

# Hydraulus



## Model Code

|    |   |    |   |     |     |
|----|---|----|---|-----|-----|
| EM | 1 | 63 | B | D31 | 72° |
|----|---|----|---|-----|-----|

Yongchang crankshaft and connecting rod low speed high torque hydraulic motor

Series

Nominal displacement (ml/r)

### Form of output shaft

1. Omit---standard rectangular spline shaft ( the center is up to exterior diameter).
2. B---Flat key shaft: Footnote number---the installation dimension is the same as BM motors series model (with flange).
3. I--- Internal spline shaft ( the center is up to interior diameter). Footnote number---the installation dimension is the same as QJM series motors(with Flange).

Omit-mounting hole position, same as illustrated

"Left deviation" indicates that one mounting hole is right below it when there is no flange. (I.e.: two corners face downward when installing the motor.)

"Right deviation" indicates that one mounting hole is right above it when there is no flange. (I.e.:one corners face upward when installing the moter.)

Distributor Type: No marked, standard.

If you have special requirements, please mark your requirements in the order.

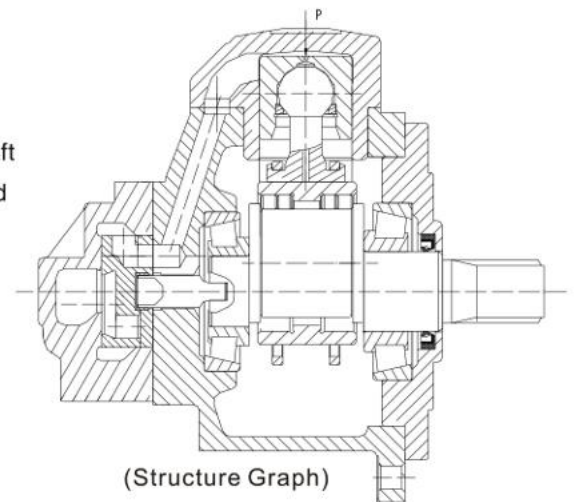
"Left deviation" and "Right deviation" are only applicable for EM2~EM11 series of motors, and oil inlet and outlet are horizontal. (Same as illustrated)

#### Product Feature:

EM series of low-speed and high-torque hydraulic motors with crankshaft and connecting rod are produced according to the technology and standard provided by Italy. On such a foundation, we also have constant technological improvement according to market demand, so as to improve the performance of the products.

The main features include:

1. Low noise due to an eccentric crankshaft and low excitation frequency of five-piston design;
2. Revolve steadily under very low speed due to high starting torque and good low-speed stability;
3. Good reliability and less leakage due to the patented flat compensation distributor, special sealing between piston and plunger bushing guarantees higher volumetrical efficiency;
4. High mechanical efficiency due to roller bearing between crankshaft and connecting rod;
5. Reversible rotation, and the output shaft can bear certain external force from both radial and axial directions;
6. High power-mass ratio, small volume and light weight.



#### Calculation:

1. Actual output torque :  $M = 0.159 (P_1 - P_2) V \cdot \eta_m$  (N.m)

where :  $P_1, P_2$  ----- (MPa) inlet and outlet pressure (MPa)

$V$  ----- displacement (ml/r)

$\eta_m$  ----- mechanical efficiency (%)

2. Output power :  $N = \frac{M \cdot n}{9550}$  (kW)

$N = \frac{q (P_1 - P_2)}{60000} \eta_m \eta_v$  (kW)

where :  $n$  ----- speed (r/min)

$q$  ----- input flow (ml/min)

$\eta_v$  ----- volumetrical efficiency (%)

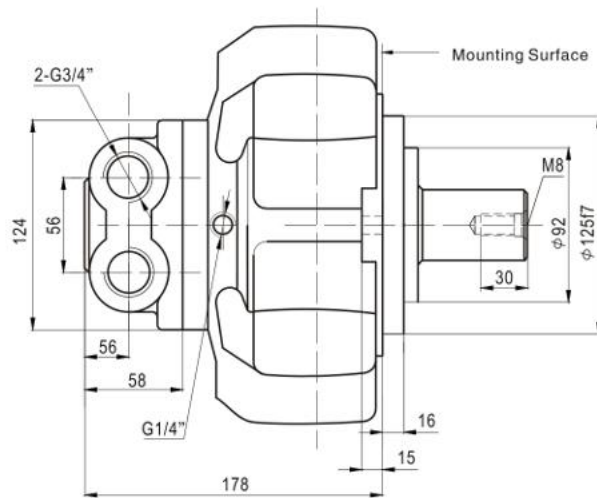
3. Speed :  $n = \frac{q}{V} \eta_v$  (r/min)

#### Note:

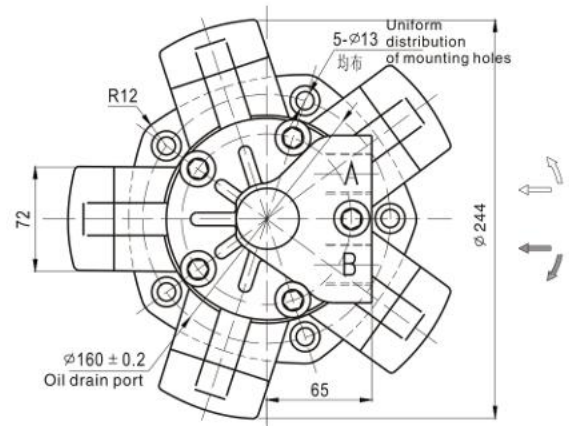
1. Filtration: the recommended filtration precision for normal industrial use is  $25 \mu m$ , and allowable precision low pressure, low speed or interval is  $75 \mu m$ .
2. Oil viscosity: the optimum performance could only be obtained under proper oil viscosity between 15–1000cst.
3. Before the first start-up, it must fill hydraulic oil in the hydraulic motor body, to avoid the damage.
4. Leakage: drain port should be connected separately to the tank. Normally the maximum pressure for the motor body is 0.1 Mpa, and it could also be improved to bear 3–5 Mpa, to meet special requirements.
5. The top line of the drain pipe should be higher than that of the motor body, in case emptying oil storage.
6. Installation: motor can be installed in any position with rigid support, When installed, shafts of the motor and its transmission should be concentric.
7. Cleanness: Strictly maintain the cleanness of the oil port, and keep any solid particles away.
8. Release both the radial and axial loads of the output shaft to enable longer life of the motor.

| Model     | Displacement<br>(ml/r) | Rated Pressure<br>(Mpa) | Peak Pressure<br>(Mpa) | Rated Torque<br>(N.m) | Theoric Specific<br>(N.m/Mpa) | Speed Range<br>(r/min) | Weight<br>(kg) |
|-----------|------------------------|-------------------------|------------------------|-----------------------|-------------------------------|------------------------|----------------|
| EM1-63    | 77                     | 25                      | 32                     | 284                   | 11                            | 15~1500                | 20             |
| EM1-80    | 91                     | 25                      | 32                     | 335                   | 13                            | 15~1250                | 20             |
| EM1-100   | 96                     | 25                      | 32                     | 355                   | 14                            | 15~1000                | 20             |
| EM1-110   | 113                    | 25                      | 32                     | 419                   | 17                            | 15~1000                | 20             |
| EM1-125   | 126                    | 20                      | 25                     | 371                   | 19                            | 15~1000                | 20             |
| EM1-140   | 138                    | 20                      | 25                     | 410                   | 20                            | 15~1000                | 20             |
| EM1-160   | 159                    | 16                      | 20                     | 376                   | 24                            | 15~1000                | 20             |
| EM1-200   | 196                    | 16                      | 20                     | 464                   | 29                            | 15~800                 | 20             |
| EM2-100   | 113                    | 25                      | 32                     | 419                   | 17                            | 15~1250                | 27             |
| EM2-125   | 138                    | 25                      | 32                     | 512                   | 20                            | 15~1250                | 27             |
| EM2-150   | 159                    | 25                      | 32                     | 588                   | 24                            | 15~1000                | 27             |
| EM2-175   | 180                    | 20                      | 25                     | 532                   | 27                            | 15~1000                | 27             |
| EM2-200   | 207                    | 20                      | 25                     | 611                   | 31                            | 8~800                  | 27             |
| EM2-250   | 235                    | 16                      | 20                     | 556                   | 35                            | 8~630                  | 27             |
| EM2-280   | 276                    | 16                      | 20                     | 653                   | 41                            | 8~500                  | 27             |
| EM3-175   | 181                    | 25                      | 32                     | 670                   | 27                            | 8~1000                 | 35             |
| EM3-200   | 201                    | 25                      | 32                     | 743                   | 30                            | 8~800                  | 35             |
| EM3-220   | 222                    | 25                      | 32                     | 819                   | 33                            | 8~800                  | 35             |
| EM3-250   | 254                    | 20                      | 25                     | 752                   | 38                            | 8~630                  | 35             |
| EM3-300   | 289                    | 20                      | 25                     | 856                   | 43                            | 6~500                  | 35             |
| EM3-350   | 340                    | 20                      | 25                     | 1000                  | 50                            | 6~400                  | 35             |
| EM3-400   | 380                    | 18                      | 22.5                   | 1008                  | 56                            | 6~350                  | 35             |
| EM6-400   | 397                    | 25                      | 32                     | 1469                  | 59                            | 5~630                  | 57.5           |
| EM6-450   | 452                    | 25                      | 32                     | 1672                  | 67                            | 5~630                  | 57.5           |
| EM6-500   | 491                    | 20                      | 25                     | 1451                  | 73                            | 5~500                  | 57.5           |
| EM6-600   | 594                    | 20                      | 25                     | 1756                  | 88                            | 4~500                  | 57.5           |
| EM6-700   | 683                    | 16                      | 20                     | 1616                  | 101                           | 4~400                  | 57.5           |
| EM6-750   | 754                    | 16                      | 20                     | 1785                  | 112                           | 4~320                  | 57.5           |
| EM8-600   | 617                    | 25                      | 32                     | 2282                  | 91                            | 4~500                  | 72             |
| EM8-700   | 710                    | 25                      | 32                     | 2626                  | 105                           | 4~400                  | 72             |
| EM8-800   | 810                    | 20                      | 25                     | 2396                  | 120                           | 4~400                  | 72             |
| EM8-900   | 889                    | 20                      | 25                     | 2629                  | 131                           | 3~350                  | 72             |
| EM8-1000  | 1000                   | 16                      | 20                     | 2366                  | 148                           | 3~300                  | 72             |
| EM11-700  | 707                    | 25                      | 32                     | 2612                  | 104                           | 4~400                  | 94             |
| EM11-800  | 784                    | 25                      | 32                     | 2899                  | 116                           | 4~400                  | 94             |
| EM11-900  | 894                    | 25                      | 32                     | 3306                  | 132                           | 4~400                  | 94             |
| EM11-1000 | 981                    | 20                      | 25                     | 2902                  | 145                           | 3~320                  | 94             |
| EM11-1100 | 1104                   | 20                      | 25                     | 3265                  | 163                           | 3~320                  | 94             |
| EM11-1200 | 1234                   | 16                      | 20                     | 2919                  | 182                           | 3~320                  | 94             |
| EM11-1300 | 1301                   | 16                      | 20                     | 3079                  | 192                           | 3~250                  | 94             |
| EM16-1400 | 1413                   | 25                      | 32                     | 5224                  | 209                           | 2~400                  | 170            |
| EM16-1600 | 1648                   | 20                      | 25                     | 4874                  | 244                           | 2~400                  | 170            |
| EM16-1800 | 1815                   | 20                      | 25                     | 5367                  | 268                           | 2~350                  | 170            |
| EM16-2000 | 2035                   | 18                      | 22.5                   | 5416                  | 301                           | 2~350                  | 170            |
| EM16-2400 | 2267                   | 16                      | 20                     | 5364                  | 335                           | 2~250                  | 170            |
| EM31-2500 | 2553                   | 25                      | 32                     | 9438                  | 378                           | 2~200                  | 298            |
| EM31-2800 | 2683                   | 20                      | 25                     | 7935                  | 397                           | 1~200                  | 298            |
| EM31-3000 | 3063                   | 20                      | 25                     | 9057                  | 453                           | 1~200                  | 298            |
| EM31-3150 | 3218                   | 20                      | 25                     | 9518                  | 476                           | 1~160                  | 298            |
| EM31-3500 | 3561                   | 20                      | 25                     | 10530                 | 527                           | 1~160                  | 298            |
| EM31-4000 | 4153                   | 18                      | 22.5                   | 11053                 | 614                           | 1~160                  | 298            |
| EM31-4500 | 4522                   | 16                      | 20                     | 10698                 | 669                           | 1~160                  | 298            |
| EM31-5000 | 4828                   | 16                      | 20                     | 11423                 | 714                           | 1~160                  | 298            |
| EM70-5000 | 4968                   | 20                      | 25                     | 14626                 | 731                           | 1~160                  | 550            |
| EM70-5400 | 5452                   | 20                      | 25                     | 16125                 | 806                           | 1~160                  | 550            |
| EM70-6000 | 5984                   | 20                      | 25                     | 17697                 | 885                           | 0.5~125                | 550            |
| EM70-6300 | 6540                   | 18                      | 22.5                   | 17408                 | 967                           | 0.5~125                | 550            |
| EM70-7000 | 7122                   | 16                      | 20                     | 16849                 | 1053                          | 0.5~125                | 550            |

## EM1-63~200 INSTALLATION DIMENSIONS

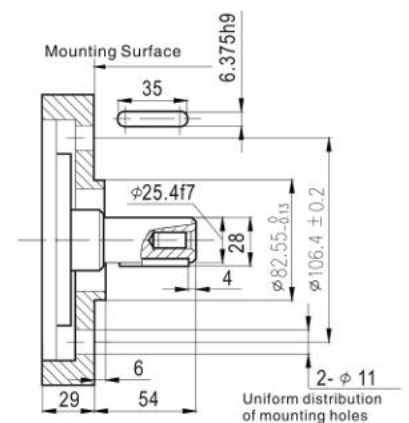
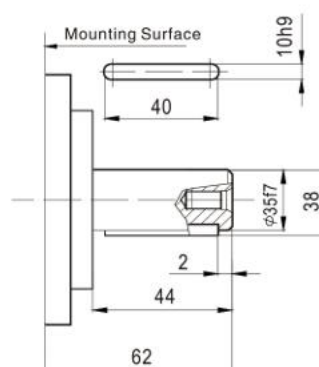
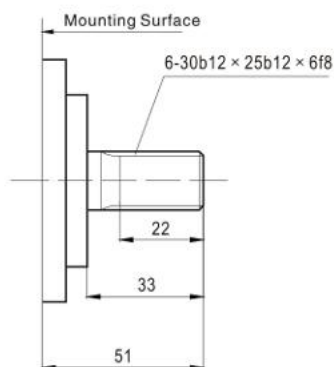


Standard Spline:  
EM1 - \*\*

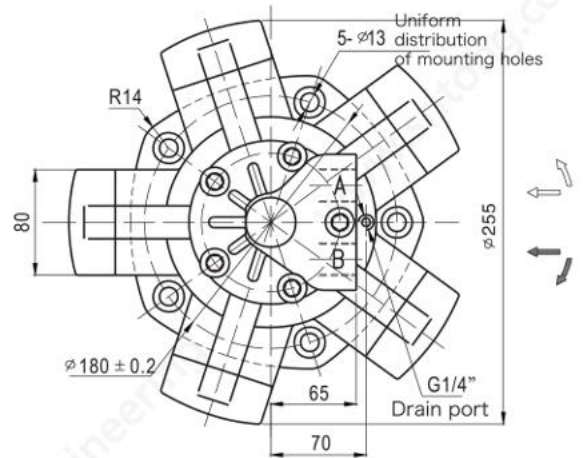
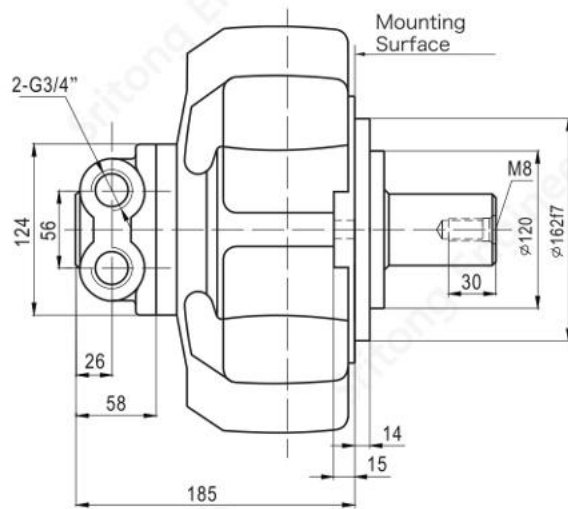


Standard Parallel Key:  
EM1 - \*\*B

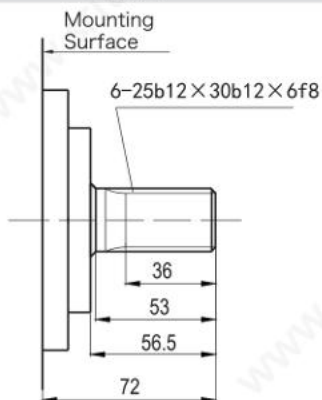
EM3- \*\*B3



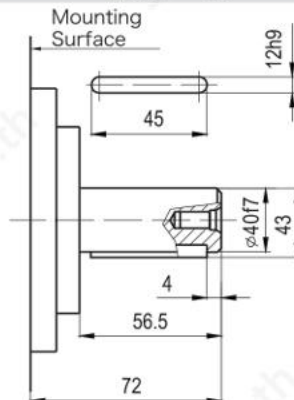
## EM2-100~280 INSTALLATION DIMENSIONS



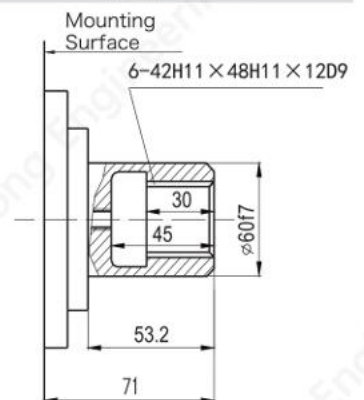
**Standard Spline:**  
EM2 - \*\*



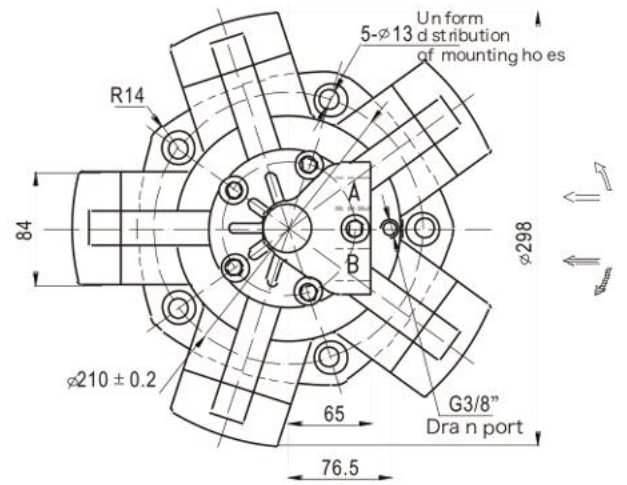
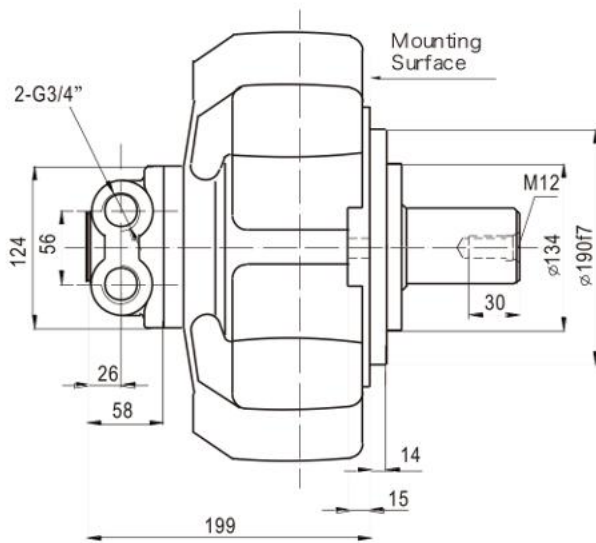
**Standard Parallel Key:**  
EM2 - \*\*B



**Standard Internal:**  
EM2- \*\*I



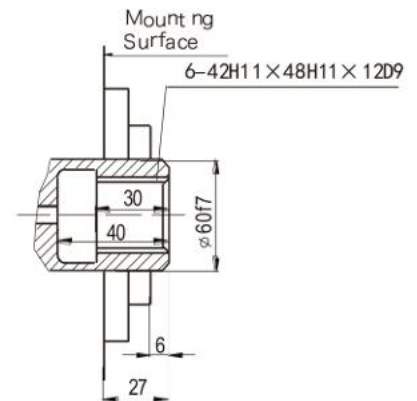
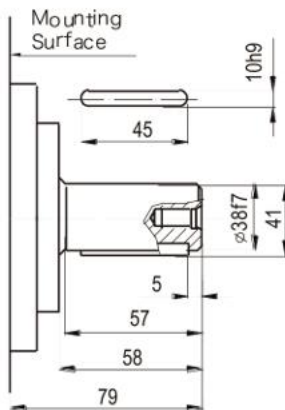
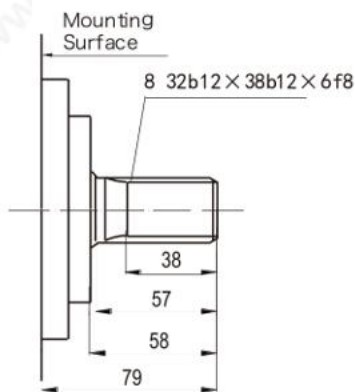
## EM3-175~400 INSTALLATION DIMENSIONS



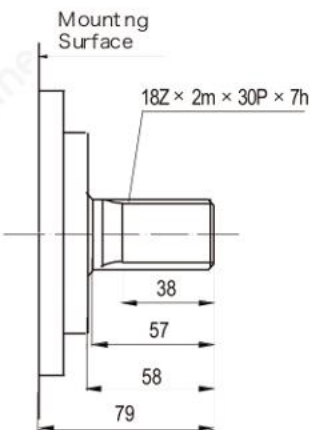
Standard Spline:  
EM3 - \*\*

Standard Parallel Key:  
EM3 - \*\*B

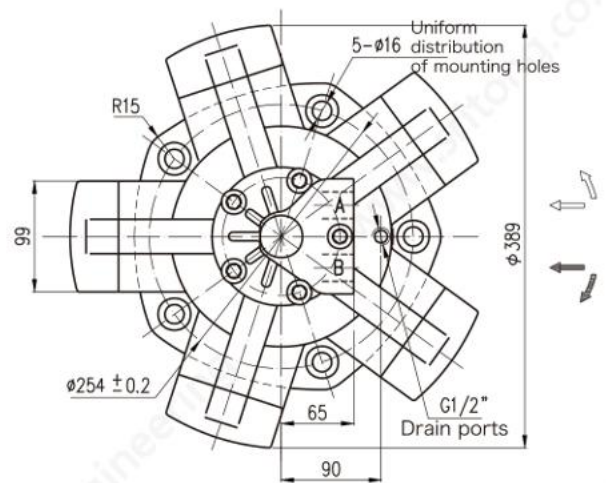
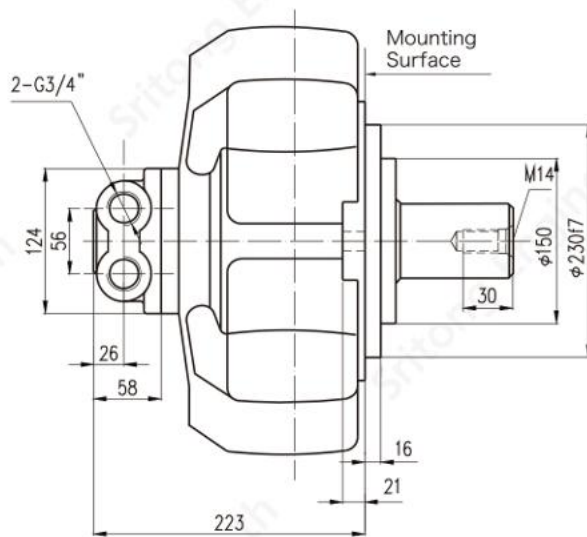
Standard Internal:  
EM3- \*\*I



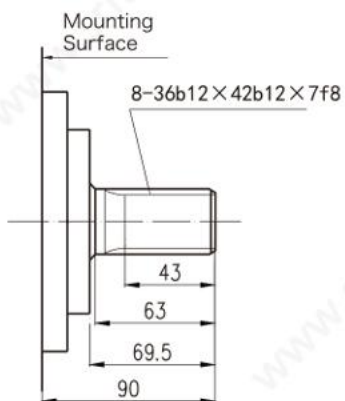
EM3- \*\*A



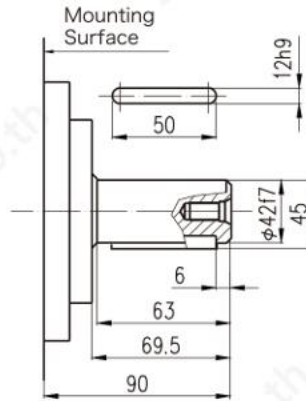
## EM6-400~750 INSTALLATION DIMENSIONS



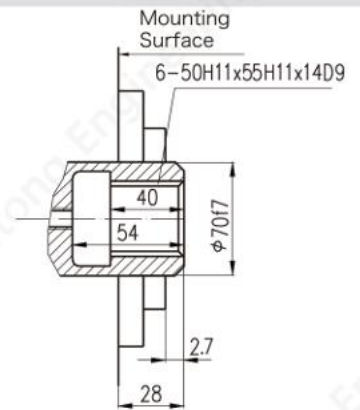
**Standard Spline:  
EM3 - \*\***



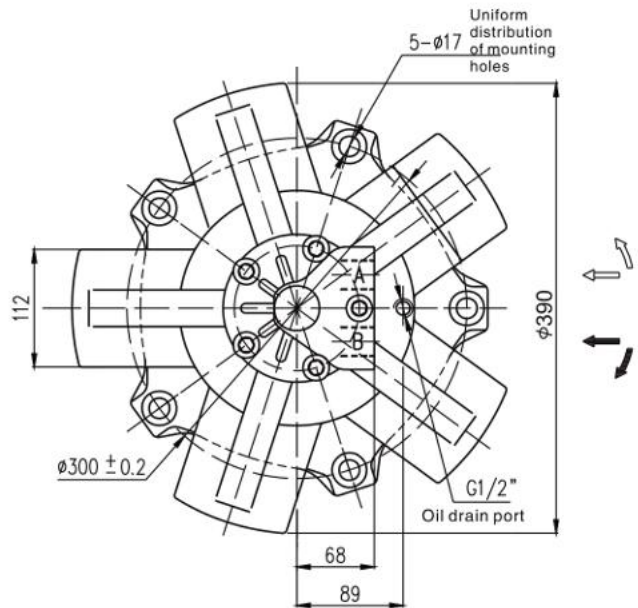
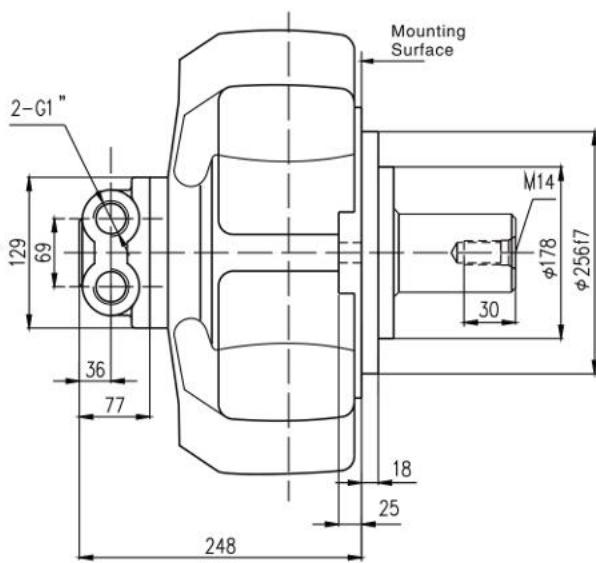
**Standard Parallel Key:  
EM3 - \*\*B**



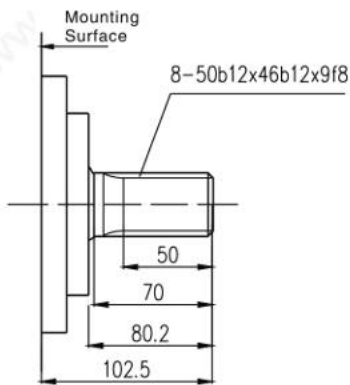
**Standard Internal:  
EM3- \*\*I**



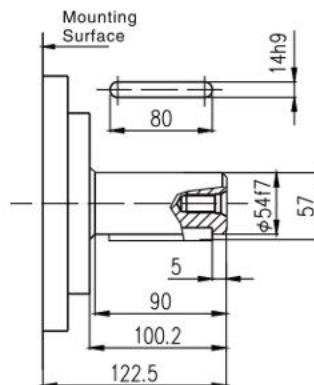
## EM8-600~1000 INSTALLATION DIMENSIONS



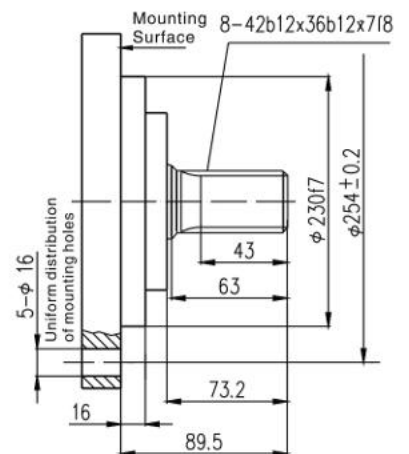
**Standard Spline:**  
EM8 - \*\*



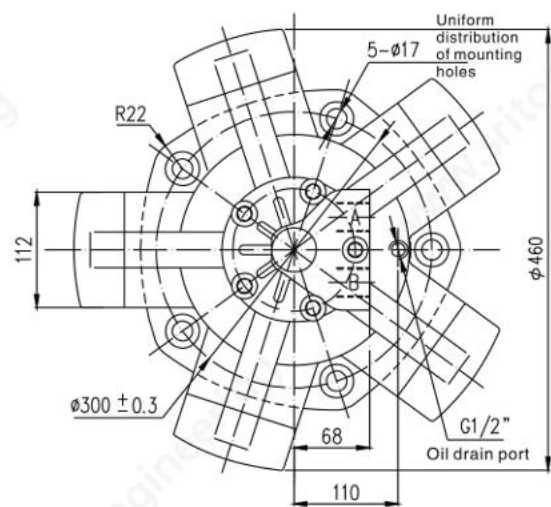
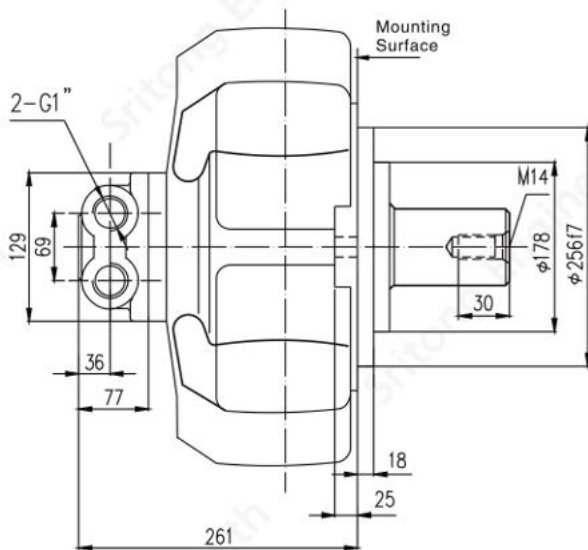
**Standard Parallel Key:**  
EM8 - \*\*B



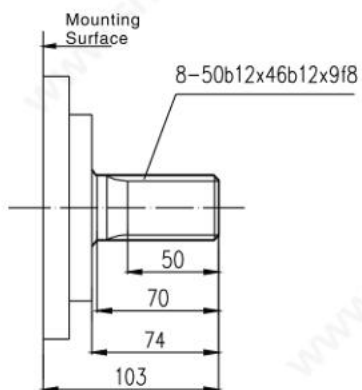
**Standard Internal:**  
EM8- \*\*6M



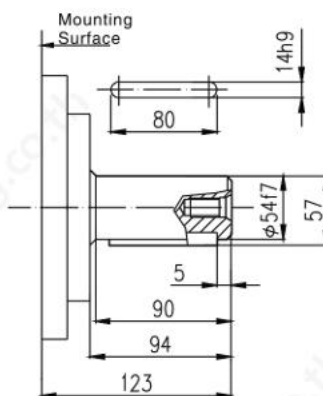
## EM11-700~1300 INSTALLATION DIMENSIONS



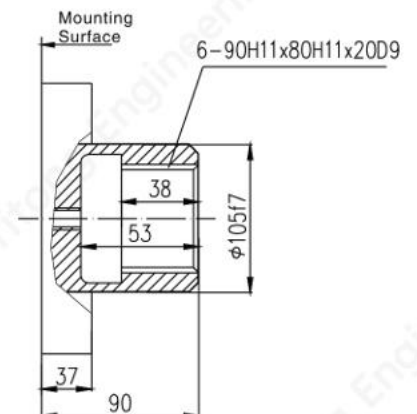
**Standard Spline:**  
EM11 - \*\*



**Standard Parallel Key:**  
EM11 - \*\*B



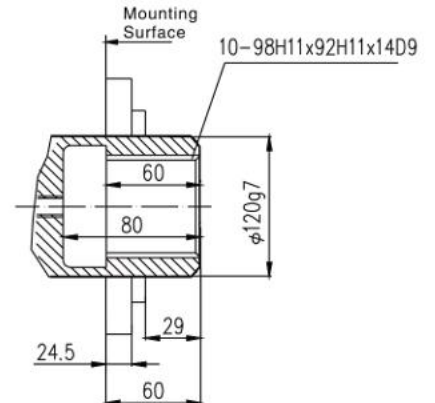
**Standard Internal:**  
EM11- \*\*I



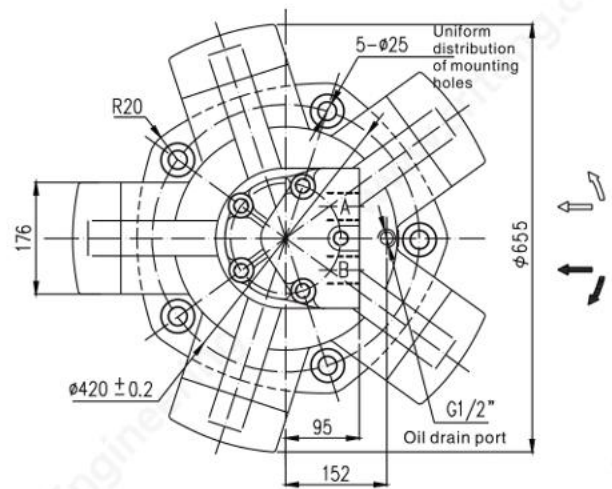
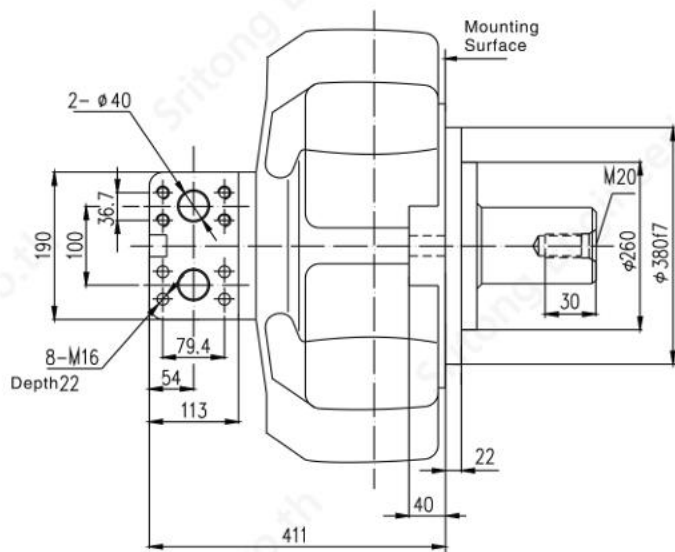
Standard Spline:  
EM16 - \*\*

Standard Parallel Key:  
EM16 - \*\*B

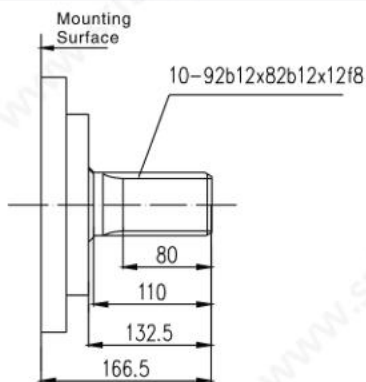
Standard Internal:  
EM16- \*\*I



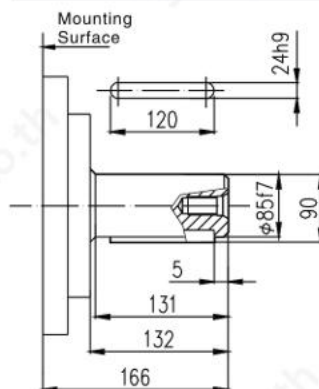
## EM31-2500~5000 INSTALLATION DIMENSIONS



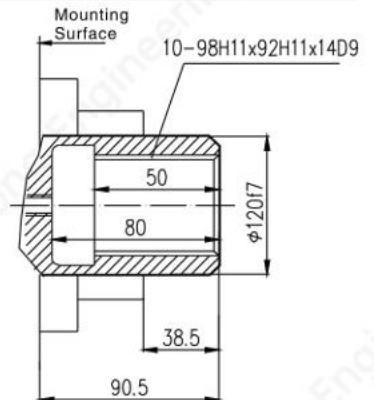
**Standard Spline:**  
EM31 - \*\*



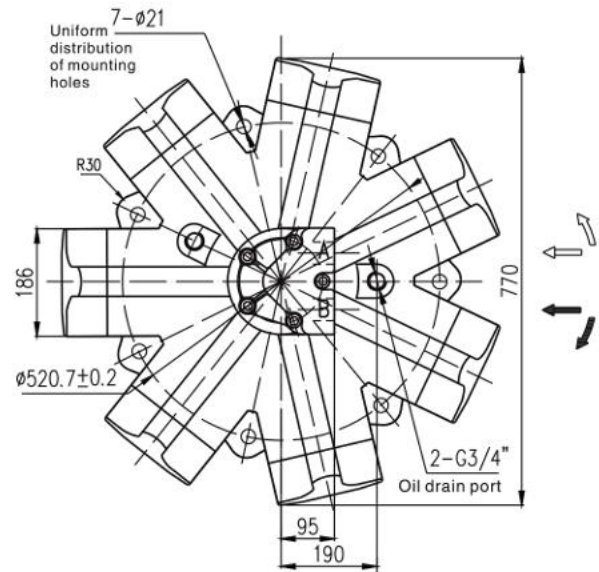
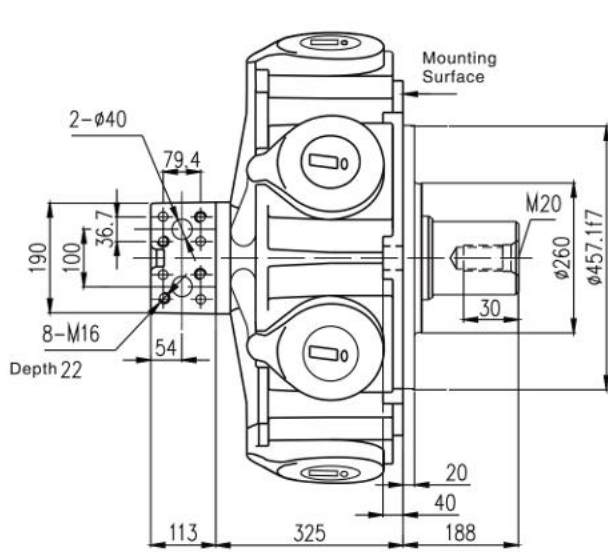
**Standard Parallel Key:**  
EM31 - \*\*B



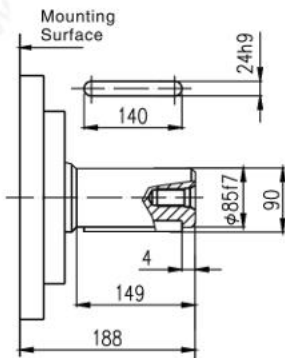
**Standard Internal:**  
EM31- \*\*I



## EM70-5000~7000 INSTALLATION DIMENSIONS



### Standard Spline: EM70 - \*\*B



# DISTRIBUTOR

## Standard Distributor

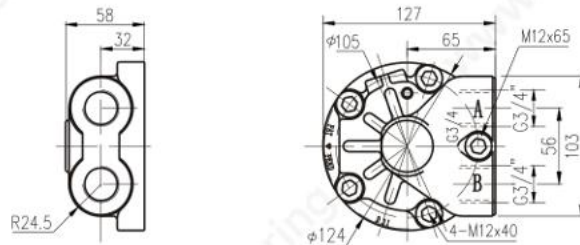
### D31

Distributor with 3/4" ports for NHM1, NHM2, NHM3, NHM6 series motors

Weight :3kg

### D310

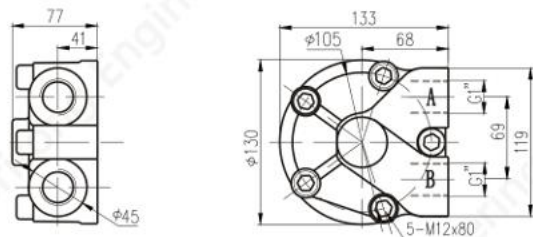
Same as D31, with 1" ports



### D40

Standard distributor for NHM8, NHM11, and small motors in the condition of high speed

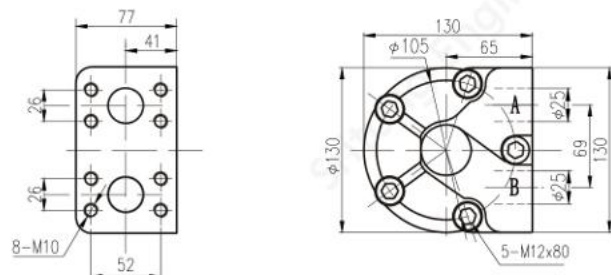
Weight :5kg



### D47

Distributor with  $\phi 25$  flanges for NHM16 series motor

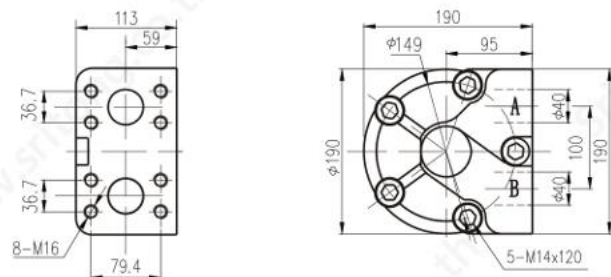
Weight :6kg



### D90

Large flow distributor for NHM31, NHM100, NHM160 series motors

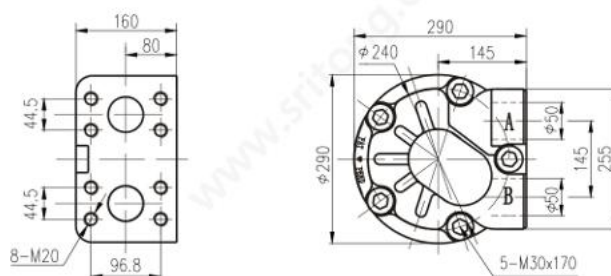
Weight :14.5kg



### D250

High flow distributor

Weight :50kg



## Distributor with integration valve block

D60221

Bidirectional counterbalance valve

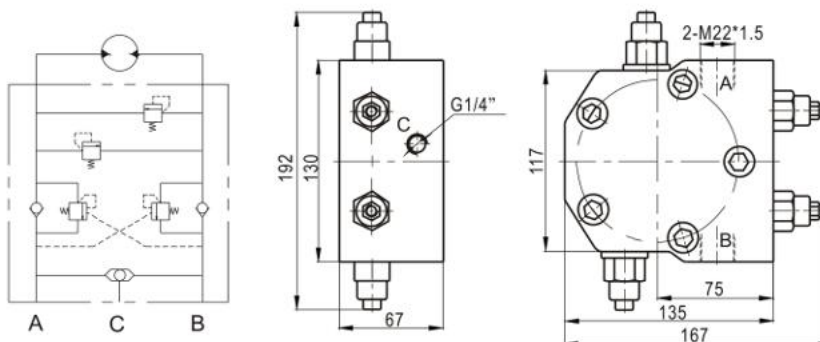
Bidirectional overload valve

Shuttle valve

Nominal pressure is 25MPa

Nominal flow is 35L/min

Input from port A, clockwise rotation (View from the shaft)



D60220

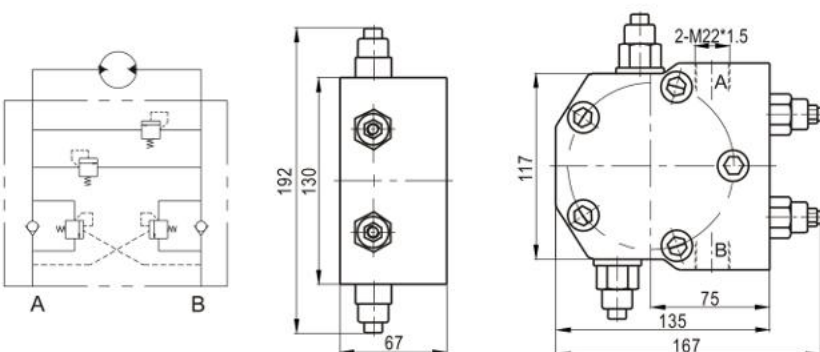
Bidirectional counterbalance valve

Bidirectional overload valve

Nominal pressure is 25MPa

Nominal flow is 35L/min

Input from port A, clockwise rotation (View from the shaft)



D6002

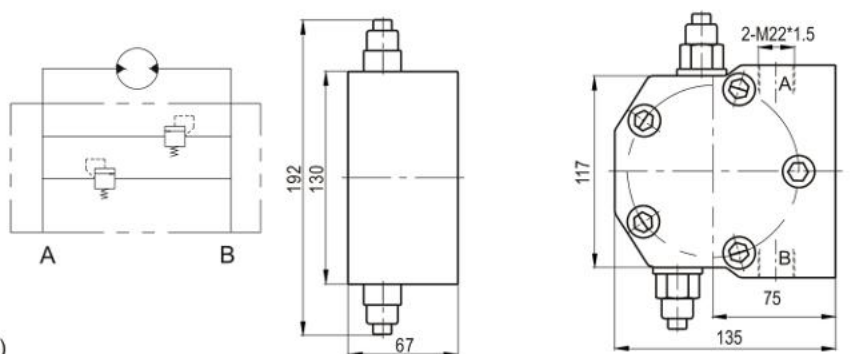
Bidirectional counterbalance valve

Bidirectional overload valve

Nominal pressure is 25MPa

Nominal flow is 35L/min

Input from port A, clockwise rotation (View from the shaft)



## Distributor with integration valve block

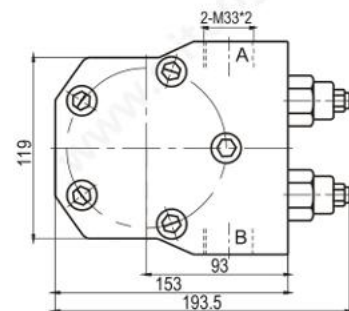
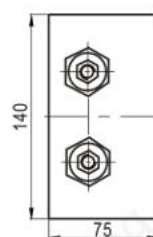
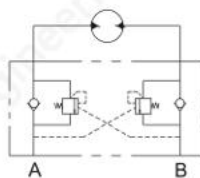
D1202

Bidirectional counterbalance valve

Nominal pressure is 25MPa

Nominal flow is 70L/min

Input from port A, clockwise rotation (View from the shaft)



D120201

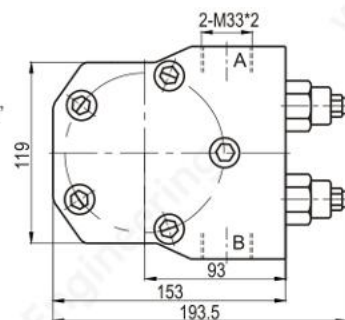
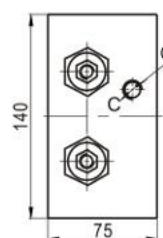
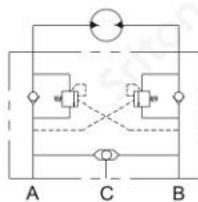
Bidirectional counterbalance valve

Shuttle valve

Nominal pressure is 25MPa

Nominal flow is 70L/min

Input from port A, clockwise rotation (View from the shaft)



D120111

Single counterbalance valve

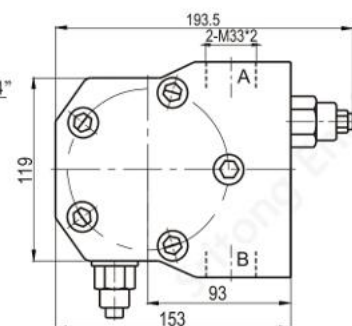
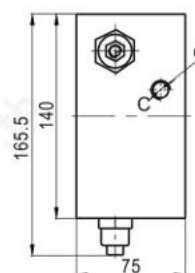
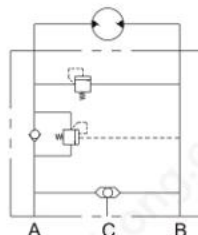
Single overload valve

Shuttle valve

Nominal pressure is 25MPa

Nominal flow is 70L/min

Input from port A, clockwise rotation (View from the shaft)



D120101

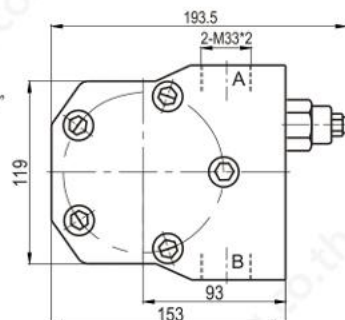
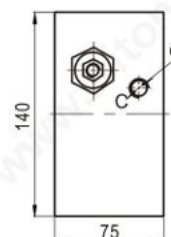
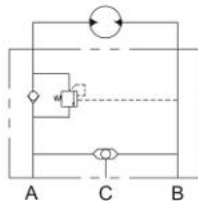
Single counterbalance valve

Shuttle valve

Nominal pressure is 25MPa

Nominal flow is 70L/min

Input from port A, clockwise rotation (View from the shaft)



## Distributor with integration valve block

### D1201

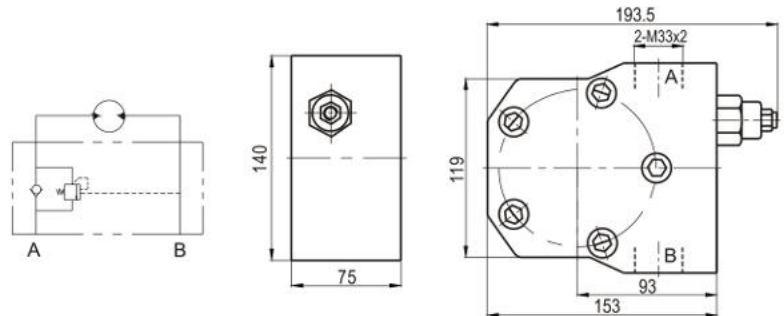
Single counterbalance valve

Shuttle valve

Nominal pressure is 25MPa

Nominal flow is 70L/min

Input from port A, clockwise rotation (View from the shaft)



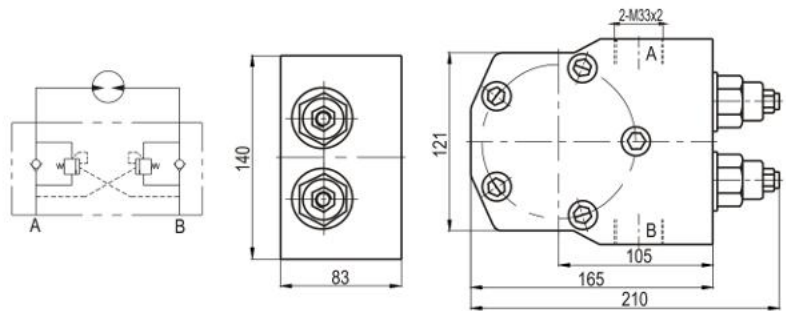
### D2402

Bidirectional counterbalance valve

Nominal pressure is 25MPa

Nominal flow is 140L/min

Input from port A, clockwise rotation (View from the shaft)



### D240201

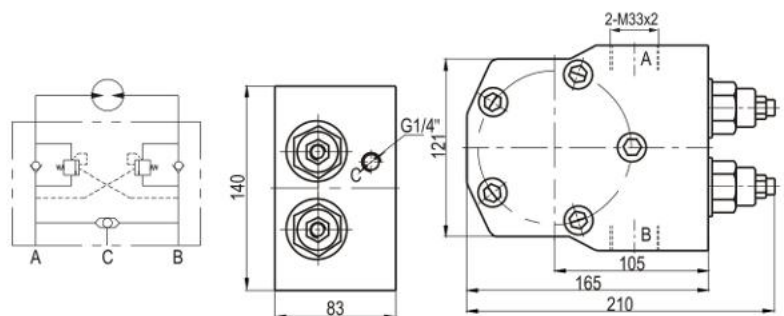
Bidirectional counterbalance valve

Shuttle valve

Nominal pressure is 25MPa

Nominal flow is 140L/min

Input from port A, clockwise rotation (View from the shaft)



### D240111

Single counterbalance valve

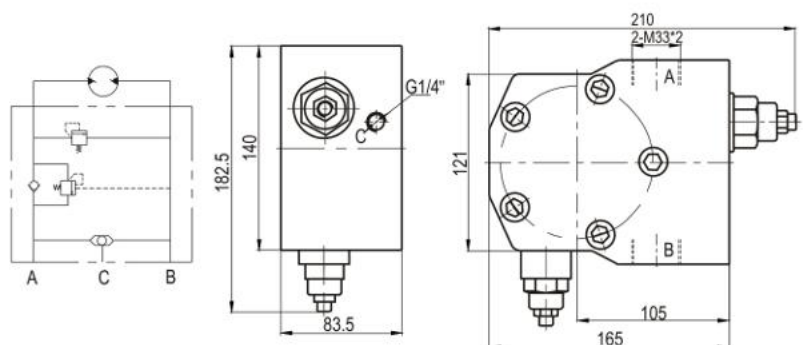
Single overload valve

Shuttle valve

Nominal pressure is 25MPa

Nominal flow is 140L/min

Input from port A, clockwise rotation (View from the shaft)



## Distributor with integration valve block

D240101F(B)

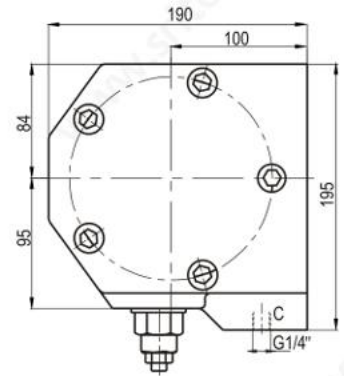
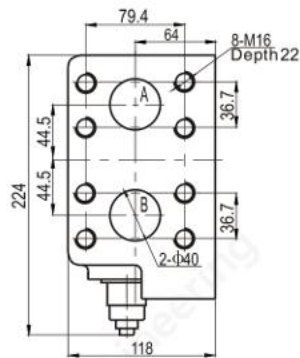
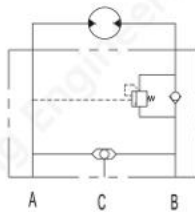
Single counterbalance valve

Shuttle valve

Nominal pressure is 25MPa

Nominal flow is 140L/min

Input from port A, clockwise rotation (View from the shaft)



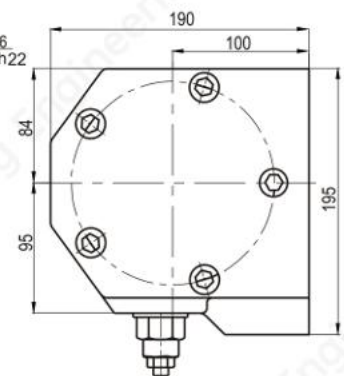
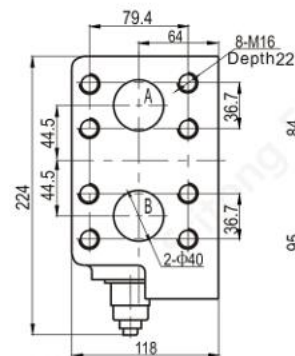
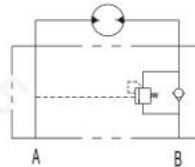
D2401F(B)

Single counterbalance valve

Nominal pressure is 25MPa

Nominal flow is 140L/min

Input from port A, clockwise rotation (View from the shaft)



D480111

Single counterbalance valve

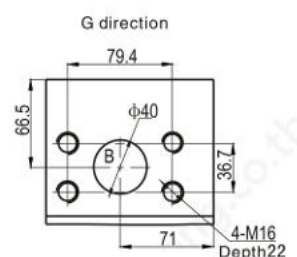
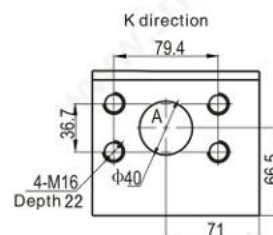
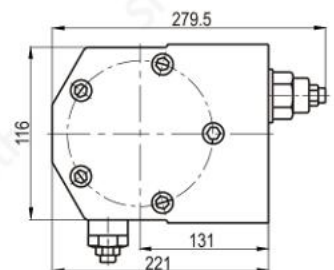
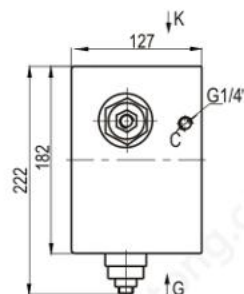
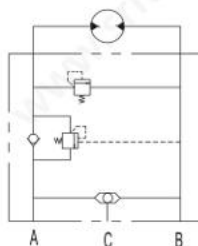
Single overload valve

Shuttle valve

Nominal pressure is 25MPa

Nominal flow is 300L/min

Input from port A, clockwise rotation (View from the shaft)



## Distributor with integration valve block

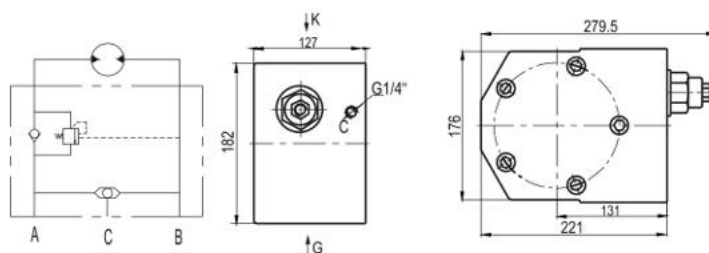
D480101

Single counterbalance valve

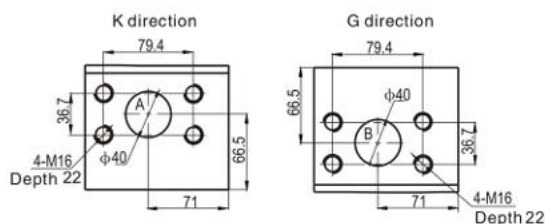
Shuttle valve

Nominal pressure is 25MPa

Nominal flow is 300L/min



Input from port A, clockwise rotation (View from the shaft)

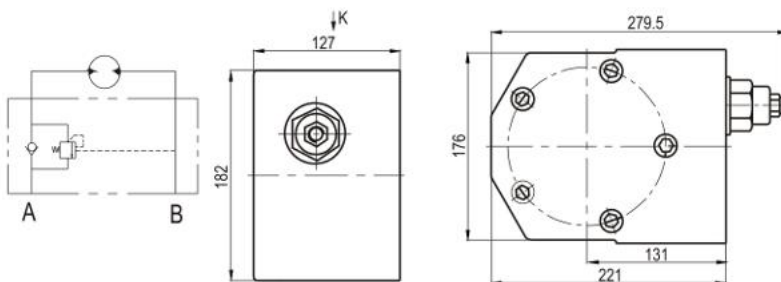


D4801

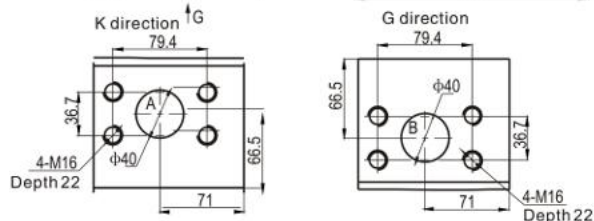
Single counterbalance valve

Nominal pressure is 25MPa

Nominal flow is 300L/min



Input from port A, clockwise rotation (View from the shaft)

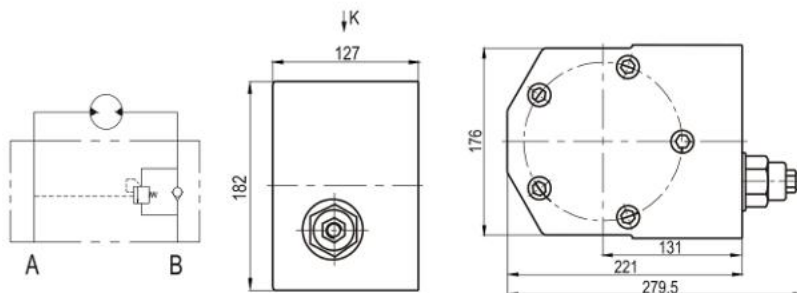


D4801-1

Single counterbalance valve

Nominal pressure is 25MPa

Nominal flow is 300L/min



Input from port A, clockwise rotation (View from the shaft)

