
OUTLINE

The IHI Auto Greastar U Type Series provides an economical single-end type lubrication system which allows each user to design a greasing plan according to his particular lubrication point conditions. The Series consists of a combination of MU type, M type and UR type distributors. These distributors have been developed by IHI based on the outstanding features of those used in the existing Auto Greastar Series (distributors in series connection for progressive operation) that have been favourably accepted by many customers. With additional improvements, the distributors are highly reliable.

The IHI Auto Greastar U Type Series ensures that user realizes a labor-saving auto lubrication of the machine with ease.

APPLICATIONS

Lubrication for buses, trucks, special-designed vehicles for civil work/construction work, mining machinery, small-size equipment for steelmaking, forging and rolling, cranes, conveyors, small-size water turbines, paper making machinery, machine tools, textile industry equipment, printing machines, railway vehicles, passenger cars, compact 4-wheel cars, machinery for food, chemicals, cosmetics and other industries, pumps, compressors, engines, etc.

FEATURES

1. Use of a single main pipe of dead end design facilitates a ready and economical piping work. In addition, it does not impair the appearance of the equipment onto which the system is mounted.
2. The straight line progressive operation system introduced for the Auto Greastar U Type Series facilitates user checking the lubricated condition of the machine. User can also discover imperfect lubrication points at an early stage, with alarm warning.
3. Various types of pumps can be used with the Auto Greastar U Type Series as a simple pump mechanism is usable.
4. Aluminum die-cast, lightweight and waterproof, is used for its distributors.
5. A variety of combinations of MU and M type distributors are possible, thus providing user with flexible lubrication planning according to each particular application.
6. The Auto Greastar U Type Series does not require air purging even when air entered in the pipeline to some extent.

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Construction

The Auto Greastar U Type lubrication system basically consists of a pump, MU, M and UR type distributors and pipes.

A Pump

Manual, motor-driven, mechanical drive and pneumatic pumps are available.

E Pipeline

E₁: Main pipe (between the pump and MU type distributor)

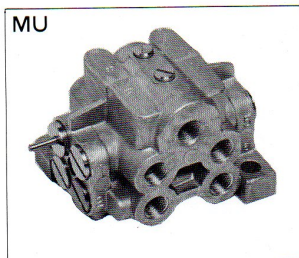
E₂: Branch pipes (between the M/MU type distributors and UR type distributors)

E₃: Feed pipes (between the MU/UR type distributors and bearings)

	Line size
E ₁	φ8×φ6, φ6×φ4
E ₂	φ8×φ6, φ6×φ4
E ₃	φ6×φ4, φ4×φ2.8

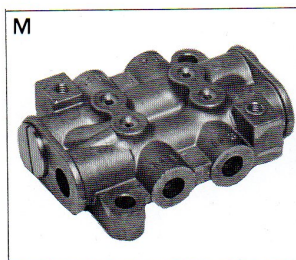
B MU Type distributor

This distributor measures the lubricant agent under pressure from the pump and distributes it to bearings and the M type distributor, to this last one through a connecting port.



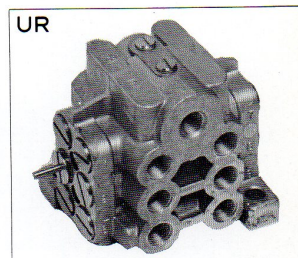
C M type distributor

This distributor measures the lubricant agent under pressure from the MU type distributor and distributes the measured lubricant portions to its slave distributors (UR type distributors).



D UR type distributor

This distributor measures the lubricant agent under pressure from the M type distributor, to lubricate bearings.



Select each appropriate pipeline size according to the oil or grease to be used and the line length.

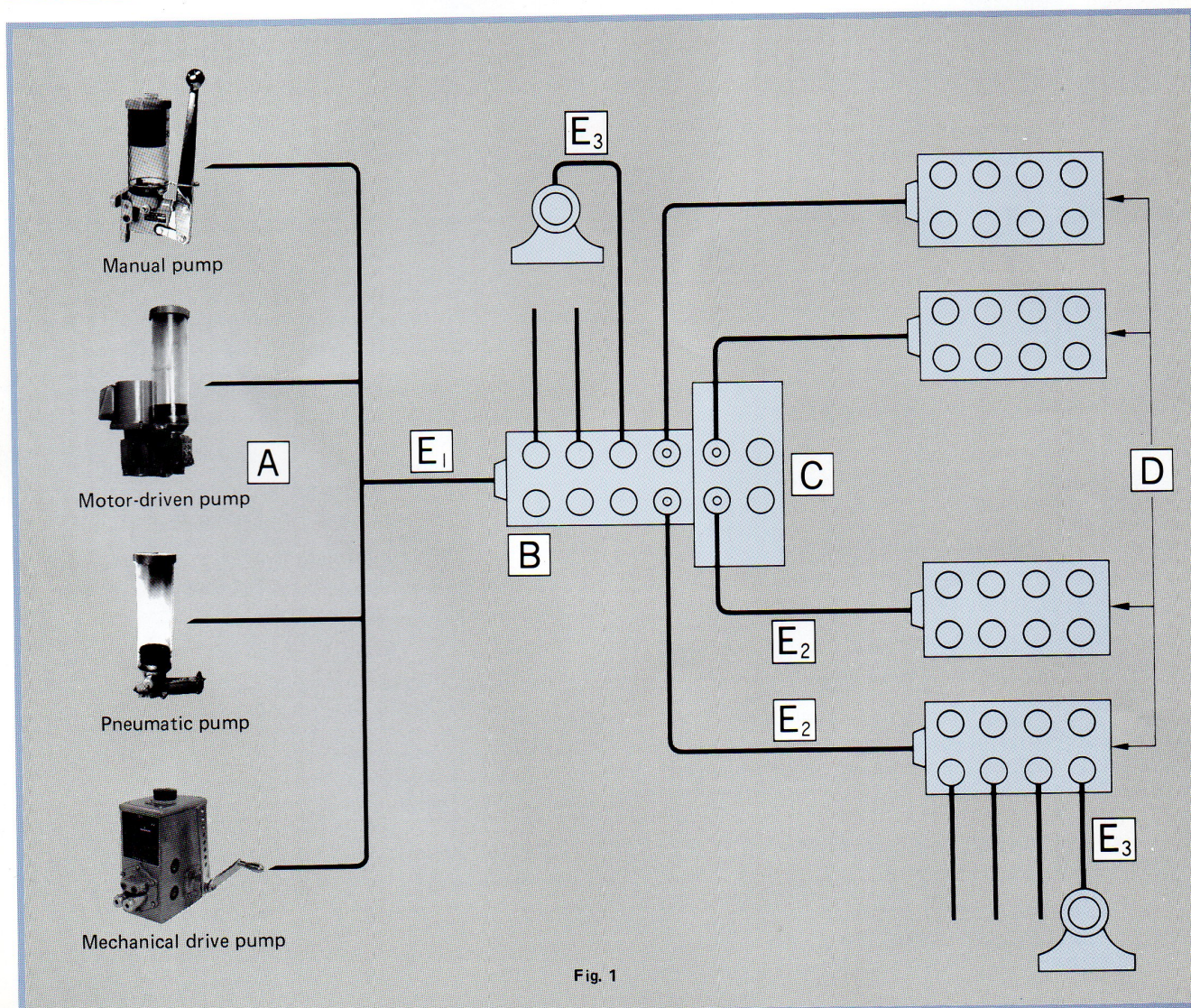


Fig. 1

Applicable Pumps

A wide range of pumps can be used with the Auto Greastar new type series, as shown in Table 1 below. Therefore, the lubricating system can meet any environmental condition.

Table 1

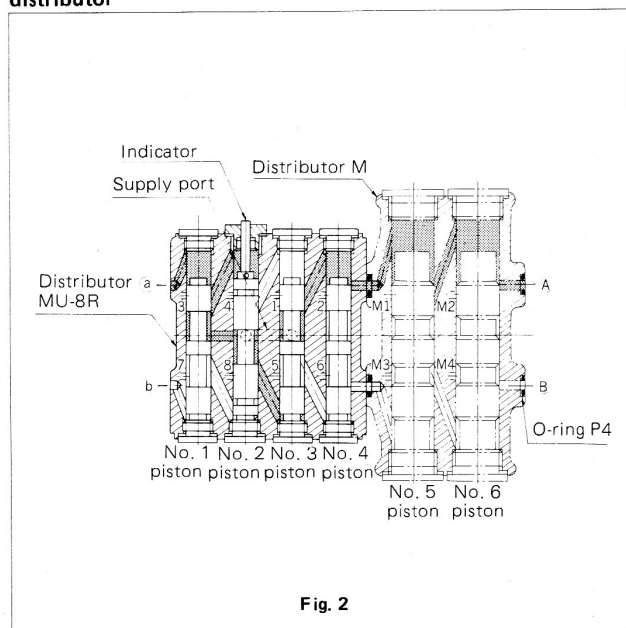
Driving system	Type of pump	Discharge pressure	Discharge capacity	Reservoir capacity	Lubricant	Model code	No. of discharge ports
Manual	SKA-214	150kgf/cm ²	1cc/stroke	400cc	Grease	RK941100	One
				400cc	Oil	RK941200	One
				1 ℓ	Grease	RK941800	One
				1 ℓ	Oil	RK941900	One
	SK-244	150kgf/cm ²	1cc/stroke	400cc	Grease	RK941300	Two
				400cc	Oil	RK941400	Two
				1 ℓ	Grease	RK942200	Two
				1 ℓ	Oil	RK942300	Two
Motor-driven	SK-505BM (DC24V)	150kgf/cm ²	16cc/min	400cc	Grease	RK934500	One
				1 ℓ	Grease	RK933900	One
	SK-521 (AC200/220V)	100kgf/cm ²	22/27cc/min. (50/60Hz)	2 ℓ	Grease	RK939300	Two
		60kgf/cm ²	0to22/27cc/min. (50/60Hz)	2 ℓ	Oil	RK939500	Two
Pneumatic	SKA-881	30~200kgf/cm ²	25 to 90cc/min (Air pressure: 2 to 7 Kg/cm)	2 ℓ	Grease	RK948300	One
				2 ℓ	Oil	RK948400	One
	SKA-800A	30~210kgf/cm ²	1 to 4 cc/stroke	2 ℓ	Grease	RK949600	One
				2 ℓ	Oil	RK949800	One
	SKA-800M	30~210kgf/cm ²	0.2 to 1 cc/stroke	2 ℓ	Grease	RK949300	One
				2 ℓ	Oil	RK949400	One
Mechanical drive	SKA-722R	60kgf/cm ²	1 port 0~1.8cc 2 ports 0~0.9ccx2	2 ℓ	Oil	RK291500	Two
	SKA-722L	60kgf/cm ²	1 port 0~1.8cc 2 ports 0~0.9ccx2	2 ℓ	Oil	RK271600	Two
	SKA-723R	60kgf/cm ²	1 port 0~5.4cc 2 port 0~2.7ccx2	2 ℓ	Oil	RK292300	Two
	SKA-723L	60kgf/cm ²	1 port 0~5.4cc 2 ports 0~2.7ccx2	2 ℓ	Oil	RK292400	Two

Distributors

The MU, M and UR type distributors are used in combination.

Principle of Operation

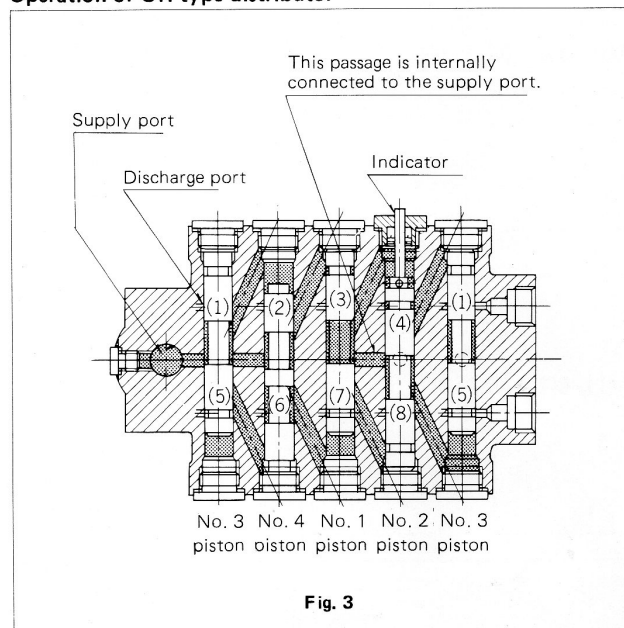
Operation of MU type distributor combined with M type distributor



1. The pressurized grease entering from the supply port pushes up No. 3 piston to deliver the grease contained in the cylinder above the same piston, through the discharge port (4). As No. 3 piston goes up, the oblique passage connecting with the upper chamber of No. 4 piston closes and that connecting with the lower chamber opens. The discharge port (1) is connected to the upper chamber of No. 4 piston through another oblique passage.
2. The pressurized grease pushes up No. 4 piston to deliver the grease contained in the cylinder above the same piston through the discharge port (1). As No. 4 piston goes up, the discharge port (2) is connected with the upper chamber of No. 5 piston via an oblique passage.
3. The pressurized grease then pushes up No. 5 piston to deliver the grease contained in the cylinder located above the same piston through the discharge port (2).
4. As No. 5 piston goes up, the pressurized grease pushes up No. 6 piston to deliver the grease contained in the cylinder located above the same piston through the discharge port (M1).
5. Then, the pressurized grease enters in the chamber b via port B to push up No. 1 piston and deliver the grease contained in the cylinder located above the same piston via chamber a, to A and through the discharge port M2. As No. 1 piston goes up, the oblique passage connecting to the upper chamber of No. 2 piston closes, and another connecting to the lower chamber opens.
6. The pressurized grease pushes up No. 2 piston to deliver the grease contained in the cylinder located above the same piston through the discharge port (3).

The operation steps 1 through 6 above complete a half cycle of lubrication. The second half of the cycle is operated in reverse order, and then one cycle of lubrication is completed.

Operation of UR type distributor



1. The grease entering from the supply port pushes down No. 1 piston to deliver the grease contained in the cylinder located underneath the same piston through the discharge port (6).
2. As No. 1 piston goes down, it closes the oblique passage connecting to the upper chamber of No. 2 piston and opens the other oblique passage connecting to the lower chamber. The upper chamber of No. 2 piston is connected to the discharge port (3) via oblique passage.
3. The pressurized grease presses up No. 2 piston to deliver the grease contained in the upper chamber through the discharge port (3). As this piston goes up (the indicator goes up), the oblique passage connecting with the lower chamber of No. 3 piston cylinder closes, and the other connecting with the upper chamber opens.
4. The pressurized grease pushes down No. 3 piston to deliver the grease contained under the piston through the discharge port (8).
5. This action of No. 3 piston closes the oblique passage connecting with the upper chamber of No. 4 cylinder and opens the other connecting with the lower chamber. The discharge port (1) is connected to the upper chamber of No. 4 piston through an oblique passage. The pressurized grease then continues to push up this piston to deliver the grease contained in the upper chamber through the discharge port (1).

This completes a half cycle of lubricating operation. The second half of the cycle is operated in reverse order, and then one cycle of lubricating is completed.

(The distributors U-4R, U-6R and U-12R basically function in a way similar to the description above for the U-8R.)

MU Type Distributors

The MU type distributor cannot be used alone.
Use it in combination with an M type distributor.

MU-4R, MU-4RL

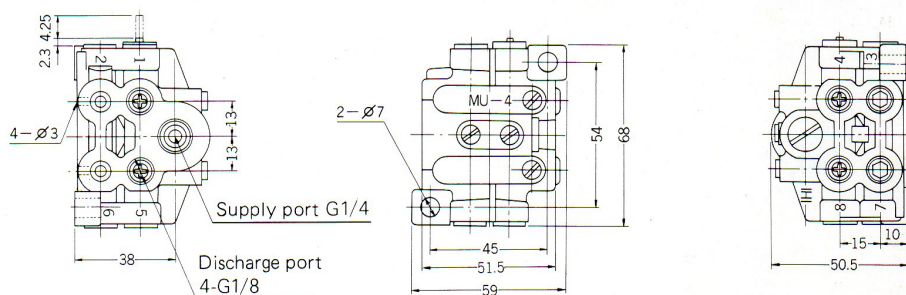


Fig. 4

MU-6R, MU-6RL

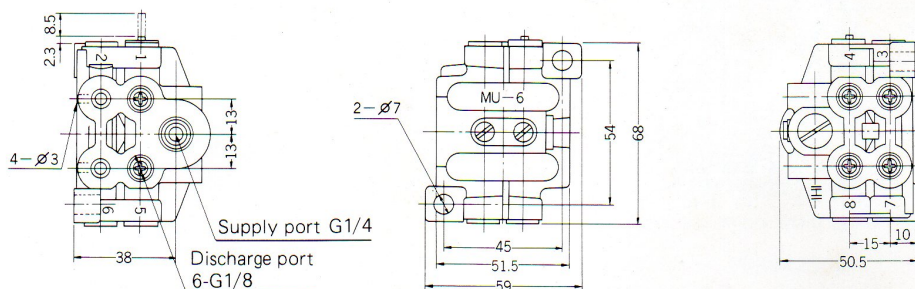


Fig. 5

MU-8R, MU-8RL

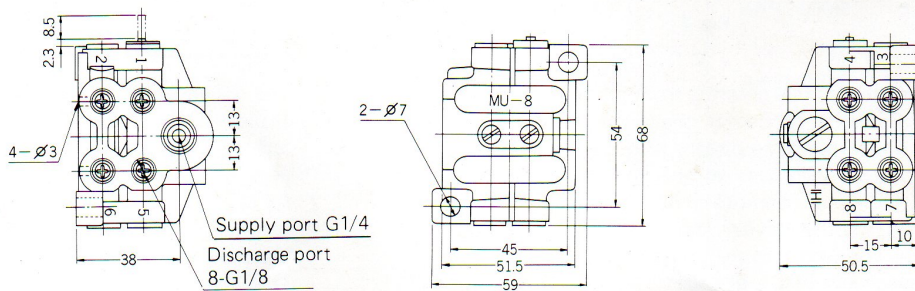


Fig. 6

MU-12R, MU-12RL

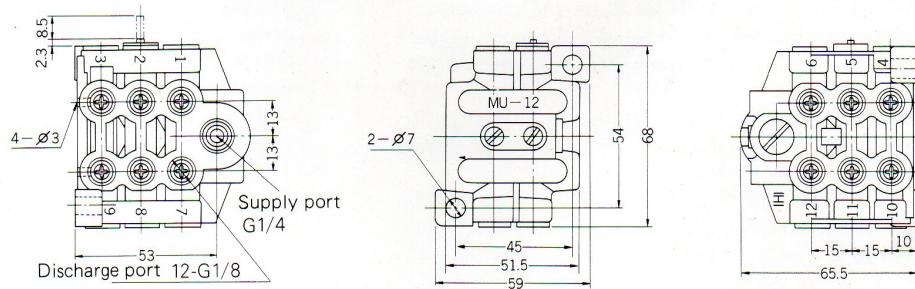


Fig. 7

Table 2

Type	No. of discharge ports	Discharge port Nos.	Discharge capacity (cc)	Weight (kg)	Model code	
					Grease	Oil
MU-4R	4	1 · 5	M*	0.32	RK 673100	RK 673500
		4 · 8	0.3			
MU-6R	6	1 · 5	M*	0.31	RK 673200	RK 673600
		3 · 4 · 7 · 8	0.3			
MU-8R	8	2 · 6	M*	0.31	RK 673300	RK 673700
		1 · 3 · 4 · 5 · 7 · 8	0.3			
MU-12R	12	3 · 9	M*	0.42	RK 673400	RK 673800
		1 · 2 · 4 · 5 · 6 · 7 · 8 · 10 · 11 · 12	0.3			

Notes: (1) Oil distributors are suffixed with 'L'. (2) "M*" indicates the discharge capacity of an M type distributor based on the piston stroke. (3) Applicable pressure values are as follows: For grease: max. 150 kgf/cm² For oil: max. 60 kgf/cm² (4) Material, body: Die-cast aluminum

M Type Distributors

This distributor cannot be used alone.
Use it in combination with an MU type distributor.

M(0-□),
M(0-□)L*

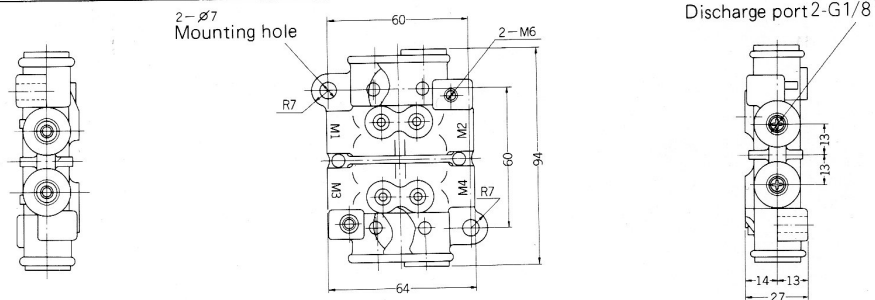


Fig 8

M(□-□),
M(□-□)L*

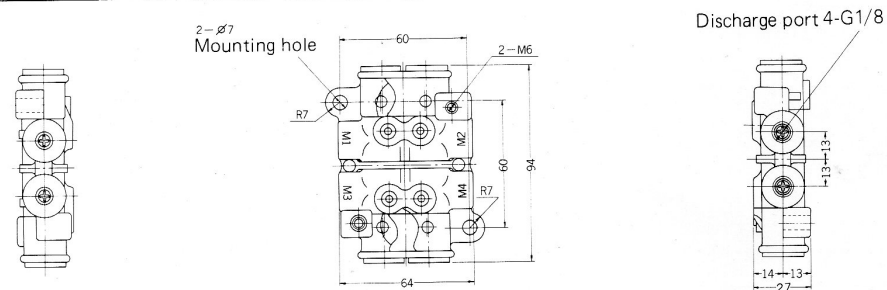


Fig. 9

Table 3

Type	No. of discharge ports	Discharge port Nos.	Discharge capacity (cc)	Weight (kg)	Model code	
					Grease	Oil
M(0-10**)	2	M2 · M4	0.3***	0.28	RK 660100	—
M(0-15**)	2	M2 · M4	0.3***	0.28	RK 660200	RK 662500
M(0-20**)	2*	M2 · M4	0.3***	0.28	RK 660300	—
M(0-30**)	2	M2 · M4	0.3***	0.28	RK 660400	RK 662600
M(15*-15)	4	M1 · M3	1.5	0.38	RK 660900	RK 662700
		M2 · M4	0.3***			
M(20*-20)	4	M1 · M3	2	0.38	RK 661500	—
		M2 · M4	0.3***			
M(30*-30)	4	M1 · M3	3	0.38	RK 662300	RK 662800
		M2 · M4	0.3***			

- Notes: (1) Oil distributors are suffixed with L.
 (2) **marks indicate the capacity of an MU type distributor discharge port.
 (3) ***marks indicate the piston stroke discharge capacity of an MU type distributor.
 (4) M(□-□)
 — size of No. 6 piston 0-w/o piston 20-2 cc/st
 — size of No. 5 piston 10-1cc/st 30-3cc/st
 (see Fig. 2)
 (5) Applicable pressure values are as follows:
 For grease: max 150 kgf/cm² For oil: max 60 kgf/cm²
 (6) Material, body: Die-cast aluminum
 (7) Accessories: Hexagon socket head bolts M6 (x2) and O-rings P4 (x4), for connection to the MU type distributor

Supply and Discharge Ports

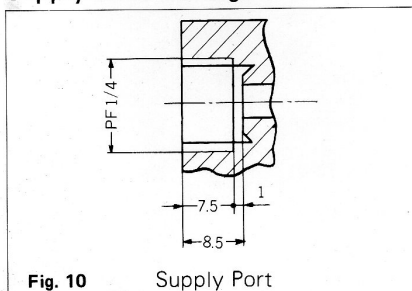


Fig. 10 Supply Port

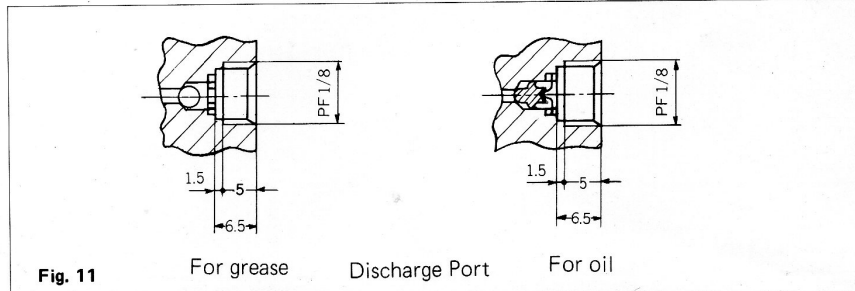


Fig. 11 For grease Discharge Port For oil

UR Type Distributors

U-4R, U-4RL

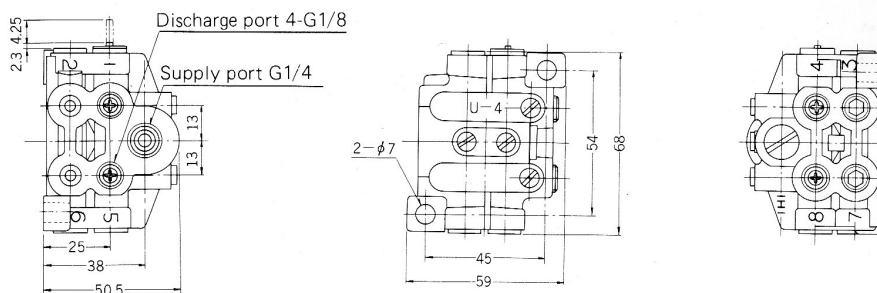


Fig. 12

U-6R, U-6RL

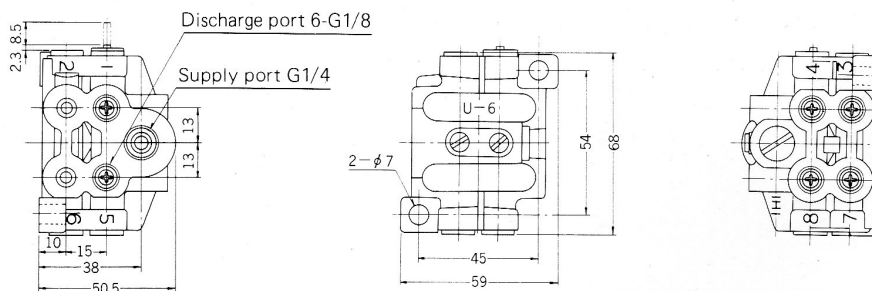


Fig. 13

U-8R, U-8RL

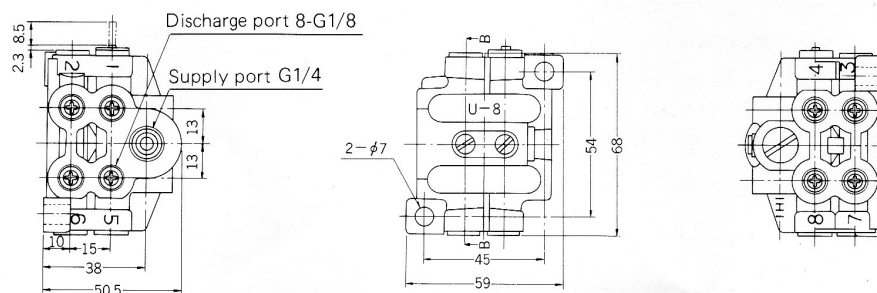


Fig. 14

U-12R, U-12RL

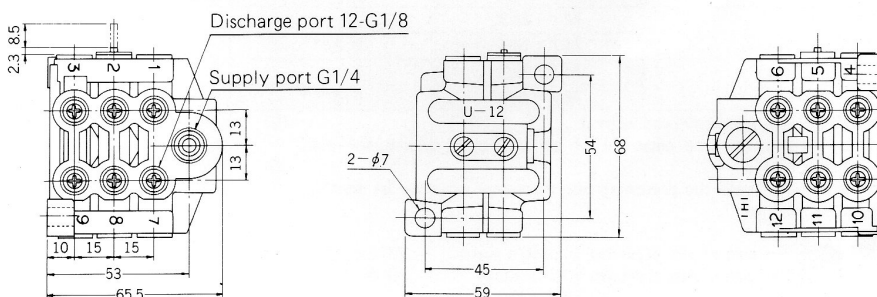


Fig. 15

Table 4

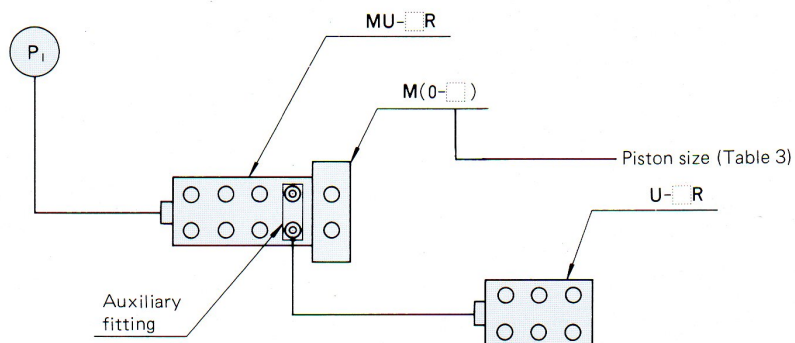
Type	No. of discharge ports	Discharge capacity	Weight (kg)	Model code	
				Grease	Oil
U-4R	4	0.3cc/stroke	0.32	RK 670100	RK 670500
U-6R	6		0.31	RK 670200	RK 670600
U-8R	8		0.31	RK 670300	RK 670700
U-12R	12		0.42	RK 670400	RK 670800

Notes: (1) Oil distributors are suffixed with 'L'. (2) Applicable pressure values are as follows:
 (3) Material, body: Die-cast aluminum For grease: max. 150 kgf/cm² For oil: max. 60 kgf/cm²

Lubrication Pattern

There are 56 combinations of MU, M and UR type distributors. Select the combination system that most suits your requirements, including the number of oil ports and the location of distribution. For selection of the number of ports and the types of distributors, see Tables 5 to 9.

1



- (1) P₁ = Oil pump w/one discharge port
(2) Oil rate based on the operation capacity of the M type distributor piston is discharged.

Fig. 16

Table 5

Lubrication pattern	No. of supply ports	No. of distributors														
		M						MU				U				
		0 5 10	0 5 15	0 5 20	0 5 30	15 20 25	30 30 30	4 R	6 R	8 R	12 R	4 R	6 R	8 R	12 R	
1	8															
	10															
	10															
	12															
	12															
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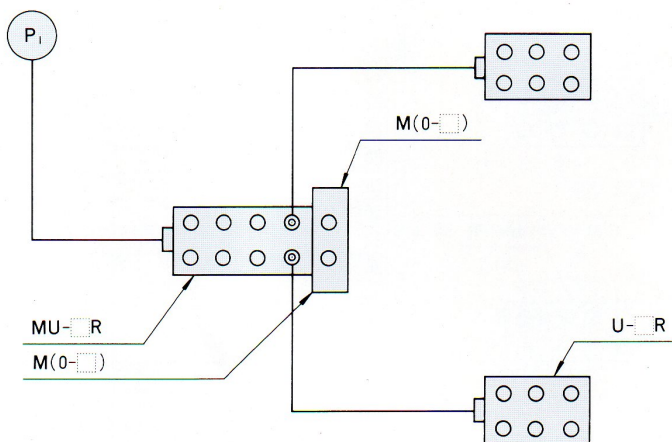


Fig. 17

Table 6

Lubrication pattern	No. of supply ports	No. of distributors															
		M						MU				U					
		0	0	0	0	15	20	30	4	6	8	12	4	6	8	12	
		5	5	5	5	5	5	5	R	R	R	R	R	R	R	R	
		10	15	20	30	15	20	30									
2	12												2				
	14												2				
	16												2				
	16													2			
	18														2		
	20												2				
	20													2			
	20														2		
	22															2	
	24													2			
24														2			
28															2		

3

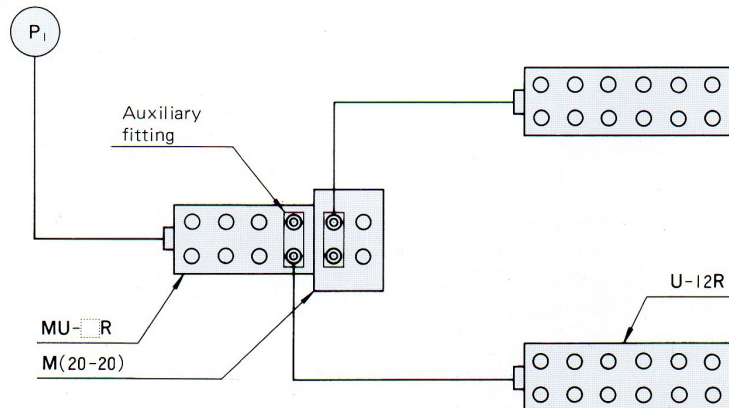


Fig. 18

Table 7

Lubrication pattern	No. of supply ports	No. of distributors															
		M						MU				U					
		0 5 10	0 5 15	0 5 20	0 5 30	15 20 25	20 25 30	4 R	6 R	8 R	12 R	4 R	6 R	8 R	12 R		
3	28														2		
	30														2		
	32														2		
	36														2		

Lubrication Pattern

4

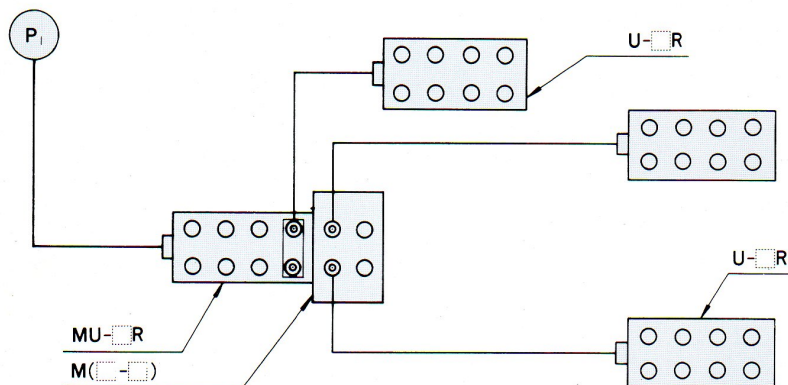


Fig. 19

Table 8

Lubrication pattern	No. of supply ports	No. of distributors														
		M						MU				U				
		0 S 10	0 S 15	0 S 20	0 S 30	15 S 15	20 S 20	30 S 30	4 R	6 R	8 R	12 R	4 R	6 R	8 R	12 R
4	20												2			
	22												2			
	24												2			
	28												2			
	28												2			
	30												2			
	32												2			
36												2				

5

Table 9

Lubrication pattern	No. of supply ports	No. of distributors															
		M						MU				U					
		0 S 10	0 S 15	0 S 20	0 S 30	15 S 20	15 S 30	4 R	6 R	8 R	12 R	4 R	6 R	8 R	12 R		
5	20											4					
	22											4					
	24											4					
	28											4					
	28												4				
	30												4				
	32												4				
	36												4				
	36														4		
	38														4		
40														4			
44														4			
52															4		
54															4		
56															4		
60															4		

Fig. 20

One cycle of U type distributor operation upon completion of 2 cycles of M type distributor operation.

6

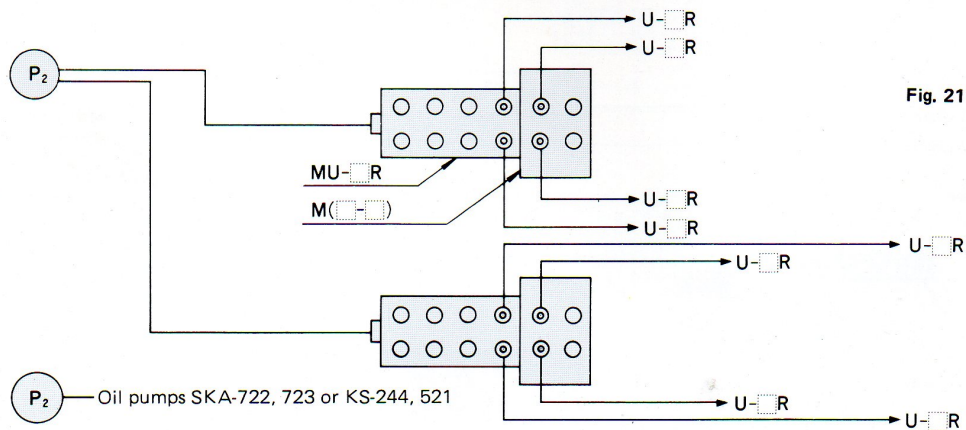


Fig. 21

Oil pumps SKA-722, 723 or KS-244, 521

Notes: (1) For the oil pump (P₂), combinations are possible for two line distributors. (2) The (P₂) oil pump has two discharge ports.

Auxiliary Components

(Optional, obtain the required number of these accessories separately.)

1. Auxiliary Fitting

Use these fitting when the number of supply ports must be decreased/increased, or when some points require double amount of oil/grease.

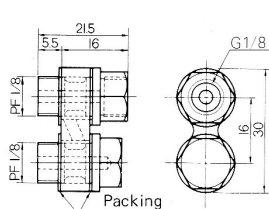


Fig 22

Table 10

Type	Code No.
AU-15	RK 864401

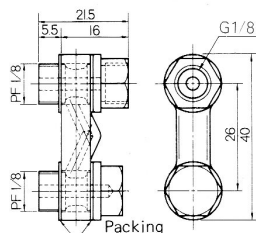


Fig 23

Table 11

Type	Code No.
AU-26	RK 864404

2. Parts for U Type Distributors

Use these parts when a 6 mm dia. polyethylene tube is used as feed pipe after its end is hot-formed.

Table 12

Application	Code No.	Hexagonal socket head bolts & nuts	Connecting nuts $\phi 6$
For 4 ports	RK 670191	M6 \times 20 ℓ \times 2	4
For 6 ports	RK 670291	M6 \times 20 ℓ \times 2	6
For 8 ports	RK 670391	M6 \times 20 ℓ \times 2	8
For 12 ports	RK 670491	M6 \times 20 ℓ \times 2	12

Note: For a copper pipe, use appropriate copper pipe joints available in the market.

REFERENCE ASSEMBLY DRAWINGS

(Combination of MU Type Distributor with M Type Distributor)

Select and order the most appropriate MU type and M type distributors separately, according to the intended purpose. Assemble them before use. They can be readily assembled using two bolts (accompanying the M type distributor).

Fig. 24 Assembly of M() with MU-4R/MU-6R/MU-8R Distributors

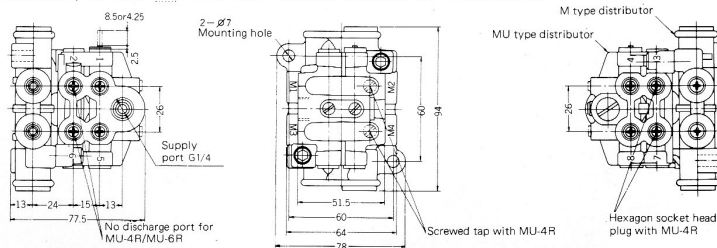


Fig. 25 Assembly of M() with MU-12R Distributors

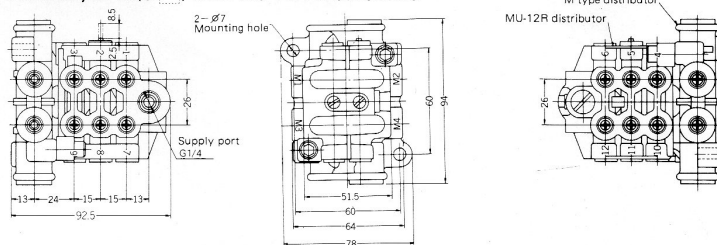


Fig. 26 Assembly of M() with MU-4R/MU-6R/MU-8R Distributors

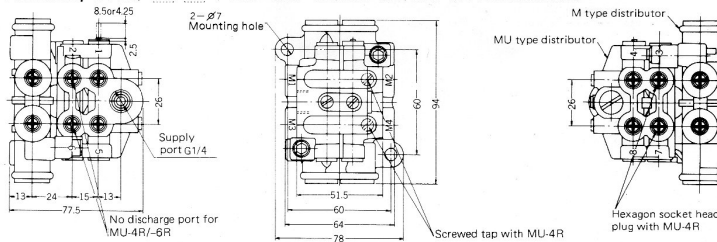


Fig. 27 Assembly of M() with MU-12R Distributors

