

SUPER METERING PUMP HY SERIES

Pulse-Free

High Accuracy & High Stability ($\pm 0.1\%$)

Triplex Plunger Type

Special Cam Drive

Maintenance-Free



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Design Features

Cam for triplex plunger drive

A special designed cam makes the total amount of liquid discharged from three cylinders always constant. Plungers are designed to make different motions in six stages within one revolution of the cam. The Super Metering Pump was so designed that the total amount of discharged liquid is constantly equal. Furthermore, the instantaneous flow velocity of discharge is the same as that of suction, therefore the occurrence of cavitations is suppressed. Even at the time of switching between suction and discharge, movement of the valve ball is so smooth that pulsation and leakage do not occur. As there is little abrasion of the valve ball and valve seats, high precision can be maintained for a long period.

Plunger Restoring Device

Unlike other conventional plunger pumps, Super Metering Pump does not use springs to make the plunger return to bottom dead center(BDC). As a substitution, this pump uses the special device, Plunger Restoring Device; It consists of a hanger rod that connects the front and rear plunger. This device enables the plunger to follow the cam's motion precisely, even in the variation of viscosity and speed without causing any suction failure. As a result, fluid can be pumped without pulsations.

How the plunger restoring device works?

- 1-During discharge stroke like other plunger pumps, the cam pushes the front-plunger forward.
- 2-During suction stroke the cam pushes the rear-plunger backward.
- 3-At the same time, front plunger follows the rear plunger's motion, since they are connected by a hanger-rod.

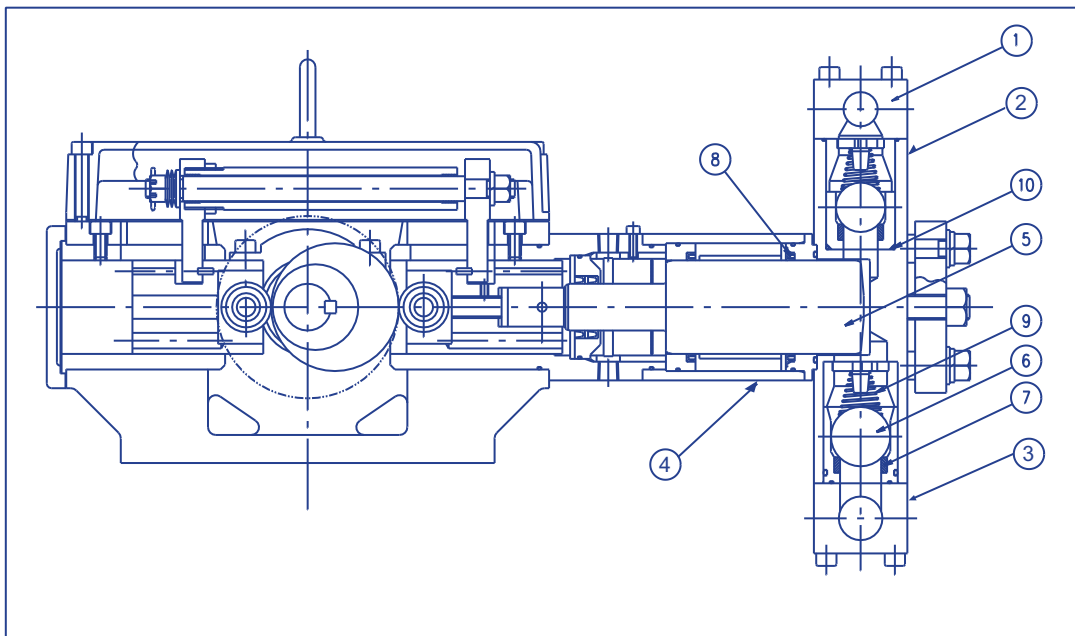
Applications

- Urethane and other resins
- Chromatography
- Explosives
- Food processing
- Feeding for extruder
- Films
- Coating
- Cosmetics
- Line mixing for liquids
- Spray Dryer

Advantages

- Pulse-Free
- High Accuracy & High Stability ($\pm 0.1\%$)
- High stability of flow volume even in suction and/or discharge pressure variation
- High stability of flow volume even in viscosity variation
- Perfect proportional flow volume to revolution

Structure



Materials

	Liquid end 1.2.3.4	Plunger 5	Valve Ball 6	Valve Seat 7	Plunger Seal 8	Spring 9	Gasket(O-ring) 10
HYSA HYSB HYSC	*Stainless-steel 316 Titanium Hastelloy-B,C	*Stainless-steel 316 (coated with-self fluxing alloy) Ceramic	*Ceramic	*Hastelloy-C	*Ultra-High-Molecule- Polyethylene PTFE	*Stainless-steel 316 Spron	*Viton(R) Kalrez(R)
HYM	*Stainless-steel 316 Titanium Hastelloy-B,C	*Stainless-steel 316 (coated with self- fluxing alloy) Ceramic	*Ruby	*Stainless-steel 316 Sapphire Hastelloy-B, C	*Ultra-High-Molecule- Polyethylene PTFE	*Stainless-steel 316 Spron	*Viton(R) Kalrez(R)

Note: Mark (*) refers to maker's standard; others are option.

Kalrez(R) and Viton(R) are registered trademarks of Du Pont Dow Elastomers.

Hastelloy-C(R) is registered trademark of Haynes.

Standard Specifications

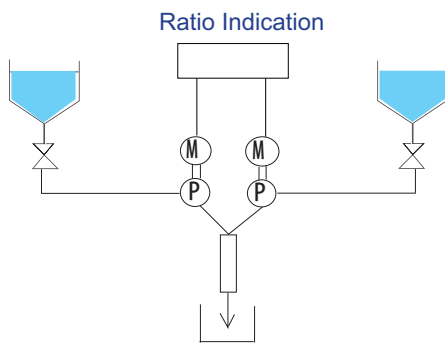
Type		MAX. Flow Rate (/min.)	Flow Rate (ml/rev.)	Max. Discharge Pressure [] ; Special Spec.		Speed Range (r.p.m.)	Viscosity Range (CP)	Temperature Range [] ; Special Spec.		Weight (about kg)
				(MPa)	(PSI)			(°C)	(° F)	
HYM	03	15.3ml	0.13	9.8 [24.5]	1422 [3555]	1-120	1-20,000	-30~120 [200]	-22~248 [392]	8
	06	61.1ml	0.51	9.8 [19.6]	1422 [2844]	1-120	1-20,000	-30~120 [200]	-22~248 [392]	8
	08	108.6ml	0.9	9.8	1422 [1988]	1-120	1-20,000	-30~120 [200]	-22~248 [392]	8
HYSA	06	203.6ml	1.70	98	14221	1-120	1-40,000	-30~120 [200]	-22~248 [392]	45
	08	361.9ml	3.02	23.5 [50.0]	3410 [7255]	1-120	1-40,000	-30~120 [200]	-22~248 [392]	45
	10	565.5ml	4.71	23.5 [32.34]	3410 [4693]	1-120	1-40,000	-30~120 [200]	-22~248 [392]	45
	12	814.3ml	6.79	23.5	3410	1-120	1-40,000	-30~120 [200]	-22~248 [392]	45
	16	1.4L	12.06	14.7	2133	1-120	1-60,000	-30~120 [200]	-22~248 [392]	48
	20	2.3L	18.85	9.4	1364	1-120	1-60,000	-30~120 [200]	-22~248 [392]	48
HYSB	16	2.5L	21.11	14.7	2133	1-120	1-60,000	-30~120 [200]	-22~248 [392]	90
	20	4.0L	32.99	11.7	1698	1-120	1-60,000	-30~120 [200]	-22~248 [392]	90
	25	6.2L	51.54	7.5	1088	1-120	1-60,000	-30~120 [200]	-22~248 [392]	105
	30	8.9L	74.22	5.1	740	1-120	1-60,000	-30~120 [200]	-22~248 [392]	105
	40	15.8L	131.95	2.9	421	1-120	1-60,000	-30~120 [200]	-22~248 [392]	105
HYSC	06	0.1L	0.84	200	29018	1-120	1-60,000	-30~120 [200]	-22~248 [392]	145
	25	6.2L	51.54	11.0 [13.7]	1596 [1988]	1-120	1-60,000	-30~120 [200]	-22~248 [392]	145
	30	8.9L	74.22	7.6 [9.5]	1103 [1379]	1-120	1-60,000	-30~120 [200]	-22~248 [392]	145
	40	15.8L	131.95	4.3 [5.3]	624 [769]	1-120	1-60,000	-30~120 [200]	-22~248 [392]	145
	50	24.7L	206.17	2.7 [3.4]	392 [493]	1-120	1-60,000	-30~120 [200]	-22~248 [392]	145
	60	35.6L	296.88	1.9 [2.3]	276 [334]	1-120	1-60,000	-30~120 [200]	-22~248 [392]	145
HYSD	60	42.4L	424.12	10.0	1451	1-100	1-100,000	-30~120 [200]	-22~248 [392]	
	65	49.8L	497.75	8.6	1248	1-100	1-100,000	-30~120 [200]	-22~248 [392]	
	80	75.4L	753.98	6.5	943	1-100	1-100,000	-30~120 [200]	-22~248 [392]	
	100	117.8L	1178.1	4.0	580	1-100	1-100,000	-30~120 [200]	-22~248 [392]	

- In case of double head type pump, the discharge quantity becomes double as compared with the standard pump.
- Max. Flow Rate and Speed Range are subjects to be changed according to liquid viscosity.
- In addition to the aforementioned standard specifications, we also manufacture pumps different in capacity, discharge pressure and withstanding temperature.
- Pumps with a jacket as well as of sanitary specifications are also available.

Typical Processes

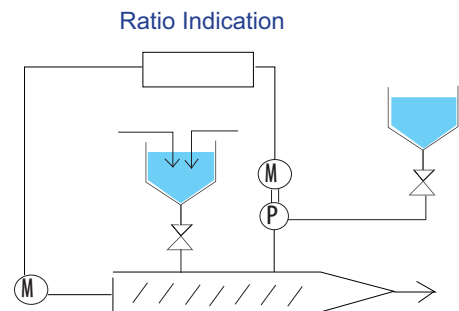
Line Mixing and Emulsification

Without pulse, excellent property of constant volume and liquid transfer can be obtained in proportion to the pump speed. By using a line mixer and a line homogenizer, emulsification and mixing can be done instantaneously in the piping line. This will replace the need of a batch system in the past.



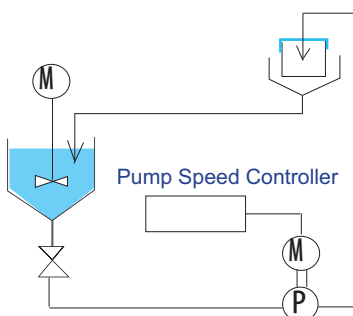
Proportional Pour of Catalyst and Pigment to Extruder

Unlike the other pumps, the discharge flow rate will not vary by change in pressure because the pump has no pulsation and it is resistant to a load change. The HY Series can precisely pour catalyst and pigment to a kneader with constantly stable volume. This system can also be employed for liquid carbon dioxide.



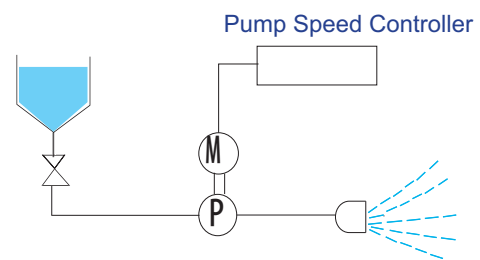
Precision Coating

For coating application, uniform thickness can be accomplished by the merit of no pulsation and constant volume. Because of the pump structure which hardly gives rise to cavitation, perfect coating is obtained without bubble mix on the coated surface. Moreover, the HY Series is not influenced at all by a little change in suction head nor a change in pressure, caused by clogging of a filter for instance.



Precision Spray Spray Drying Granulation

Because of no pulsation and constant volume, the diameter of particles sprayed from the nozzle becomes constant, and thus the quality of product will be improved.



Iretaro (Precise feeding equipment for extruder)

Iretaro is a device, that can feed catalyst and pigment to an extruder proportionally without pulsation. It consists of Super Metering Pump (core), a tank, a control board, etc. It is fixed on the hand cart, therefore, it can be moved easily. It corresponds to explosion proof, high temperature, etc., and the max pressure is 40MPa. A wide range of flow rate is available for your selection. Iretaro has high flexibility and it is adaptable from liquid gases to slurries.

Specifications

- * Flow Range: 0.1ml/min - 100L/min.
- * Max Pressure: 40MPa (It differs in types.)
- * Temperature Range: -30°C~+120°C (200°C is also possible.)



HYM-PORTABLE-TYPE

HYM-Portable-Type Pump: It consists of Super Metering Pump HYM, Motor, Speed-Controller, and Revolution-Counter in a portable cabinet.

Specifications

- * Flow Range: 0.4 - 90ml/min.
- * Max Pressure: 9.8MPa

Advantages

- * Compact Body >>> Mobility: Easy to Handle
- * Prompt Setting: Just insert a plug to start.

Applications

- * High Performance Liquid Chromatography (HPLC)
- * Supercritical-Fluid (Lab. Research)
- * Mixing, Precision-Filling, and more...



Liquid Carbon Dioxide Injector

Recently, the rules for preservation of the environment have been strengthened, such as the regulation of fluorocarbon.

During the flow, people are directing their attention to the liquid carbon dioxide for foaming, because it is safer and more efficient than flammable gas (butane, pentane) or poisoning liquid (methy-lane chloride). Liquid carbon injector (LCD-Injector) can fill the liquid carbon dioxide precisely and continuously.



All sizes required
for lab scale till
industrial plants,
are available.

1.Features

- a. A complete system starting from the supply of Liquid Carbon Dioxide till its injection into certain devices, is available.
- b. Super Metering Pump is used for feeding, and it can pump liquid carbon dioxide with high accuracy. (Fixed quantity : Water $\pm 0.1\%$)
- c. Although LCD-injector uses a plunger pump, the amount of leakage is negligible. A special shaft seal is used, which prevents a breaking out of dry ice and an abnormal abrasion of plunger seal.
- d. Explosion proof type is possible.

2.Structure

LCD-injector consists of a pump, temperature regulator, controller, gauge (option) and a tank (high-pressure cylinder). The whole unit is compact. A portable type is also available. We can sell the pump separately.

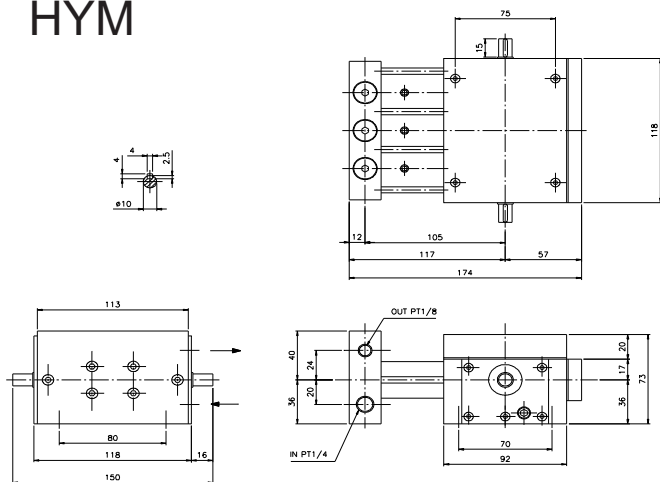
3.Specifications

- * Flow Range : 0.1ml/min. - 15L/min.
(Max.flow range of one type is about 1:120. It's pumping ability can be attained up to 100L/min.)
- * Max Discharge Pressure : 39. 21MPa (It differs with the type of the pump.)
- * Temperature Range : About -22° F - 86° F (but we can design for other temperatures, as well.)

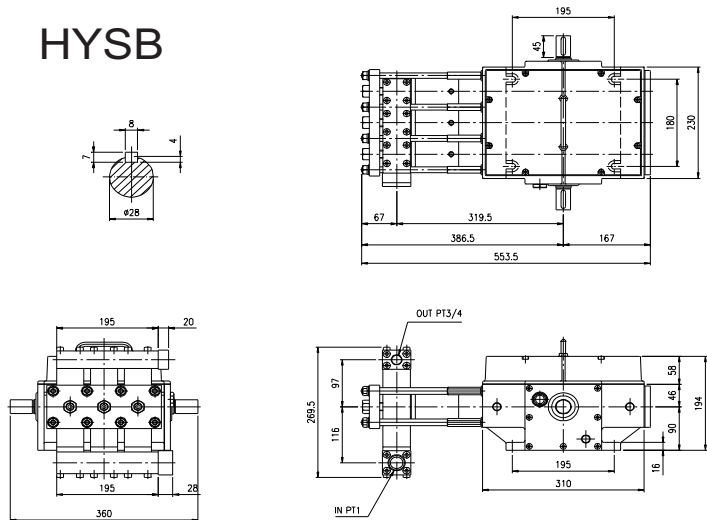
Dimensions

(m m)

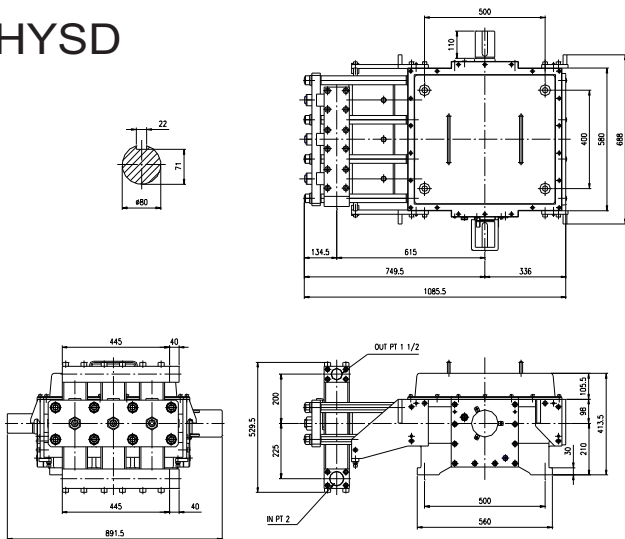
HYM



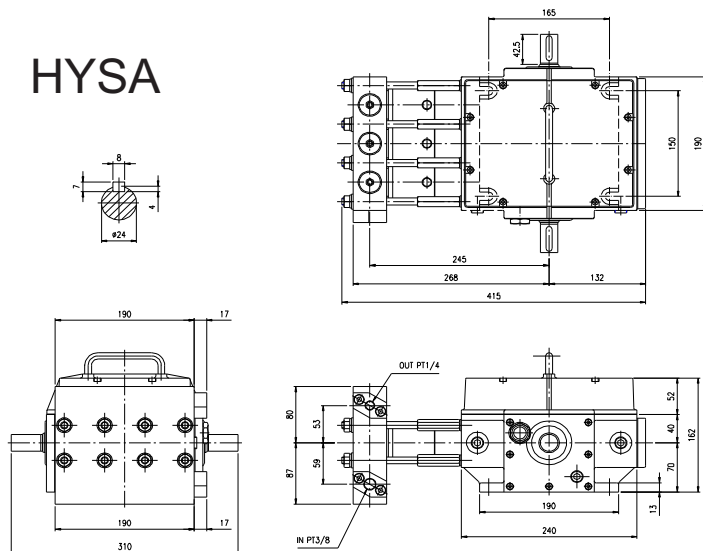
HYSB



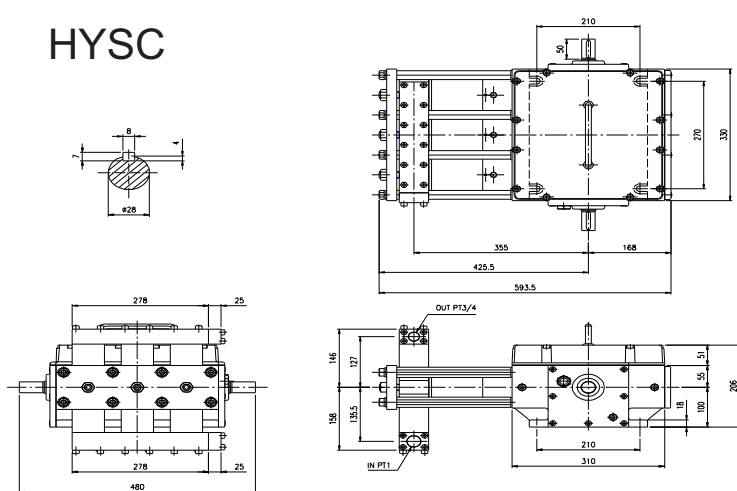
HYSD



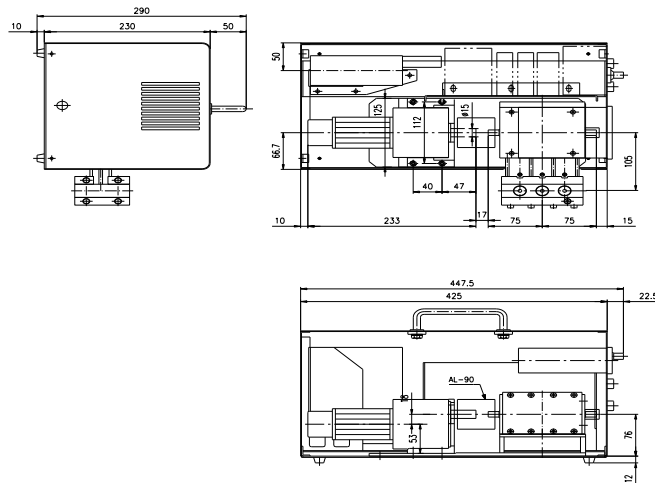
HYSA



HYSC



HYM-Portable



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