IWAKI

Chemical Gear Pumps
G

Innovative Fine Ceramic Gear
Achieves Stable Non Pulsatile Quantitative Injection

The Heart of Industry

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 a Proven Track Record in a Wide Range
Integrated Production From Piping Units to Control Panel Design

Page 14

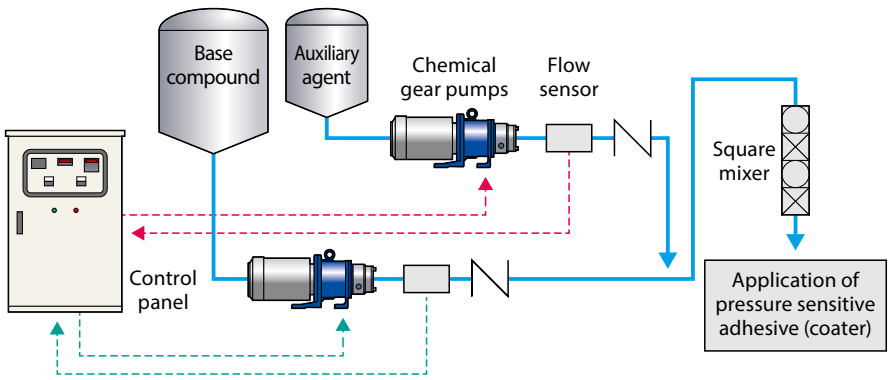
IWAKI Proprietary Internal Gear Pump Equips With Fine Ceramic Gears

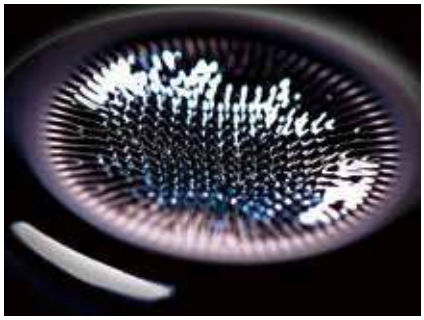
Without detracting from any of the advantages of conventional internal gear pumps, abrasion resistance, chemical resistance, low-viscosity characteristics and sealing characteristics have been remarkably improved.
Our internal gear pumps achieves pulsation-free operation even transferring liquid with 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.

Capable of 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 provides superior abrasion resistance and chemical resistance than conventional gear pumps, prevents “galling” and “seizing” when the pump operates at a high speed. Main materials are stainless which provides of 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	✓Average	✓Excellent	✓Excellent
	Hard coated	✓Average	✓Excellent	✓Excellent	○Poor	✓Excellent	✓Average	✓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.

Wide Range of Viscosity Liquids and Fine Slurries Can Be Handled

The fine ceramics 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.

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.

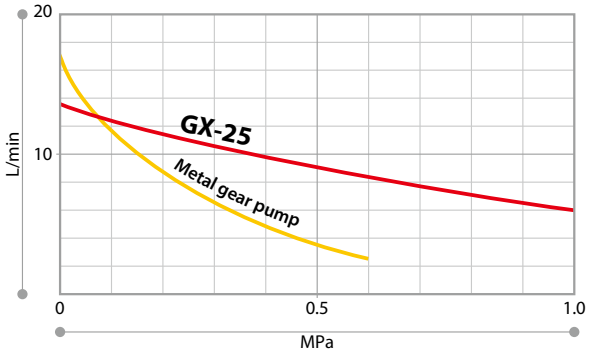
• The height of self-priming varies depending on the liquid quality, liquid temperature, piping conditions. Please contact us for details.

Seal-Less Design (GM type)

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

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.



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 11) 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.

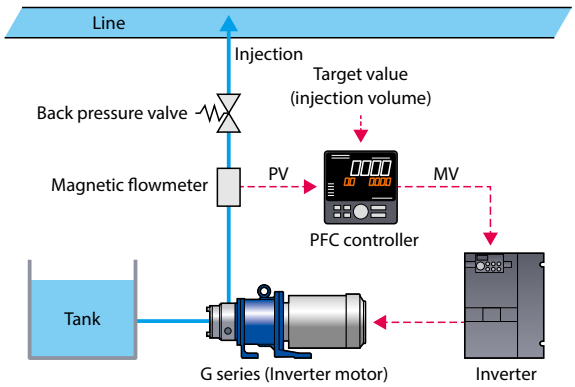
• Rangeability 1:100
• To perform constant flow Injection, use this pump with a PFC controller, magnetic flowmeter, inverter and back pressure valve.

Cost Reduction

Fine ceramics have excellent abrasion resistance so there is almost no wear on the parts and they have a long life. 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

We provide an long term supply products according to your needs, from designing and manufacturing piping units and control panels to inspection, shipping, and on-site adjustment.

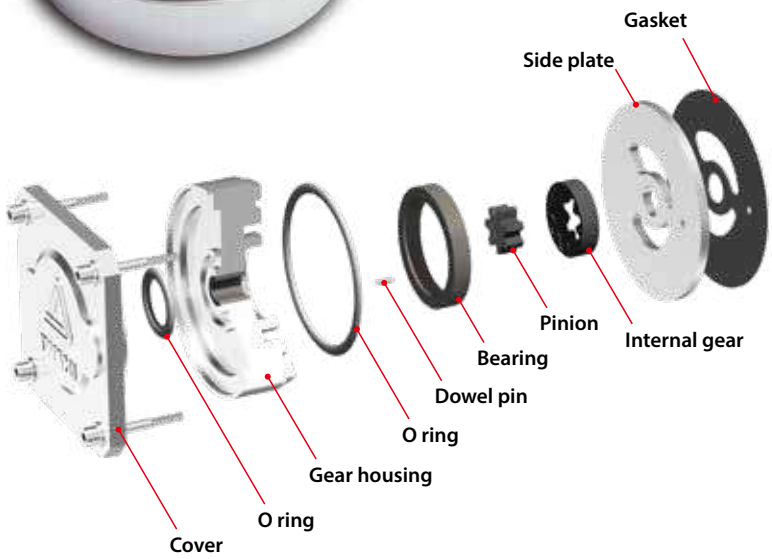


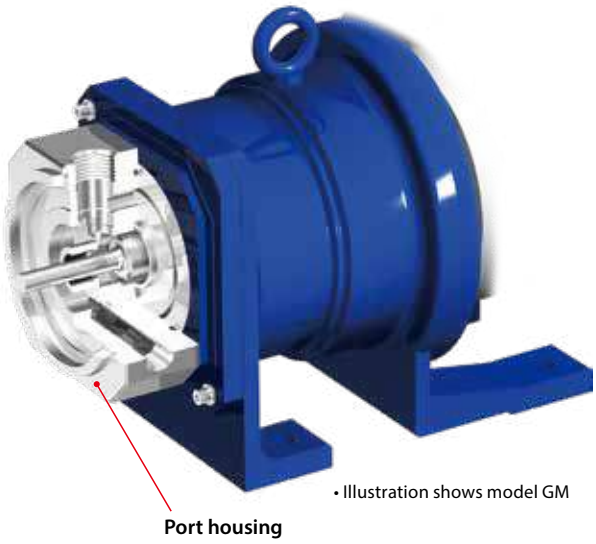
The Pulsation Free injection system consists of a G series chemical gear pump, PFC controller, magnetic flowmeter, inverter and back pressure valve.
The pump discharge volume is measured by an magnetic flowmeter, and this value is converted into an electrical signal and sent to the PFC controller.
The PFC controller compares the measured value with a target value (injection volume) and controls the inverter to eliminate any deviation.
The inverter keeps the discharge volume constant by increasing or decreasing the pump speed according to the output of the PFC controller.

• It can be controlled with equivalent control devices (such as PLCs) other than PFC controllers.
• Please contact us for a recommended piping diagram.

• GX type pump unit

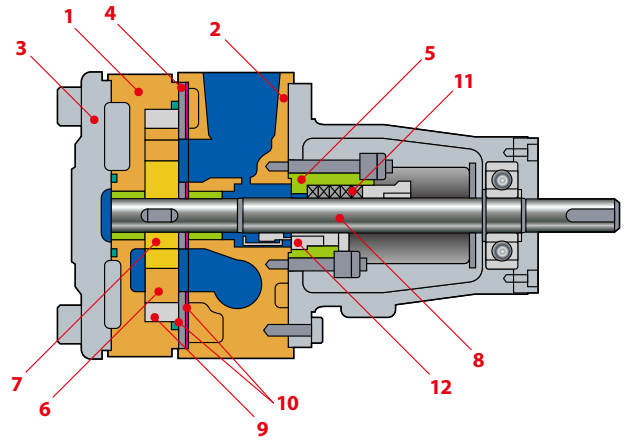
Construction and Materials



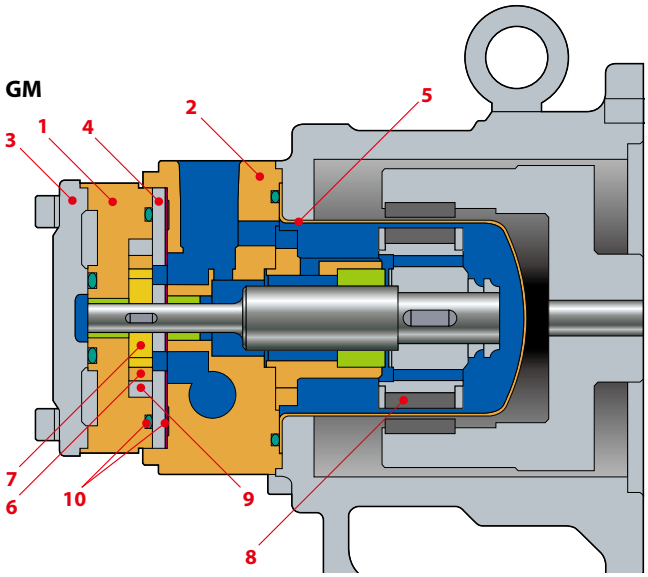


• Illustration shows model GM

GX



GM



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_3N_4
8 Shaft		SUS630 equivalent or SUS316/Cr_2O_3
9 Bearing		Carbon or SiC
10 Gasket/O ring		PTFE
11 Gland packing		PTFE
12 Mechanical seal	M	SUS316, Carbon/Al_2O_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_3N_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 : Si_3N_4/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/Al_2O_3)
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

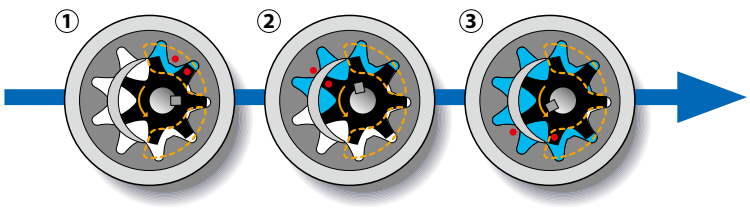
Note1: Materials of the pinion/internal gear. The pinion material CFRPEEK is also possible.
Note2: For IE3 motors of 0.75 kW or more, select F, E, H3, H5 when using the inverter.
Note3: Inverter motor can not be selected.

Specifications

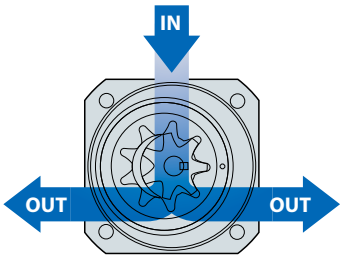
Model	Discharge per revolution mL/rev	Max. speed min^{-1}	Max. discharge pressure MPa Note1	Temp. range °C	Viscosity range mPa•s Note3	Connections	
						IN	OUT
GX-12	1.0	1800	1.0	0 to 150	0.5 to 10000	RC1/2	RC3/8
GX-15	3.3					RC1/2	RC3/8
GX-25	12.8					RC1	RC3/4
GX-32	25.0					RC1 1/4	RC1
GM-12	1.0	1800	0.5	0 to 80 (0 to 50) Note2	0.5 to 1000	RC1/2	RC3/8
GM-15	3.3					RC1/2	RC3/8
GM-25	12.8		0.7			RC1	RC3/4
GM-32	25.0				0.5 to 700	RC1 1/4	RC1

Note1: The valnes depending on the motor speed and liquid viscosity. Please contact us for details.
Note2: The maximum liquid temperature when transferring liquid of 200 mPa·s or more with GM is 50°C.
Note3: Please contact us for the motor speed and motor output suited to the viscosity of your liquid.

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 transfered 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)

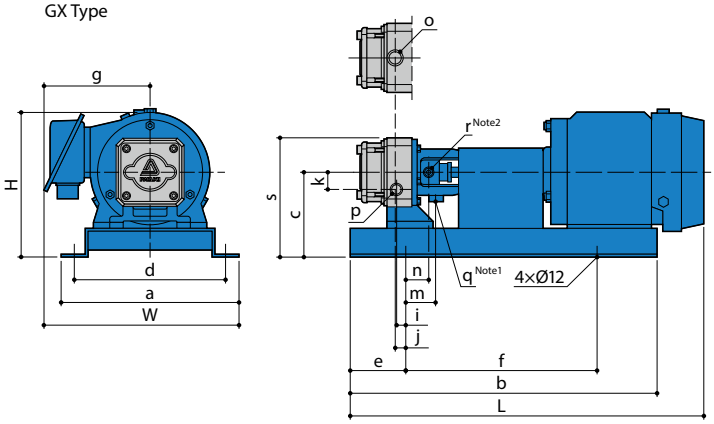
Model	Viscosity range mPa•s	Max. discharge pressure MPa	Max. discharge capacity L/min	Max. speed min^{-1}	Motor	
GX-12	0.5 ≤ viscosity < 1	0.3/0.36	1.4/1.7	1410/1700	4P, 0.2kW	
	1 ≤ viscosity < 9	0.47/0.57				
	9 ≤ viscosity < 200	1.0/1.0				
	200 ≤ viscosity < 1000		0.9/1.1	920/1110	6P, 0.2kW	
	1000 ≤ viscosity < 3000	0.7/0.7	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			4P, 0.4kW	
	200 ≤ viscosity < 1000		3.0/3.7	920/1110	6P, 0.4kW	
	1000 ≤ viscosity < 3000	0.7/0.7	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		11.8/14.2	920/1110	6P, 1.5kW	
	1000 ≤ viscosity < 3000	0.7/0.7	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				
	100 ≤ viscosity < 200				4P, 3.7kW	
	200 ≤ viscosity < 500		23.0/27.7	950/1140	6P, 2.2kW	
	500 ≤ viscosity < 1000		12.5/15.0	500/600	4P, 1.5kW, 1/3	
	1000 ≤ viscosity < 3000	0.7/0.7				
	3000 ≤ viscosity ≤ 10000		7.5/9.0	300/360	4P, 1.5kW, 1/5	
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, 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 is 50°C.

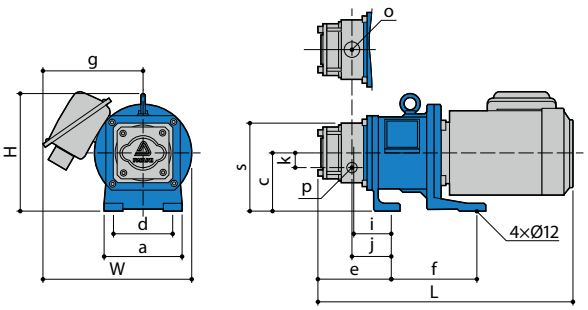
⚠ Install strainers and relief valves to protect a pump. The size of a strainer mesh depends on liquid. For clean water, 150 mesh is recommended. Please contact us for details.
The recommended gear material code is K(SiC/SiC) for a viscosity below 200 mPa•s and N(Si3N4/SiC) for above 200 mPa•s. However, in the case of gear material N (Si3N4/SiC), the maximum pump speed is 1200 min^{-1}.

Dimensions in mm

GX Type



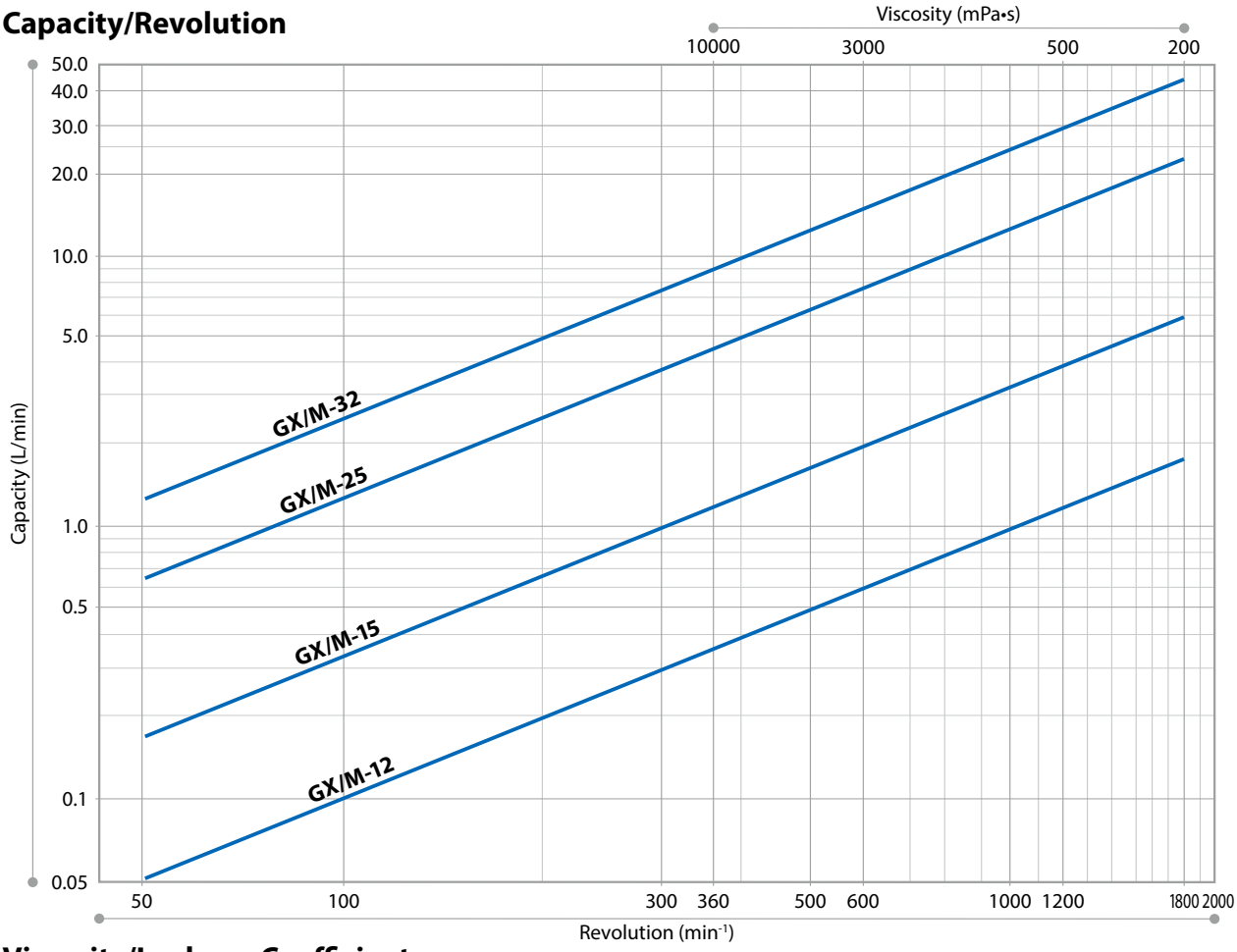
GM Type



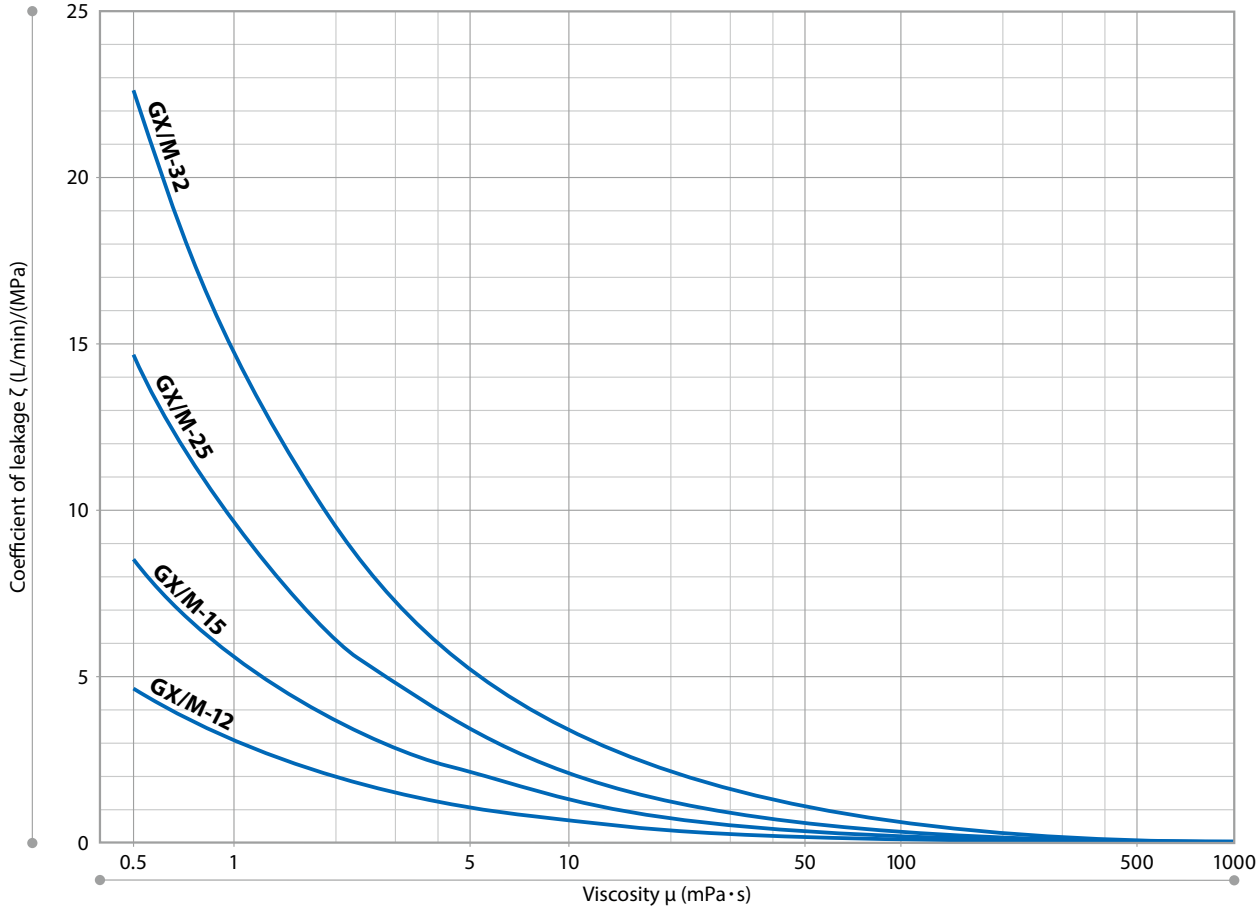
Model	Motor	W	H	L	a	b	c	d	e	f	g	i (Discharge)	j (Suction)	k	m	n	o	p	q Note1	r Note2	s	Mass kg
GX-12S -15S	02MC	264	241	460	252	440	111.5	222	80	280	138	13	14	24	41	27.5	Rc½	Rc⅜	Rc⅛	Rc⅛	160.5	20
	04MC	281	228.5	481							155											21
	02SC																					
	04SC	285	215	499			120				159										169	24
	04G□C	252	200	547			140				120										189.5	
GX-25S	07MC	301	227	570	266	570	140.5	236	100	360	168	8	9.5	30	49.5	36	Rc1	Rc¾	Rc¼	Rc⅛	203	37
	15MC	306	242	585							173											42
	15SC	318	281	648			151				185										213	52
	07G□C	272		670			170.5				139										233	51
GX-32S	22MC	355	300	740	340	740	170	300	115	510	185	0	0	37	80	60	Rc1¼	Rc1	Rc⅜	Rc¼	247	86
	37MC	366	311	759							196											99
	22SC																					
	15G□C	340	320	774			198				149										275	93
GM-12S	02M/FC	230	193	400	128	–	95	98	121	141	150	65	66	24	–	–	Rc½	Rc⅜	–	–	144.5	25
	02EC	245		421							165											27
GM-15S	02M/FC	230	193	400	128	–	95	98	121	141	150	65	66	24	–	–	Rc½	Rc⅜	–	–	144.5	25
	04M/FC	245		421							165											28
	04EC	265	235	432					131													32
GM-25S	07M/FC	265	235	466	160	–	120	120	165	245	165	83.5	85	–	–	–	Rc1	Rc¾	–	–	182.5	43
	15M/FC	278		533							178											50
	15EC	310	275	600	205		146	160	169	224	185	87.5	89								208.5	70
GM-32S	22M/FC	310	275	621	205	–	146	160	190	224	185	91	91	–	–	–	Rc1¼	Rc1	–	–	223	80
	37M/FC	321	287	651							196											91
	22EC			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 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.

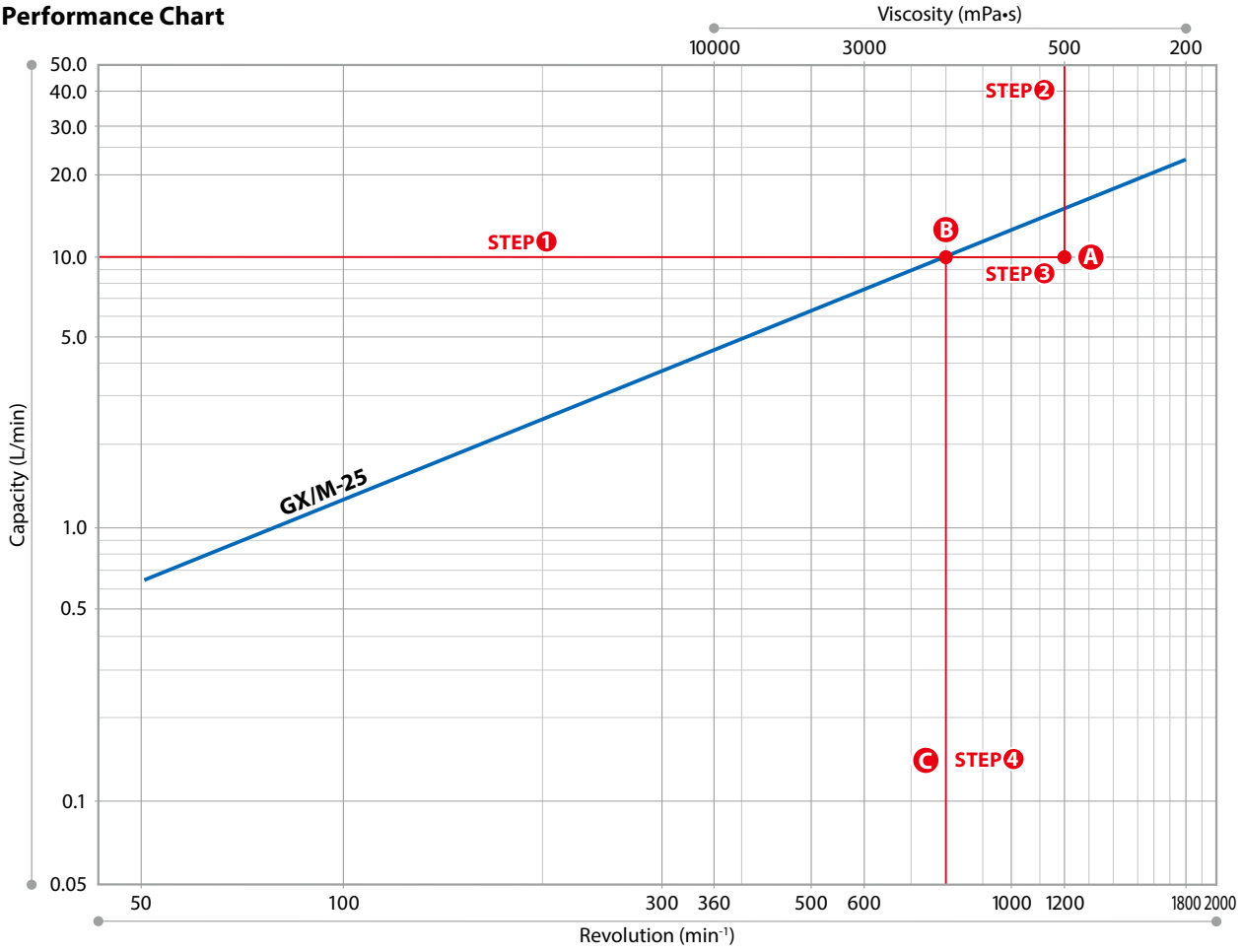
STEP❶ Mark the value of your required output (10 L/min) on the scale on the left, and draw a horizontal line to the right.

STEP❷ 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).

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

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

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.

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

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

For the value of the coefficient of leakage in formula (1), stee 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

2 Pump size
15 : 3.3mL/rev
25 : 12.8mL/rev

3 Material of body
V : PVC
X : Special specification

4 Gear materials Note1
K : SiC/SiC
X : Special specification

5 Bearing material
C : Carbon
K : SiC

6 Material of O-ring
V : FKM
E : EPDM

7 Motor output
04 : 0.4kW
07 : 0.75kW

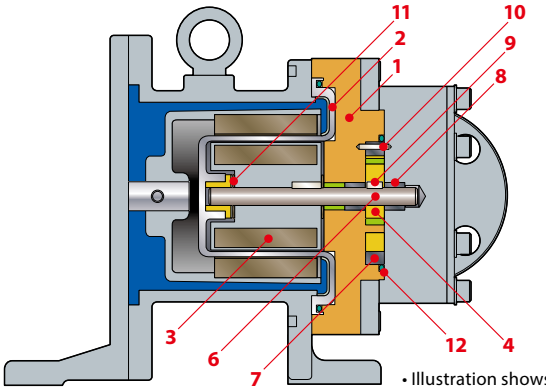
8 Motor type
F : 4P Inverter motor or IE3 motors Note2

9 Motor specifications
B : Explosion-proof, outdoor type
C : Totally enclosed fan cooled, outdoor type

10 Special specifications Note3
S : Other special specifications

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



• Illustration shows model GM-15V

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

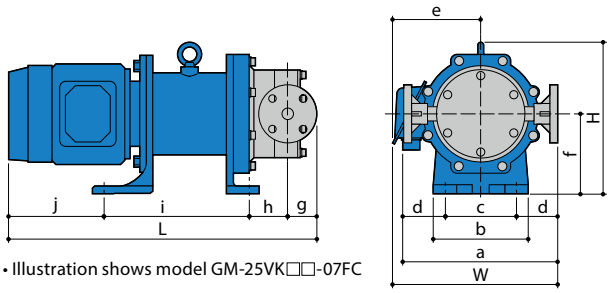
• Conditions of liquid to be handled : Temperature = 0 to 50˚C/Viscosity = 0.5 to 50 mPa • S/No slurry can be handled.

Standard Pumps Selection Table (6 to 60Hz)

Models	Speed min^{-1}	Capacity L/min					
		Viscosity mPa•s	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

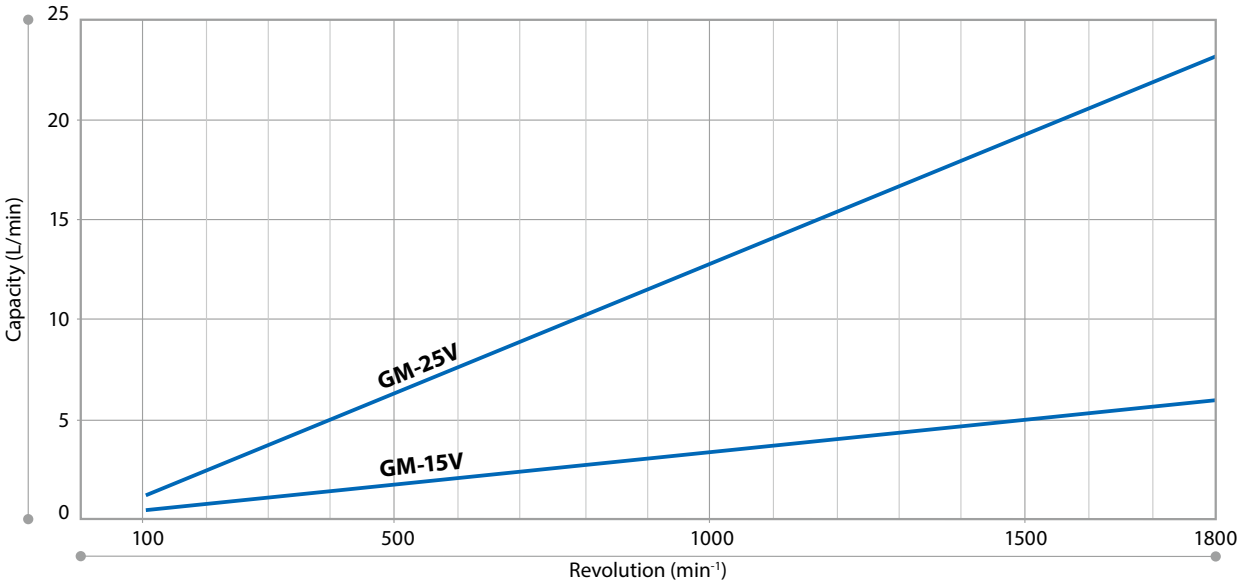


• Illustration shows model GM-25VK□□-07FC

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.

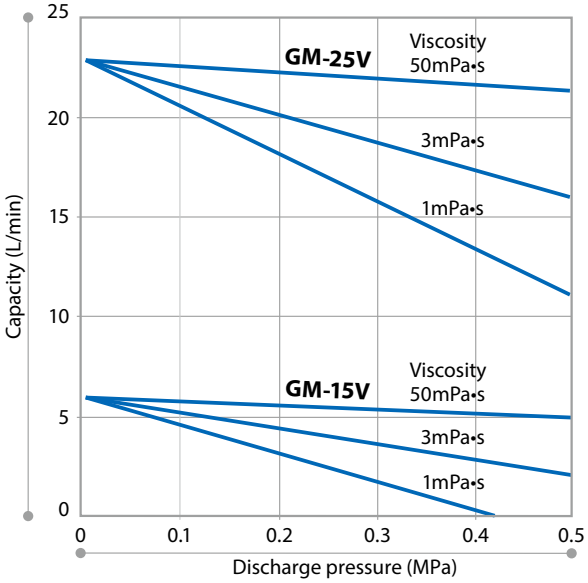
Capacity/Revolution



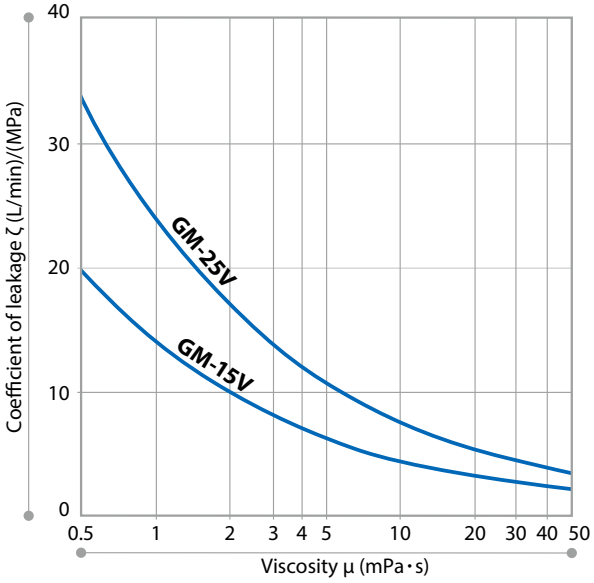
• Below 100 min^{-1}, the capacity is not linearly related to the revolution especially for a viscous liquid. Please contact us for further details.

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), stee 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

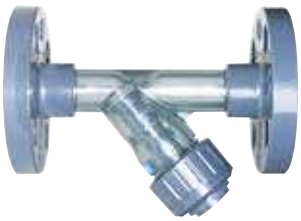
Install a back pressure valve when the pressure difference between the discharge side and suction side (differential pressure) is small.

- 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.

Legal attention related to export.

Our products and/or parts of products fall in the category of goods contained in control list of international regime for export control. Please be reminded that export license could be required when products are exported due to export control regulations of countries.