YIZUMI伊之密

WE WALK ALONGSIDE THE WORLD

China Famous Trademark

40%-70% energy saved

Significant Breakthrough of Third-generation Energy-saving Technology!

——SM Series Servo Die Casting Machine

SM Series Servo Die Casting Machine

ROLOP

PRENSAS HIDRAULICAS

Significant Breakthrough of Third-generation Energy-saving Technology!

SM Series Servo Die Casting Machine

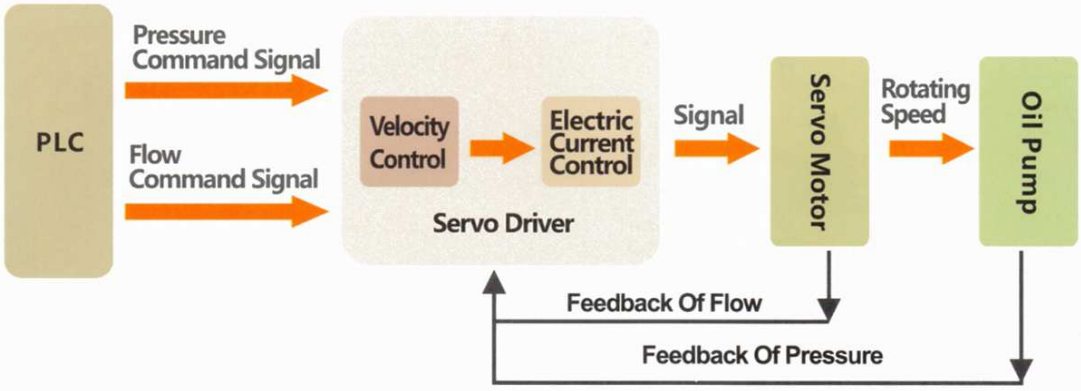
In existing hydraulic system of general die casting machine,
the oil pump controls oil volume in constant speed,
and redundant oil returns through the relief valve.
This is called high-pressure throttling which is
estimated to cause energy loss up to 36%~68%.

YIZUMI Servo Die Casting Machine is the latest solution to the aforesaid problem, saving energy by 40%-70% and improving production efficiency by 5%-12%.

Because of customers' higher demands on efficiency, stability, energy-saving performance, maintenance and noise level of die casting machines, mature application and lower cost of servo systems, servo control technology gradually becomes preferable than fixed-displacement pump system for the driving unit of die casting machines. Energy-saving servo technology is an important breakthrough of hydraulic driving technology of die casting machines. The electro-hydraulic servo system with a high price-performance ratio perfectly meets customers' requirements in cost and efficiency, which is the development trend of die casting machines.

With the advantages of quick response, wide range of speed control and constant torque, the energy-saving servo system which receives the feedback of pressure and flow can achieve precision control.

Principle of Control:



Main Components of Servo System

The servo system consists mainly of PLC, analog modules, digital modules, touch screen, servo driver, servo motor, filter reactor, regenerative braking resistor and pressure sensor. The servo system is shown in the diagram below:

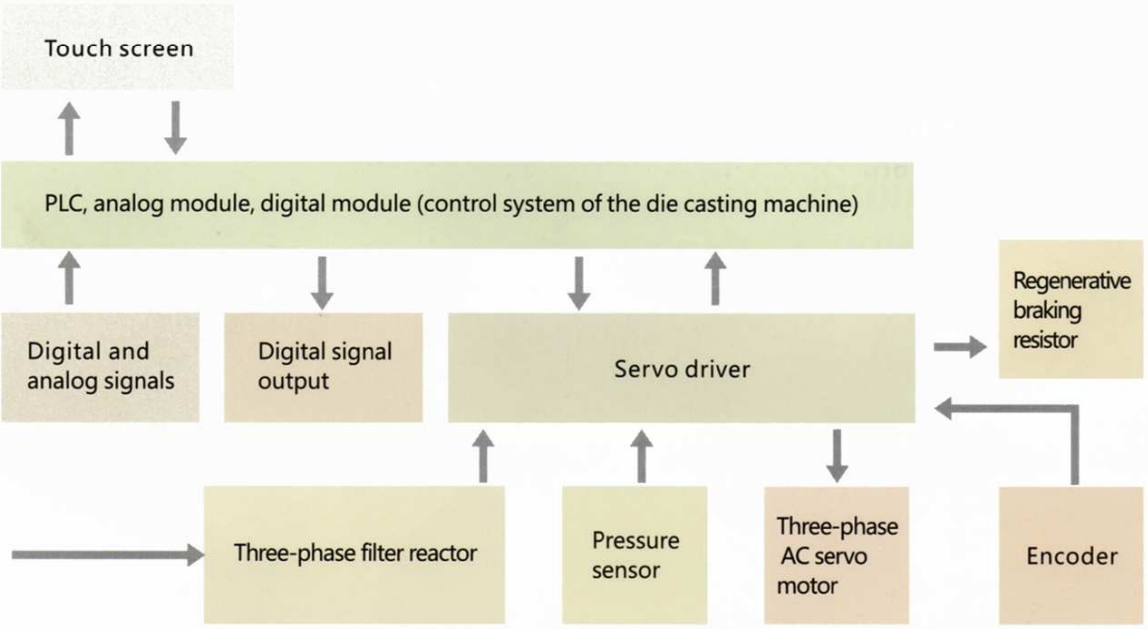


Diagram of the Servo System

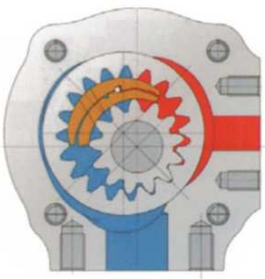
40%-70% energy saved

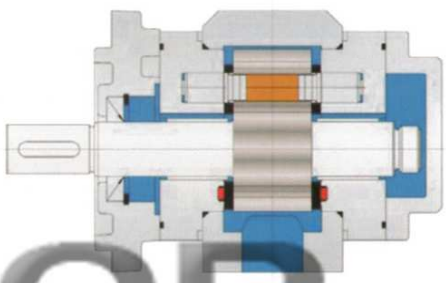
Significant Breakthrough of Third-generation Energy-saving Technology!

SM Series Servo Die Casting Machine

The Best Hydraulic Control System Of Servo Die Casting Machine

After testing oil pumps of different brands, we choose imported German -made hydraulic pump!





Features

1. Radial and axial force compensation with high efficiency. Patented two-segment gap compensation by decentration effectively enhances radial force compensation.
2. Suction port and pressure port in vertical direction.
3. Low noise (test value<66dB).
4. Low pulsation (2%), stable machine operations and long service life.

Innovation of Energy-saving Technology!
40%-70% Energy Savings!
5%-12% Productivity Increase!

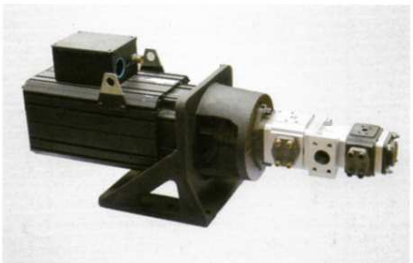
Based on the latest developed servo drive technology and rich experience in developing servo-motor-driven injection molding machines, Yizumi develops SM Series Servo Die Casting Machines that have outstanding advantages of high efficiency, high stability, low energy consumption and easy maintenance, etc.

1 High Energy-saving Rate per cycle: High pressure throttling is completely eliminated, saving energy by 40%-70%.
2. Quick Response of Servo System: Pressure increasing from 0 to 100% takes 30ms at most, improving productivity by 5%-12%. Take Yizumi DM500 Die Casting Machine for example, the cycle time of producing certain product decreases from 34s to 31s after the servo system is used.
3. Lower Temperature of Hydraulic Oil: Cooling water consumption is reduced by over 30% and in certain conditions it is not even needed, which extends the service life of hydraulic parts and cuts costs of repairing.
4. Improvement of Working Environment: In non-operating state, the servo motor stops and produces no noise. Relatively short time of full-load operation greatly reduces the noise level.

Main Components:

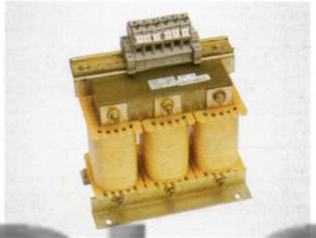

Single pump

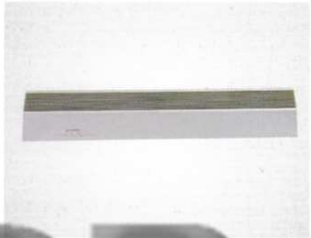

Dual pump


Motor


Pressure sensor


Servo driver


Reactor


Brake resistor

Factory No-load Test Run of DM400 Servo Die Casting Machine and General Die Casting Machine

No.	Comparative Items		General Die Casting Machine		Servo Die Casting Machine		Test Conditions	Conclusion
1	Dry Cycle Time (s)	Mold Closing	9.39	2.5	8.02	2	Pressure:160Bar, Flow: 100	Dry cycle time of servo die casting machine is less.
		Mold Opening		2.95		2.7	Pressure:160Bar, Flow: 100	
		Ejector Fwd.		0.9		0.85	Pressure:160Bar, Flow: 100	
		Ejector Bwd.		0.95		0.91	Pressure:160Bar, Flow: 100	
		Plunger Fwd.		0.06		0.06	Pressure:160Bar, Flow: 100	
		Plunger Bwd.		2.03		1.5	Pressure:160Bar, Flow: 100	
2	Oil temperature reaching 50℃		0.5h		3h		No cooling water	Oil temperature of servo die casting machine increases more slowly.
3	Noise (dB)		83.7		83		Noise detector placed at 1 meter away from machine and the ground.	Nearly the same noise level.
4	Electricity Consumption (kW)		26		12		170 cycles in one hour	Servo machine has much lower consumption.
5	Pressure Building Time (ms)		14		13		Turn the intensification hand wheel 7 circles and 3rd stage hand wheel 4 circles. Starting position of the 3rd stage and intensification is respectively 232mm and 382mm. Nitrogen pressure for intensification is 95Bar and accumulator charging pressure for intensification is 120Bar.	Nearly the same
6	Max .dry shot speed (m/s)		8.52		8.6		Nitrogen pressure and accumulator charging pressure of 3rd stage are respectively 120 Bar and 150Bar. Starting position of 3rd stage is 50mm.	Nearly the same
7	Acceleration time (ms)		27		24		Nitrogen pressure and accumulator charging pressure of 3rd stage are respectively 120 Bar and 150Bar. Starting position of 3rd stage is 50mm.	Servo machine uses less time.
8	Accumulator charging time (s)		16.2		14.5		Press the button of accumulator. Accumulator charging pressure of both 3rd stage and intensification increase from 0 to 160 Bar.	Servo machine uses less time.
9	Operation		Simple		Simple		Judging from the way of operation	The same
10	Failure rate		Low		Very low		Judging from the complexity of oil circuit and electric circuit of the system.	Servo machine has less failure.
11	Maintenance		Quite slow		Quick		Judging from the complexity of oil circuit and electric circuit of the system.	Servo machine is easier to maintain.
12	Structure of system		Complicated		Simple		Judging from the complexity of oil circuit and electric circuit of the system.	Servo machine is simpler.

Comprehensive Comparison between Servo Die Casting Machine and General Die Casting Machine (Under No-load Condition)

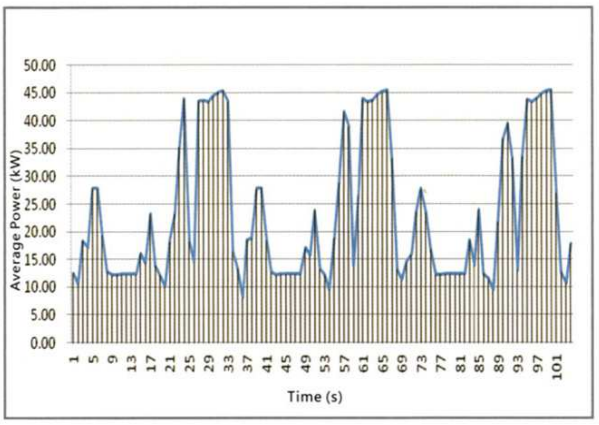
		Frequency motor of General Die Casting Machine	Servo motor of Servo Die Casting Machine
Data on Energy Consumption	Energy consumption of the first hour of auto operation (kW•h)	16	10.4
	Energy consumption of the second hour of auto operation (kW•h)	16	10.4
	Total energy consumption of two-hour auto operation (kW•h)	32	20.8
	Energy consumption of one cycle (kW•h)	0.122	0.067
	Max. load current (A)	50.7	85.5
	No-load current (A)	19.7	1.5
	Time (H) of oil temperature increase from 43.6℃to 57.8℃, with the environment temperature of29.6 ℃ and no cooling water.		4
	Time (H) of oil temperature increase from 29.4℃ to 50℃, with the environment temperature of 29.4℃ and no cooling water.	1	
Power Parameters	Cycles in the first hour of auto operation (times)	131	155
	Cycles in the second hour of auto operation (times)	131	155
	Cycles in two-hour auto operation (times)	262	310
	Average cycle time (s)	27.48	23.2
	Interference of the transducer (Yes/ No)	No	No
	Interference of the pressure sensor (Yes/ No)	No	No

Statistics show that in the no-load test run carried out in the factory, the 400-ton servo die casting machine:

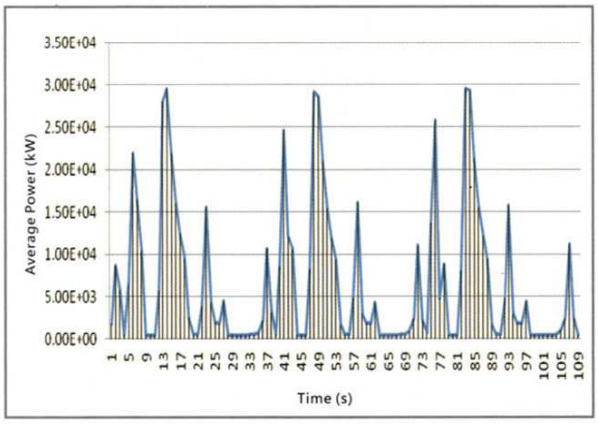
1) saves electricity of 5.6 kW•h per hour on average, with an energy-saving rate of 45% per cycle.
2) has an oil temperature increase of 3.5℃ per hour under the condition of no cooling water, while that of the standard die casting machine is 20.3℃ per hour.
3) improves the production efficiency by 18.3% per hour on average.
4) has very low no-load current.
5) does not interfere other control, without any failure.

Case

DM500 general die casting machine and new servo die casting machine are tested separately in practical production with almost the same setting parameters.



Power Consumption of General Die Casting Machine



Power Consumption of Servo Die Casting Machine

Analysis of Characteristics and Advantages

Annual Savings on Electric Bill

Take Yizumi DM500 Die Casting Machine (motor power: 37kW) that is equipped with servo system working in Guangdong Xiong Xin Factory, for example. The die casting machine works 22 hours per day and 26 days per month. The actual power consumption of the load is 63% of power rating and actual electricity consumption is approximately saved by 71%. Annual electricity saving is: 37*63%*71%*22*26*12=113,600kWh/year Assume that the electricity rate is 0.8 Yuan/kWh, and annual savings on electricity bill will be: 113,600*0.8=90,880 Yuan.

Annual Increase in Production

For Yizumi DM500 General Die Casting Machine, output per shift is 800 pieces, and daily output (3 shifts per day) is 3*800 =2,400 pieces. Assume that productivity is increased by 10% after the servo system is used and there are 26 workdays per month, annual increase in production will be: 2400*26*12*0.1 =74,880 pieces.

Conclusion:

The servo system is notably energy-saving. Under certain conditions, the servo system not only considerably improves productivity, creating more economic benefits, but also effectively restrains the increase of oil temperature so that hydraulic parts are less likely to have problems and the machine has better performance and longer service life.

Yizumi' s Development of Energy-saving Servo Technology of Injection Molding Machines

The variety of injection molding machines extends from the hydraulic models, electric models , tie-bar-less modes to two platen versions and variable displacement pump versions. At the beginning of 21st century, energy-saving servo system is applied in injection molding machine and soon recognized by customers. As the technology of servo-motor-driving becomes mature, more and more customers have recognized the benefit gained from servo injection molding machines which become popular in recent years. Over 70% of customers prefer servo machines in the selection of injection molding machine.

Yizumi Servo Injection Molding Machines

Energy saving in standard case

Successful experience in servo injection molding machines has facilitated our further development of servo technology. We are boosting upgrades of die casting machines with innovative servo technology.

Development of Servo Injection Molding Machines

2005: As the first Chinese company to develop servo pump with Japan YUKEN, we successfully developed the first energy-saving servo-motor-driven injection molding machine.

2006: We used Japan DAKIN IPMP system for R&D of injection molding machines.

2007: We conducted tests of the latest YUKEN ASR System and Chinese-made servo pump system and launched them for one year, receiving good market response.

2008: After four years of serious research and numerous tests, Yizumi chose Japan YUKEN servo system as the standard component of injection molding machines. Mass production of Yizumi servo injection molding machines began.

2009: More and more customers purchased Yizumi servo injection molding machines.

2012: Yizumi servo injection molding machines account for 70% of total sales.

Specifications of DM180SM-DM900SM

Item	Unit	DM140SM	DM180SM	DM300SM	DM400SM	DM500SM	DM650SM	DM800SM	DM900SM
Clamping Force	kN	1400	1800	3000	4000	5000	6500	8000	9000
Clamping Stroke	mm	350	380	460	550	580	670	760	760
Die Height (min.-max.)	mm	200-500	200-600	250-700	300-750	350-850	350-900	400-950	400-950
Platen Size (H×V)	mm	650X650	710x710	870x870	1000x1000	1150x1150	1280x1280	1420x1420	1470x1470
Space between Tie Bars	mm	430X430	480x480	570x570	650x650	750x750	850x850	930x930	960x960
Tie Bar Diameter	mm	80	85	110	130	140	160	180	190
Injection Force	kN	200	280	320	370	450	540	645	700
Injection Stroke	mm	320	350	410	510	580	650	760	760
Plunger Diameter	mm	40,50	50,60	50,60,70	60,70,80	70,80,90	70,80,90	80,90,100	80,90,100
Injection Weight (Mg)	kg	0.5,0.8	0.9,1.3	1.0, 1.5,2.0	1.9, 2.6,3.4	2.9, 3.8,4.9	3.3, 4.4,5.5	5.1, 6.4,7.9	5.1, 6.4,7.9
Injection Weight (Al)	kg	0.7,1.1	1.2,1.8	1.5,2.1,2.9	2.7,3.6,4.8	4.1,5.4,6.9	4.6,6.1,7.7	7 1,9,11.1	7.1,9,11.1
Casting Pressure (intensification)	MPa	159,101	142,99	163,113,83	130,96,73	116,89,70	140,107,84	128,101,82	139,110,89
Casting Area	cm^2	87,137	125,180	182,263,357	305,412,540	427,555,704	460,601,764	620,784,963	645,815,1010
Max. Casting Area (40MPa)	cm^2	350	450	750	1000	1250	1625	2000	2250
Injection Position	mm	0,-100	0,-100	0,-125	0,-175	0,-220	0,-250	0,-250	0,-250
Plunger Penetration	mm	120	130	155	210	250	280	300	300
Diameter of Shot Chamber Flange	mm	110	110	120	130	150	165	200	200
Protrusion of Shot Chamber Flange	mm	10	10	15	15	15	15	20	20
Ejector Force	kN	90	105	150	180	240	300	360	360
Ejector Stroke	mm	80	90	110	130	140	150	180	180
Working Pressure of System	MPa	14	14	16	16	16	16	16	16
Oil Tank Capacity	L	400	500	600	800	1000	1000	1200	1500
Machine Weight	kg	5500	6400	11000	15000	25000	31000	40000	50000
Machine Dimensions (L×W×H)	mm	5200x1250x2200	5600x1500x2700	6200x1720x2750	6900x1920x2880	7600x2150x2980	7950x2280x3100	9000x2420x3220	9200x2450x3250

Standard Features of Energy-saving Servo Systems of DM180SM-DM900SM

Machine Model	DM140SM - DM180SM	DM300SM - DM400SM	DM500SM - DM650SM	DM800SM - DM900SM
New Oil Pump (cc)	50.3(cc)2500r/min	64.4(cc) 2500r/min	101.3(cc) 2200r/min	125.8(cc) 2100r/min
New Servo Motor (N•m)	105Nm	132Nm	235Nm	269Nm
New Servo Driver (kW)	KT-CT-1802-A-1-Y	KT-CT-2502-A-0-Y	KT-CT-4502-A-1-Y	KT-CT-4502-A-1-Y

■ We reserve the right to make changes or improvements of the product without prior notice. The product photos in this catalog are for reference only.