

TACMINA

Hydraulic Diaphragm type

Metering Pump



High-precision
Safe

For Metering Injection in Petr

Hydraulic diaphragm metering pumps have both the high-pressure and high-precision features of plunger type pumps and zero liquid leakage thanks to the fully enclosed structure of diaphragm pumps.

M

Hydraulic Diaphragm Pump

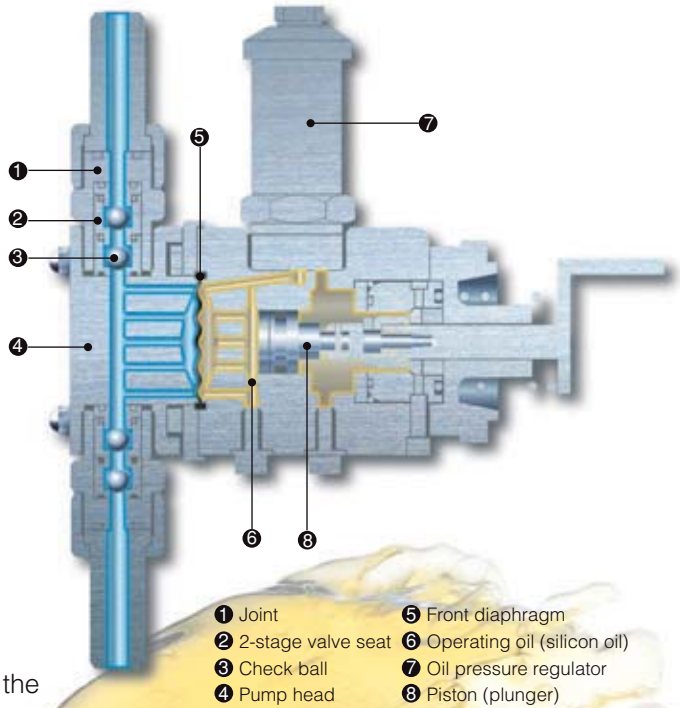
Packed with all the features of plunger and diaphragm pumps, this pump is ideal for petrochemical and food processes that demand high precision and safety.

Features

- **Oil pressure regulating valve**
Built-in relief mechanism allows excess pressure to escape during pipe blockages, for example, for improved safety and durability.
- **Silicon oil used in hydraulic mechanisms**
Low-toxicity, stable silicon oil is used separately from gear oil in the drive for sustained performance and safety.

Mechanism

Piston reciprocating motion is transmitted to the operating oil (silicon oil) to suck in and discharge liquid. The top of the pump is equipped with an oil pressure regulator in which an oil pressure regulating valve (pressure relief valve) is installed.



MW

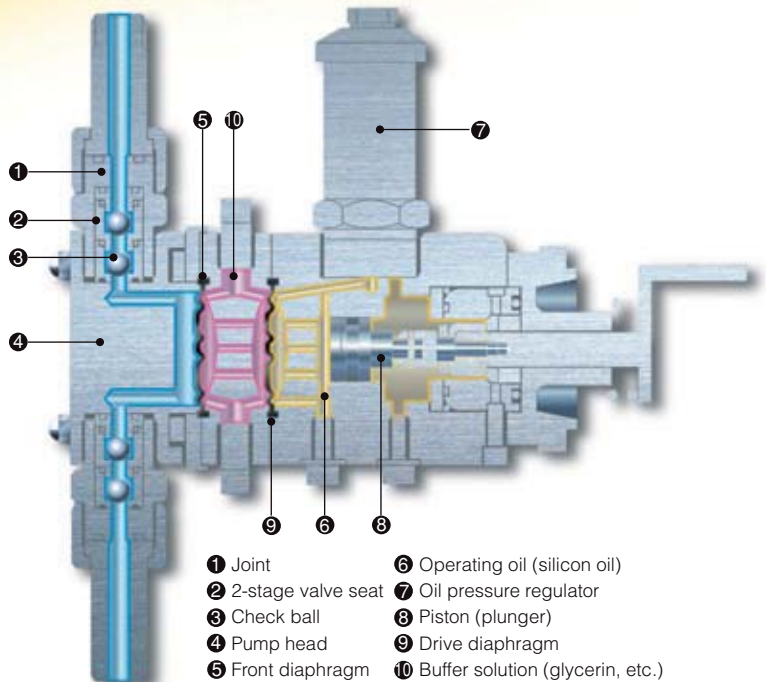
Hydraulic Double-diaphragm Pump

This enhanced hydraulic diaphragm pump is ideal for food processes and metering injection of high-viscosity liquids and liquids containing slurry.

Features

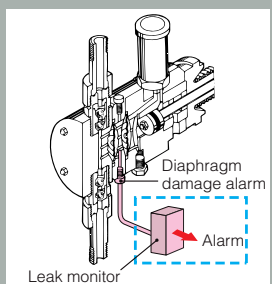
PTFE corrugated diaphragm used

A thick PTFE diaphragm free of impurities is used for the front diaphragm to ensure higher precision and safety.



Diaphragm Breakage Damage Alarm

A diaphragm breakage alarm can be installed between the two diaphragms to improve safety. The electrode mounted in the buffer solution immediately detects diaphragm damage and notifies the error.



Mechanism

Piston reciprocating motion is transmitted to the operating oil (silicon oil) to reciprocally operate the drive diaphragm. This reciprocating motion is transmitted uniformly to the front diaphragm by the buffer solution (glycerin, etc.) to suck in and discharge liquids stably.

ochemical and Food Processes

Applied Products

Liquid used, on-site operation and control means, installation space and other factors greatly affect the operating conditions of metering pumps. And injection needs are as equally diverse. This is why TACMINA has prepared a wide range of enhanced precision and safety applied products in response to all possible injection needs. TACMINA also provides a custom-made system for helping users choose the required products.
* Several application series can be combined.



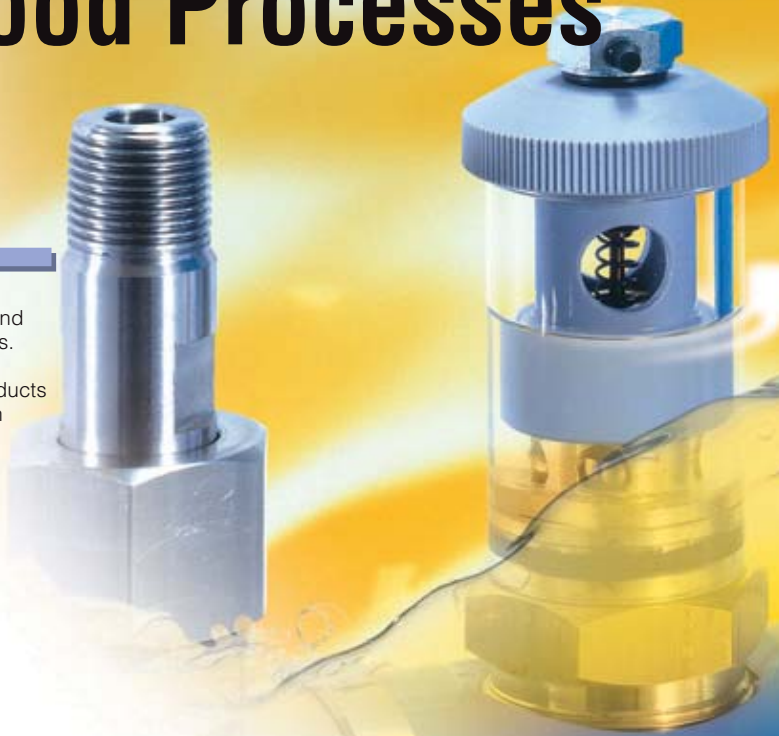
Smoothflow Pump

- For food and other processes
- Extremely easy on-site assembly and disassembly. CIP cleaning also possible
 - No liquid accumulating points prevents the propagation of bacteria.



Remote Head

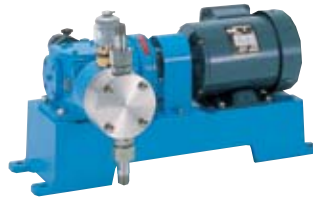
- For metering injection of hot liquids between 100 and 130°C
- For metering injection of liquids that must be maintained in a high-temperature state
 - When cleaning by steam and hot water is required
 - Effective for pumping slurry



Variation



SXMA1 model



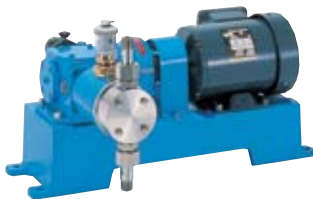
SYMA1 model



ZM2 model



SXMWA1 model



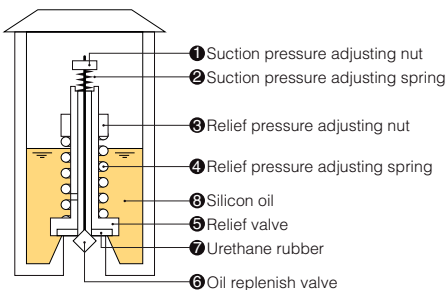
SYMWA1 model



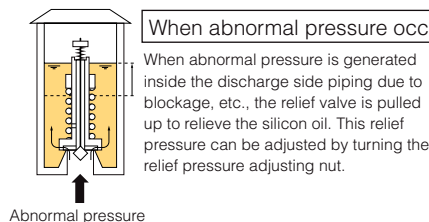
ZM1 model

Name of Hydraulic Adjusters and Principle of Operation

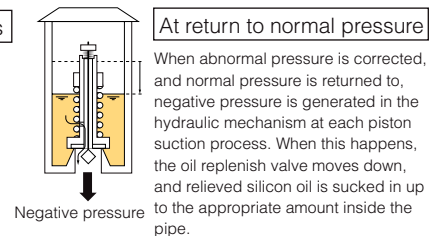
During normal operation



When abnormal pressure occurs



At return to normal pressure



Model Code



- 1 Series name**
S: S series
R: R series
- 2 Drive box type**
X: Vertical type
Y: Horizontal type
Z: Horizontal reinforced specification (R series only)
- 3 Pump head**
M: Hydraulic diaphragm
MW: Hydraulic double-diaphragm
- 4 Number of pump heads**
1: Single=Basic type
2: Duplex
3: Triplex
4: 4-head
5: 5-head
6: 6-head
- 5 Model (piston diameter standard)**
a) 014: Piston diameter 14 mm
b) P: High-pressure type (some models only)
No indication: General model
- 6 Liquid contact material**
a) Pump head
V: PVC
S: SUS304
F: PVdF
T: PTFE
b) Diaphragm
E: EPDM
T: PTFE
c) Check ball
C: Ceramic
S: SUS304
* Combinations are limited.
- 7 Connections**
a) Connection type
U: Union
F: Flange
b) Valve structure
W: Standard
V: High-viscosity

* For details on Z Series model codes, check in the Z Series catalog.

Performance Specifications

Model	SXMA1/SXMWA1			SYMA1/SYMWA1			ZM1/ZMW1						
	-014	-020	-030	-014	-020	-030	-028	-028P	-040	-040P	-056	-056P	
Max. discharge volume (mL/min)	97	195	500	97	195	500	670	670	1370	1370	2700	2700	
60 Hz	115	235	600	115	235	600	800	800	1650	1650	3200	3200	
Max. discharge pressure (MPa)	2.5	2.0		2.5	2.0		1.6	2.5	1.6	2.5	1.2	1.7	
Strokes per minute (spm)			105						81				
60 Hz			126						97				
Stroke length (mm)			8						15				
Piston diameter (mm)	14	20	30	14	20	30	28	28	40	40	56	56	
Connection type/aperture	Flange	JIS 30K 15 mm (JIS 10K 15 mm)						JIS 16K 15 mm	JIS 30K 15 mm	JIS 16K 15 mm	JIS 30K 15 mm	JIS 16K 20 mm	JIS 30K 20 mm
	FW	JIS 10K 15 mm						JIS 16K 15 mm			JIS 16K 20 mm		
Union UW	R3/8 (VTC uses VP-16)												
Motor specifications	Type/power supply	Totally enclosed fan-cooled outdoor type 3-phase 200/200/220 V: 50/60/60 Hz											
	Power/number of poles	0.2kW4P						0.4kW4P			0.75kW 4P		
	Rated current (A)	1.3/1.1/1.1						2.3/2.0/2.0			3.6/3.2/3.1		
	Startup current (A)	5.0/4.6/5.0						10.2/9.07/9.98			19.5/17.4/19.4		
Paint color	Acrylic urethane resin (Munsell 10B 5/10)												
Weight (kg)	Approx. 16	Approx. 16	Approx. 16	Approx. 19	Approx. 19	Approx. 19	Approx. 20	Approx. 21	Approx. 20	Approx. 21	Approx. 20	Approx. 29	

Notes

- To calculate the max. discharge volume for two pump heads or more, multiply the values for one pump head by the number of pump heads.
- The max. indicated discharge volume is the discharge volume at the max. discharge pressure.
- The max. discharge pressure is 1.0 MPa when the pump material is resin (PVC, PVDF, etc.) even on models where the max. discharge pressure exceeds 1.0 MPa.
- The max. dischargeable viscosity is 50 mPa•s.
- Numerical values in specifications for Z Series are for the STST.
- Contact your dealer regarding special specifications.

Liquid Contact Material

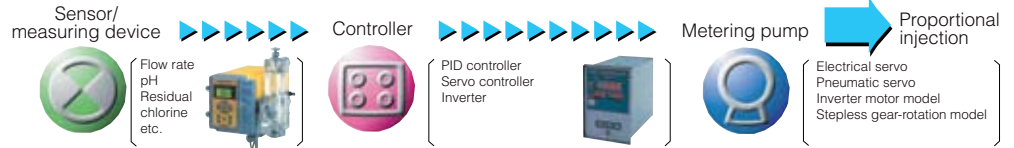
Part	S Series			Z Series	
	STST	VTC	FTC	STST	VTCF
Pump Head	SUS304	PVC	PVdF	SUS304	PVC
Diaphragm			PTFE		
Check ball	SUS304	Ceramic	Ceramic	SUS304	Ceramic
Joint	SUS304	PVC	PVdF	SUS304	PVC
O-ring	PTFE	Fluoro rubber	PTFE	PTFE	Fluoro rubber
Valve seat				SUS304	PVC





Notes

- Fluoro rubber, or Vyton by trade name, is a copolymer of vinylidene fluoride and propylene hexafluoride.
- Contact your dealer regarding special materials other than the above.

Control Variations

A wide range of unique discharge volume automatic control products is available for you to choose to suit your conditions of use. Naturally, dual control that allows the discharge volume to be adjusted over a wide range is also possible.



Control Method		Control Equipment	Features	Pump
Stroke Length Control	Stroke length remote control method	Digital Servo Controller DSC100 (for electrical servo, applicable to all models) • Input signal: DC4 to 20 mA	Stroke length remote-controlled by two servo types (electrical and pneumatic) • Wide power source range (85 to 264 VAC) • Automatic operation output • Error output and self-diagnostics function	 Electrical servo  Pneumatic servo
	Inverter rpm control method (frequency control method)	Inverter • Input signals: DC4 to 20 mA, 0 to 5V, 0 to 10V	• Speed of general-purpose motor can be varied. • Low-cost • Max. speed is not influenced by power supply frequency.	
Stroke Count Control	Manual stepless speed change control system	Stepless speed change unit	• Control panel or inverter not required • Can be used even in explosive areas	
	Dual control method	Wide control range (50:1) enabled by dual control of number of strokes and stroke length	• Max. control range of 50:1 is possible while maintaining high precision. • Easy connection (automatic control) with flow meter or other measuring devices	

Model	RYM/MW1					RZM/MW1			RYM/MW2								
	-028	-040	-056	-080	-100	-056	-080	-100	-028	-040	-056	-080	-100				
Max. discharge volume (L/min)	0.8	1.66	3.2	6.6	10.3	3.2	6.6	10.3	2x0.80	2x1.66	2x3.2	2x6.6	2x10.3				
Max. discharge pressure (MPa)	2.5		1.2	0.7	0.6	2.5	1.0	0.8	2.5		1.2	0.7	0.6				
Strokes per minute (spm)						97											
Stroke length (mm)						15											
Piston diameter (mm)	28	40	56	80	100	56	80	100	28	40	56	80	100				
Connection type/aperture	Flange Discharge side	JIS 30 K 15 mm		JIS 16K 20 mm		JIS 10 K 40 mm		JIS 30K 20 mm		JIS 10 K 40 mm		JIS 30 K 15 mm		JIS 16K 20 mm		JIS 10 K 40 mm	
	FW Suction side	JIS 10 K 15 mm		JIS 10K 20 mm		JIS 10 K 40 mm		JIS 10K 20 mm		JIS 10 K 40 mm		JIS 10 K 15 mm		JIS 10K 20 mm		JIS 10 K 40 mm	
Union UW																	
Motor specifications	Type/power supply	Totally enclosed fan-cooled outdoor type 3-phase 200/200/220 V: 50/60/60 Hz															
	Power/number of poles	0.4kW4P					1.5kW4P			0.4kW4P							
	Rated current (A) 200/200/220 V 50/60/60 Hz	2.3/2.0/2.0					3.9/3.4/3.4			2.3/2.0/2.0							
	Startup current (A) 200/200/220 V 50/60/60 Hz	7.01/7.17/7.83					17.9/16.5/17.6			7.0/7.2/7.9							
Paint color	Acrylic urethane resin (Munsell 10B 5/10)																
Weight (kg)	Approx. 75	Approx. 75	Approx. 75	Approx. 80	Approx. 80	Approx. 85	Approx. 85	Approx. 85	Approx. 120	Approx. 120	Approx. 120	Approx. 130	Approx. 130				

Notes)

- To calculate the max. discharge volume for two pump heads or more, multiply the values for one pump head by the number of pump heads.
- The max. indicated discharge volume is the discharge volume at the max. discharge pressure.
- The max. discharge pressure is 1.0 MPa when the pump material is resin (PVC, PVdf, etc.) even on models where the max. discharge pressure exceeds 1.0 MPa.
- The max. dischargable viscosity is 50 mPa•s.
- Contact your dealer regarding special specifications.

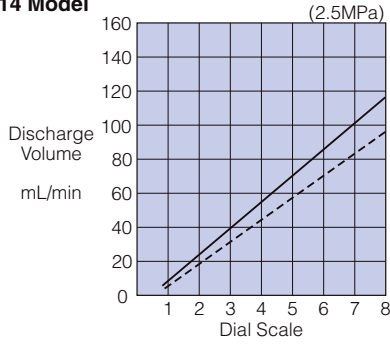
Part	Series Name	R Series			
	Liquid Contact Type Name	STS	VEC	VES	VTC
Pump Head		SUS304	PVC	PVC	PVC
Diaphragm		PTFE	EPDM	EPDM	PTFE
Check ball		SUS304	Ceramic	SUS304	Ceramic
Joint		SUS304	PVC	PVC	PVC
O-ring		PTFE	Fluoro rubber	Fluoro rubber	Fluoro rubber
Valve seat		SUS304	PVC	PVC	PVC

Note) VEC and VES are not available for hydraulic double-diaphragm mode.

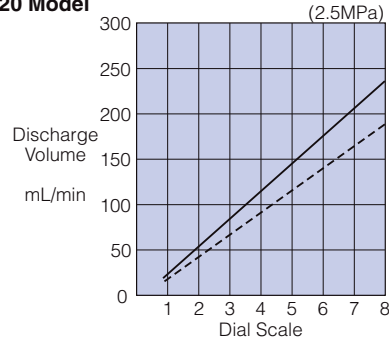
Performance Curves

SXMA•MWA/SYMA•MWA Model

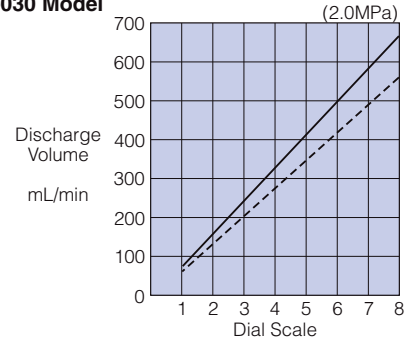
-014 Model



-020 Model

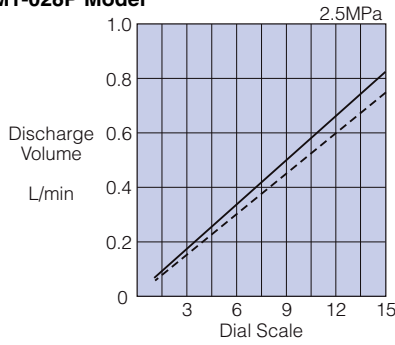


-030 Model

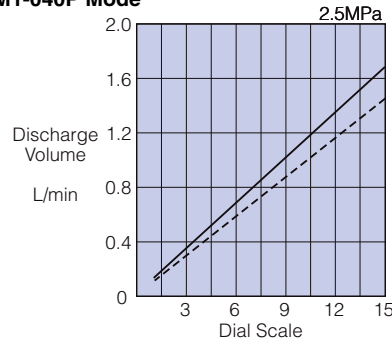


ZM/ZMW Model

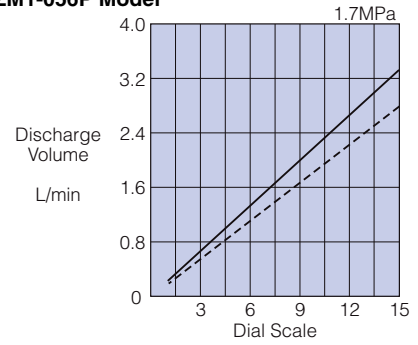
ZM1-028P Model



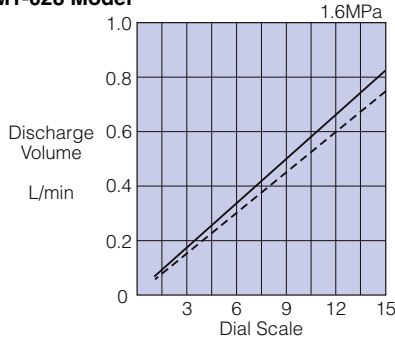
ZM1-040P Model



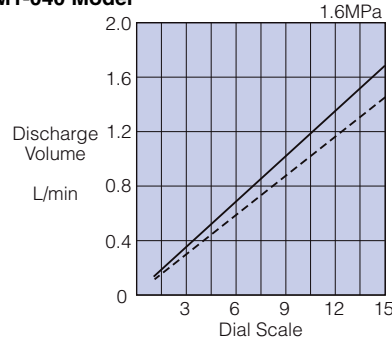
ZM1-056P Model



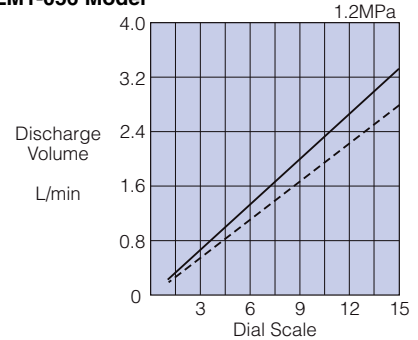
ZM1-028 Model



ZM1-040 Model

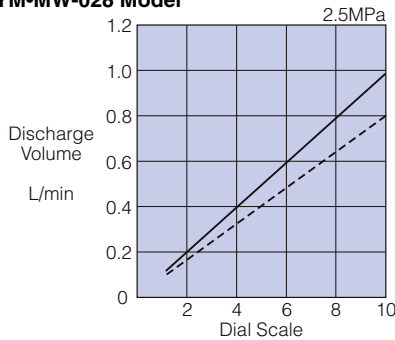


ZM1-056 Model

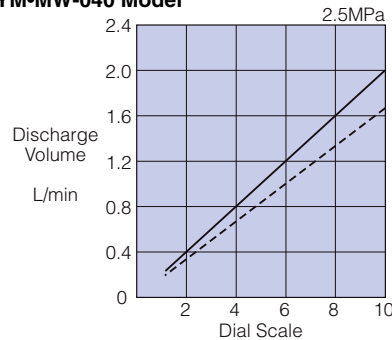


RYM•MW/RZM•MW Model

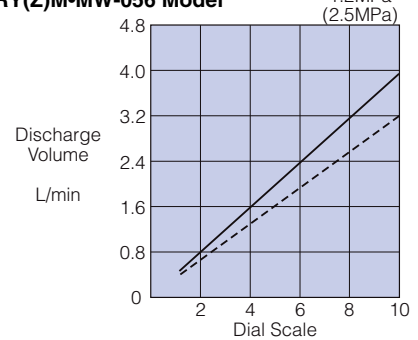
RYM•MW-028 Model



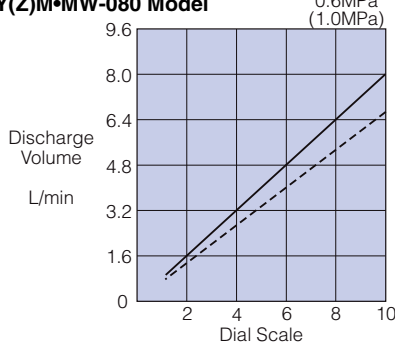
RYM•MW-040 Model



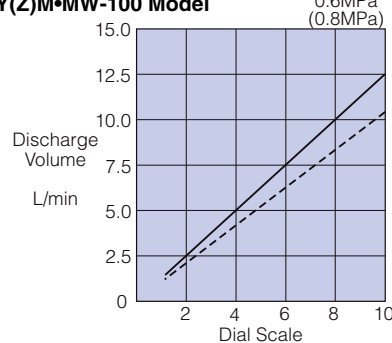
RY(Z)M•MW-056 Model



RY(Z)M•MW-080 Model



RY(Z)M•MW-100 Model



Request

- Measure discharge volume based upon user operating conditions, and set the dial according to that performance curve.

Remarks

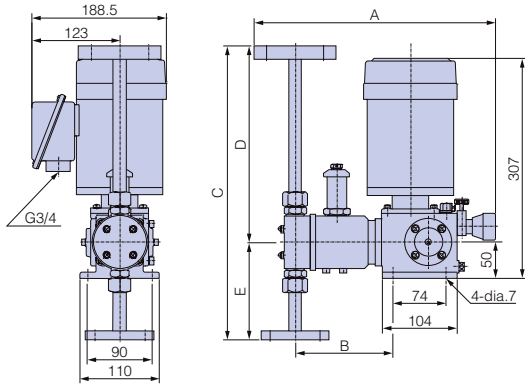
- The above performance curves are examples of measurements performed under fixed conditions by test equipment at TACMINA. These curves may vary slightly due to individual on-site conditions and equipment differences.

Conditions: Room temperature, clean water

- 50 Hz
- 60 Hz

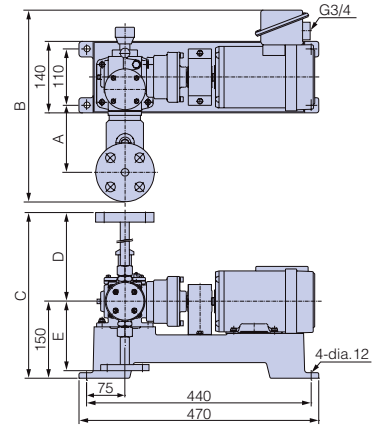
External Dimensions

SXMA1 (MWA1)



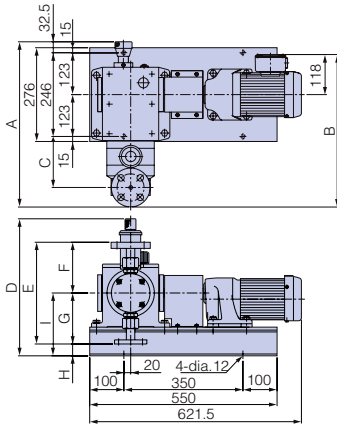
Model	A	B	C	D	E
-014-ST5-FW	340.5 (362.5)	136.5 (158.5)	405	274	131
-VTC-FW	330.5 (352.5)	136.5 (158.5)	394	274	120
-FTC-FW	330.5 (352.5)	136.5 (158.5)	405	274	131
-020-ST5-FW	340.5 (362.5)	136.5 (158.5)	405	274	131
-VTC-FW	330.5 (352.5)	136.5 (158.5)	394	274	120
-FTC-FW	330.5 (352.5)	136.5 (158.5)	405	274	131
-030-ST5-FW	330.5 (355.5)	126.5 (151.5)	421	282	139
-VTC-FW	320.5 (355.5)	126.5 (151.5)	410	282	128
-FTC-FW	320.5 (355.5)	126.5 (151.5)	421	282	139

SYMA1 (MWA1)



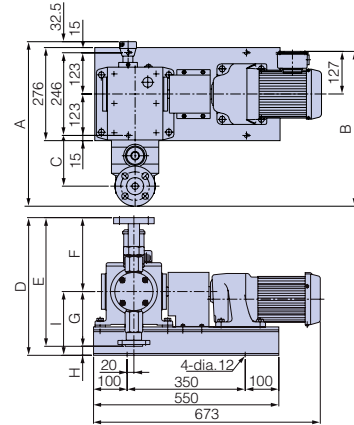
Model	A	B	C	D	E
-014-ST5-FW	131 (153)	375.5 (397.5)	424	274	131
-VTC-FW	131 (153)	365.5 (387.5)	424	274	120
-FTC-FW	131 (153)	365.5 (387.5)	424	274	131
-020-ST5-FW	131 (153)	375.5 (387.5)	424	274	131
-VTC-FW	131 (153)	365.5 (387.5)	424	274	120
-FTC-FW	131 (153)	365.5 (387.5)	424	274	131
-030-ST5-FW	121 (146)	365.5 (390.5)	432	282	139
-VTC-FW	121 (146)	355.5 (380.5)	432	282	128
-FTC-FW	121 (146)	355.5 (380.5)	432	282	139

RYM1 (MW1)



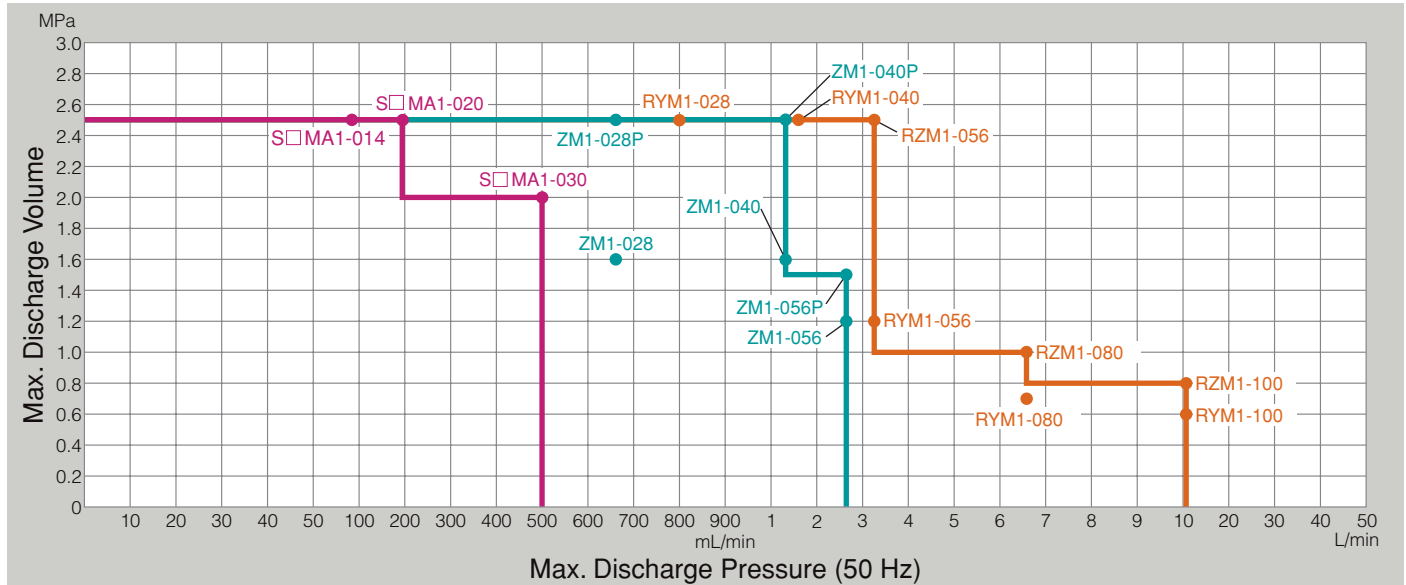
Model	A	B	C	D	E	F	G	H	I
-028-V□□	476 (509.5)	438.5 (472)	150 (183.5)	402	293	155.5	137.5	46.5	184
-028-ST5	486 (519.5)	448.5 (482)	150 (183.5)	402	299	149.5	149.5	34.5	184
-040-V□□	476 (509.5)	438.5 (472)	150 (183.5)	402	267	133.5	133.5	50.5	184
-040-ST5	486 (519.5)	448.5 (482)	150 (183.5)	402	263	131.5	131.5	52.5	184
-056-V□□	478.5 (512)	441 (474.5)	150 (183.5)	402	267	133.5	133.5	50.5	184
-056-ST5	478.5 (512)	441 (474.5)	150 (183.5)	402	263	131.5	131.5	52.5	184
-080-V□□	509 (539)	471.5 (501.5)	160.5 (190.5)	449.5	385	192.5	192.5	8.5	184
-080-ST5	503 (533)	465.5 (495.5)	154.5 (184.5)	441	349	174.5	174.5	9.5	184
-100-V□□	509 (539)	471.5 (501.5)	160.5 (190.5)	449.5	385	192.5	192.5	8.5	184
-100-ST5	503 (533)	465.5 (495.5)	154.5 (184.5)	441	349	174.5	174.5	9.5	184

RZM1 (MW1)



Model	A	B	C	D	E	F	G	H	I
-056-ST5	448.5 (522)	460 (493.5)	150 (183.5)	408.5 (407)	382 (325)	219.5 (162.5)	162.5	26.5	189
-080-V□□	509 (539)	480.5 (510.5)	160.5 (190.5)	449.5	385	192.5	192.5	3.5	189
-080-ST5	503 (533)	474.5 (504.5)	154.5 (184.5)	446	349	174.5	174.5	14.5	189
-100-V□□	509 (539)	480.5 (510.5)	160.5 (190.5)	449.5	385	192.5	192.5	3.5	189
-100-ST5	503 (533)	474.5 (504.5)	154.5 (184.5)	446	349	174.5	174.5	14.5	189

Hydraulic Diaphragm/Hydraulic Double-Diaphragm Pump Selection Table

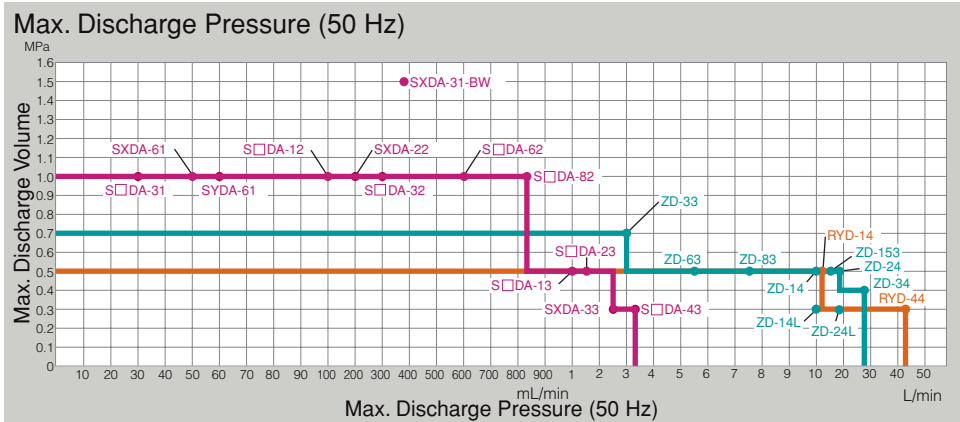


* Values in the table are common to M and MW models. * For □ in S model, select X (vertical type) or Y (horizontal type).



Direct-drive Diaphragm Pump

Low-cost model with stable injection precision ideal for water treatment and waste water processing

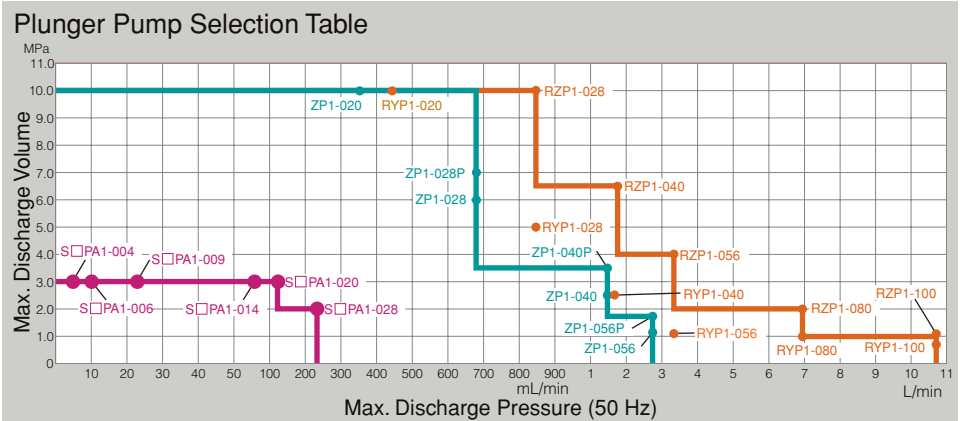


* For □, select X (vertical type) or Y (horizontal type).



Plunger Pump

Capable of high-precision injection of trace amounts at high pressure, and with increased service life seals. Ideal for metered injection of boiler chemicals



* For □, select X (vertical type) or Y (horizontal type).

- Numbers in graphs are for a 50 Hz power source. When a 60 Hz power source is used, leave the maximum discharge pressures at the same values, and multiply the maximum discharge volumes by about 1.2 times.
- Each of the values is calculated for a single pump head. In a duplex and triplex configuration, leave the maximum discharge pressures at the same values, and double and triple the maximum discharge volumes, respectively.
- Up to six in-series pumps can be manufactured for the S/E/R series.

CAUTION

- Do not use outside the temperature range shown below as this may result in failure:
Ambient temperature: 0 to 40°C
Requirement for liquid being handled: Liquid temperature: 0 to 50°C
- Operate at discharge pressures and viscosities within specifications listed in this catalog.
- Viscosities that can be transferred differ according to model.
- Contact your dealer when handling liquids containing slurry.

Product designs and specifications are subject to change without notice for product improvement.

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EC-022 (4) 05
2010/12/CSS



ISO 9001 Registration
JQA-1274 Production Division

ISO 14001 Registration
JQA-EM0637 Production Division

We are using environmentally friendly materials.

Mixed Sources
Product group from well-managed forests and other controlled sources
www.fsc.org Cert no. SGS-COC-004289
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