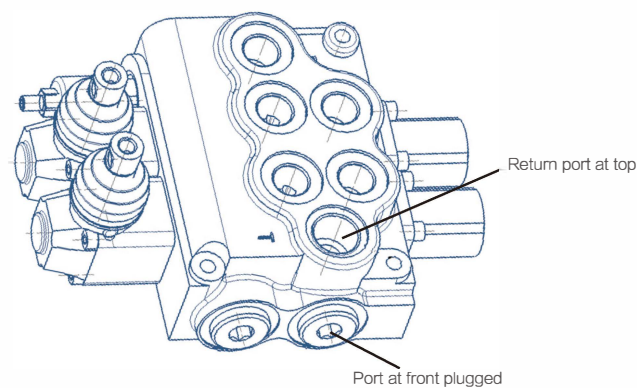


## Return Port Options

Return Port Option Code: T1(Return port at front)



Return Port Option Code: T2(Return port at the top)

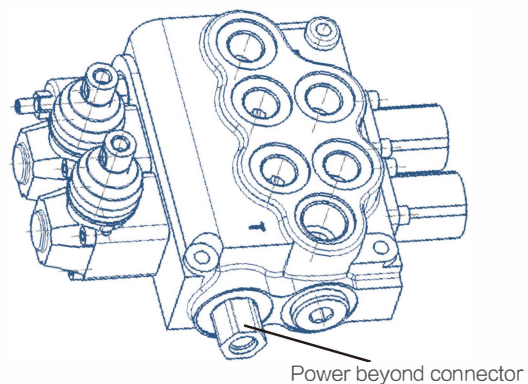


## Power Beyond Options

Power Beyond Option Code:

D1(A power beyond connector to supply pump flow to other device)

D0(Without power beyond port)



## Typical Spool Functions

Spool Function	Hydraulic Schematic	Function	Notes
FG1		3-position 4-way At neutral: P, T, A, B are all blocked	Double acting cylinder applications
FG2		3-position 4-way At neutral: P blocked, T, A, B connected	Hydraulic motor applications
FG3		3-position 4-way At neutral: P, A, B and T all connected	Hydraulic motor applications
FG4		3-position 3-way At neutral: P, T, A, B all blocked	Single acting cylinder applications
FG5 (not available)		4-position 4-way At neutral: P, T, A, and B are all blocked 4th position floating	Double acting cylinder applications
FG6 (not available)		4-position 4-way At neutral: P blocked, T, A and B are connected 4th position floating	Double acting cylinder or hydraulic motor applications



## Drive Options

Drive Style Code	Hydraulic Schematic	Function
KQ1		Standard manual control
KQ2 (not available)		Hydraulic remote
KQ3		Manual control with mechanical detent
KQ4		Manual control with 4th position floating and detent
KQ5 (not available)		Electrical actuated (on/off)
KQ6 (not available)		Electrical actuated with floating function

## Ordering Code

GDV70    -\*    -P\*    /\*\*\*    -T\*    -D\*    -O1    -FG\*    KQ\*    -DC/\*\*    -AR/\*\*

a    |    b    |    c    |    d    |    e    |    f    |    g    |    h    |    i    |    j    |    k

- Ⓐ Model
- Ⓑ Number of spools
- Ⓒ Inlet port code
- Ⓓ Inlet relief setting(bar)
- Ⓔ Return port code
- Ⓕ Power beyond
- Ⓖ First spool
- Ⓜ Spool function  
FG1、FG2、FG3、FG4、FG5、FG6
- Ⓜ Drive code  
KQ1、KQ2、KQ3、KQ4、KQ5、KQ6
- Ⓜ Electrical option  
12VDC、24VDC、00=none electrical
- Ⓜ Relief settings of the over load relief at A port(bar)  
If no relief, Input for pressure: 000

-BR/\*\*    -O2    .....

l    |    m    |    n

- Ⓜ Relief settings of the over load relief at B port (bar)  
If no relief, Input for pressure: 000
- Ⓜ Second spool
- Ⓜ .....

## Ordering Example

**GDV70 -3 -P1 /210 -T1 -D1 -O1 -FG1 KQ1 -DC/00-AR/250 -BR/190**  
 a | b | c | d | e | f | g | h | i | j | k | l

- |                                |  |
|--------------------------------|--|
| Ⓐ Model                        | Ⓔ First spool                                |
| Ⓑ Three Spools                 | Ⓕ First spool function                       |
| Ⓒ Inlet port at front          | Ⓖ Standard manual control                    |
| Ⓓ Inlet relief setting(210bar) | Ⓗ Not electrical                             |
| Ⓔ Return port on top           | Ⓚ 250 bar over load relief setting at A port |
| Ⓕ Power beyond                 | Ⓛ 190 bar over load relief setting at B port |

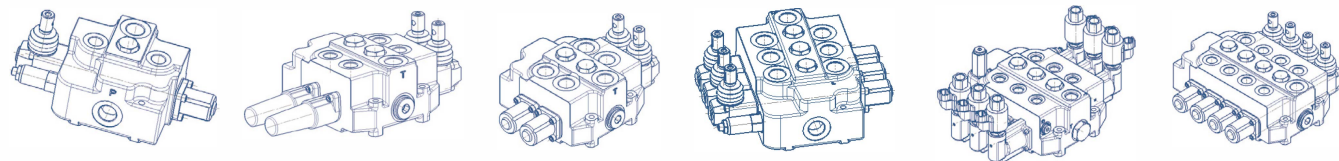
**-O2 -FG2 -KQ5 -DC/24 -AR/000 -BR/000 -O3 -FG2 -KQ2 -DC/00 -AR/220 -BR/000**  
 a | b | c | d | e | f | g | h | i | j | k | l

- |   |   |
|---|---|
| Ⓐ Second spool                              | Ⓔ Third spool                               |
| Ⓑ Spool function<br>FG1、FG2、FG3、FG4、FG5、FG6 | Ⓕ Spool function<br>FG1、FG2、FG3、FG4、FG5、FG6 |
| Ⓒ Electrical drive                          | Ⓗ Hydraulic remote                          |
| Ⓓ 24 VDC                                    | Ⓖ Not electrical                            |
| Ⓔ No relief at A port                       | Ⓚ 220 bar relief setting at A port          |
| Ⓕ Power beyond                              | Ⓛ No relief at B port                       |

## GDV80 Series Monoblock Valves

	<b>37</b>	└ Main Features
Technical Data	<b>37</b>	
	<b>38</b>	└ Performance Data
Basic Operating Principle	<b>39</b>	
	<b>40</b>	└ Hydraulic Schematics
Dimensions	<b>41-43</b>	
	<b>44</b>	└ Inlet Port Options
Return Port Options	<b>44</b>	
	<b>44</b>	└ Power Beyond Options
Typical Spool Functions	<b>45</b>	
	<b>46</b>	└ Drive Options
Ordering Code	<b>47</b>	
	<b>48</b>	└ Ordering Example

## GDV80 Series Monoblock Valves



### Main Features

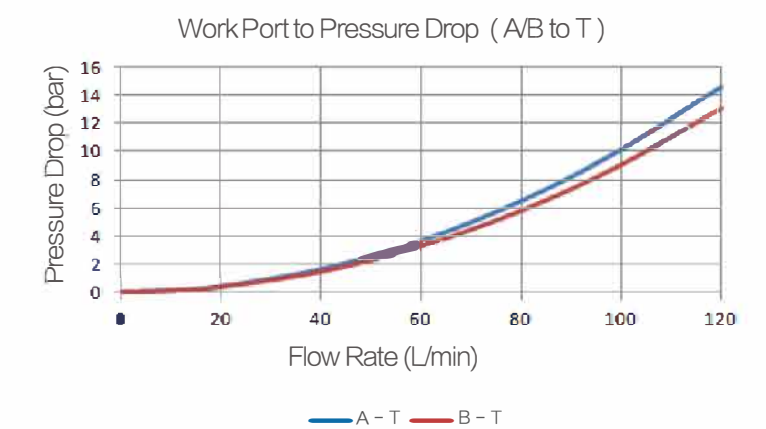
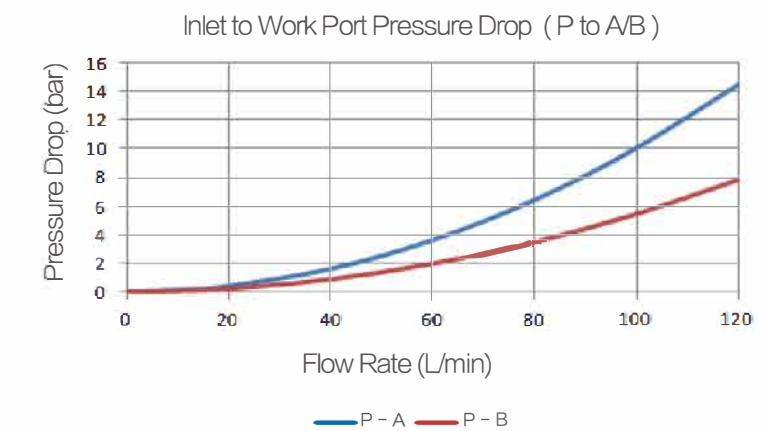
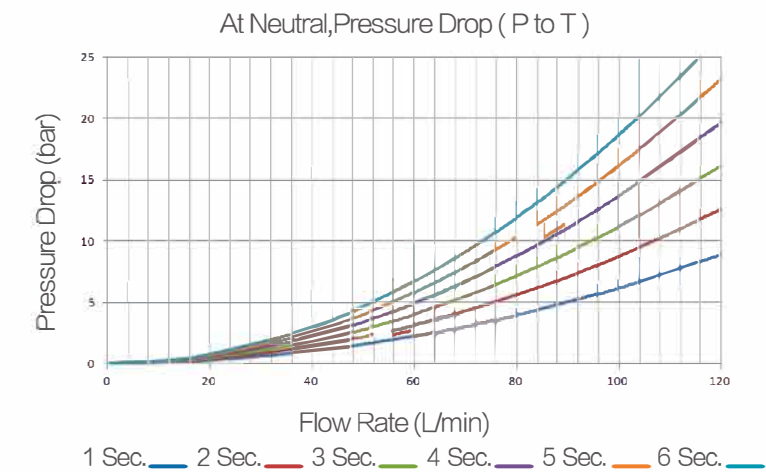
- Cast iron monoblock body.
- Spring cap, mechanical detent cap, as well as electrol or hydraulic pilot controlled module body are made by cast aluminum or die cast aluminum.
- Parallel circuit. Each spool has its own load check valve.
- Provides dump valve options for each work port.
- Provides different drive modules (electrical, hydraulic remote, manually control, wire driving).
- Provides power beyond port.
- Provides different spool functions to be used for controlling double acting cylinder , single acting cylinders, hydraulic motors.
- Provides floating functions for spools.
- Provides mechanical detent.
- Provides port relief options.
- Provides excellent flow characteristics and small operating force.
- Can be made with 1-6 spools.

### Technical Data

Rated flow rate	80 L/min	With NBR(BUNA--N) seals	-20C° - 80C°
Maximum flow rate	100 L/min	With FPM(VITON) seals	-20C° - 100C°
Maximum pressure at P port	310 bar	Spool stroke(1、 2 position)	+7 -7mm
Maximum pressure at A、 B port	310 bar	With floating function(1、 2 、 F position)	+7 -7 -9mm
Maximum pressure at T port	25 bar	Recommend hydraulic oil viscosity range	15-75mm <sup>2</sup> /s
Internal leakage(@70 bar)	A、 B to T 30-35 cc/min	Recommend temperature range	-40C° - 60C°

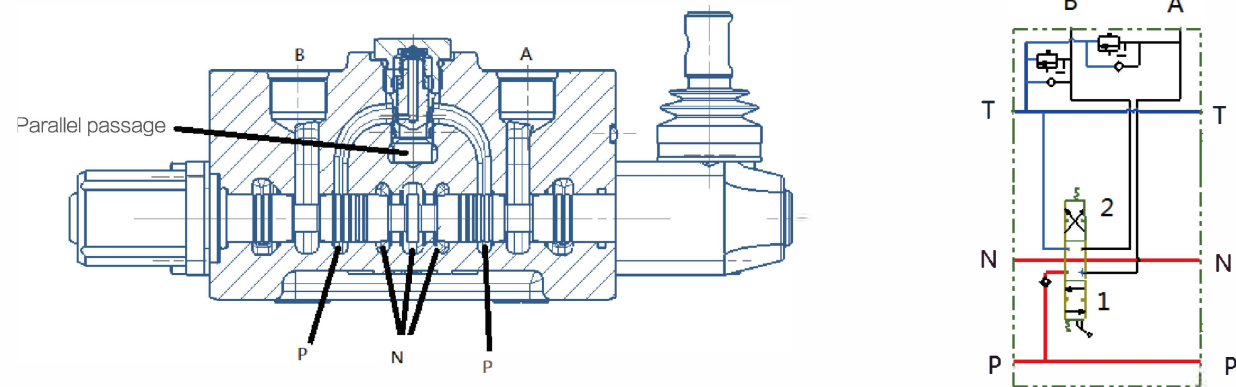
Solenoid can be either 12 VDC or 24 VDC, corresponding current is 0 - 1.5 or 0 - 0.75 Amp.

### Performance Data

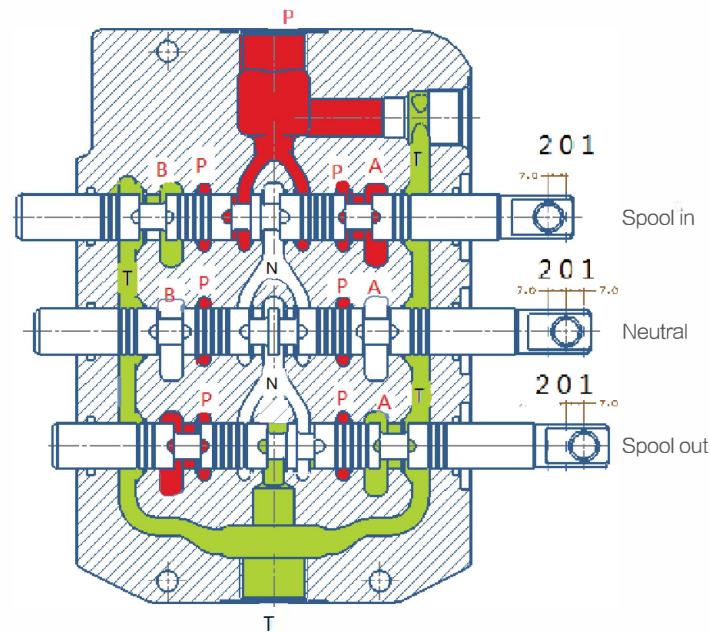




## Basic Operating Principle

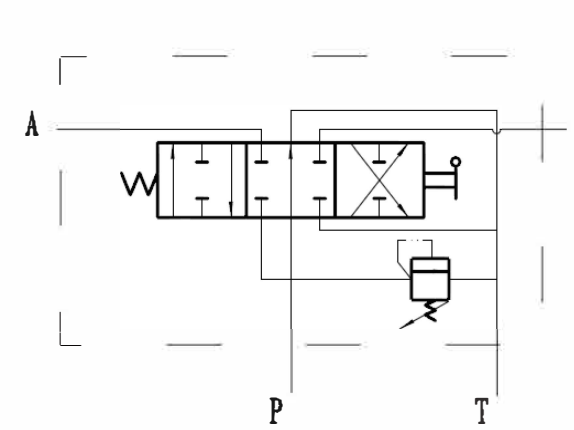


GDV80 series monoblock valve is an open centered 3-position 4-way valve. When spool is in its neutral position, the flow from pump passes through the neutral passage to tank, with very low pressure drop. When one of the spool is moved to 1 or 2 position, the neutral passage is blocked. The flow from pump can only pass through parallel passage to load check valve, then, through the bridge and spool opening to work port A or B.

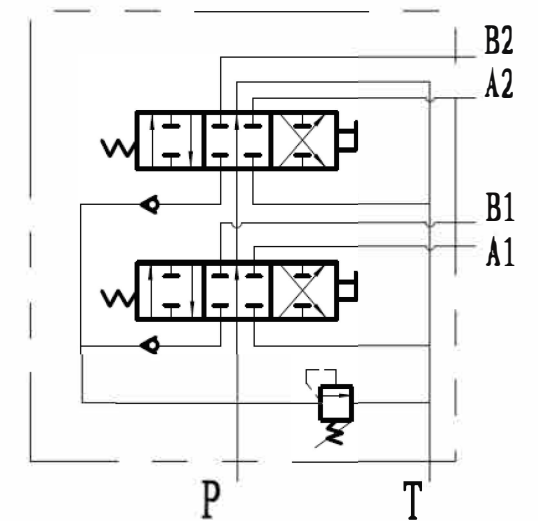


For multi-spool monoblock valves, if one of the spools is in 1 or 2 position, then, there is no flow in its down stream spools neutral passage. The main throttle occurs on the valve opening between bridge passage and spool. The operator can control more than one spools, but the magnitude of the flow rate for each controlled spool is dependent on the load.

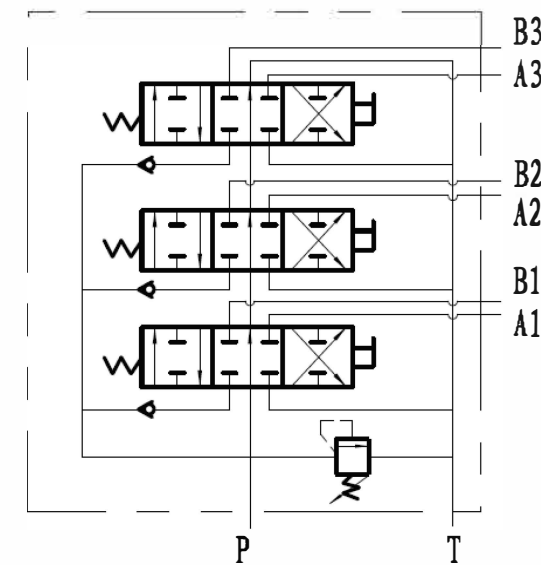
## Hydraulic Schematics



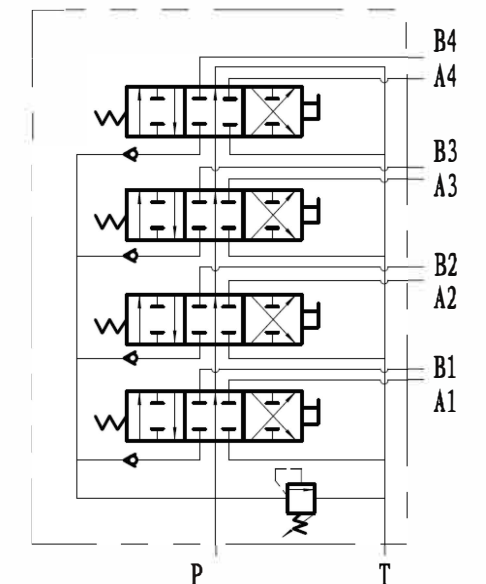
GDV80-1



GDV80-2



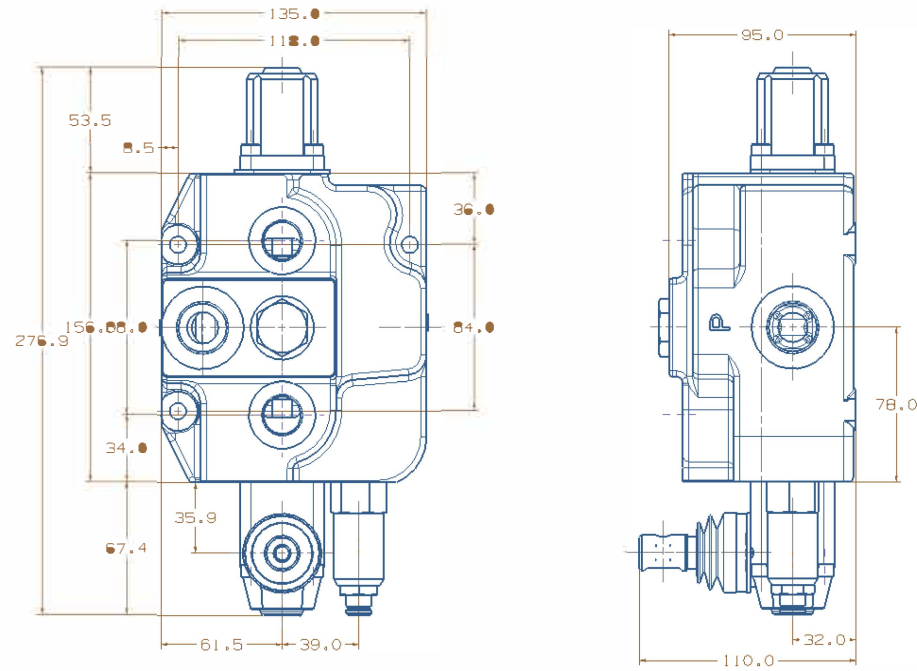
GDV80-3



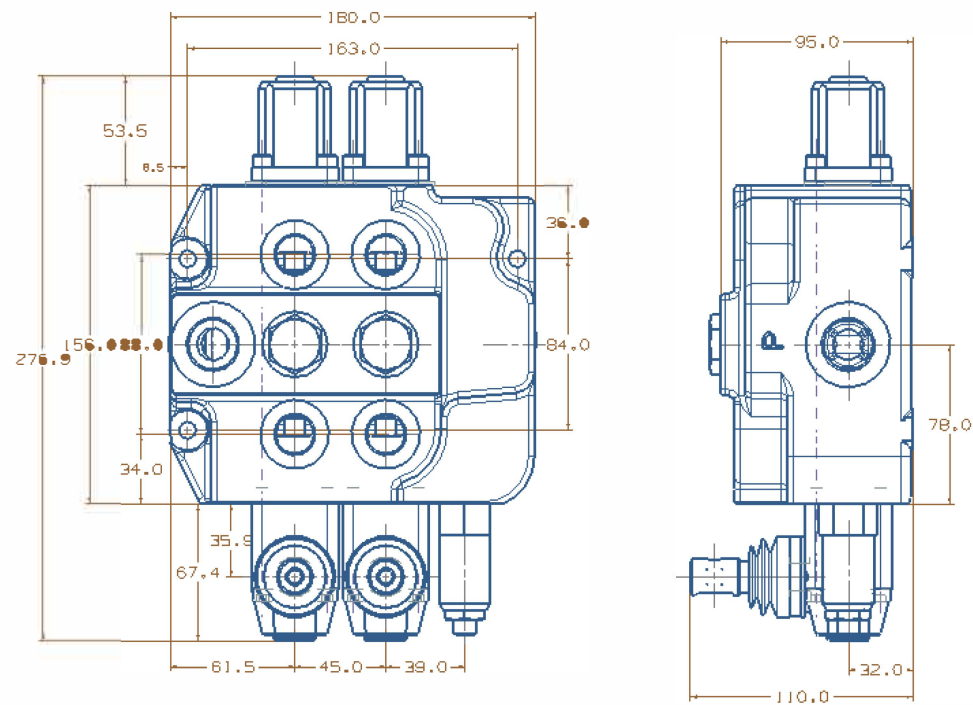
GDV80-4

### Dimensions

GDV80-1: 1 Spool Monoblock Valve

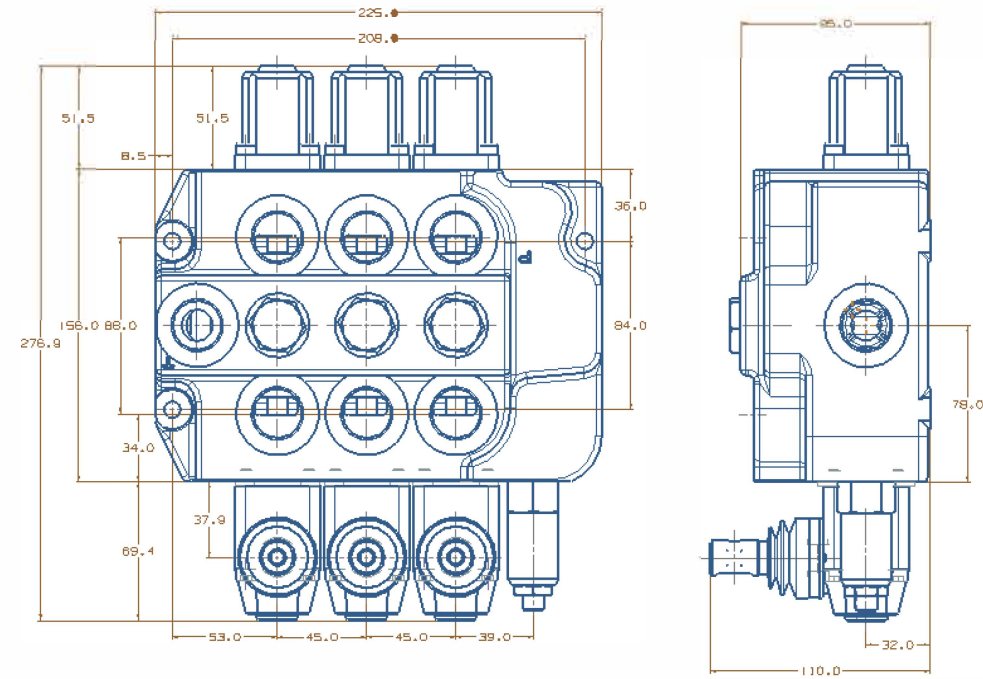


GDV80-2: 2 Spools Monoblock Valve

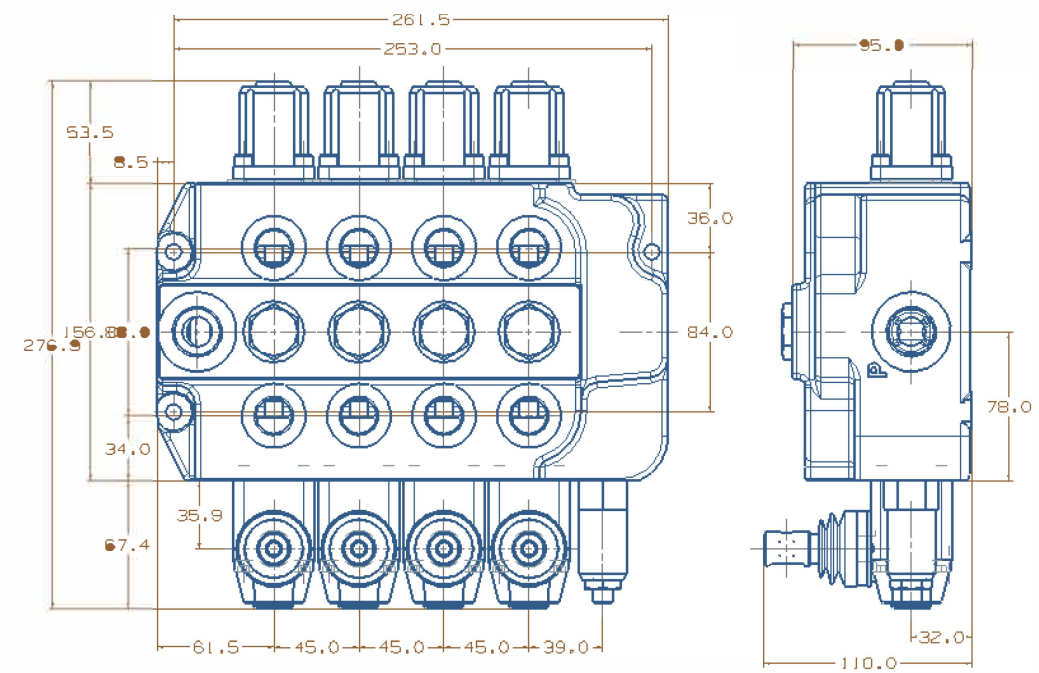


### Dimensions

GDV80-3: 3 Spools Monoblock Valve

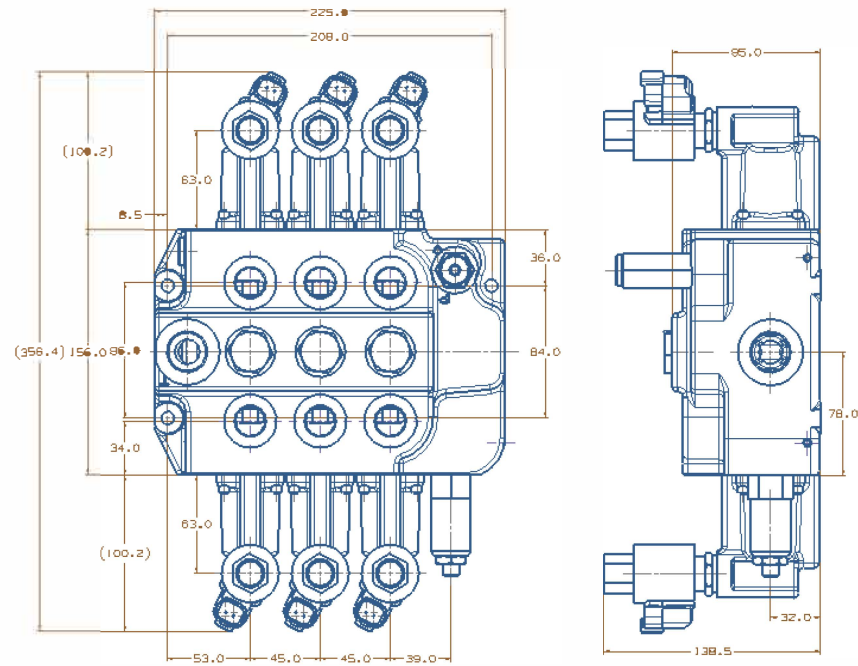


GDV80-4: 4 Spools Monoblock Valve

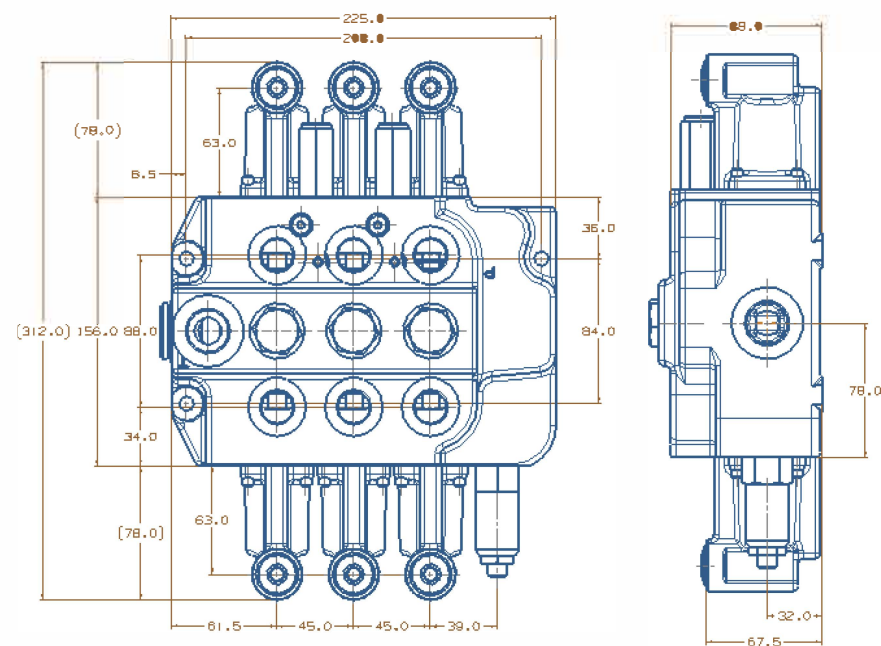


## Dimensions

GDV80-3: 3 Spools, Electrical Drive

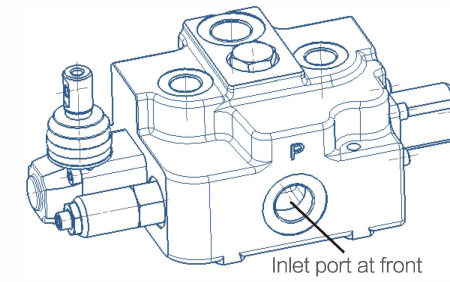


GDV80-3: 3 Spools, Hydraulic Remote

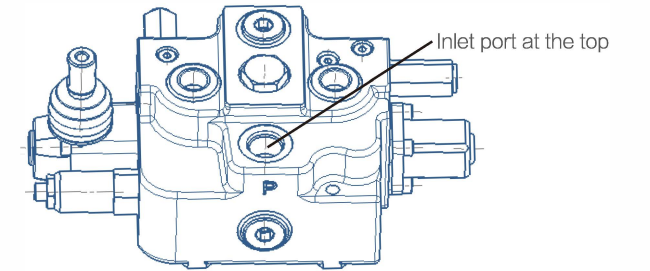


## Inlet Port Options

Inlet Option Code: P1(Inlet port at front)

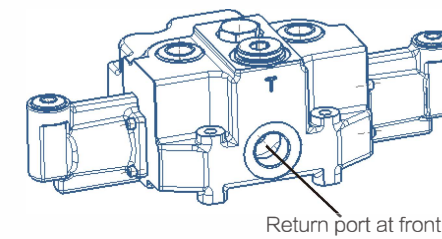


Inlet Port Option Code: P2(Inlet port at the top)

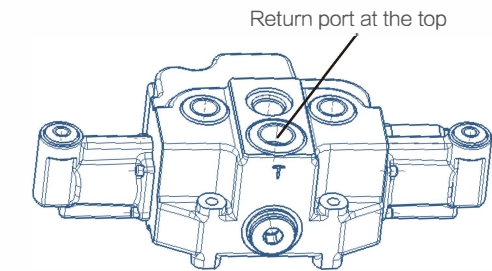


## Return Port Options

Return Port Option Code: T1(Return port at front)

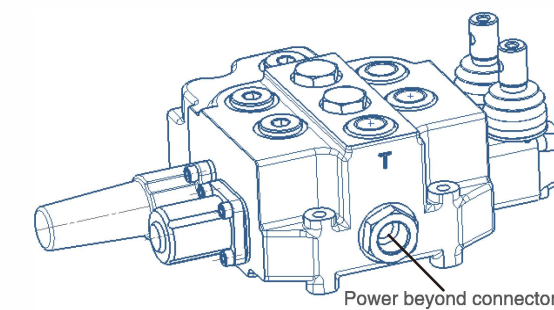


Return Port Option Code: T2(C)



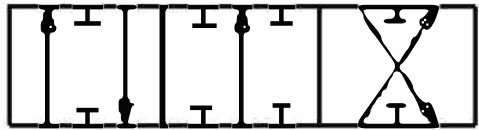
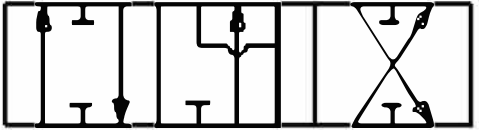
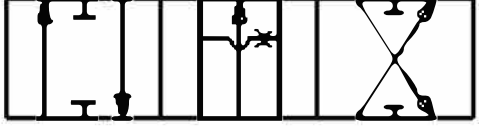
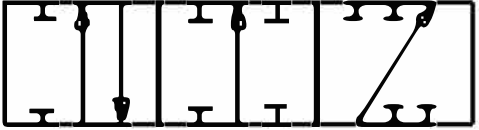
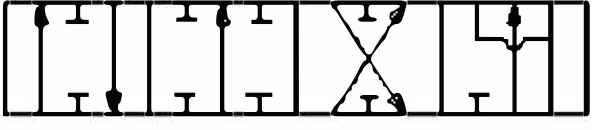

## Power Beyond Options

Power Beyond Port Option Code: D1(With power beyond), D0(No power beyond port)

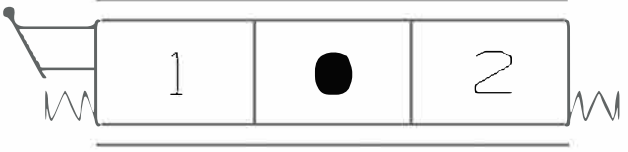
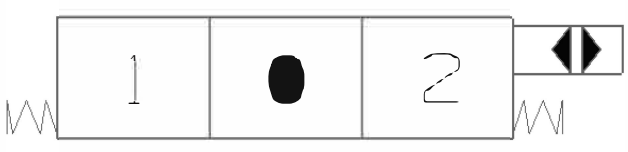
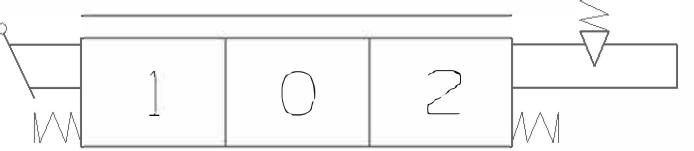
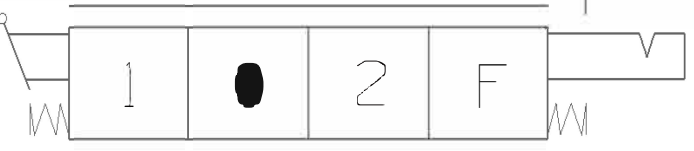
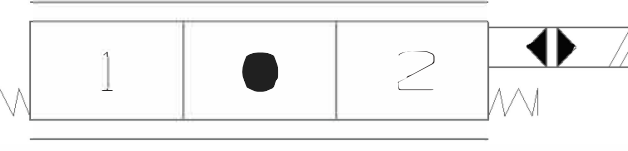
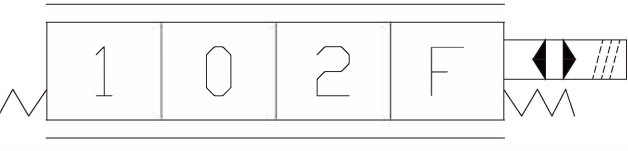




## Typical Spool Functions

Spool Function	Spool Type	Function	Notes
FG1		3-position 4-way At neutral: P, T, A, B are all blocked	Double acting cylinder applications
FG2		3-position 4-way At neutral: P blocked, T, A, B connected	Hydraulic motor applications
FG3		3-position 4-way At neutral: P, A, B and T all connected	Hydraulic motor applications
FG4		3-position 3-way At neutral: P, T, A, B all blocked	Single acting cylinder applications
FG5		4-position 4-way At neutral: P, T, A, and B are all blocked 4th position floating	Double acting cylinder applications
FG6		4-position 4-way At neutral: P blocked, T, A and B are connected 4th position floating	Double acting cylinder or hydraulic motor applications

## Drive Options

Drive Style Code	Hydraulic Schematic	Function
KQ1		Standard manual control
KQ2		Hydraulic remote
KQ3		Manual control with mechanical detent
KQ4		Manual control with 4th position floating and detent
KQ5		Electrical actuated ( on/off )
KQ6		Electrical actuated with floating function

## Ordering Code

**GDV80 -\* -P\* /\*\*\* -T\* -D\* -O1 -FG\* KQ\* -DC/\*\* -AR/\*\*\***  
 a | b | c | d | e | f | g | h | i | j | k

- Ⓐ Model
- Ⓑ Number of spools
- Ⓒ Inlet port code
- Ⓓ Inlet relief setting(bar)
- Ⓔ Return port code
- Ⓕ Power beyond
- Ⓖ First spool
- Ⓜ Spool function  
FG1、FG2、FG3、FG4、FG5、FG6
- Ⓨ Drive code  
KQ1、KQ2、KQ3、KQ4、KQ5、KQ6
- Ⓛ Electrical option  
12VDC、24VDC、00=none electrical
- Ⓚ Relief settings of the over load relief at A port(bar)  
If no relief, Input for pressure: 000

**-BR/\*\*\* -O2 .....**  
 l | m | n

- Ⓛ Relief settings of the over load relief at B port(bar)  
If no relief, Input for pressure: 000
- Ⓜ Second spool
- Ⓨ .....

## Ordering Example

**GDV80 -3 -P1 /210 -T1 -D1 -O1 -FG1 KQ1 -DC/00 -AR/250 -BR/190**  
 a | b | c | d | e | f | g | h | i | j | k | l

- Ⓐ Model
- Ⓑ 3 Spools
- Ⓒ Inlet port at front
- Ⓓ Inlet relief setting(210bar)
- Ⓔ Return port on top
- Ⓕ Power beyond
- Ⓖ First spool
- Ⓜ First spool function
- Ⓨ Standard manual control
- Ⓛ Not electrical
- Ⓚ 250 bar over load relief setting at A port
- Ⓛ 190 bar over load relief setting at B port

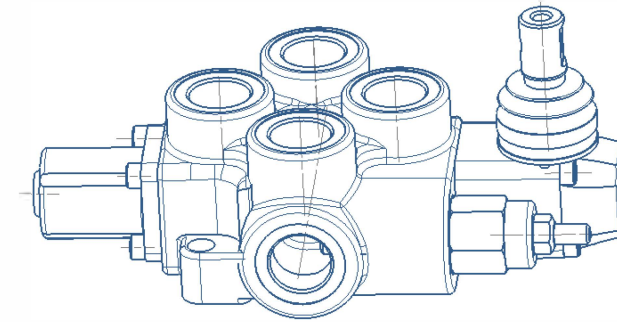
**-O2 -FG2 -KQ5 -DC/24 -AR/000 -BR/000 -O3 -FG2 -KQ2 -DC/00 -AR/220 -BR/000**  
 m | n | o | p | q | r | s | t | u | v | w | x

- Ⓜ Second spool
- Ⓨ Spool function  
FG1、FG2、FG3、FG4、FG5、FG6
- Ⓛ Electrical drive
- Ⓚ 24VDC
- Ⓛ No relief at A port
- Ⓕ Power beyond
- Ⓛ Third spool
- Ⓨ Spool function  
FG1、FG2、FG3、FG4、FG5、FG6
- Ⓛ Hydraulic remote
- Ⓨ Not electrical
- Ⓚ 220 bar relief setting at A port
- Ⓛ No relief at B port

## GDV120 Series Monoblock Valves

	50	└ Main Features
Technical Data ┘	50	
	51	└ Performance Data
Basic Operating Principle ┘	52	
	53	└ Dimensions
Inlet Port Options ┘	54	
	54	└ Return Port Options
Typical Spool Functions ┘	55	
	56	└ Drive Options
Ordering Code ┘	57	
	57	└ Ordering Example

## GDV120 Series Monoblock Valves



### Main Features

- Cast iron mono-block body.
- Spring cap, mechanical detent cap, as well as electrical or hydraulic pilot controlled module body are made by cast aluminum or die cast aluminum.
- Provides different drive modules (electrical, hydraulic remote, manually control, wire driving).
- Provides power beyond port.
- Provides different spool functions to be used for controlling double acting cylinder , single acting cylinders, hydraulic motors.
- Provides floating functions for spools.
- Provides mechanical detent.
- Provides excellent flow characteristics and small operating force.
- Can be made with 1-4 spools (now we can offer 1 spool).

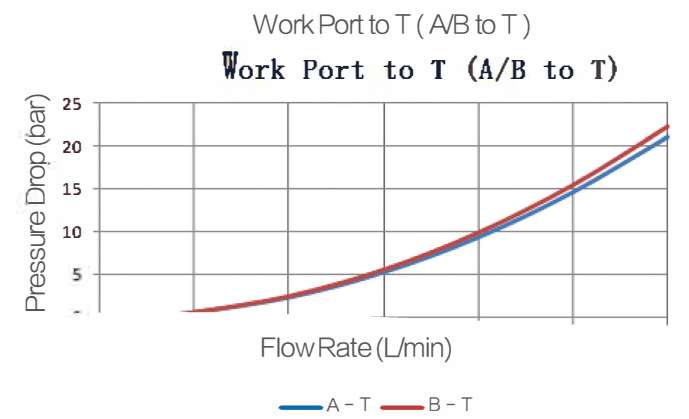
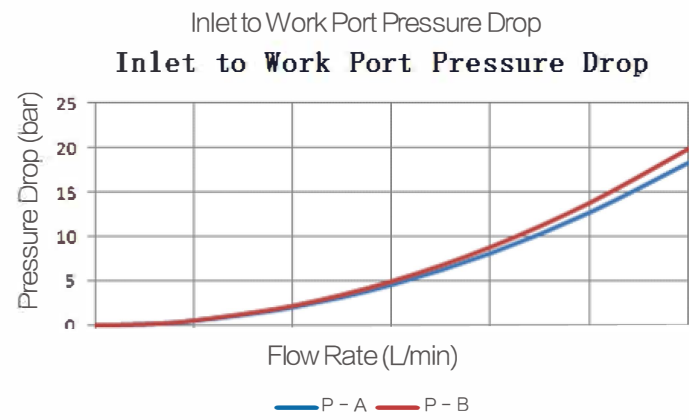
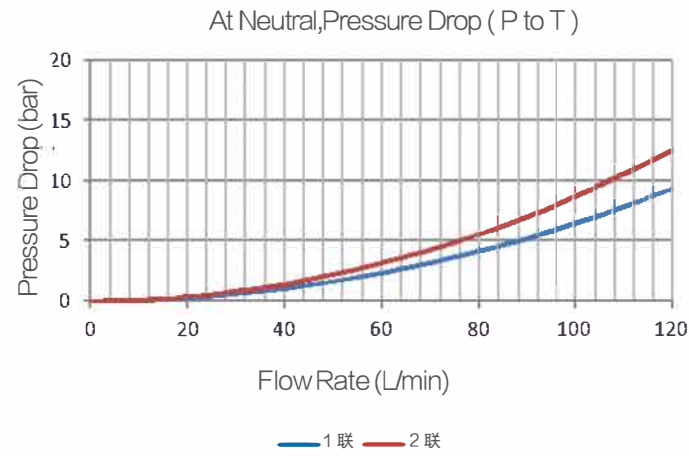
### Technical Data

Rated flow rate	120 L/min	With NBR(BUNA--N) seals	-20C° - 80C°
Maximum flow rate	130 L/min	With FPM(VITON) seals	-20C° - 100C°
Maximum pressure at P port	310 bar	Spool stroke(1、 2 position)	+7 -7mm
Maximum pressure at A、 B port	310 bar	With floating function(1、 2 、 F position)	+7 -7 -9mm
Maximum pressure at T port	25 bar	Recommend hydraulic oil viscosity range	15-75mm <sup>2</sup> /s
Internal leakage(@70 bar)	A、 B to T 30-35cc/min	Recommend temperature range	-40C° - 60C°

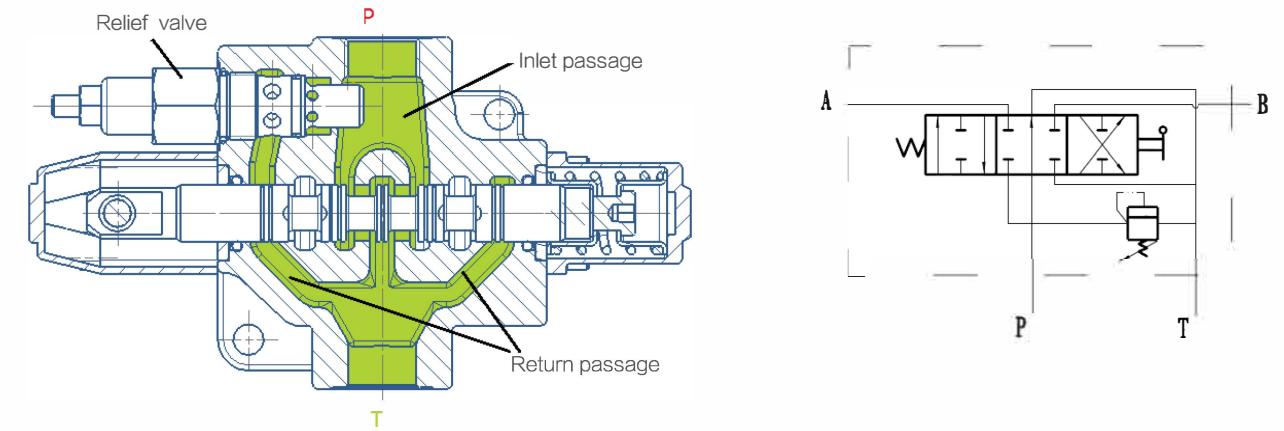
Solenoid can be either 12 VDC or 24 VDC, corresponding current is 0 - 1.5 or 0 - 0.75 Amp.



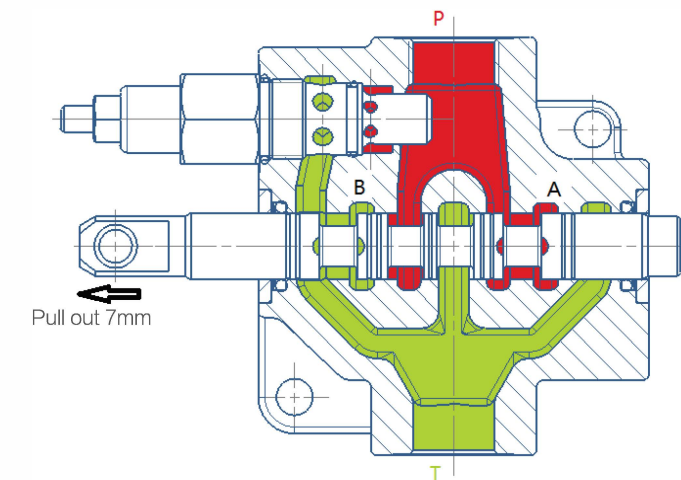
## Performance Data



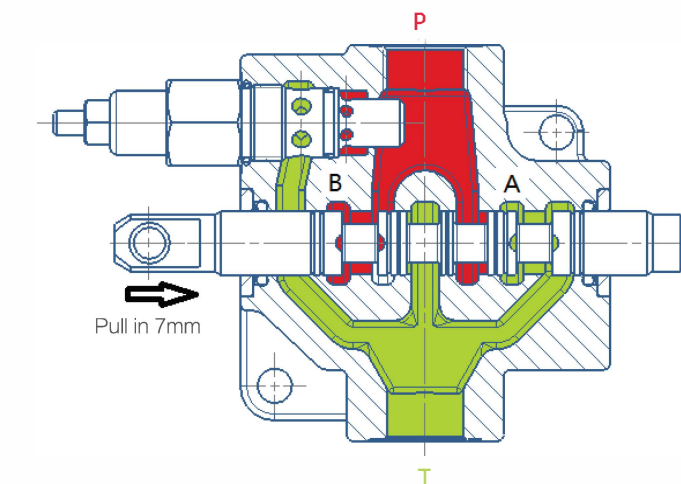
## Basic Operating Principle



GDV120 series mono-block valve is an open centered 3-position 4-way valve. When spool is in its neutral position, the flow from pump passes through the neutral passage to tank, with very low pressure drop.



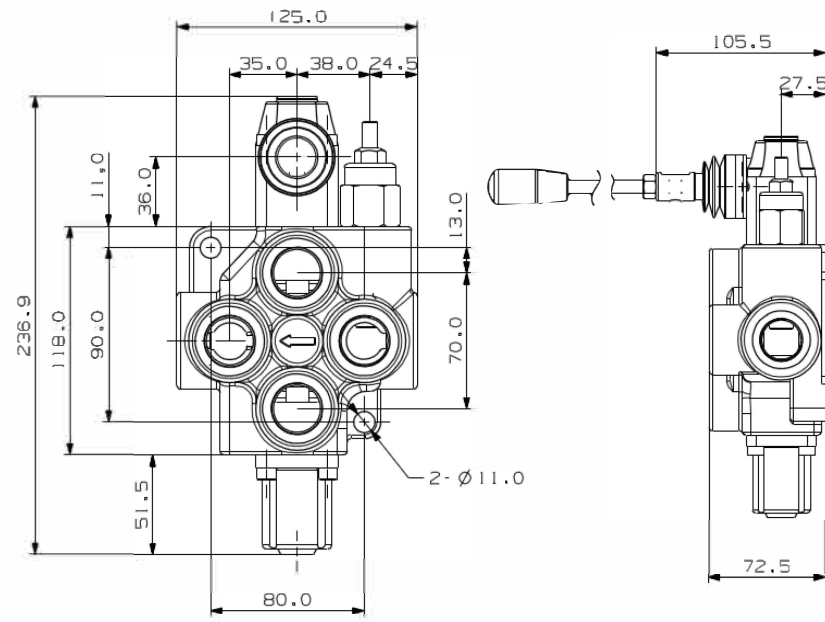
When spool is pulled out 7 mm, the neutral passage is blocked. Flow from pump passes through the spool opening on the right side to work port A. At the same time, the flow from port B passes to return passage, then to tank, through the spool opening on the left side of the spool.



When spool is pushed in 7 mm, the neutral passage is blocked. Flow from pump passes through the spool opening on the left side to work port B. At the same time, the flow from port A passes to return passage, then to tank, through the spool opening on the right side of the spool.

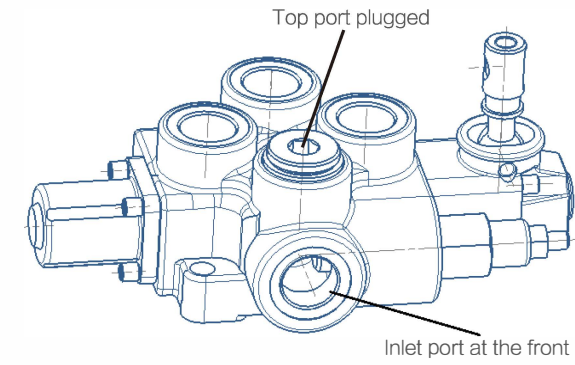
## Dimensions

GDV120-1:1 Spool Monoblock Valve

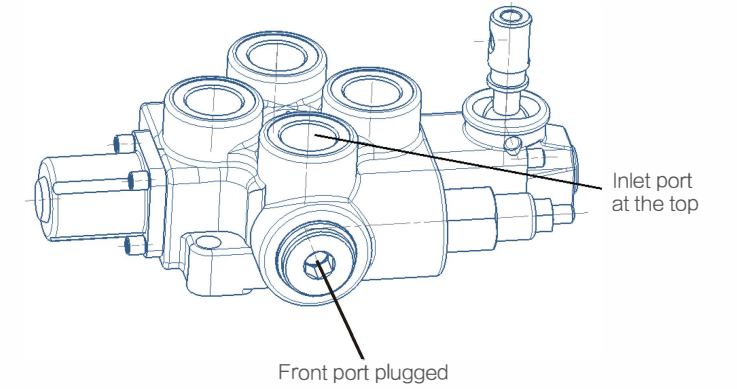


## Inlet Port Options

Inlet Option Code: P1(Inlet port at front)

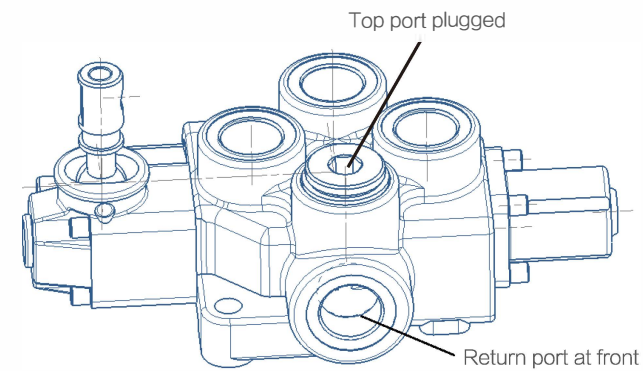


Inlet Port Option Code: P2(Inlet port at the top)

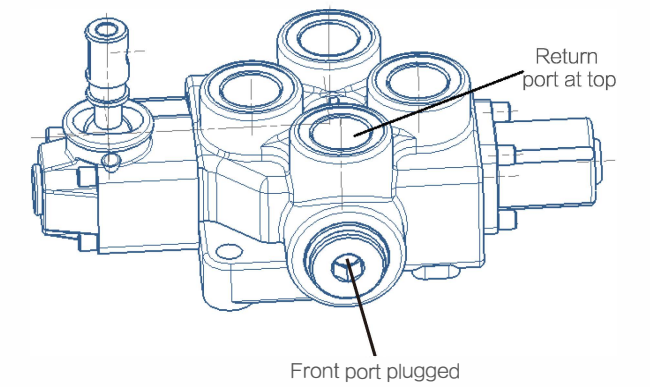


## Return Port Options

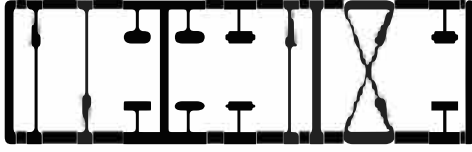

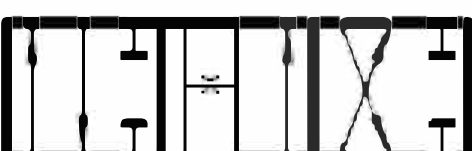
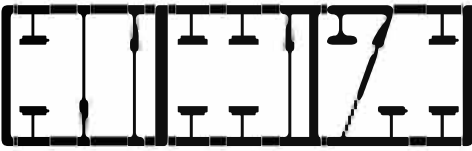


Return Port Option Code: T1(Return port at front)



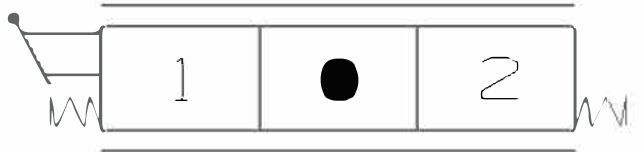
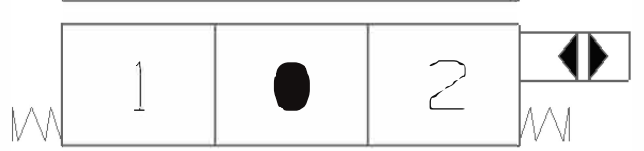
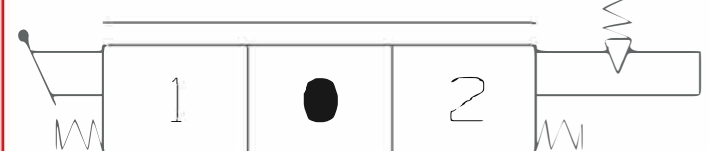
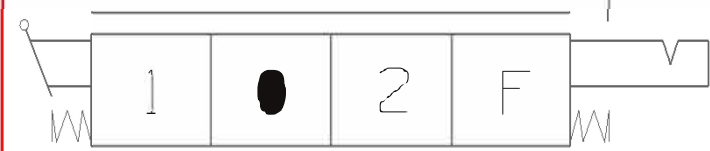
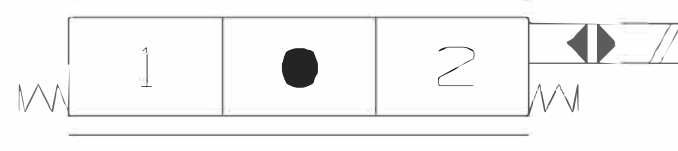
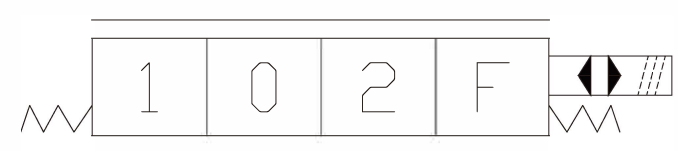
Return Port Option Ode: T2(Return port at the top)



### Typical Spool Functions

Spool Function	Spool Type	Function	Notes
FG1		3-position 4-way At neutral: P、T、A、B are all blocked	Double acting cylinder applications
FG2		3-position 4-way At neutral: P blocked,T、A、Bconnected	Hydraulic motor applications
FG3		3-position 4-way At neutral: P、A、B and T all connected	Hydraulic motor applications
FG4		3-position 3-way At neutral: P、T、A、B all blocked	Single acting cylinder applications
FG5 (not available)		4-position 4-way At neutral: P、T、A、 and B are all blocked 4th position floating	Double acting cylinder applications
FG6 (not available)		4-position 4-way At neutral: P blocked,T、A and B are connected 4th position floating	Double acting cylinder or hydraulic motor applications

### Drive Options

Drive Style Code	Hydraulic Schematic	Function
KQ1		Standard manual control
KQ2 (not available)		Hydraulic remote
KQ3		Manual control with mechanical detent
KQ4		Manual control with 4th position floating and detent
KQ5 (not available)		Electrical actuated ( on/off )
KQ6 (not available)		Electrical actuated with floating function



## Ordering Code

<b>GDV120</b>	<b>-P*</b>	<b>/***</b>	<b>-T*</b>	<b>-FG*</b>	<b>KQ*</b>
a	b	c	d	e	f

- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>Ⓐ Model</li> <li>Ⓑ Inlet port code</li> <li>Ⓒ Inlet relief setting(bar)</li> <li>Ⓓ Return port code</li> </ul> | <ul style="list-style-type: none"> <li>Ⓔ Spool function<br/>FG1、FG2、FG3、FG4、FG5、FG6</li> <li>Ⓕ Drive code<br/>KQ1、KQ2、KQ3、KQ4、KQ5、KQ6</li> </ul> |
|---|--|

## Ordering Example

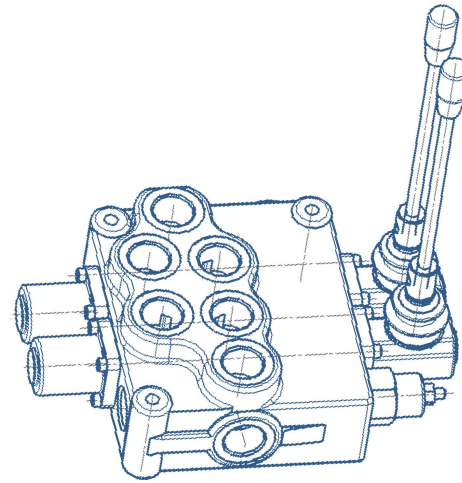
<b>GDV120</b>	<b>-P1</b>	<b>/210</b>	<b>-T1</b>	<b>-FG1</b>	<b>KQ1</b>
a	b	c	d	e	f

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>Ⓐ Model</li> <li>Ⓑ Inlet port at front</li> <li>Ⓒ Inlet relief setting(210bar)</li> <li>Ⓓ Return port at front</li> </ul> | <ul style="list-style-type: none"> <li>Ⓔ Spool function O type<br/>FG1、FG2、FG3、FG4、FG5、FG6</li> <li>Ⓕ Drive code<br/>KQ1、KQ2、KQ3、KQ4、KQ5、KQ6</li> </ul> |
|--|---|

## GDV160 Series Monoblock Valves

	<b>59</b>	<b>L</b> Main Features
Technical Data <b>L</b>	<b>59</b>	
	<b>60</b>	<b>L</b> Performance Data
Basic Operating Principle <b>L</b>	<b>61</b>	
	<b>62</b>	<b>L</b> Dimensions
Inlet Port Options <b>L</b>	<b>63</b>	
	<b>63</b>	<b>L</b> Return Port Options
Power Beyond Options <b>L</b>	<b>63</b>	
	<b>64</b>	<b>L</b> Typical Spool Functions
Drive Options <b>L</b>	<b>65</b>	
	<b>66</b>	<b>L</b> Ordering Code
Ordering Example <b>L</b>	<b>66</b>	

## GDV160 Series Monoblock Valves



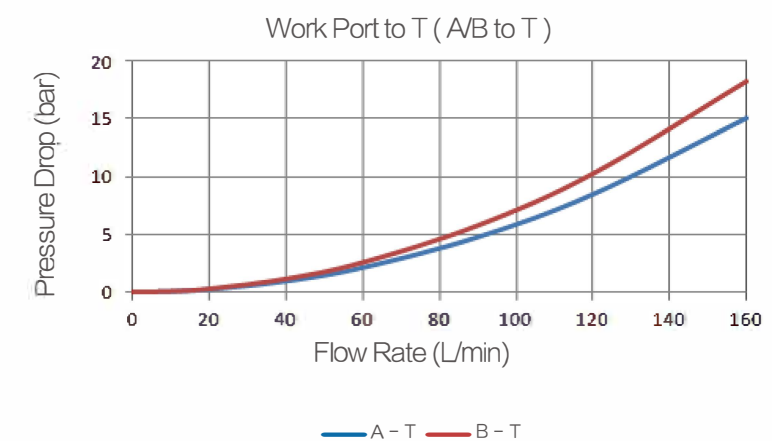
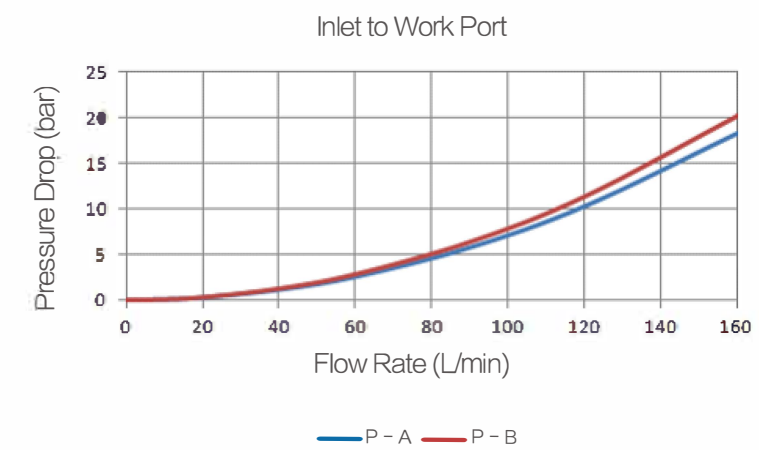
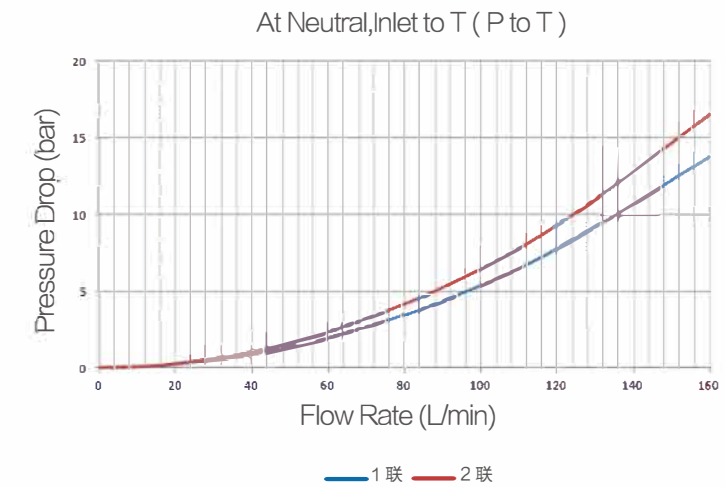
### Main Features

- Cast iron mono-block body.
- Spring cap and mechanical detent cap are made in die cast aluminum.
- Parallel circuit. Each spool has its own load check valve.
- Provides dump valve options for each work port.
- Provides different drive modules (electrical, hydraulic remote, manually control, wire driving).
- Provides power beyond port.
- Provides different spool functions to be used for controlling double acting cylinder , single acting cylinders, hydraulic motors.
- Provides floating functions for spools.
- Provides mechanical detent.
- Provides port relief options.
- Provides excellent flow characteristics and small operating force.
- Can be made with 1-4 spools (now we can offer 2 spools).

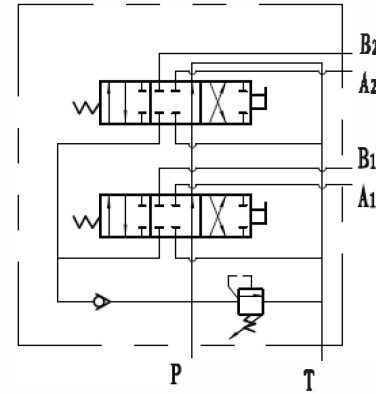
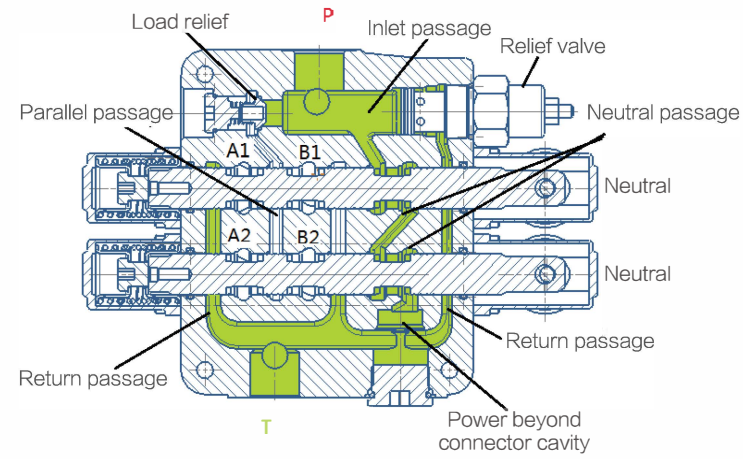
### Technical Data

Rated flow rate	160 L/min	With NBR(BUNA--N) seals	-20C° - 80C°
Maximum flow rate	170 L/min	With FPM(VITON) seals	-20C° - 100C°
Maximum pressure at P port	310 bar	Spool stroke(1、 2 position)	+7 -7mm
Maximum pressure at A、 B port	310 bar	With floating function(1、 2 、 F position)	+7 -7 -9mm
Maximum pressure at T port	25 bar	Recommend hydraulic oil viscosity range	15-75mm <sup>2</sup> /s
Internal leakage(@70 bar )	A、 B to T 30-35 cc/min	Recommend temperature range	-40C° - 60C°

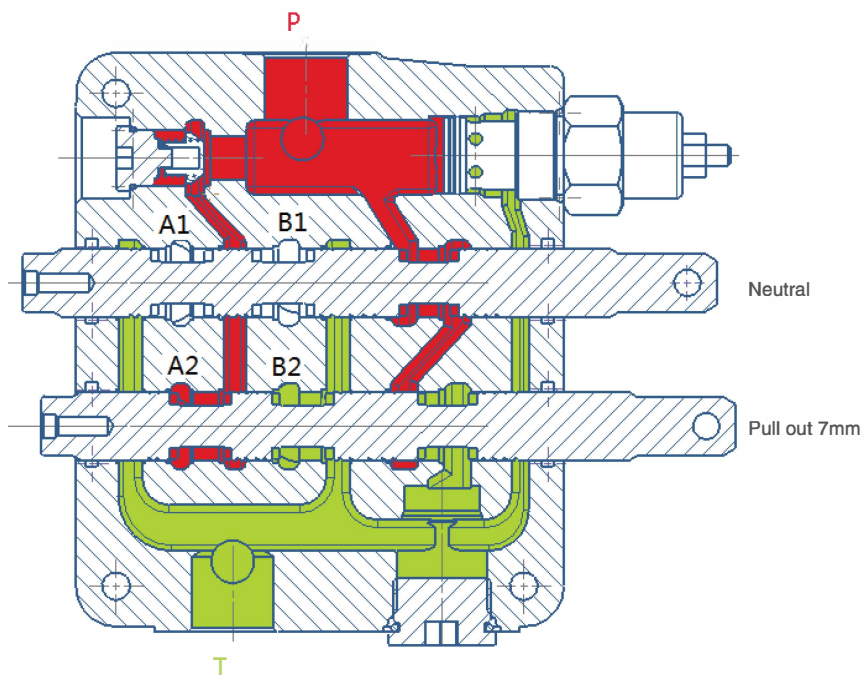
### Performance Data



## Basic Operating Principle



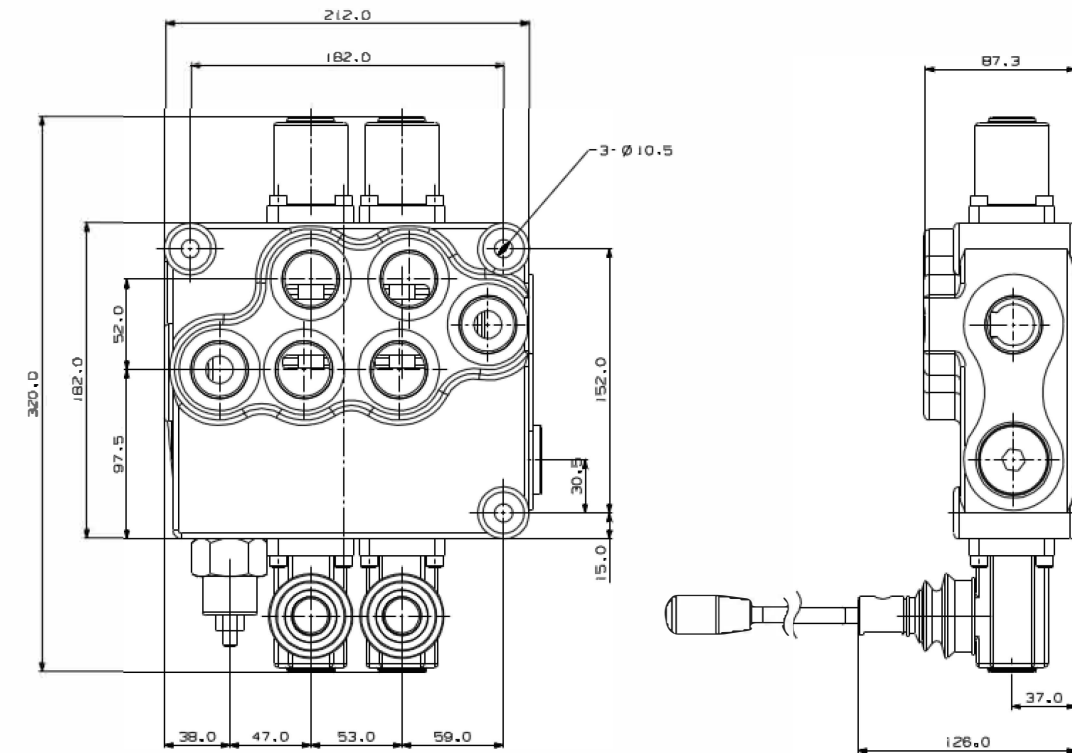
GDV160 series monoblock valve is an open centered 3-position 4-way valve. When spool is in its neutral position, the flow from pump passes through the neutral passage to tank, with very low pressure drop. When one of the spool is moved to 1 or 2 position, the neutral passage is blocked. The flow from pump can only pass through load check valve to parallel passage, then, through spool opening to work port A or B.



As shown in above picture, the first spool is in neutral position, flow from pump flows to parallel passage through the load check valve to supply flow to two spools. Because the second spool is pulled out 7mm, the second spool opening between parallel passage to A2 port allows flow to enter the A2 port. B2 port connected to return passage. Neutral passage is blocked by second spool.

## Dimensions

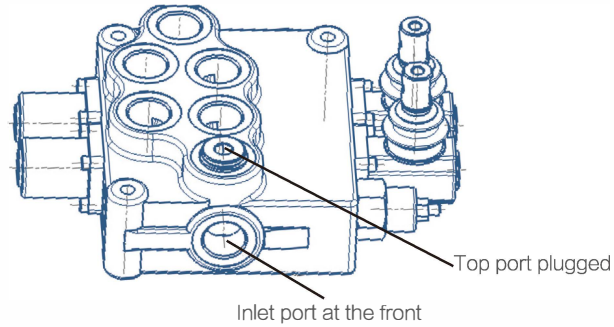
GDV160-2: 2 Spools Monoblock Valve



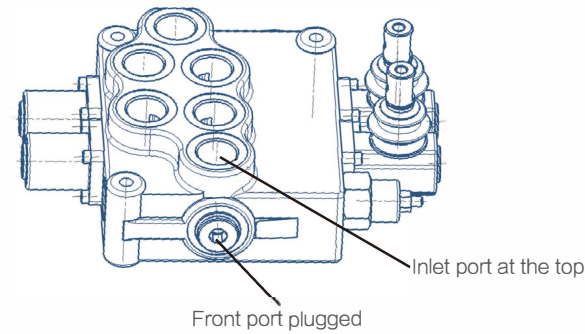


## Inlet Port Options

Inlet Option Code: P1(Inlet port at front)

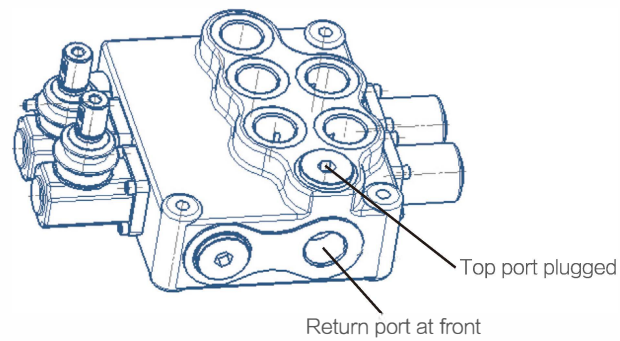


Inlet Port Option Code: P2(Inlet port at the top)

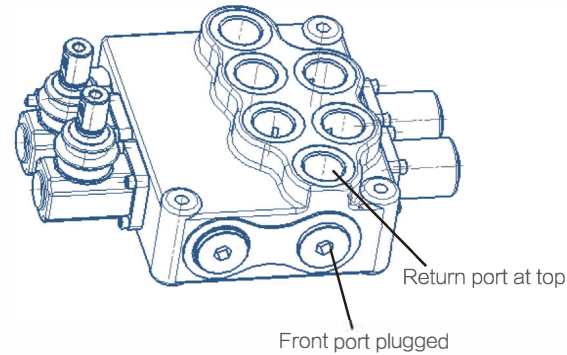


## Return Port Options

Return Port Option Code: T1(Return port at front)

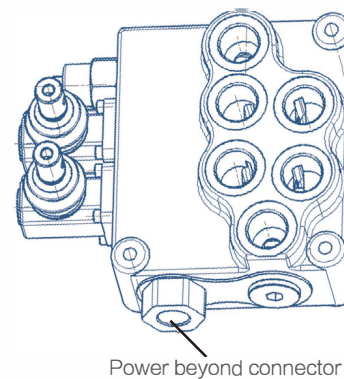


Return Port Option Code: T2(Return port at the top)



## Power Beyond Options

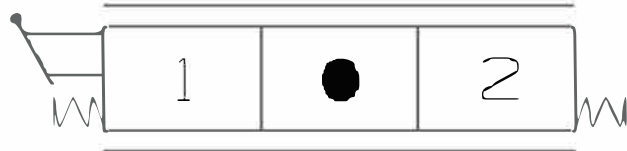
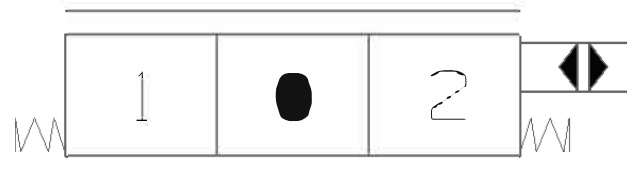
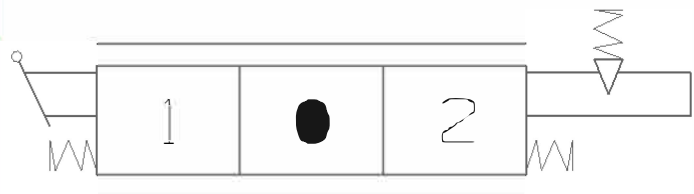
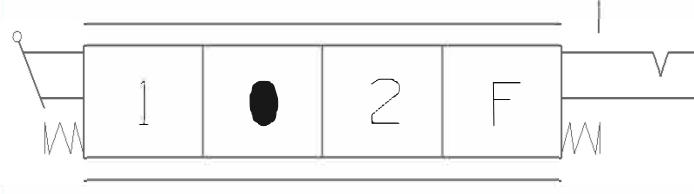
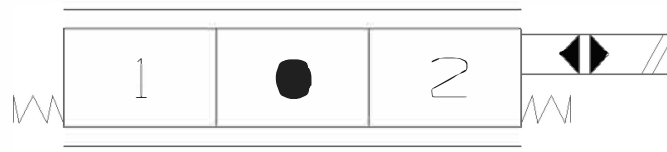
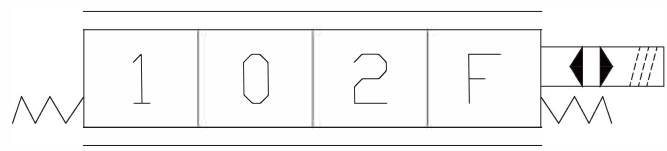
Power Beyond Option Code:  
D1(Pump flow output through a power beyond connector)  
D0(Without Power Beyond)



## Typical Spool Functions

Spool Function	Spool Type	Function	Notes
FG1		3-position 4-way At neutral: P、T、A、B are all blocked	Double acting cylinder applications
FG2		3-position 4-way At neutral: P blocked, T、A、B connected	Hydraulic motor applications
FG3		3-position 4-way At neutral: P、A、B and T all connected	Hydraulic motor applications
FG4		3-position 3-way At neutral: P、T、A、B all blocked	Single acting cylinder applications
FG5 (not available)		4-position 4-way At neutral: P、T、A、and B are all blocked 4th position floating	Double acting cylinder applications
FG6 (not available)		4-position 4-way At neutral: P blocked, T、A and B are connected 4th position floating	Double acting cylinder or hydraulic motor applications

## Drive Options

Drive Style Code	Hydraulic Schematic	Function
KQ1		Standard manual control
KQ2		Hydraulic remote
KQ3		Manual control with mechanical detent
KQ4		Manual control with 4th position floating and detent
KQ5 (not available)		Electrical actuated ( on/off )
KQ6 (not available)		Electrical actuated with floating function

## Ordering Code

**GDV160**   **-P\***   **/\*\*\***   **-T\***   **-D\***   **-O1**   **-FG\***   **KQ\***  
a            b            c            d            e            f            g            h

- Ⓐ Model
- Ⓑ Inlet port code
- Ⓒ Inlet relief setting(bar)
- Ⓓ Return port code
- Ⓔ Power beyond Option code

- Ⓕ First spool
- Ⓖ Spool function  
FG1、FG2、FG3、FG4、FG5、FG6
- Ⓗ Drive code  
KQ1、KQ2、KQ3、KQ4、KQ5、KQ6

**-O2**   **-FG\***   **-KQ\***  
i            j            k

- Ⓖ Second spool
- Ⓘ Spool function
- Ⓚ Drive code  
KQ1、KQ2、KQ3、KQ4、KQ5、KQ6

## Ordering Example

**GDV160**   **-P1**   **/210**   **-T1**   **-D0**   **-O1**   **-FG1**   **KQ1**  
a            b            c            d            e            f            g            h

- Ⓐ Model
- Ⓑ Inlet port at front
- Ⓒ Inlet relief setting(210bar)
- Ⓓ Return port at front

- Ⓔ Without power beyond
- Ⓕ First spool
- Ⓖ Spool function O type
- Ⓗ Manual control

**-O2**   **-FG2**   **-KQ1**  
i            j            k

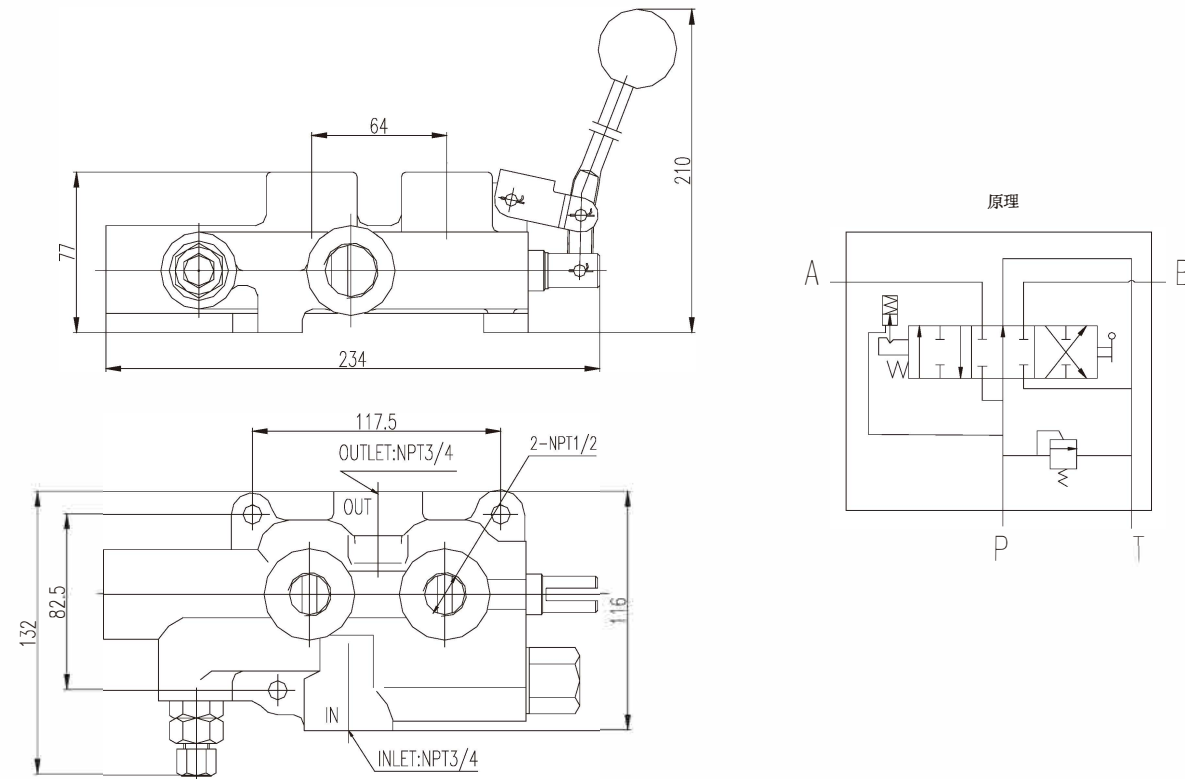
- Ⓖ Second spool  
FG1、FG2、FG3、FG4、FG5、FG6
- Ⓘ Spool function Y type
- Ⓚ Manual control

## LS-TW-20F Log Splitter Valve

### Specifications

Flow	95(L/min)
Relief Pressure	200(bar)
Detent Release Pressure	70 to 140 (bar)
Pressure Drop (P to A or B)	3bar(at 75L/min)
Pressure Drop (P to T)	0.8bar(at 75L/min)

### Installation Dimensions and Function Symbol



### Ordering Code

<b>LS</b>	<b>-TW</b>	<b>20</b>	<b>F</b>
a	b	c	d

Ⓐ Model

Ⓑ With pressure release detent

Ⓒ Nominal size (mm)

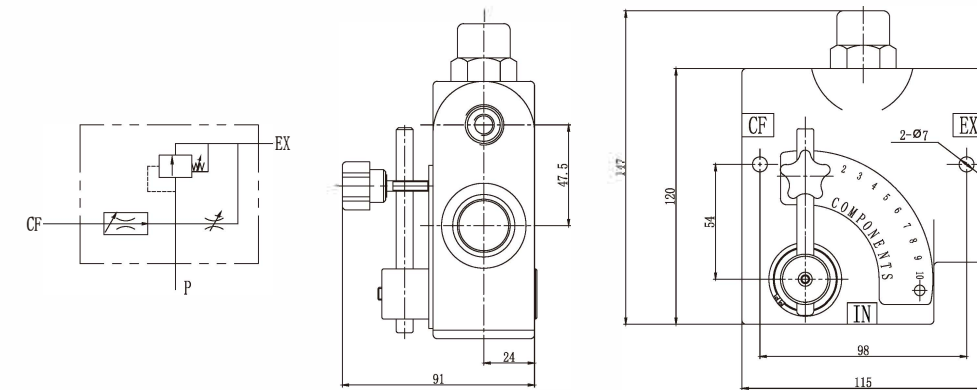
Ⓓ Pressure F:20Mpa

## Pressure Compensating Variable Flow Control Valve

### Specifications

Model	Oil Port	Flow (gpm)	Standard Pressure (bar)
LKF-40-3/8NPT	3/8" -NPT	0-30L/min(0-8gpm)	210
LKF-60-1/2NPT]	1/2" -NPT	0-60L/min(0-16gpm)	
LKF-114-3/4NPT	3/4" -NPT	0-114L/min(0-30gpm)	

### Installation Dimensions and Function Symbol



LKF model is a full range pressure compensating variable flow control. It is designed so that the orifice area varies as the lever is rotated. The outlet flow is smooth and constant regardless of the pressure on the control flow or excess flow ports. An adjustable ball spring relief allows for pressure compensated flow up to the pressure setting on the relief. Relief valves are preset at 1500 psi and field adjustable from 750 to 3000 psi.

