



**Innovative Fine Ceramic Gear
Achieves Stable, Non Pulsatile, and Quantitative Injection**

GX

Gland Packing or Mechanical Seal

**Hard and Soft
Fine Slurries
Can Be Handled**



Page 3 to 10

GM

Seal-Less (Magnetic Drive)

**No Liquid Leaks
Ideal for Handling
Chemical Liquids**



Page 3 to 10

GM-V

Dedicated for Corrosive Chemical Solutions

**Non Metallic Construction
with Corrosion Resistance**



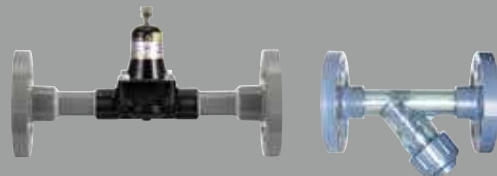
Page 11 to 13

Optional Accessories

Non Pulsatile Quantitative Injection System Components

Have Extensive Experience in a Wide Range of Application

Integrated Production From Piping Units to Control Panel Design



Page 14

IWAKI Proprietary Internal Gear Pump Equips With Fine Ceramic Gears

Without detracting from any of the advantages of conventional internal gear pumps, abrasion resistance, chemical resistance, low-viscosity characteristics and sealing characteristics have been remarkably improved.

Our internal gear pumps achieve pulsation-free operation even transferring liquid with low-high viscosity and fine slurries.^{Note}

In addition to the gland packing/mechanical seal type (Model GX), magnetic drive sealless type (Model GM) is available as the standard product for an expanded range of uses.

Note: To perform constant flow Injection, use this pump with a PFC controller, magnetic flowmeter, inverter and back pressure valve.

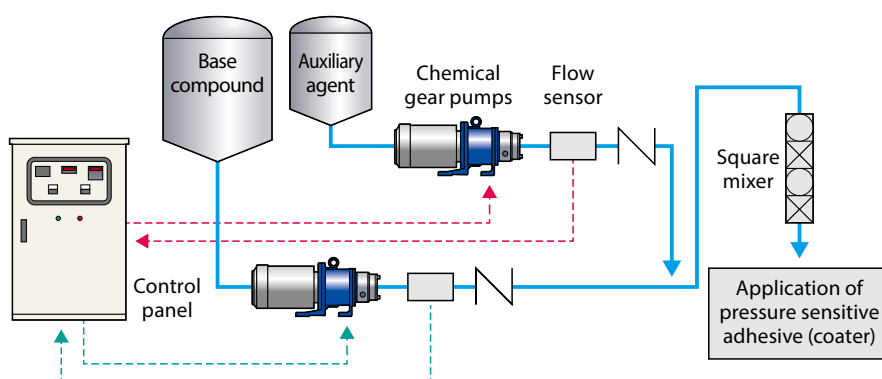


Applications (GX/GM)

- Non pulsatile quantitative injection of animal glue in copper foil manufacturing process.
- Quantitative transfer of magnetic slurry liquid.
- Quantitative transfer of paint and dye slurry liquid.
- Quantitative injection of coagulant.
- Quantitative injection of paper strength enhancer.
- Non pulsatile quantitative transfer of fine slurry of electronic materials.
- Ammonia water/urea water spray in flue gas denitration equipment such as cleaning factory.
- Transfer of perfume such as detergent.
- Transfer of cleaning solvent for metal parts, electronic parts etc.
- Solvent-based adhesive transfer.
- Chemical liquid transfer for various processes. (caustic soda, 98% sulfuric acid, nitric acid etc.)
- Coating of positive and negative electrode materials for rechargeable lithium-ion battery manufacturing.



• This photo is for illustrative purposes only.



Dealing With a Wide Range of Industrial Processes Which Grow in Sophistication

The fine ceramic gears provide longer life and higher performance than our conventional internal gear pumps.



High Levels of Durability

Fine ceramic gears provide superior abrasion resistance and chemical resistance than conventional gear pumps, prevent “galling” and “seizing” when the pump operates at a high speed. Main materials are stainless which provides corrosion resistance and thermal resistance. Superior anticorrosive materials such as stainless, ceramic, PTFE and carbon are used in liquid ends so that all sorts of chemical liquids can be handled.

Ceramic vs stainless steel gear comparison

	Corrosion resistance	Thermal resistance	Seizing resistance	Exfoliation resistance	Abrasion resistance	Coefficient of friction	Impact resistance
Fine ceramic gear	✓ Excellent	✓ Excellent	✓ Excellent	✓ Excellent	✓ Excellent	✓ Excellent	○ Poor
Metal gear	Heat-treated	○ Poor	✓ Excellent	✓ Average	✓ Average	✓ Excellent	✓ Excellent
	Hard coated	✓ Average	✓ Excellent	✓ Excellent	○ Poor	✓ Excellent	✓ Average



Quiet Liquid Transfer with Less Pulsation

Without the pulsation that is common to the reciprocating pump and the gear pump for general uses, liquid is transferred quietly and smoothly, not agitating or generating foam/bubbles.



Seal-Less Design (GM type)

Magnetic drive seal-less pumps are free from leakage problems and the need for seal replacement.



Wide Range of Viscosity Liquids and Fine Slurries Can Be Handled

The fine ceramics are available in two types. SiC (silicon carbide) ceramics, which is ideal for handling low viscosity liquids, and Si3N4 (silicon nitride) ceramics, which is ideal for handling high viscosity liquids. The GX type can handle hard and soft fine slurries.

• Do not use the GM type for slurry applications.



Improved Performance

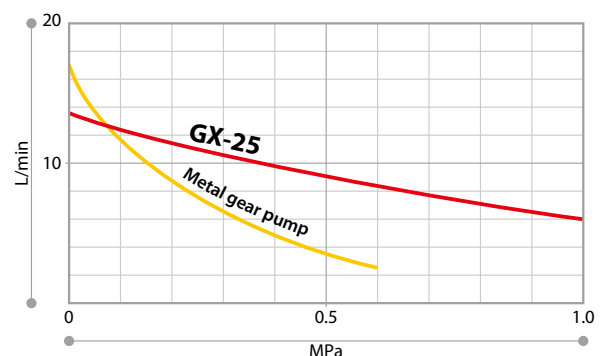
Performance has been noticeably improved. Ceramic gears make it possible to reduce spaces between parts, therefore out-performing conventional metal gear models. The pump is far less subject to declining output even under high pressure.



High Self-Priming Ability

Because the suction port is at the top of the pump, the pump chamber is filled with liquid when pump stops. The self-priming capacity is enhanced at re-start.

• The height of self-priming varies depending on the liquid characteristics, liquid temperature, piping conditions. Please contact us for details.





Simple Device Configuration Easy Maintenance

By simply combining a PFC controller, magnetic flowmeter, inverter, and back pressure valve, it is possible to inject a constant flow with less pulsation even if there are fluctuations in the level of the suction tank or load fluctuations on the discharge side.

• Please refer to the optional accessories (page 14) for the each device.



Constant Flow Injection with Excellent Controllability

Regardless of the temperature change, viscous liquid can be handled at accurate flow rate, which cannot do with other pumps. As the output is linearly related to rpm, the flow rate is easily controlled by changing motor speed. The pump achieves fixed injection with the rangeability 10 times greater than conventional metering pumps.

- Rangeability 1:100
- To perform constant flow Injection, use this pump with a PFC controller, magnetic flowmeter, inverter and back pressure valve.



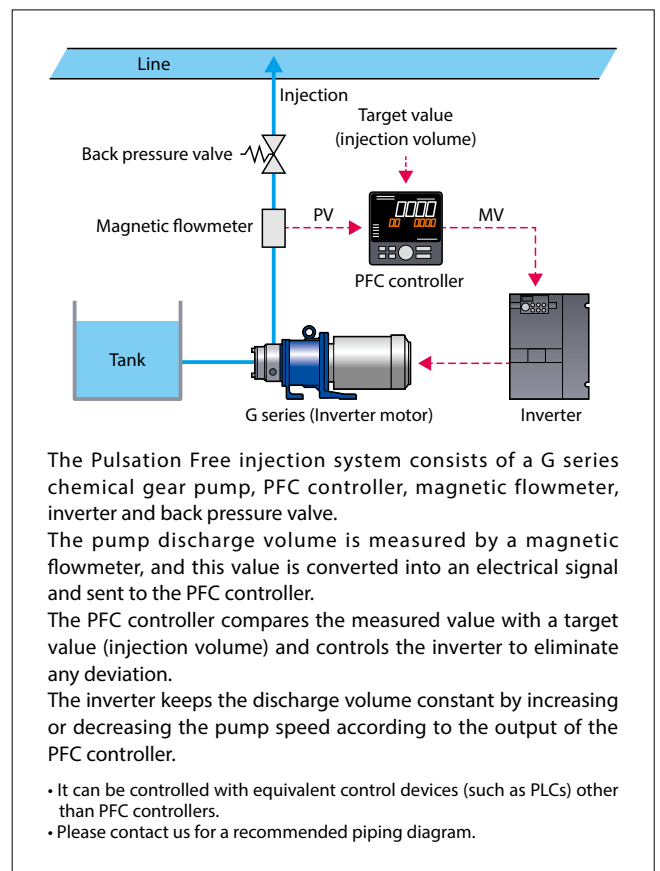
Cost Reduction

Fine ceramics have excellent abrasion resistance so there is almost no wear on the parts and they can be used for a long period. In addition, the pump performs pulsation-free operation without pulsation suppression accessories such as air chambers. Compared to reciprocating pumps, fewer components reduce initial and total costs.



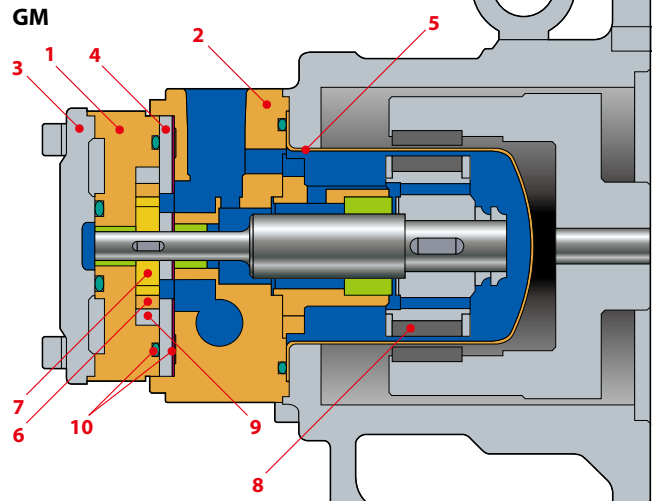
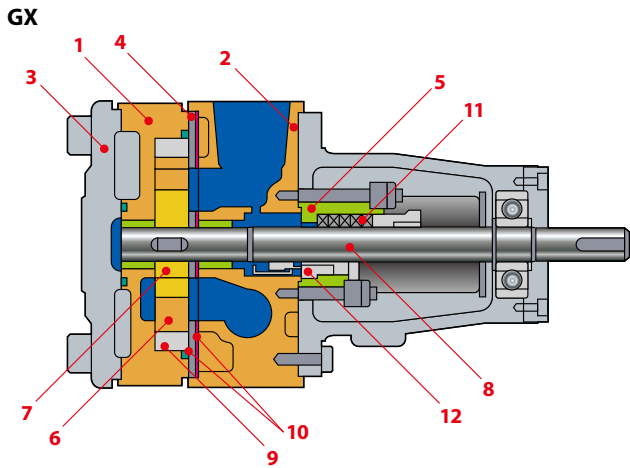
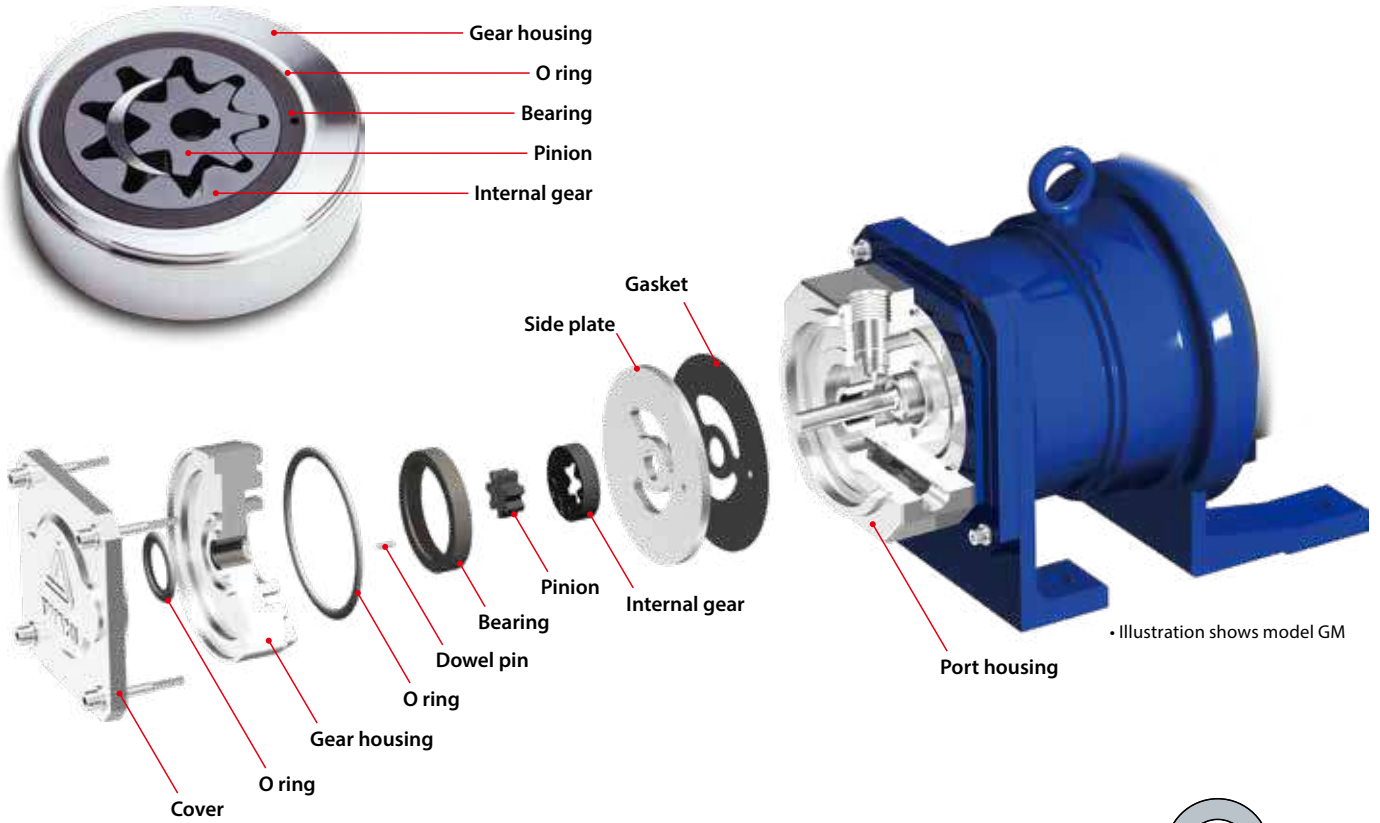
We Offer a Wide Range of Customized Unit

We provide comprehensive support for our products according to your needs, from designing and manufacturing piping units and control panels to inspection, shipping, and on-site adjustment.



• GX type pump unit

Construction and Materials



Parts	Wet end materials
1 Gear housing	SUS316
2 Port housing	SUS316
3 Cover	SCS14
4 Side plate	SUS316
5 Seal case	SCS14 or SUS316
6 Internal gear	SiC
7 Pinion	SiC or Si ₃ N ₄
8 Shaft	SUS630 equivalent or SUS316/Cr ₂ O ₃
9 Bearing	Carbon or SiC
10 Gasket/O ring	PTFE
11 Gland packing	PTFE
12 Mechanical seal	M SUS316, Carbon/Al ₂ O ₃ , PTFE
	C SUS316, SiC/SiC, PTFE

Parts	Wet end materials
1 Gear housing	SUS316
2 Port housing	SUS316
3 Cover	SCS14
4 Side plate	SUS316
5 Rear casing	SUS316
6 Internal gear	SiC
7 Pinion	SiC or Si ₃ N ₄
8 Magnet capsule	SUS329J1/SUS316
9 Bearing	Carbon or SiC
10 Gasket/O ring	PTFE

Pump Identification

G	X	-	12	S	K	C	G	-	02	M	A	-	J
1	2		3	4	5	6	7		8	9	10		11

- 1 Pump series
G Series
- 2 Pump type
X : Gland packing or mechanical seal
M : Magnetic drive
- 3 Pump size
12 : 1.0mL/rev
15 : 3.3mL/rev
25 : 12.8mL/rev
32 : 25.0mL/rev
- 4 Housing material
S : Stainless steel
- 5 Gear materials^{Note1}
K : SiC/SiC
N : Si₃N₄/SiC
- 6 Bearing material
C : Carbon
K : SiC
- 7 Shaft seal
G : Gland packing seal
W : Gland packing seal (Water injection type)
M : Mechanical seal (Carbon/Al₂O₃)
C : Mechanical seal (SiC/SiC)
R : Rare earth magnetic drive
- 8 Motor output
02 : 0.2kW
04 : 0.4kW
07 : 0.75kW
15 : 1.5kW
22 : 2.2kW
37 : 3.7kW
- 9 Motor type^{Note2}
M : 4P motor
S : 6P motor
F : 4P Inverter motor
E : 6P Inverter motor
G3 : Geared motor (Reduction ratio 1/3) GM-D/GM-DP
G5 : Geared motor (Reduction ratio 1/5) GM-D/GM-DP
H3 : Inverter geared motor (Reduction ratio 1/3) GM-DZ/GM-DP
H5 : Inverter geared motor (Reduction ratio 1/5) GM-DZ/GM-DP
X : Special specification
- 10 Motor specifications
Blank : TEFC, indoor type
A : Increased safety, outdoor type^{Note3}
B : Explosion-proof, outdoor type
C : Totally enclosed fan cooled, outdoor type
- 11 Special specifications
J : Equipped with heat jacket
T : Equipped with torque limiter (GX)
JT : Equipped with heat jacket and torque limiter (GX)
S : Other special specifications

Note1: Materials of the pinion/internal gear. The CFRPEEK material is also available for the pinion.

Note2: Select the motor type code of F, E, H3, or H5 when using the IE3 motor and inverter.

Note3: Inverter motor can not be selected.

Specifications

Model	Discharge per revolution mL/rev	Max. speed min ⁻¹	Max. discharge pressure MPa ^{Note1}	Temp. range °C	Viscosity range mPa·s ^{Note4}	Connections	
						IN	OUT
GX-12	1.0	1800	1.0	0 to 150 ^{Note2}	0.5 to 10000 ^{Note5}	RC ¹ / ₂	RC ³ / ₈
GX-15	3.3					RC ¹ / ₂	RC ³ / ₈
GX-25	12.8					RC1	RC ³ / ₄
GX-32	25.0					RC1 ¹ / ₄	RC1
GM-12	1.0	1800	0.5	0 to 80 (0 to 50) ^{Note3}	0.5 to 1000	RC ¹ / ₂	RC ³ / ₈
GM-15	3.3					RC ¹ / ₂	RC ³ / ₈
GM-25	12.8		0.7			RC1	RC ³ / ₄
GM-32	25.0					RC1 ¹ / ₄	RC1

Note1: The max. value depends on the motor speed and liquid viscosity. Please contact us for details.

Note2: When using GX type with a liquid temperature higher than 80°C, the temperature-resistant O-ring material must be used correspondingly. Please contact us for details.

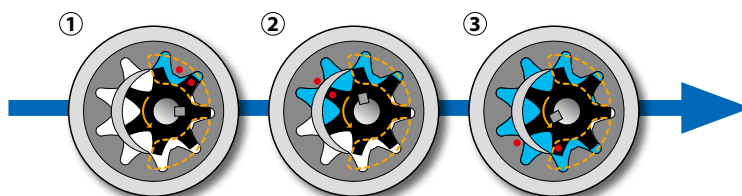
Note3: The maximum liquid temperature when transferring liquid of 200 mPa·s or more with GM pump is 50°C.

Note4: Please contact us for the motor speed and motor output suited to the viscosity of your liquid.

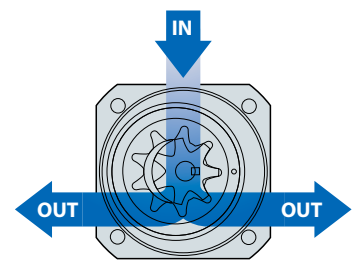
Note5: The max. viscosity when using a mechanical seal in GX type is 1000 mPa·s. In addition, allowable viscosity and rotational speed vary depending on the liquid temperature range. Refer to the table on the right.

Viscosity range	mPa·s	0.5 to 199	0.5 to 1000
Max. speed	min ⁻¹	1800	1200
Temp. range	°C	0 to 40	0 to 60
		0 to 70	0 to 70

Operating Principle



- 1 A pinion (drive gear) coupled with a shaft supported by two bearings meshes with an internal gear (driven gear) whose periphery is supported by a strong bearing.
- 2 Liquid is transferred by a change in the capacity of this meshed portion. In the suction process, the gears are disengaged and a space defined by the two gears and the casing expands. The liquid is drawn into the space by the negative pressure generated.
- 3 In the discharge process, their teeth begin to mesh and space defined by the two gears and the casing is reduced to force out the liquid.



The discharge port is on the right side when viewed from the front of the pump, also available selected the left side as a special order.

Standard Pumps Selection Table (50/60Hz)

Model	Viscosity range mPa·s	Max. discharge pressure MPa	Max. discharge capacity L/min	Max. speed min ⁻¹	Motor		
GX-12	0.5 ≤ viscosity < 1	0.3/0.36	1.4/1.7	1410/1700	4P, 0.2kW		
	1 ≤ viscosity < 9	0.47/0.57					
	9 ≤ viscosity < 200	1.0/1.0					
	200 ≤ viscosity < 1000	0.7/0.7	0.9/1.1	920/1110	6P, 0.2kW		
	1000 ≤ viscosity < 3000		0.5/0.6	500/600	4P, 0.4kW, 1/3		
	3000 ≤ viscosity ≤ 10000		0.3/0.36	300/360	4P, 0.4kW, 1/5		
GX-15	0.5 ≤ viscosity < 1	0.54/0.65	4.7/5.6	1410/1700	4P, 0.2kW		
	1 ≤ viscosity < 9	0.7/0.7					
	9 ≤ viscosity < 200	1.0/1.0					
	200 ≤ viscosity < 1000	0.7/0.7	3.0/3.7	920/1110	6P, 0.4kW		
	1000 ≤ viscosity < 3000		1.7/2.0	500/600	4P, 0.4kW, 1/3		
	3000 ≤ viscosity ≤ 10000		1.0/1.2	300/360	4P, 0.4kW, 1/5		
GX-25	0.5 ≤ viscosity < 9	0.7/0.7	18.0/21.8	1410/1700	4P, 0.75kW		
	9 ≤ viscosity < 200	1.0/1.0			4P, 1.5kW		
	200 ≤ viscosity < 1000	0.7/0.7	11.8/14.2	920/1110	6P, 1.5kW		
	1000 ≤ viscosity < 3000		6.4/7.7	500/600	4P, 0.75kW, 1/3		
	3000 ≤ viscosity ≤ 10000		3.8/4.6	300/360	4P, 0.75kW, 1/5		
GX-32	0.5 ≤ viscosity < 9	0.7/0.7	35.2/42.5	1420/1710	4P, 2.2kW		
	9 ≤ viscosity < 100	1.0/1.0			23.0/27.7	950/1140	4P, 3.7kW
	100 ≤ viscosity < 200						6P, 2.2kW
	200 ≤ viscosity < 500	0.7/0.7	12.5/15.0	500/600	4P, 1.5kW, 1/3		
	500 ≤ viscosity < 1000		7.5/9.0	300/360	4P, 1.5kW, 1/5		
	1000 ≤ viscosity < 3000						
3000 ≤ viscosity ≤ 10000							
GM-12S□□R	0.5 ≤ viscosity < 1	0.30/0.36	1.4/1.7	1410/1700	4P, 0.2kW	General purpose motor	
		0.38	1.8	1800		Inverter motor	
	1 ≤ viscosity < 9	0.4/0.48	1.4/1.7	1410/1700		General purpose motor	
		0.5	1.8	1800		Inverter motor	
	9 ≤ viscosity ≤ 200	0.5/0.5	1.4/1.7	1410/1700		General purpose motor	
		0.5	1.8	1800		Inverter motor	
200 ≤ viscosity ≤ 1000	0.5	1.2	1200	6P, 0.2kW (Inverter motor only)			
GM-15S□□R	0.5 ≤ viscosity < 9	0.5/0.5	4.7/5.6	1410/1700	4P, 0.2kW	General purpose motor	
		0.5	5.9	1800		Inverter motor	
	9 ≤ viscosity < 200	0.5/0.5	4.7/5.6	1410/1700		General purpose motor	
		0.5	5.9	1800		Inverter motor	
	200 ≤ viscosity ≤ 1000	0.5	3.9	1200		6P, 0.4kW (Inverter motor only)	
GM-25S□□R	0.5 ≤ viscosity < 9	0.7/0.7	18.0/21.8	1410/1700	4P, 0.75kW	Commercial power supply direct drive operation	
		0.7	23	1800		Inverter motor	
	9 ≤ viscosity < 200	0.7/0.7	18.0/21.8	1410/1700	4P, 1.5kW	Commercial power supply direct drive operation	
		0.7	23	1800		Inverter motor	
	200 ≤ viscosity ≤ 1000	0.7	15.3	1200	6P, 1.5kW (Inverter motor only)		
	GM-32S□□R	0.5 ≤ viscosity < 30	0.7/0.7	35.2/42.5	1420/1710	4P, 2.2kW	Commercial power supply direct drive operation
45.0				1800	Inverter motor		
30 ≤ viscosity < 200		35.2/42.5		1420/1710	4P, 3.7kW	Commercial power supply direct drive operation	
		45.0		1800		Inverter motor	
200 ≤ viscosity ≤ 700		0.7		30.0	1200	6P, 2.2kW (Inverter motor only)	

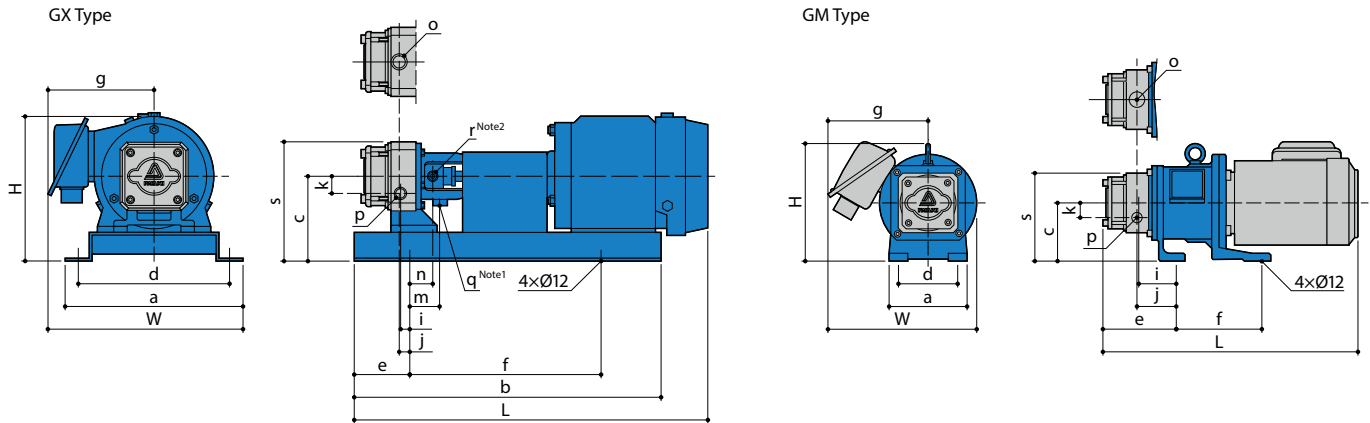
- For handling liquids containing slurry, sticky liquids, or liquids that harden easily, etc., select a model with a torque limiter. Please contact us for information on pumps with torque limiters.
- Max. pressure varies depending on pump size, viscosity of transferred fluid, and motor used. Please contact us separately for combinations other than the standard model selection table.
- The maximum liquid temperature when transferring liquid of 200 mPa·s or more with GM pump is 50°C.



Install strainers and relief valves to protect a pump. The size of a strainer mesh depends on liquid. For clean water, 150 mesh is recommended. Please contact us for details.

The recommended gear material code is K(SiC/SiC) for a viscosity below 200 mPa·s and N(Si3N4/SiC) for above 200 mPa·s. However, in the case of gear material N (Si3N4/SiC), the maximum pump speed is 1200 min⁻¹.

Dimensions in mm



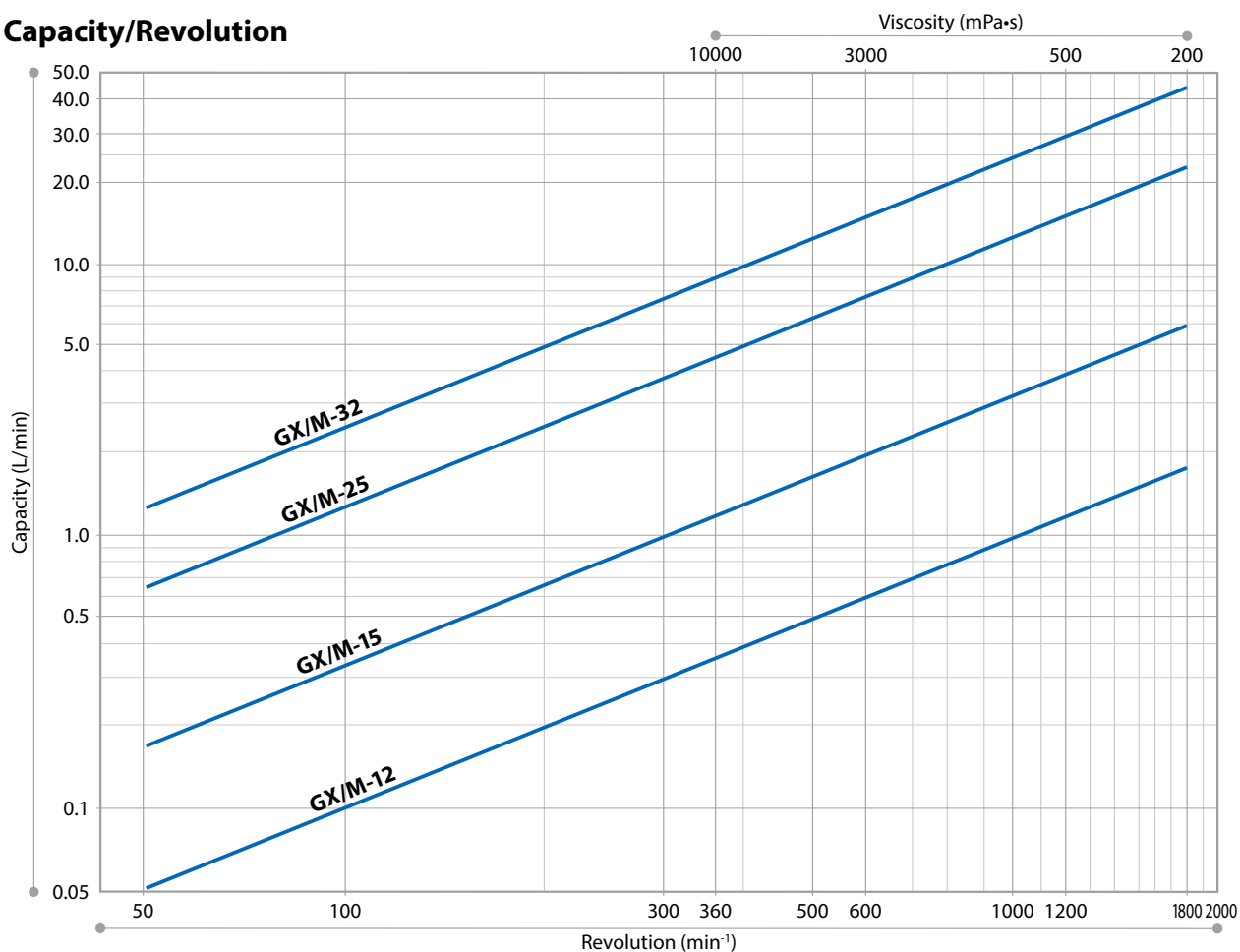
Model	Motor	W	H	L	a	b	c	d	e	f	g	i (Discharge)	j (Suction)	k	m	n	o	p	q ^{Note1}	r ^{Note2}	s	Mass kg
GX-12S -15S	02MC	264	241	460							138											20
	04MC						111.5														160.5	21
	02SC	281	228.5	481	252	440		222	80	280	155	13	14	24	41	27.5	Rc ¹ / ₂	Rc ³ / ₈	Rc ¹ / ₈	Rc ¹ / ₈		169
	04SC	285	215	499			120				159											24
	04G□C	252	200	547			140				120											189.5
GX-25S	07MC	301	227	570							168											37
	15MC	306	242	585			140.5				173										203	42
	15SC	318	281	648	266	570	151	236	100	360	185	8	9.5	30	49.5	36	Rc1	Rc ³ / ₄	Rc ¹ / ₄	Rc ¹ / ₈		213
	07G□C	272		670			170.5				139											233
GX-32S	22MC	355	300	740							185											86
	37MC						170														247	99
	22SC	366	311	759	340	740		300	115	510	196	0	0	37	80	60	Rc ¹ / ₄	Rc1	Rc ³ / ₈	Rc ¹ / ₄		275
	15G□C	340	320	774			198				149											93
GM-12S	02M/FC	230		400							150											25
	02EC	245	193	421	128	-	95	98	121	141	165	65	66	24	-	-	Rc ¹ / ₂	Rc ³ / ₈	-	-	144.5	27
GM-15S	02M/FC	230		400							150											25
	04M/FC	245	193	421	128	-	95	98	121	141	165	65	66	24	-	-	Rc ¹ / ₂	Rc ³ / ₈	-	-	144.5	28
	04EC	265	235	432						131												32
GM-25S	07M/FC	265		466							165											43
	15M/FC	278	235	533	160	-	120	120	165	245	178	83.5	85	-	-	-	Rc1	Rc ³ / ₄	-	-	182.5	50
	15EC	310	275	600	205		146	160	169	224	185	87.5	89									208.5
GM-32S	22M/FC	310	275	621							185											80
	37M/FC			651	205	-	146	160	190	224	196	91	91	-	-	-	Rc ¹ / ₄	Rc1	-	-	223	91
	22EC	321	287	688																		96

• All dimensions are for Mitsubishi Electric outdoor motors. Dimensions may differ if other motors are installed.

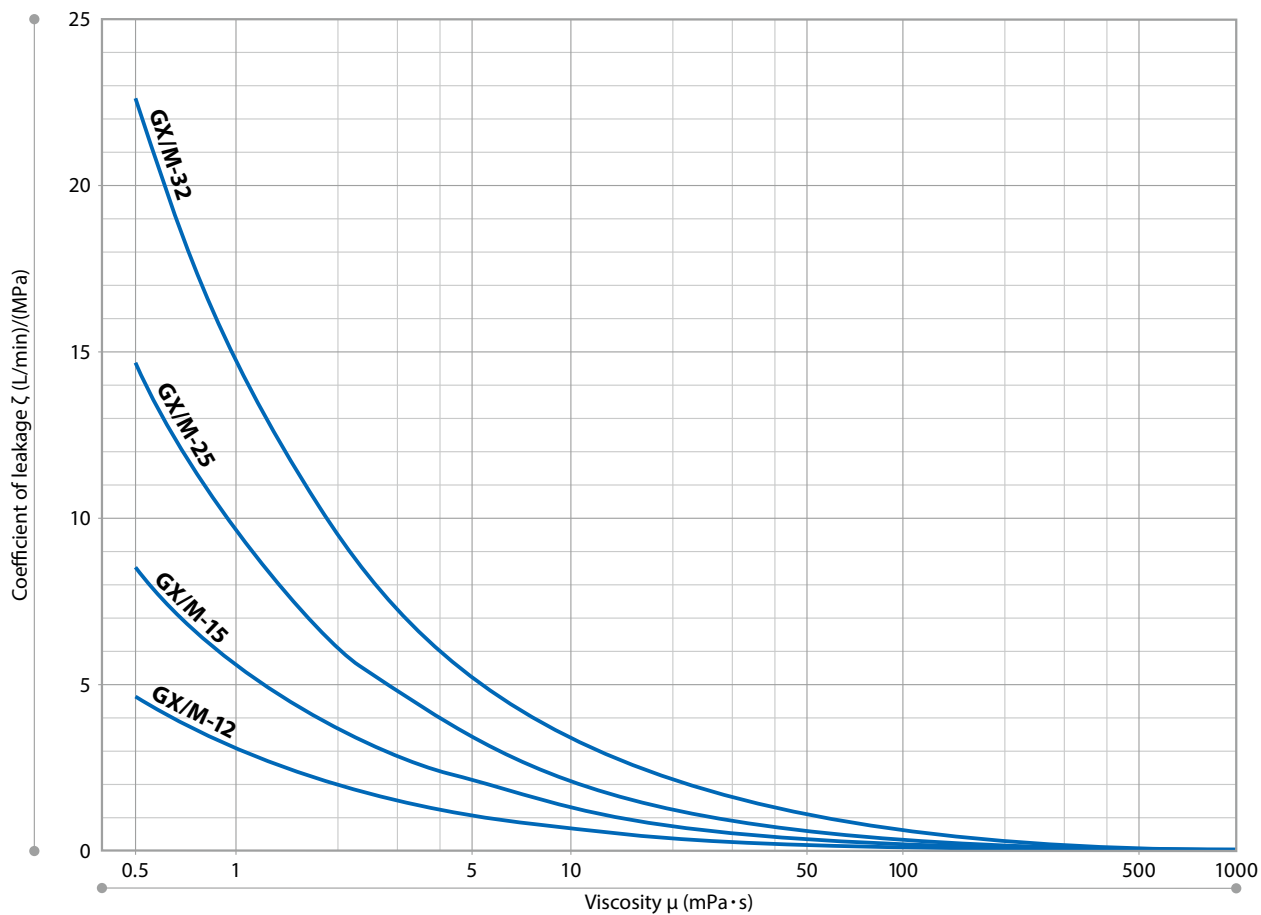
Note1: "q" is the diameter of the drain port.

Note2: "r" is the diameter of the water inlet. These dimensions are applied only to the pumps with the gland packing seals (water inlet type).

Capacity/Revolution



Viscosity/Leakage Coefficient



How to Use the Graph

The chart on the left shows the output at a discharge pressure of 0 MPa. The output changes in proportion to min^{-1} , but min^{-1} should be reduced when pumping higher viscous liquid. Knowing required output and viscosity, the proper pump/motor min^{-1} can be selected as in the following example.

STEP 1

Mark the value of your required output (10 L/min) on the scale on the left, and draw a horizontal line to the right.

STEP 2

Mark the value of your viscosity on the scale at the top and draw a line downward. In the event your viscosity falls in the middle of two scale lines, select the line on the left (the higher value).

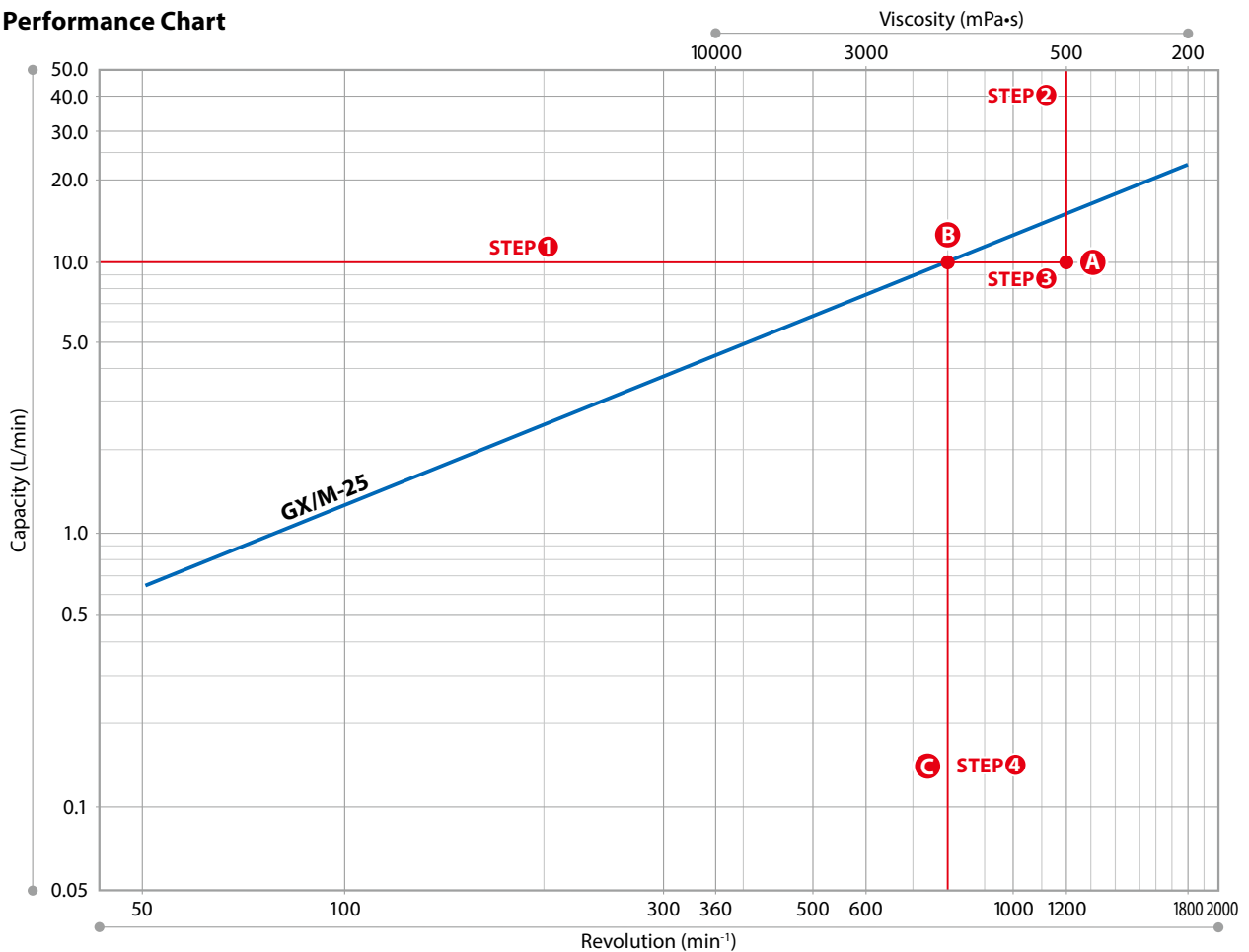
STEP 3

Extend the intersected point **A** to the left horizontally until intersecting the first pump line. This point **B** specifies pump.

STEP 4

Draw a downward line from **B** to specify motor rpm **C**.

Performance Chart



When discharge pressure rises

The lower the viscosity, as discharge pressure rises, the lower the output will be. You can estimate the actual output, in case of a change in viscosity or discharge pressure, from the following formula.

$$\zeta = K \times \mu^{-0.65} \quad (1)$$

$$Q_c = q \times N / 1000 - \zeta \times \Delta P$$

For the value of the coefficient of leakage in formula (1), see the viscosity-leakage coefficient graph.

Qc: Estimated output (L/min)

q: Output per revolution (mL/rev)

N: min^{-1}

ΔP : Effective differential pressure (MPa)

ζ : Coefficient of leakage (L/min)/(MPa)

μ : Viscosity (mPa·s)

K: Constant

GX/M-12: K=3

GX/M-15: K=5.5

GX/M-25: K=9.5

GX/M-32: K=15

- When handling low viscosity liquids (100 mPa·s or less) at low speeds using a geared motor, the discharge rate will be lower than that calculated by the formula. Please contact us for information.

For slurries

For soft slurries, reduce rpm by 75%.

For hard slurries, reduce rpm by 50%.

In principle, only slurries of less than 10 μm in diameter can be handled.

- GM type pumps cannot handle slurries.

Highly Corrosion Resistant Sealless and Non-Metal Construction

Safely Handles Most Corrosive Liquid Chemicals, Including Acids and Alkalis

GM-V Dedicated for Corrosive Chemical Solutions

While retaining all the features of the GM type, it does not use any metal materials in the liquid wet ends.

• To perform constant flow injection, flow control using a PFC controller, magnetic flowmeter, inverter and back pressure valve is required.



Applications (GM-V)

- Automatic injection of coagulant at a constant mixing ratio of coagulant in low flow/high head chemical lines.
- Quantitative transfer of paper-making dye.
- Transfer of sodium hypochlorite.
- Pulsation-free metering, injection and transfer of chemical solutions.
- Transfer of various acids, alkalis and chemical solutions.



Highly Corrosion-Resistant Design

Liquid wet ends are made of PVC, silicon carbide and fluorine resin, all of which are resistant to most acids and alkalis. The pump uses no seals, which eliminates the risk of leaks.



Lightweight and compact

Close coupled to its motor, eliminating the need for intermediate coupling and making the assembly both lightweight and compact. Space-saving design makes it suitable for built-in pump systems.

Pump Identification

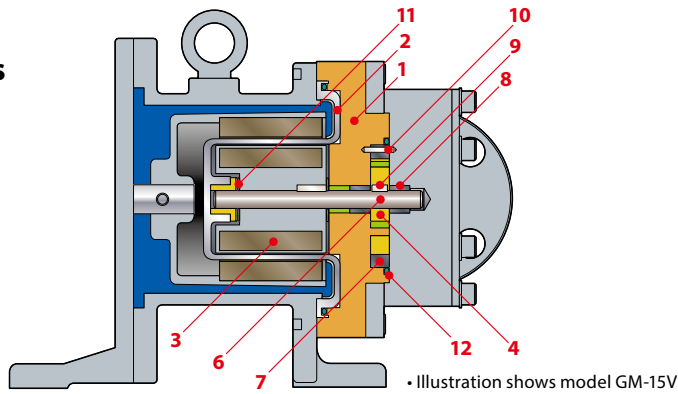
GM	-	15	V	K	C	V	-	04	F	B	-	S
1		2	3	4	5	6		7	8	9		10
1 Pump series, Pump type G Series M : Magnetic drive		4 Gear materials ^{Note1} K : SiC/SiC X : Special specification		5 Bearing material C : Carbon K : SiC		7 Motor output 04 : 0.4kW 07 : 0.75kW		8 Motor type F : 4P Inverter motor or IE3 motors ^{Note2}		9 Motor specifications B : Explosion-proof, outdoor type C : Totally enclosed fan cooled, outdoor type		10 Special specifications ^{Note3} S : Other special specifications
2 Pump size 15 : 3.3mL/rev 25 : 12.8mL/rev		3 Material of body V : PVC X : Special specification		6 Material of O-ring V : FKM E : EPDM								

Note1: Materials of the pinion/internal gear.

Note2: For IE3 motors, use the inverter.

Note3: When transferring hydrochloric acid, be sure to select the SiC shaft (special order).

Construction and Materials



Models	GM-15V	GM-25V
1 Housing (Pump body)		PVC
2 Rear casing		CFRETFE
3 Magnet capsule	PVC	CFRETFE
4 Pinion/Internl gear		SiC/SiC
5 Spindle (GM-25V type)	-	Alumina ceramic (Bearing: carbon) or SiC (Bearing: SiC)
6 Shaft ^{Note}		Si3N4 (Silicon nitride)
7 Bearing for gear		SiC or High density carbon
8 Bearing for pump shaft	SiC only or SiC and High density carbon	SiC or High density carbon
9 Key		PVC
10 Parallel pin		Alumina ceramic
11 Spacer (GM-15V type)	Fluorine resin with filler	-
12 O-ring		FKM or EPDM

- With carbon fiber filling.
- Keys are custom-ordered, and PPS is also available.
- Note: When transferring hydrochloric acid, be sure to select the SiC shaft (special order).

Specifications (60Hz)

Models	Discharge per revolution mL/rev	Max. Capacity L/min	Max. Speed min ⁻¹	Max. discharge pressure MPa	Connections	Motor kW
GM-15V-04F	3.3	5.9	1800	0.5	JIS10K15A	0.4 General purpose flange motor
GM-25V-07F	12.8	23.0			JIS10K20A	0.75 General purpose flange motor

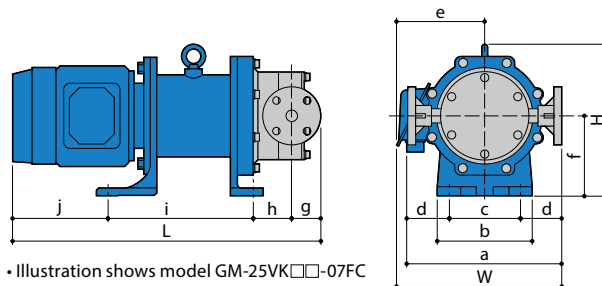
• Conditions of liquid to be handled : Temperature = 0 to 50°C/Viscosity = 0.5 to 50 mPa • S/No slurry can be handled.

Standard Pumps Selection Table (6 to 60Hz)

Models	Speed min ⁻¹	Viscosity mPa•s	Capacity L/min					
			Discharge pressure MPa					
			0	0.1	0.2	0.3	0.4	0.5
GM-15VK□□-04F□	180 to 1800	0.5	0.6 to 5.9	0.05 to 3.9	0.05 to 1.9	-		
		1		0.05 to 4.5	0.05 to 3.1	0.05 to 1.7	0.05 to 0.3	-
		3		0.05 to 5.1	0.05 to 4.3	0.05 to 3.5	0.05 to 2.7	0.05 to 1.9
		50		0.4 to 5.7	0.2 to 5.5	0.05 to 5.3	0.05 to 5.1	0.05 to 4.9
GM-25VK□□-07F□	180 to 1800	0.5	2.3 to 23.0	0.1 to 19.6	0.1 to 16.2	0.1 to 12.8	0.1 to 9.4	0.1 to 6.0
		1		0.1 to 20.6	0.1 to 18.2	0.1 to 15.8	0.1 to 13.4	0.1 to 11.0
		3		0.9 to 21.6	0.1 to 20.2	0.1 to 18.8	0.1 to 17.4	0.1 to 16.0
		50		2.0 to 22.7	1.7 to 22.3	1.3 to 22.0	1.0 to 21.6	0.6 to 21.3

- The flow-rate values given in the above table are for a liquid temperature of 20°C. Flow rates vary with liquid characteristics and temperatures. Please contact us for details.
- To protect pump, install a strainer and relief valve. Please contact us for information.

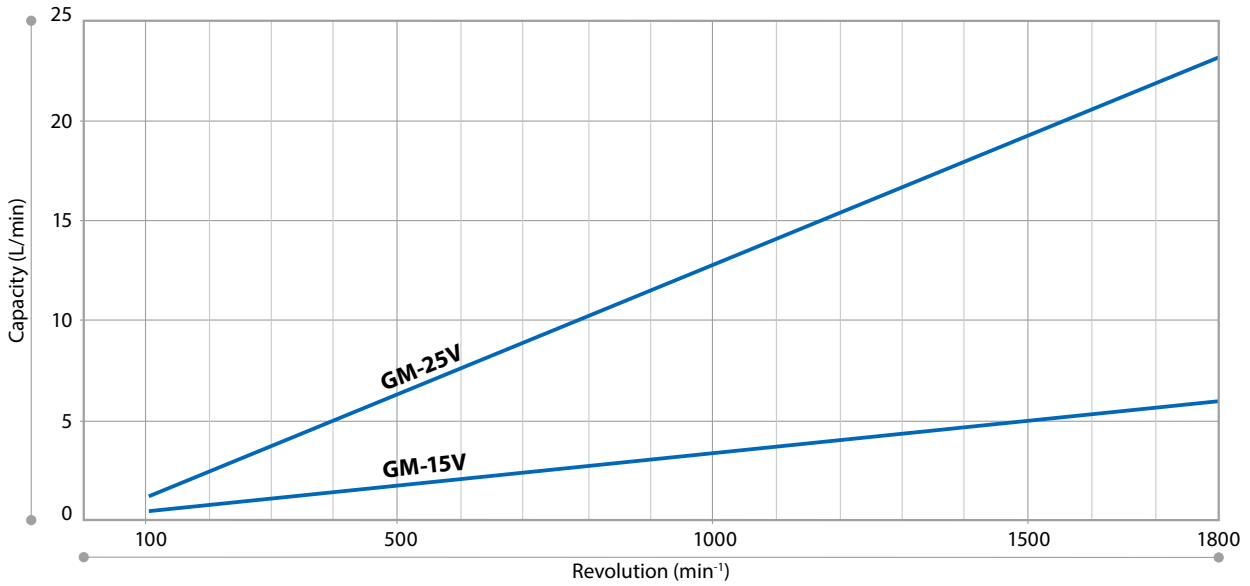
Dimensions in mm



Models	W	H	L	a	b	c	d	e	f	g	h	i	j	Mass kg
GM-15V-04F	234	188.3	424	197	128	98	49.5	151	95	47.5	34.8	158.5	183	20
GM-25V-07F	292	257.5	518	254	170	130	62	165	135	50	71	250	147	37

• All dimensions are for Mitsubishi Electric outdoor motors. Dimensions may differ if other motors are installed.

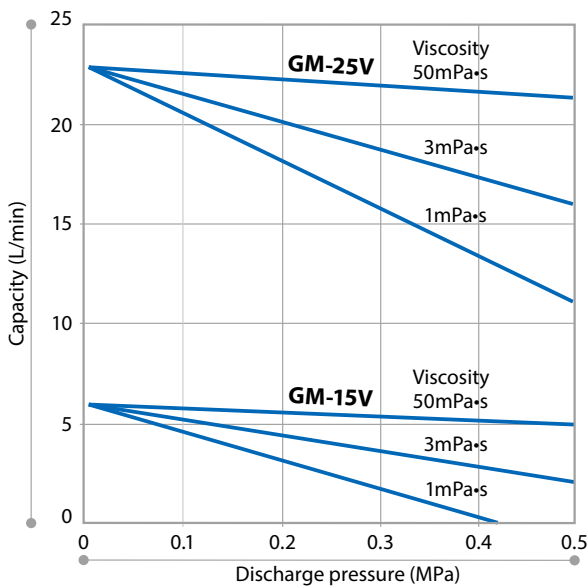
Capacity/Revolution



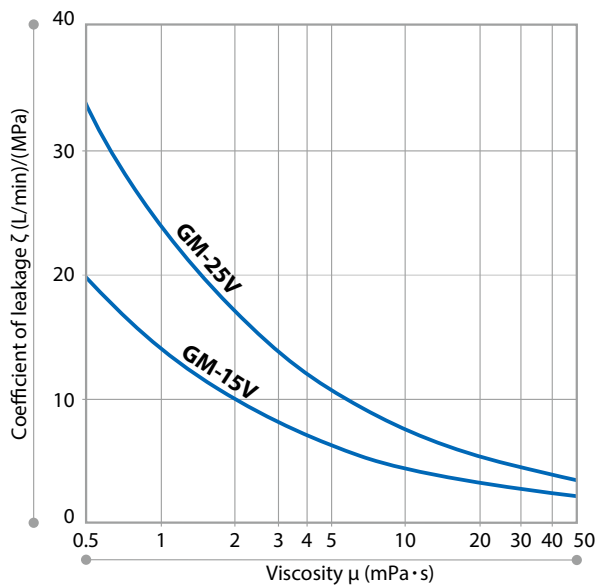
• Below 100 min⁻¹, the capacity is not linearly related to the revolution especially for a viscous liquid. Please contact us for further details.

Discharge pressure/Capacity

(Speed: 1800 min⁻¹, Temperature: 20°C)



Viscosity/Leakage Coefficient



When discharge pressure rises

The lower the viscosity, as discharge pressure rises, the lower the output will be. You can estimate the actual output, in case of a change in viscosity or discharge pressure, from the following formula.

$$\zeta = K \times \mu^{-0.65} \quad (1)$$

$$Qc = q \times N / 1000 - \zeta \times \Delta P$$

Qc: Estimated output (L/min)
 q: Output per revolution (mL/rev)
 N: min⁻¹
 ΔP: Effective differential pressure (MPa)
 ζ: Coefficient of leakage (L/min)/(MPa)
 μ: Viscosity (mPa·s)
 K: Constant
 GM-15V: K=14
 GM-25V: K=24

For the value of the coefficient of leakage in formula (1), see the viscosity-leakage coefficient graph.

When calculating the Expected RPM level

Expected RPM level can be obtained from required flow as follows.

$$Nc = (Q + \zeta \times \Delta P) 1000 / q$$

Nc: expected speed of revolution (min⁻¹)
 Q: required flow rate (L/min)

⚠ Since the catalog values are theoretical values derived from the results obtained using our test equipment, they may not be satisfied depending on the environment and conditions, and we do not guarantee the values.

Since PVC is used as the material of the pump body, changes in air temperature and liquid temperature, frictional heat on the gear sliding surface, uneven tightening of bolts, tilted mounting, etc. The performance may fluctuate due to expansion/contraction/change of the housing. Therefore, there is no fixed-quantity injection capability of the pump alone. Be sure to introduce a pulseless dosing system when pulseless dosing is required.

Optional Accessories

Relief Valve RV

When the pressure in the piping rises above the set pressure, a relief valve opens to release the pressure.

- Always install the relief valve to prevent overpressure in the discharge line.



Back Pressure Valve BV

Install a back pressure valve when the pressure difference between the discharge side and suction side (differential pressure) is small.

- The valve maintains constant pressure over a wide range of flow rate control.



Y Type Strainer

Install a Y type strainer in the suction piping to prevent dirt and foreign matter from entering the pump chamber.

- The appropriate mesh number for the filter varies depending on the type of liquid. Please contact us for information.




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() Country codes

 **Caution for safety use:**
Before use of pump, read instruction manual carefully to use the product correctly. Actual pumps may differ from the photos. Specifications and dimensions are subject to change without prior notice. For further details please contact us.

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