HY series

Axial Piston Pump
Sizes: 10 to 320
Max. Pressure upto 400 Bar

Index

Introduction

The HY14-1B Hydraulic Pump is of axial piston type with hydrostatic film lubrication of bearing. It makes a feature of compact size ,light weight, high efficiency, longer life, simple construction and easy maintenance. This Hydraulic Pump nominal displacement up to (10, 25, 63, 160, 250) ml/r and carries its rating pressure up to 315Bar and a maximum pressure up to 400Bar, and can run with a speed upto 1500rpm.

Ordering code

HY	107	Y	-	R	P

Variable displacement pump
Rated pressure 315 Bar
Peak pressure 400 Bar

Displacement
10, 16, 18, 25, 28, 32, 40, 45, 55, 63, 71, 80, 90, 95, 100, 107, 125, 140, 160, 180, 200, 225, 250, 280, 300, 320 ml/r

Controller direction of rotation

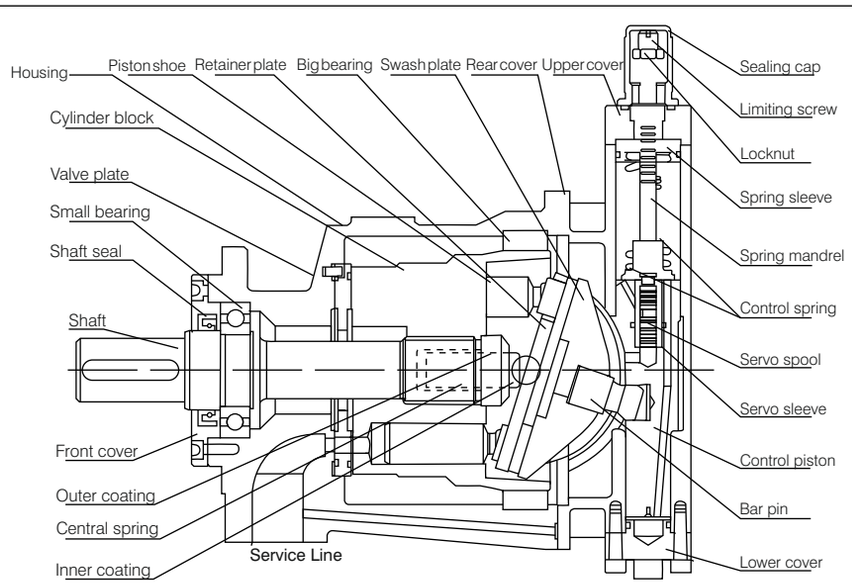
Fix displacement control	= M
Constant power control	= Y
Grading variables control	= MY
Electro hydraulic	= B
Manual control	= S
Pressure control	= P
Pressure control, energy-saving	= P01
Remote pressure control	= P02
Pressure and flow control	= P03
High and low voltage compensation control	= P04
High and low voltage compensation remote control	= P04

Direction of rotation

Clockwise	= R
Anti-clockwise	= L

Shaft end
Metric parallel with key = P

- Construction:



Technical data

- Operating pressure range - inlet

Absolute pressure at inlet
Pabs min = 0.8 bar
Pabs max = 30 bar

Pressure at outlet
PN = 315 bar Nominal pressure PN
Pmax = 400 bar Peak pressure Pmax
Clearance work pressure (at 10% cycle period)

Case drain pressure
Maximum permissible pressure of oil drain port. Maximum 0.5bar higher than inlet pressure, but no higher than 2 bar absolute pressure.

Parameter list

Displacement	Vg		ml	10	16	18	25	28	32	40	45	55	63	71	80	90
Max. flow	1500 r/min	qv	L/min	15	24	27	37.5	42	48	60	67.5	82.5	94.5	106.5	120	135
Max. power	in 315bar@ 1500r/min	P	kw	7.9	13	14	19.7	22	25.2	31.5	35.4	43.3	49.6	55.9	63	70.9
Max. torque	in 315bar	Tmax	Nm	50	80	90	125	140	160	200	225	275	316	356	401	451
Displacement	Vg		ml	95	100	107	125	140	160	180	200	225	250	280	300	320
Max. flow	1500 r/min	qv	L/min	143	150	160.5	187.5	210	240	270	300	337.5	375	420	450	480
Max. power	in 315bar@ 1500r/min	P	kw	74.8	78.8	84.3	98.4	110	126	142	157.5	177.5	196.9	220.5	236.3	252
Max. torque	in 315bar	Tmax	Nm	476	501	536	626	701	802	902	1003	1128	220.5	1403	1504	1605

- Parameter relations:

Flow $q_v = \frac{Vg \cdot n \cdot \eta_v}{1000}$ [L/min]

Drive torque $T = \frac{1.59 \cdot Vg \cdot \Delta P}{100 \cdot \eta_{mh}} = \frac{Vg \cdot \Delta P}{20 \cdot \pi \cdot \eta_{mh}}$ [Nm]

Drive power $T = \frac{T \cdot n}{9549} = \frac{2\pi \cdot T \cdot n}{60000} = \frac{qv \cdot \Delta P}{600 \cdot \eta t}$ [kw]

V_g = Geometry displacement each rotate [cm^3]
ΔP = Differential pressure [bar]
n = Rotary speed [rpm]
η_v = Cubage's efficiency
η_{mh} = Mechanical-hydraulic efficiency
η_t = Overall efficiency ($\eta_t = \eta_v$ X η_{mh})

Installation

Optional installation position. The displacement over 160L/min can't be installed on the reservoir and should ensure the reservoir cover have enough rigidity. The concentricity (verticality) < 0.05mm. The pump housing must be filled with fluid during commissioning and remain full when operating. In order to attain the lowest noise level, all connections (suction, pressure, case drain ports) must be linked by flexible couplings to tank. Avoid placing a check valve in the case drain line.

1. Vertical installation (shaft end upwards)
The following installation conditions must be taken into account:
1.1. Arrangement in the reservoir
Before installation fill pump housing, keeping it in a horizontal position.
a). If the minimum fluid level is equal to or above the pump mounting
face close port "outlet 2" plugged, leave port "outlet 2" and "inlet" open, "outlet 2" piped and recommendation inlet piped (see Fig.1)

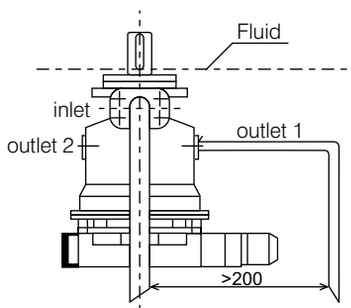


Fig. 1

1.2. Arrangement outside the reservoir
Before installation fill pump housing, keeping it in a horizontal position. For mounting above reservoir see Fig.2.
Limiting conditions:
1.2.1Minimum pump inlet pressure P_{abs} min = 0.8bar under both static and dynamic conditions.
Note: Avoid mounting above reservoir wherever possible in order to achieve a low noise level.

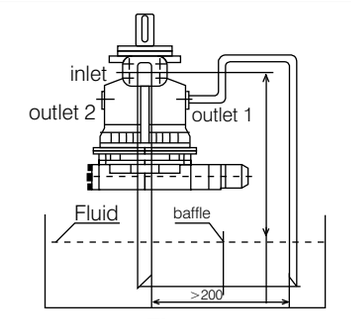


Fig. 2

1.2.1The permissible suction height h comes from the overall pressure loss, but may not be bigger than h_{max} = 500mm(immersion depth h_{tmin} = 200mm).

2. Vertical installation (shaft end upwards)
The pump must be installed, so that "outlet 1" is at the top.
2.1. Arrangement in the reservoir
a). If the minimum fluid level is above the top of the pump, port"outlet 2" closed, "outlet 1" and "inlet" should remain open,"outlet I" piped and recommendation "inlet" piped (see Fig.3)

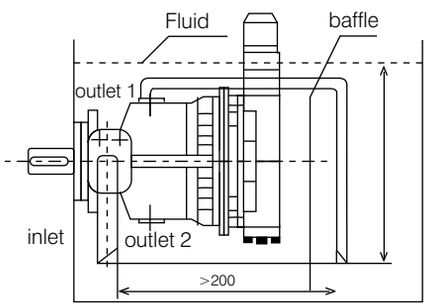


Fig. 3

a). If the minimum fluid level is equal to or below the top of thepump, pipe ports " outlet 1" and possibly "inlet" as Fig.4; close port "outlet 2".The conditions according to item1.2.1
2.2. Installation outside the reservoir
Fill the pump housing before commissioning. Close the port "outlet 1"
a). When mounting above the reservoir, see Fig.4. Conditions according to 1.2.1.

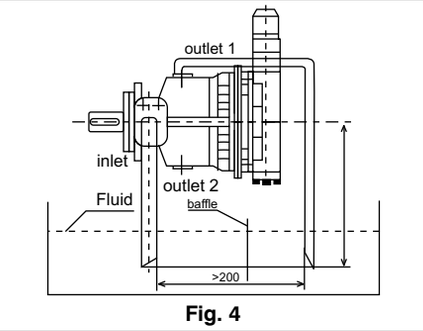
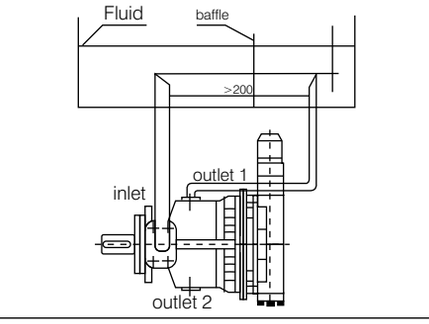


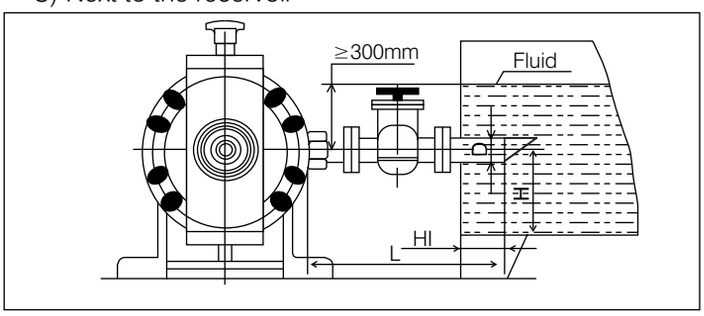
Fig. 4

b). Mounting below the reservoir pipe ports "outlet" and "inlet"according to Fig. 5, close port "outlet 2"



Installation

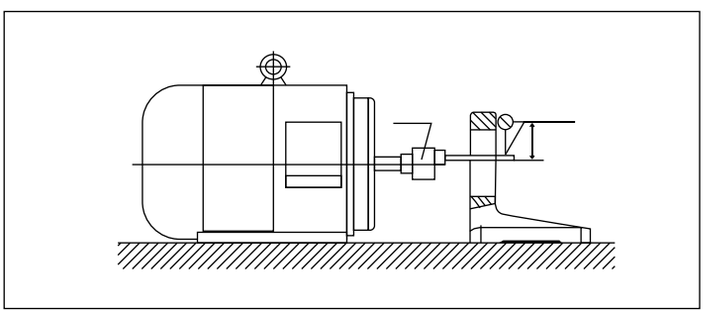
C) Next to the reservoir



Note:

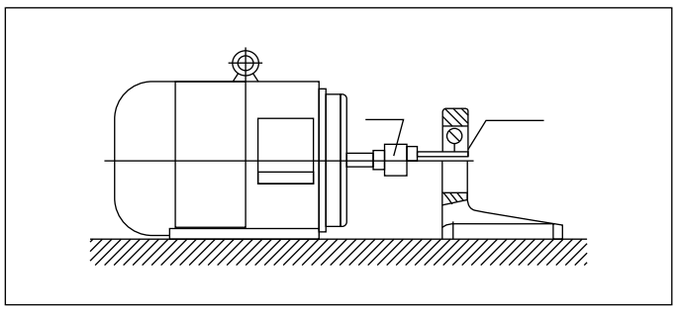
- The minimum oil tank surface to pump center distance >300, pump can be little deflection angle self-printing start.
- The size of oil inlet should no less than the recommended numerical, globe valve size should big than oil inlet
- L < 2500, piping elbows should not more than two. H1 > 3D,H > 2D

3. Installation precision testing:



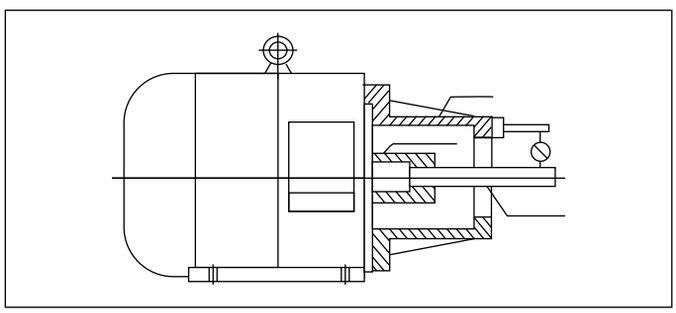
3.1. Stent installation:

- The checking method of installation accuracy of prime mover output shaft and support are shown in figure 3.
- In figure 2, the co-axial tolerance of error < Ø0.05
- In figure 3, Vertical degree beating < 0.05 Ⓡ is circle radius of pump installation screw holes distribution).



3.2 Flange installation:

In this form, if prime mover and pump is connected with the coupling, the installation precision testing methods as shown in figure 3. If the pump shaft directly into prime mover in the output shaft, the installation precision testing method is as figure 4.



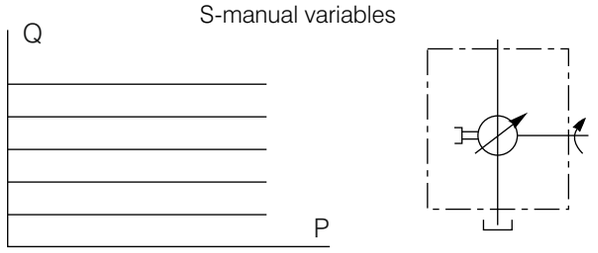
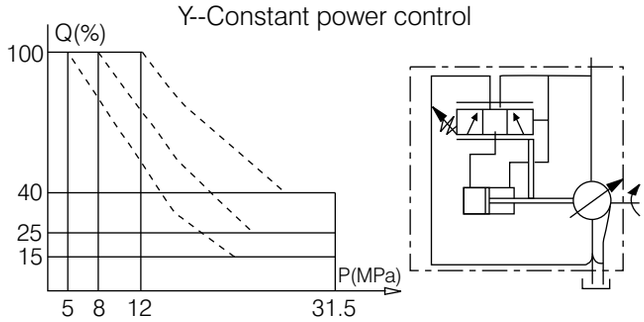
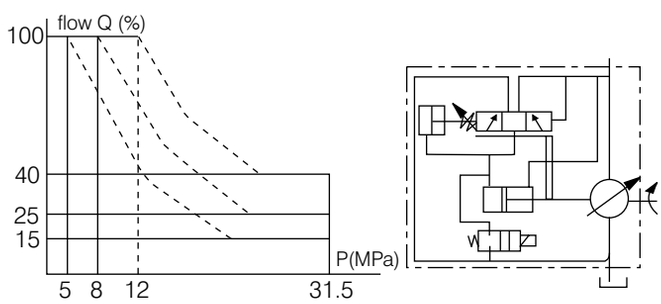
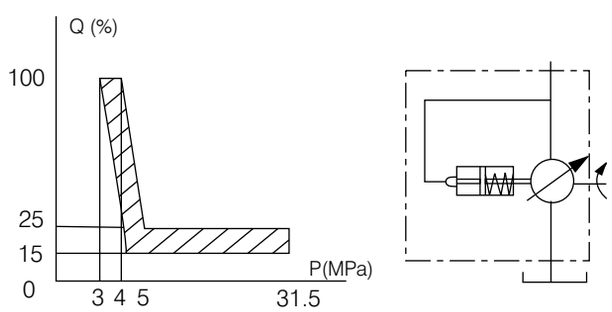
3.3 The bad co-axiality can cause the noise, the damage of bearing and skeleton oil seal. The shaft between pump and prime mover should us elastic coupling as far as possible. When electric motor and pump is installed, should check whether the coupling has axial clearance, if not, can make pump bearing with axial force, causing the damage of the bearing.

Hydraulic fluid

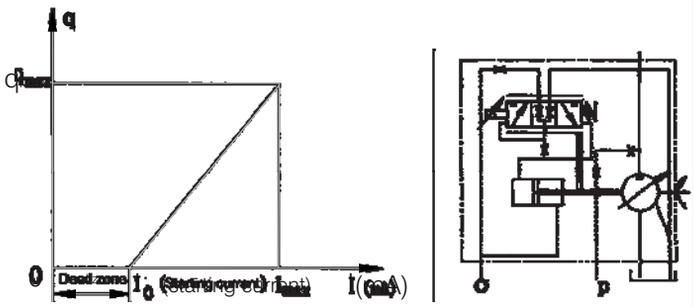
- Recommend use low-freezing, high pressure and anti-wear hydraulic fluid as L-HM32 46 68. and choose the different oil with the change of the temperature. If temperature is high, choose high grades oil, conversely is also be such.

- Normal work oil temperature is : 15-65°C Ideal work oil temperature is 50°C. Operating viscosity is : 27-43mm²/s. We recommend that the operating viscosity (at normal work temperature) should no less than 27mm²/s of 65°C also no more than 43mm²/s of 15°C. The self-priming vacuum because of the high operating viscosity when it cold start. To ensure the functioning of the axial piston unit a minimum cleanliness level of NAS10 (19/16) is necessary.

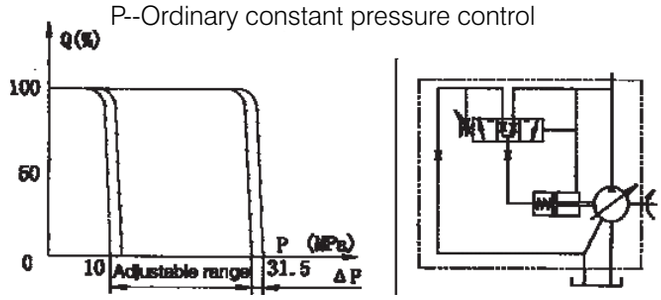
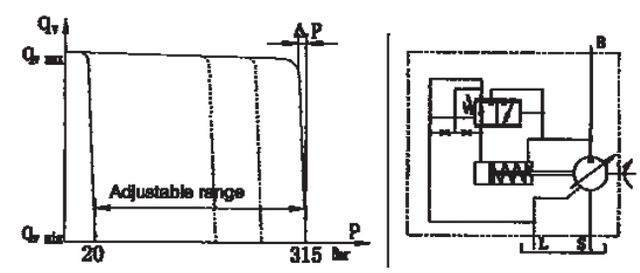
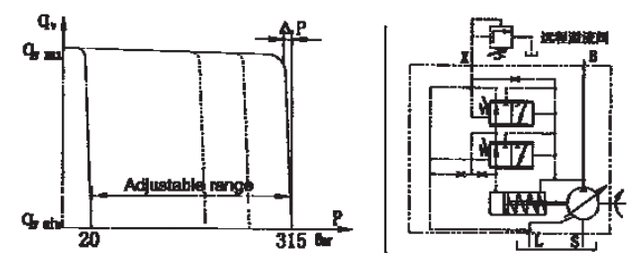
Controller 1

Static characteristic & Circuit drawing	Instruction
S-manual variables 	Manual variable pump change the flow by turning the handwheel, turn adjusting screw, driving the variable along the move of axial piston, and drive head variables around the center turn, change the dip angle, to achieve variables purpose. when meet the desired flow can make the lock nut tighten. If adjust the hand wheel clockwise, flow decrease. If want to change the flow when working, should with unloading operation.
Y--Constant power control 	The outlet flow of constant power variable pump change with the size of the outlet pressure approximately in a certain range according to the constant power curve changes. Adjust flow characteristics, can put the limit screws to the top and according to need pressure range, adjusting spring set, make its initial pressure meet the requirements when the flow changed and then will limit screws to ultimate pressure of the flow of change, of which no longer flow and pressure changes between the relationship of the pump design decision by itself
DY--Constant power standby control 	In the constant power hydraulic pressure, the basic principle of the variable cylinder in superior in the street a two two of the variable cylinder electromagnetic valve, become a constant power stand by control pump. Unloading electromagnetic valve ca realize pump start-up, also can achieve no-load pump system pressure and flow to quickly unload. (the application system without unloading loop).
MY--Grading variables 	This pump is rely on internal control hydraulic control variable institutions. The pump pressure adjusting rang are small, hydraulic in 3-4 Mpa generated when the variables, flow diminishes quickly to the requirements of high pressure flow value. This pump is equivalent to the combination of high and low voltage actually pumps, pump drive power choose reference may be made to the constant power variable pump power selection method to calculate. Adjust variable characteristics, according to need flow and pressure range, adjusting adjustment sets, making pump pressure flow of ultimate no longer changes, and then adjusting adjustment screw pump flow change the initial pressure meets the requirement.

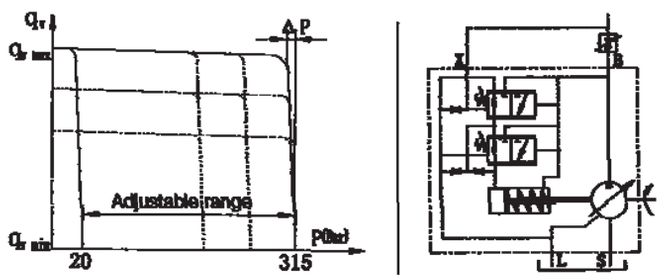
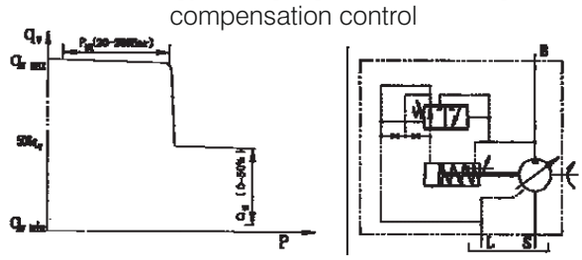
Controller 1

Static characteristic & Circuit drawing	Instruction
B--Electrohydraulic proportional 	In general, the rated conditions for the oil pressure is 6 to 12 MPa. The starting current (dead zone) of the pump, adjust the size of the general in 150-250 mA, the biggest control general is 650-800 mA. BCY electro hydraulic proportion of oil pump in and out, and its from variables mouth direction of pass in and out of oil pump mouth is exactly the opposite, that is, from the shaft watch, clockwise (are turning pump) inlet on the right, the outlet on the left. Note: BCY variable pump in zero deflection angle when no current input, so should on large deflection angle shall before start, in case of the damage of the pump.

Controller 2

Static characteristic & Circuit drawing	Instruction
P--Ordinary constant pressure control 	In the adjustment of the pump range, can make the system maintains a constant pressure of work. When the pump pressure under control through the constant pressure pump valve settings, in the system to achieve the set pressure, pump emissions rapidly to only be able to maintain automatic cut the constant pressure of the system for emissions. The system pressure can through the constant pressure valve stepless adjustment , and the system relief valves are for the relief valve function, its adjustment pressure should be greater than constant pressure valve set up the pressure of 15%-20%.
P01--Energy-saving constant pressure 	In the control range of hydraulic system pressure to maintain constant pressure, pump system required only provide oil pressure, and stepless setting. Control response speed, small leakage.
P02--Energy-saving constant pressure+ Distance constant pressure 	In the control range of hydraulic system pressure to maintain constant pressure, pump system required only provide oil pressure, and stepless setting. Control response speed, small leakage. Can be connected to the relief valve in the X mouth for remote constant pressure control; Can realize zero flow unloading can also be based on control, multilevel pressure control. Relief valve is not within the scope of supply.

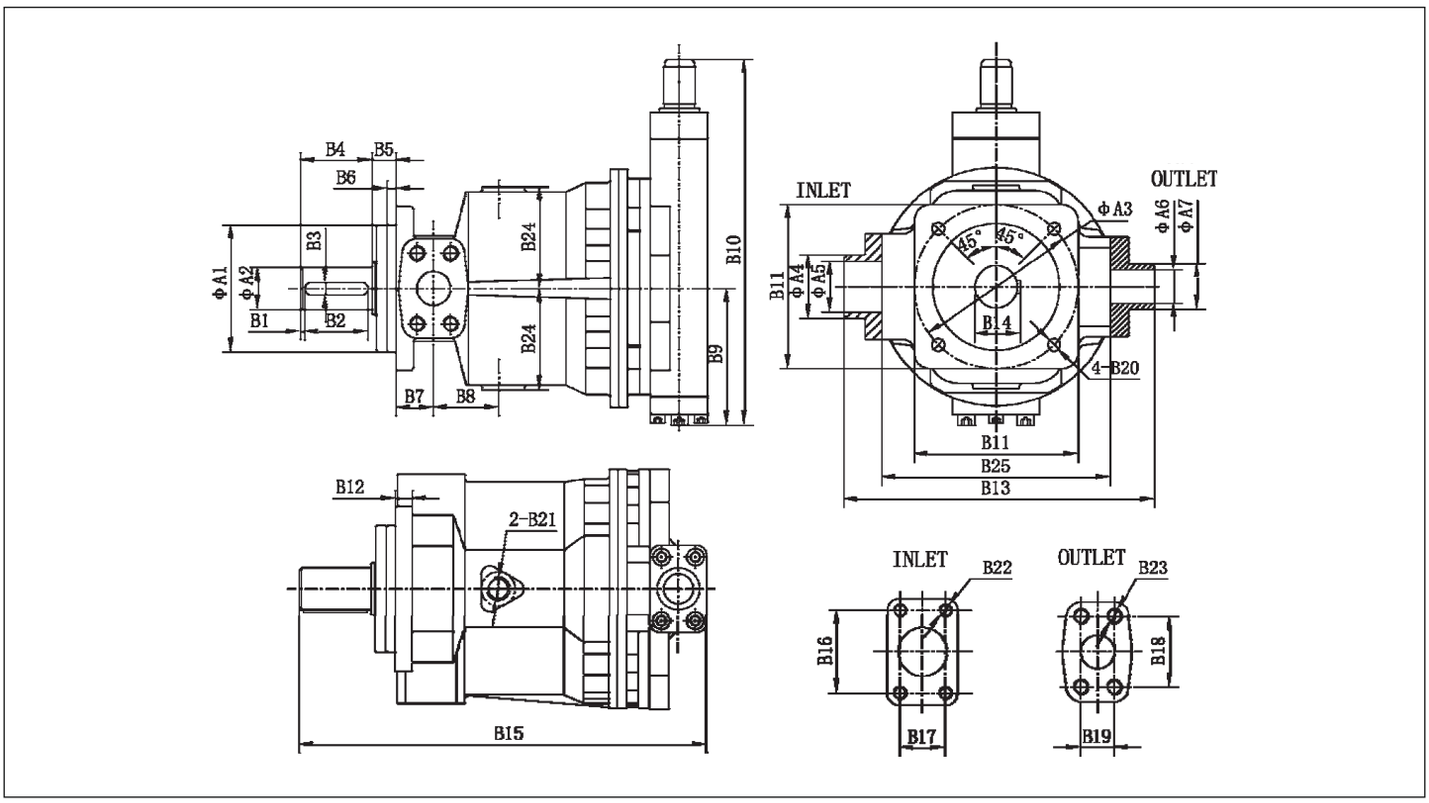
Controller 2

Static characteristic & Circuit drawing	Instruction
P-03 energy saving constant pressure+flow control 	In addition to the functions of the constant pressure, by load (as orifice) differential pressure can change the flow of agencies need. Also can realize zero flow unloading standby control.
P04--Energy-saving high and low voltage compensation control 	The adjusting range of the pump pressure is bigger, it can be within 2-28 Mpa range to regulation. In less than a set pressure, the displacement pump full output; when meet or exceed the set pressure, flow diminishes quickly decrease to the setting value high pressure flow. (if set with the remote control valve mouth, can realize multilevel pressure setting control.)

Diameter size

Serial number	Displacement specifications	Inlet (inner diameter)	Outlet (inner diameter)	Leakage port	
				Pipe fitting	The inside diameter of
1	10-18	Ø25	Ø15	M14x1.5	> Ø 10
2	25-45	Ø34	Ø20	M14x1.5	> Ø 10
3	55-90	Ø40	Ø25	M18x1.5	> Ø 15
4	95-125	Ø50	Ø32	M22x1.5	> Ø 18
5	140-225	Ø66	Ø38	M22x1.5	> Ø 18
6	250-320	Ø90	Ø50	M33x2	> Ø 25

Mounting Dimension



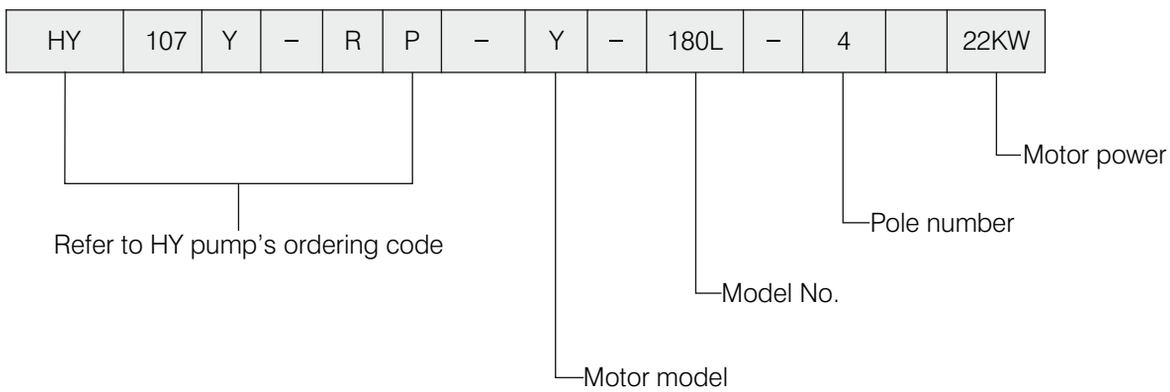
Nominal size	A1	A2	A3	A4	A5	A6	A7	B1	B2	B3	B4	B5	B6	B7	B8	B9
10/16/18	75f9	25h6	100	35	25	15	25	4	30	8	39	18	9	25	33	102.4
25/28/32/40/45	100f9	30h6	125	42	34	20	28	4	45	8	52	21	9	30	48	108.0
55/63/71/80/90	120f9	40h6	155	50	40	25	35	4	50	12	60	21	9	35	57	129.5
95/100/107/125	120f9	40h6	155	60	50	32	43	4	60	12	68	23	9	35	62	131
140/160/180/ 200/225	150f9	55h6	198	76	66	38	52	4	100	16	105	25	9	44	74	146
250/280/300/320	180f9	60h6	230	100	90	50	65	5	100	18	110	23	9	75	95	168.5

Nominal size	B10	B11	B12	B13	B14	B15	B16	B17	B18	B19	B20	B20
10/16/18	295	100	11	210	28	237.5	52.4	26.2	40.5	18.3	12	ø18
25/28/32/40/45	295	125	15	236	33	303	58.7	30.2	50.8	23.8	12	ø21
55/63/71/80/90	346	155	16	271	42.8	350	70	35.7	57.1	27.8	14	ø21
95/100/107/125	346	155	16	294	42.8	385.5	77.8	42.9	66.7	31.6	14	ø23
140/160/180/ 200/225	359	200	20	329	59	458.5	89	50.8	79.4	36.7	18	ø25
250/280/300/320	383	230	28	392	63.9	541.5	120.7	69.9	96.8	44.5	24	ø23

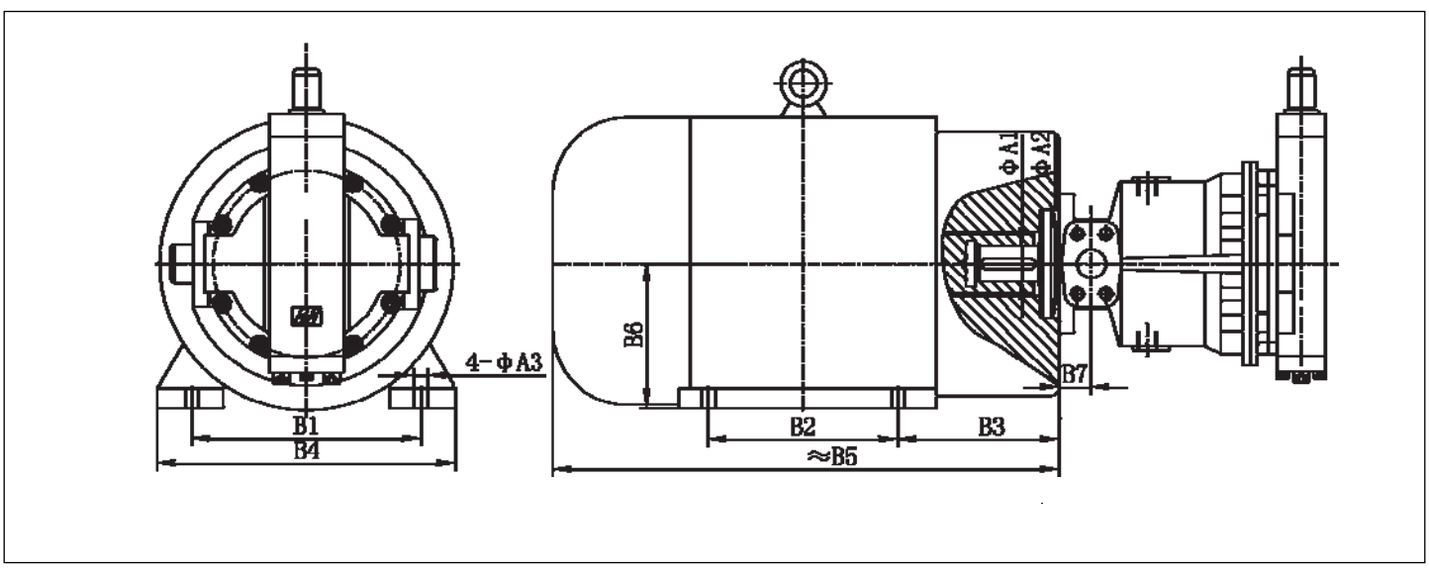
Nominal size	B21	B22	B23	B24	B25
10/16/18	M14x1.5	M1016	M815	60	146
25/28/32/40/45	M18x1.5	M1018	M1020	71	168
55/63/71/80/90	M18x1.5	M1220	M1224	88	200
95/100/107/125	M22x1.5	M1220	M1424	96	216
140/160/180/200/225	M22x1.5	M1220	M1625	112.5	249
250/280/300/320	M33x2	M1627	M2035	135	295

Motor for HY series

- Ordering code



- Mounting dimension



HY size	motor type	A1	A2	A3	B1	B2	B3	B4	B5	B6	B7
HY10～18	Y112M	25	75	12	190	140	92	245	360	112	25
HY25～45	Y132S(Y132M)	30	100	12	216	140(178)	107	280	410(445)	132	30
HY55～125	Y160M(Y160L)	40	120	15	254	210(254)	119	330	545(590)	160	35
	Y180M(Y180L)			15	279	241(279)	133	355	622(660)	180	
	Y200L			19	318	305	150	395	675	200	
	Y225S(Y225M)			19	356	286(311)	143	435	680(705)	225	
HY140～225	Y180M(Y180L)	55	150	15	276	241(279)	133	355	622(660)	180	44
	Y200L			19	318	305	150	395	675	200	
	Y225S(Y225M)			19	356	286(311)	143	435	680(705)	225	
	Y250M			24	406	349	161	490	784	250	
HY250～320	Y250M	60	180	24	406	349	161	490	784	250	75
	Y280S(Y280M)			24	457	368(419)	200	550	876(927)	280	

The specified data is for product description purposes only and may not be deemed to be guaranteed unless expressly confirmed in the contract.

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