LUBE USA

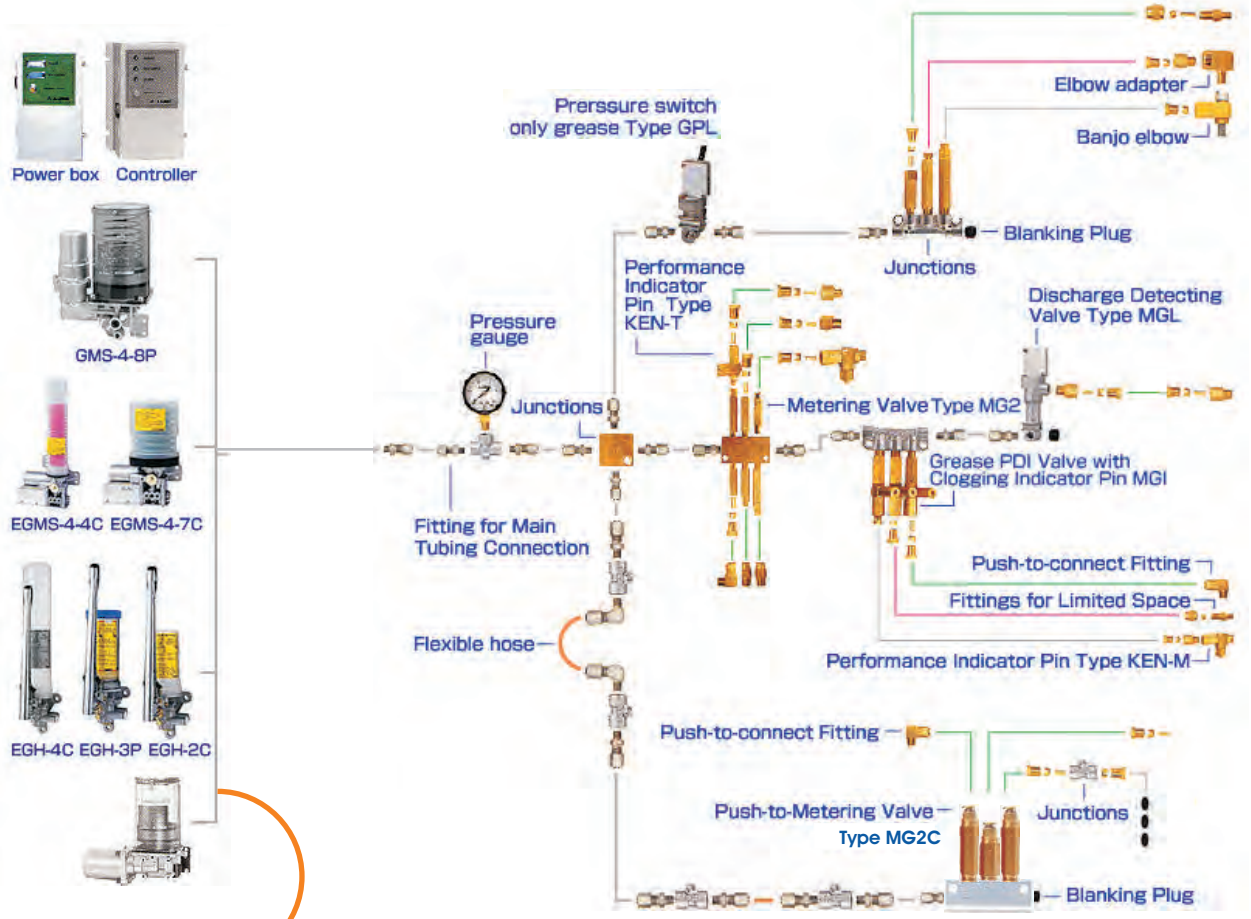
Subsidiary of Lube Corporation

LUBE USA

Sample Layout

Tubing Type
- φ8 Steel Tubing
- φ4 Steel Tubing
- φ4 Copper Tubing
- φ4 Nylon Pype
- Flexible hose

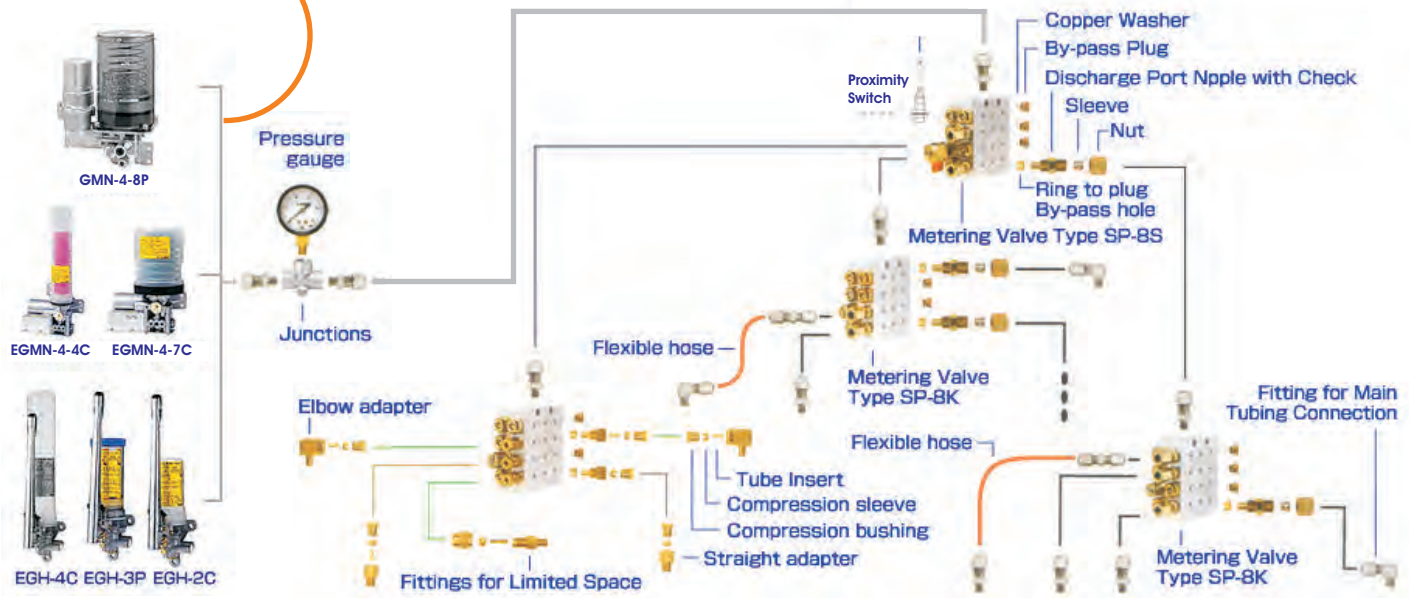
Positive Displacement Injector



Hybrid

A series of electric pumps that are designed to be able to operate either a Positive Displacement Injector lubrication system or a Series Progressive lubrication system together from the same pump. Available as Twin Pumps (shown left) or Multi-Port (not pictured) offer a tremendous amount of flexibility when lubricating machinery which has both very small and very large grease delivery requirements.

Series Progressive



Automatic grease pump (PDI) GMS (Reservoir)

Motor driven piston pump.

GMS-4-3P

GMS-4-8P

Specifications

Pump	Discharge volume	20ml/min
	Discharge pressure	8.0MPa (safety valve set pressure)
Grease level switch (option)	Contact type	B contact(NC) It turns OFF at a oil level minimum.
	Contact capacity	AC250V 2A DC30V 3A smaller
Power	DC24V	
	Mortor	15W/0.65A
	Pressure relief solenoid	30W/1.25A
		Total: 45W/1.9A
Pressurization	Max. ON time: 3 min.	
Pressure relief	Min. OFF time: 1 hour	
Working consistency	NLGI No.000,00,0,1 (Lithium grease)	
Recommended grease	Lube Original Grease MP0, MP1, FS2	
Weight	1.8kg(3P),2.8kg(8P)	
Pressure relief	Built-in solenoid	

How to order

GMS−4□−□P

Type of Reservoir

P	Reservoir Type

Reservoir capacity (effective capacity)

3	260cc
8	800cc

Grease level switch

Blank	Blank
L	With

Voltage

4	DC24V

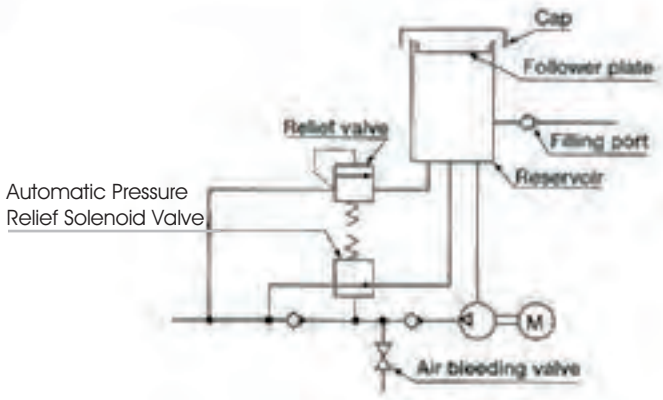
Part Number

Part Number	Model	Part Number	Model
103624	GMS-4-3P	103619	GMS-4L-3P
103625	GMS-4-8P	103621	GMS-4L-8P

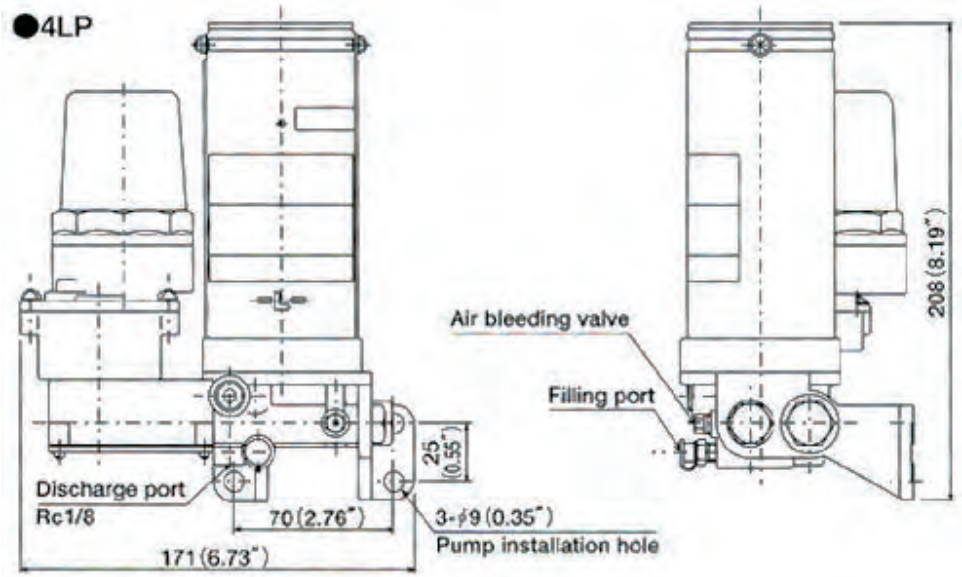
[Directions for use]

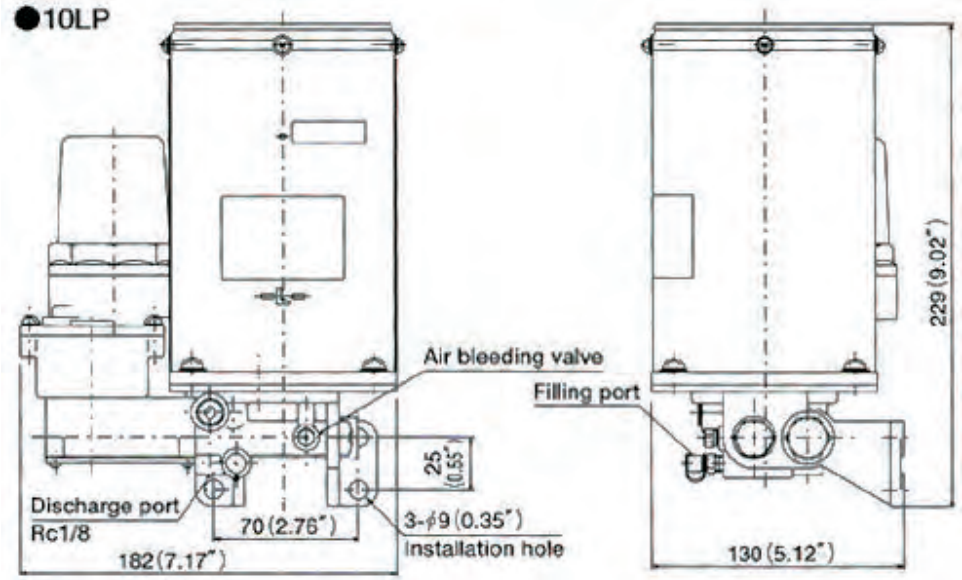
- •Use recommended greases.
- •Never use molybdenum disulfide-contained grease.
- •Use lithium greases. (Contact us for consultation when other than lithium grease is used.)
- •Do not use any greases containing substances that attack brass and rubber.
- •When refilling, take care not let foreign matter in the grease.
- •Avoid continuous operation.
- •After refilling, always press AIR BLEED push button to purge the pump of air.
- •When refilling grease in main pipe and during test operation, stick to an intermittent cycle of running for 30 seconds and resting for 90 seconds. Failure to follow this requirement will result in thermal protector being activated by a heated solenoid, leaving the solenoid de-energized without pressure built up.

Hydraulic circuit drawing



Dimensional drawing





Automatic grease pump (PDI) GMS (Cartridge)

Compact, low-cost pump exclusively designed for Lube Original Grease cartridge greases

GMS-4-4C

GMS-1-7C·GMS-2-7C

Specifications

Pump	Discharge volume	20ml/min
	Discharge pressure	8.0MPa (safety valve set pressure)
Power	DC24V·EAC100V,200V,φ1	
	DC24VMortor Pressure relief solenoid	15W/0.65A 30W/1.25A Total:45W/1.9A
	AC100VMortor Pressure relief solenoid	25W/0.65A 30W/0.32A Total: 55W/0.97A
	AC200VMortor Pressure relief solenoid	25W/0.3A 30W/0.16A Total: 55W/0.46A
Pressurization	Max. ON time: 3 min.	
Pressure relief	Min. OFF time: 1 hour	
Working consistency	Cartridge grease No.000,00, 0, 1 (lithium grease)	
Recommended grease	Lube Original Grease MPO, MP1, FS2	
Cartridge size	400ml, 700ml cartridge	
Weight	1.8kg(4C),2.8kg(7C)	
Pressure relief	Built-in solenoid	

How to order

GMS−□−□C

Type of Reservoir
- C Cartridge Type

Cartridge
- 4 For400cc
- 7 For700cc

Voltage
- 1 AC100V
- 2 AC200V
- 4 DC24V

Part Number

Part Number	Model	Part Number	Model
103560	GMS-1-4C	103580	GMS-2-7C
103578	GMS-1-7C	103546	GMS-4-4C
103562	GMS-2-4C	103576	GMS-4-7C

[Directions for use]

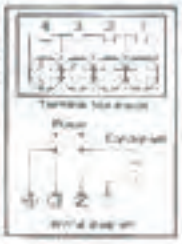
- Use recommended cartridge greases.
- Never use molybdenum disulfide-contained grease.
- Use lithium greases. (Contact us for consultation when other than lithium grease is used.)
- Do not use any greases containing substances that attack brass and rubber.
- When replacing cartridge, take care not to let foreign matter in the pump.
- Avoid continuous operation.
- After replacing cartridge, always press AIR BLEED push button to purge the pump of air.

Wiring diagram

●Solenoid

For 103546

For 103578

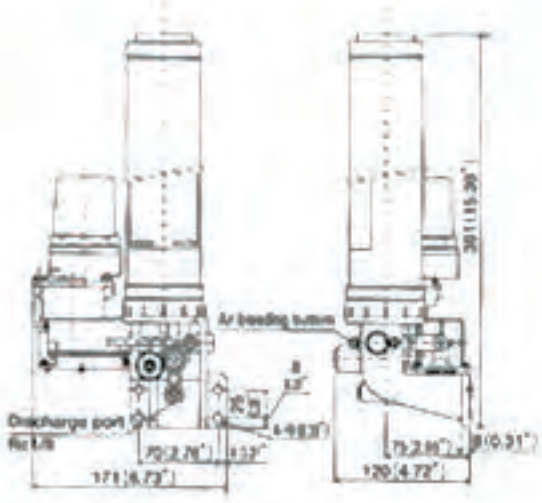


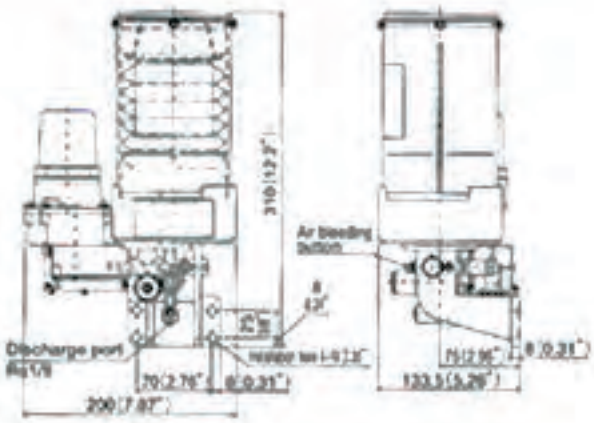
●Condenser

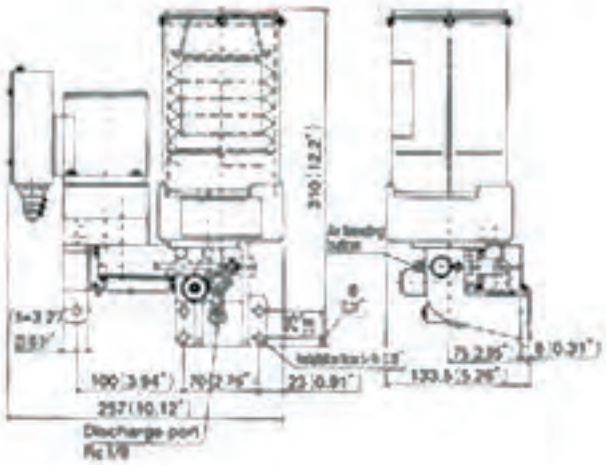
AC100V 6 μ F
(For 103578)

AC200V 1.5 μ F
(For 103580)

Dimensional drawing







Automatic grease pump (PDI) EGMS

Motor driven piston pump.

EGM-10S-4-4C

EGM-10S-4-7C

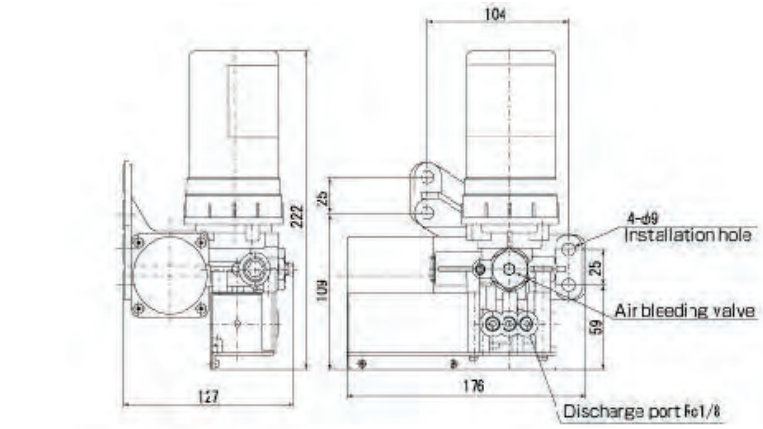
Specifications

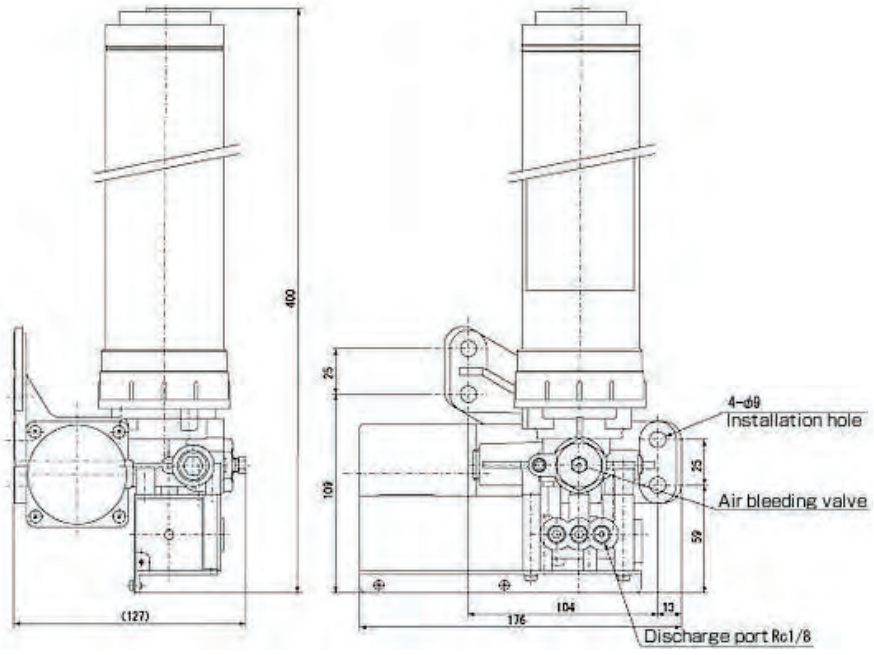
Pump	Discharge volume	10ml/min
	Discharge pressure	10MPa (safety valve set pressure)
Power DC24V AC100V , 200V , φ1	DC24V	
	Mortor	20W/0.8A
	Pressure relief solenoid	26W/1.1A
	Total	46W/1.9A
Pressurization	Max. ON time: 7.5 min.	
Power distribution rate	Max.25% (20°C)	
Working consistency	Cartridge grease No.000,00,0,1	
Recommended grease	MP0, FS2, MT1	
Cartridge size	200ml , 400ml , 700ml cartridge	
Weight	1.8kg (4C) , 2.8kg (7C)	
Pressure relief	Built-in solenoid	

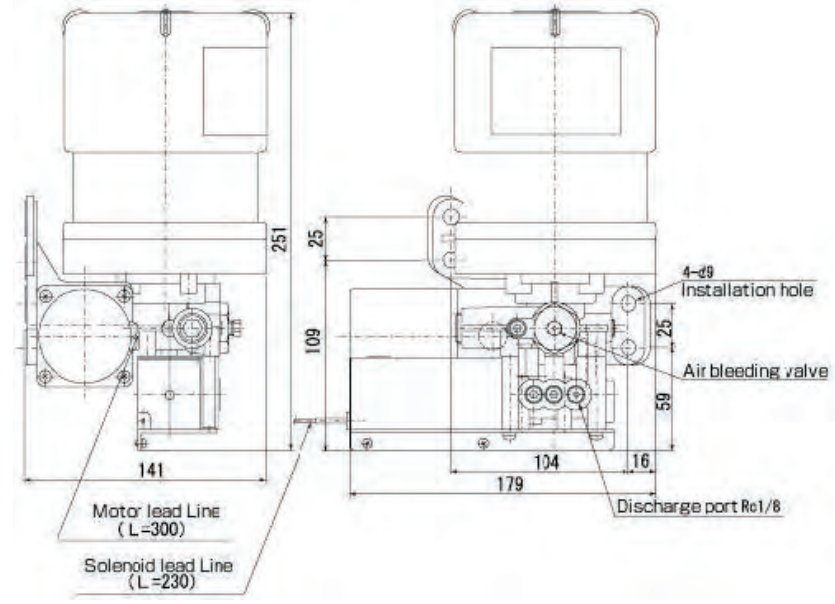
Part Number

Part Number	Model	Part Number	Model
103809	EGM-10S-4-2C	103811	EGM-10S-4-7C
103810	EGM-10S-4-4C		

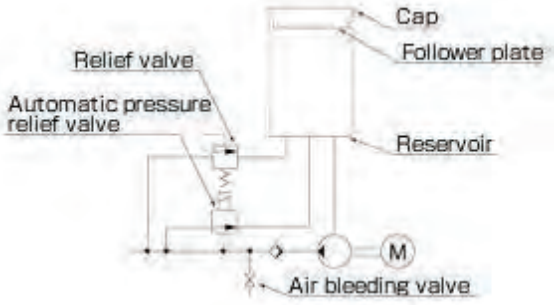
Dimensional drawing



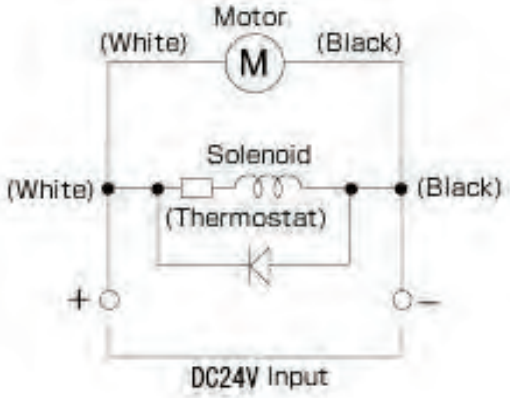




Hydraulic circuit drawing



Wiring digram



Compact Pneumatic Grease Pump GAS

Pneumaticly actuated grease pump

GAS-8P

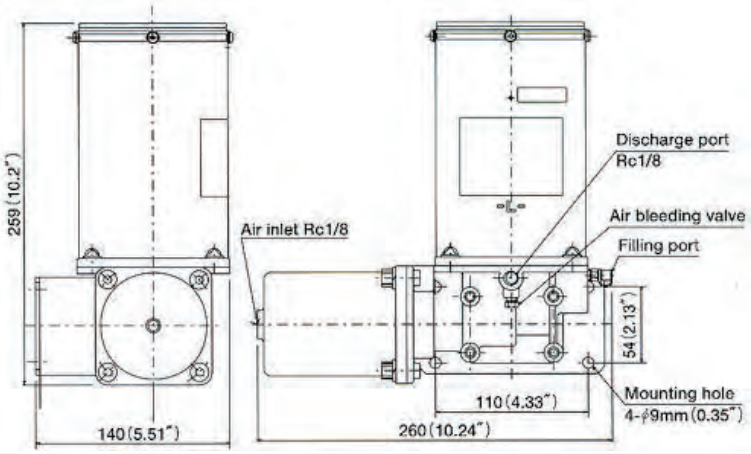
Specifications

Pump	Discharge volume	16ml/stroke (MAX)
	Discharge pressure	Pressure ratio 1 : 7 (ex.Pressure ratio 0.3MPa × 7 = 2.1MPa)
Working air pressure Range		0.3~0.56MPa (MAX)
Working consistency		NLGI No.000,00,0,1 (Lithium grease)
Working grease		MP0, FS2
Grease level switch		Option
Reservoir capacity		800ml
Weight		3.6kg
Pressure relief		Automatic pressure relief

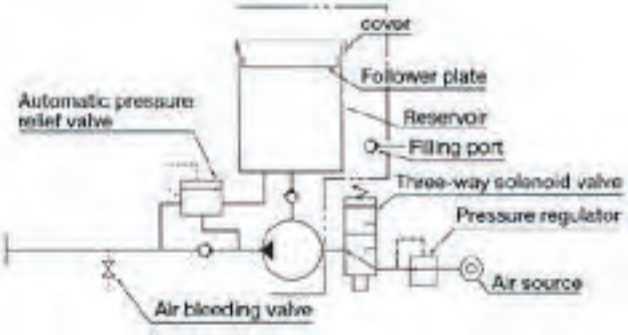
Part Number

Model	Part Number
GAS-8P	102621

Dimensional drawing



Hydraulic circuit drawing



[Directions for use]

- Use recommended greases.
- Never use molybdenum disulfide-contained grease.
- Use lithium greases. (Contact us for consultation when other than lithium grease is used.)
- Do not use any greases containing substances that attack brass and rubber.
- When refilling, take care not let foreign matter in the grease.
- Avoid continuous operation.
- After refilling, always press AIR BLEED push button to purge the pump of air.
- Use the pressure relief lever correctly.

Manual Pump for Series Progressive System EGH

Compact, low-cost manually operated pump

Reservoir type
EGH-3P

Cartridge type
EGH-2C

Cartridge type
EGH-4C

Specifications

EGH-3P		
Pump	Discharge volume	1m~/stroke
	Discharge pressure	10MPa (safety valve set pressure)
Working consistency		NLGI No.000~00~0~1 (lithium grease)
Recommended grease		MP0~FS2~MT1
Cartridge size		260ml
Weight		1.4kg
Pressure relief		Manual pressure relief lever

EGH-2C EGH-4C		
Pump	Discharge volume	1ml/stroke
	Discharge pressure	10MPa (safety valve set pressure)
Working consistency		Cartridge grease No.000~00~0~1 (lithium grease)
Recommended grease		MP0~FS2~MT1
Cartridge size		200ml~400ml Cartridge
Weight		1.4kg
Pressure relief		Manual pressure relief lever

How to order

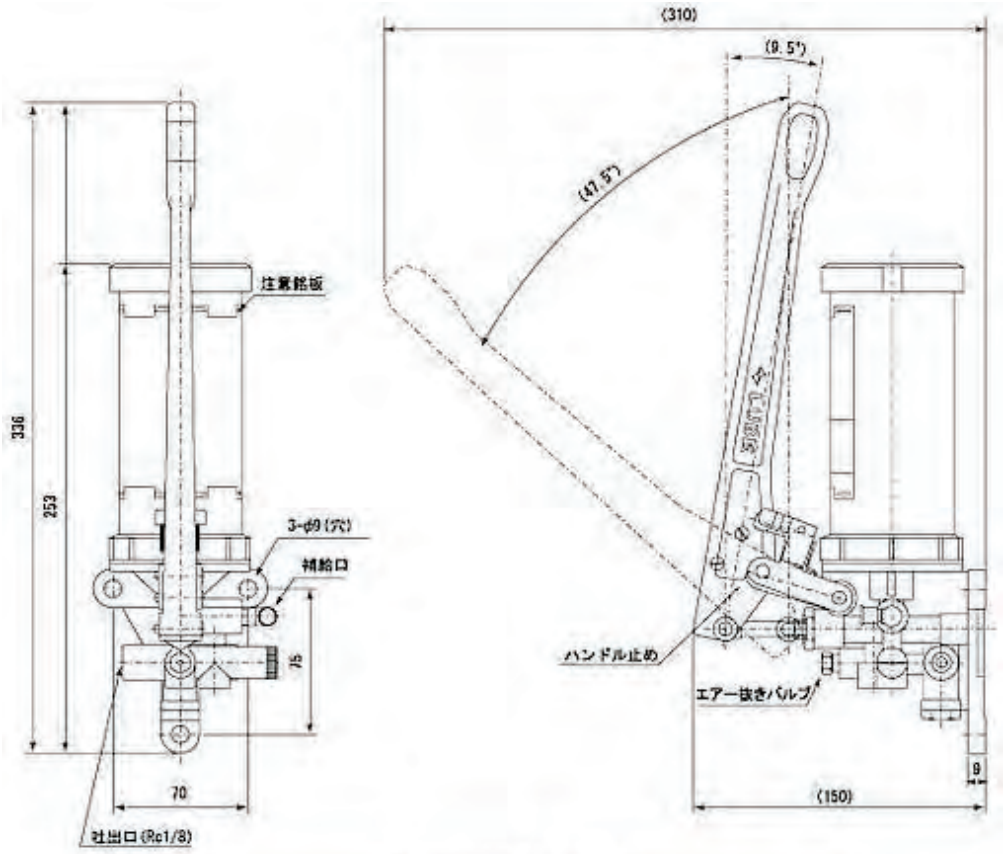
EGH−□□

Type of Reservoir (effective capacity)

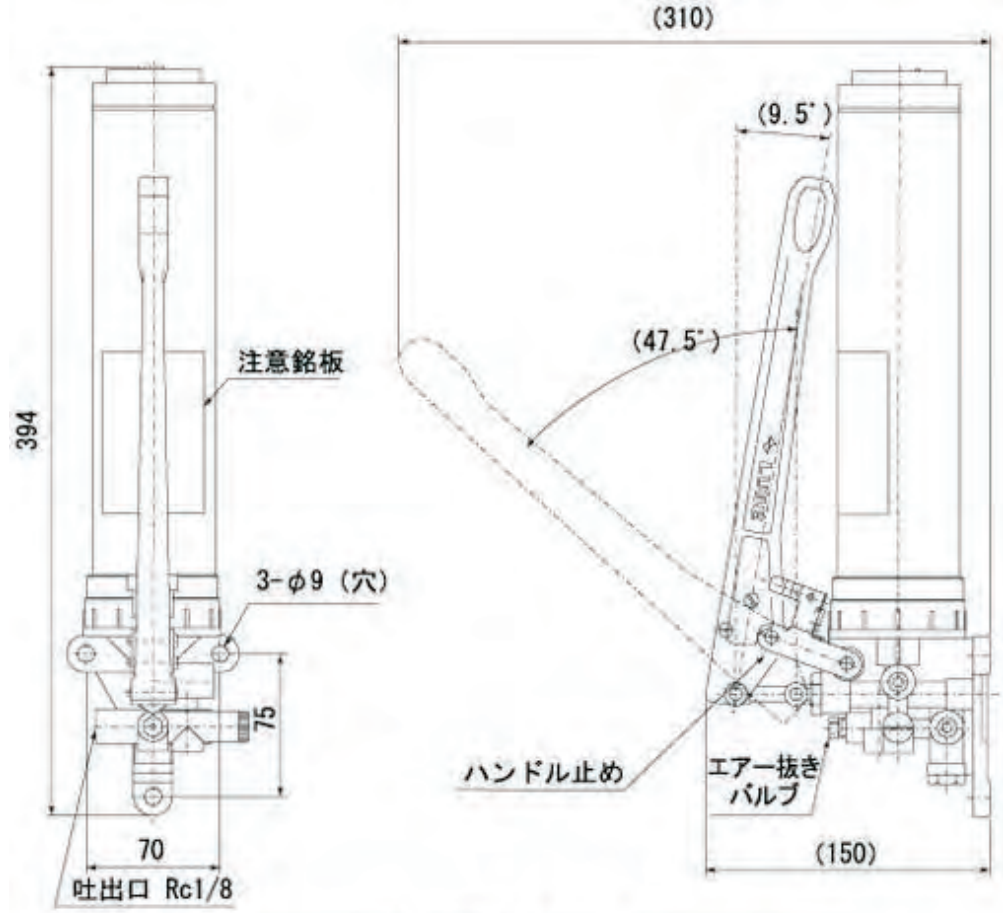
3P	Reservoir Type(For260ml)
2C	Cartridge Type(For200ml)
4C	Cartridge Type(For400ml)

Part Number

Part Number	Model	Part Number	Model
103780	EGH-2C	103783	EGH-3P
103782	EGH-4C		



Reservoir type
EGH-3P



Cartridge type
EGH-4C

Grease PDI Valve MG • MGA

Highly reliable positive displacement injectors. Combinable with each other as desired for best result

[MG • MGA

Specifications

Operating pressure	MG: 1.5MPa; MGA/MGAC: 2.5MPa
Reset pressure	MG: 0.5MPa; MGA/MGAC: 1.2MPa

How to order

Part Number

MG

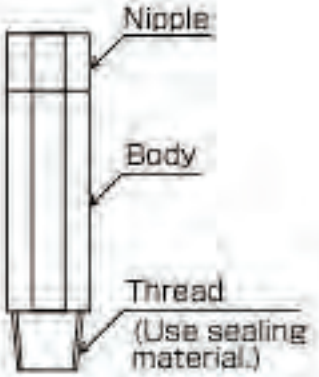
Model	Part Number	Discharge volume(ml)	L(mm)	B(mm)	Mark
MG-3	205601	0.03	44.5	11	3
MG-5	205062	0.05			5
MG-10	205063	0.1			10
MG-20	205064	0.2	53.5		20
MG-30	205065	0.3			30
MG-50	205066	0.5	65		50
MG-100	205067	1	74.5	19	100
MG-150	205068	1.5			150

MGA * When piping length demands the use of GAS pump, contact us for consultation.

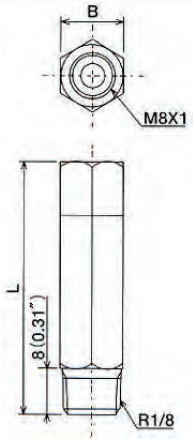
Model	Part Number	Discharge volume(ml)	L(mm)	B(mm)	Mark
MGA-3	205501	0.03	53.5	11	3
MGA-5	205502	0.05			5
MGA-10	205503	0.1			10
MGA-20	205504	0.2			20
MGA-30	205505	0.3	65	12	30
MGA-50	205506	0.5			50
MGA-100	205507	1	74.5	19	100
MGA-150	205508	1.5	77.5		150

[Directions for use]

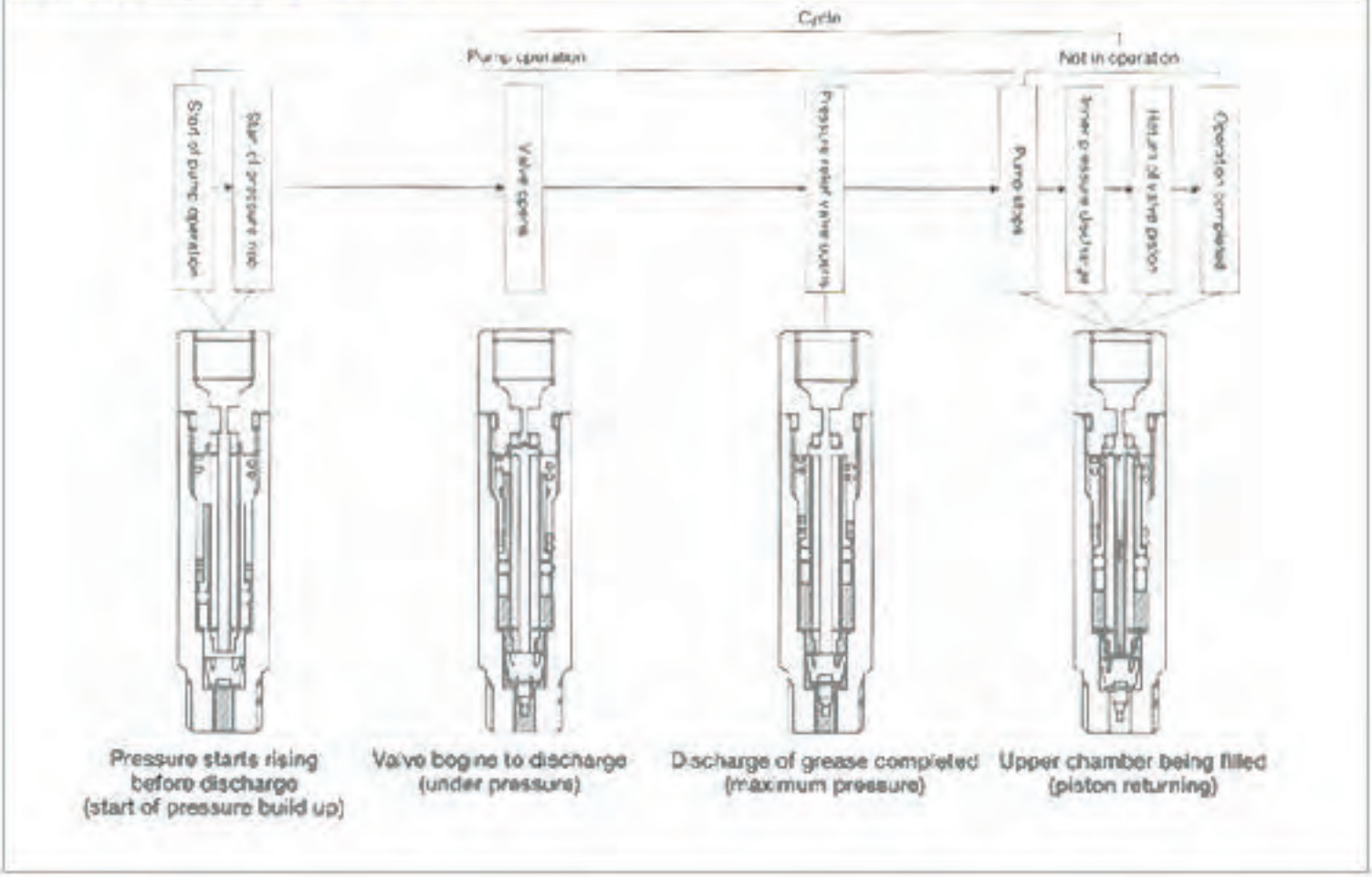
- When installing the valve on a junction side, screw it into place with a wrench applied to the valve body.
- When connecting the valve to piping, turn bushing holding nipple with a wrench.



Dimensional drawing



Valve operation chart



Positive Displacement Injector (PDI) System for Small - Medium Size Machines

Grease PDI Valve with Clogging Indicator Pin MGI

When grease line is clogged at a lubrication point, a red pin pops up to tell the problem.

JV-4S-MGI-10-10

Specifications

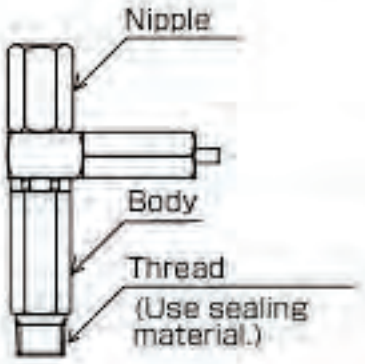
Operating pressure	1.5MPa
Reset pressure	0.5MPa
Detection pin operating ressure	1.5MPa

Part Number

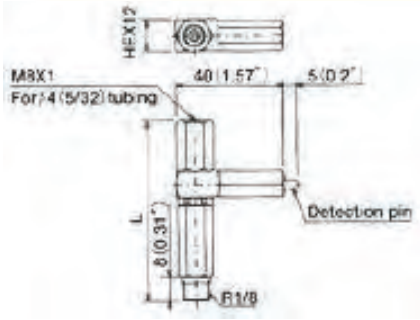
Model	Part Number	Discharge volume(ml)	L(mm)	Mark
MGI-3	205174	0.03	66.5	3
MGI-5	205175	0.05		5
MGI-10	205176	0.1		10
MGI-20	205177	0.2	74	20
MGI-30	205178	0.3		30
MGI-50	205182	0.5	85.5	50

[Directions for use]

- When installing the valve on a junction side, screw it into place with a wrench applied to the valve body.
- When connecting the valve to piping, turn bushing holding nipple with a wrench.



Dimensional drawing



Junctions for Grease PDI Valve

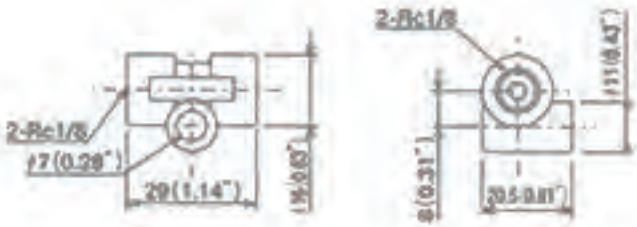
For main tubing connection, branching and valve installation.

JV-6S

Single Junctions

Junctions [For MG valve installation/6mm/8mm O.D. tubing]

Dimensional drawing

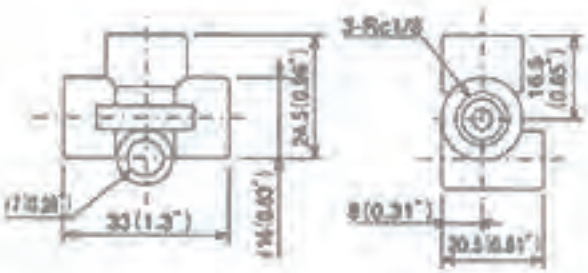


Part Number

Part Number	Model	Specification	Size	
			L1	L2
206470	JV-2	0 port straight junction	-	-

Material:ZDC

Dimensional drawing

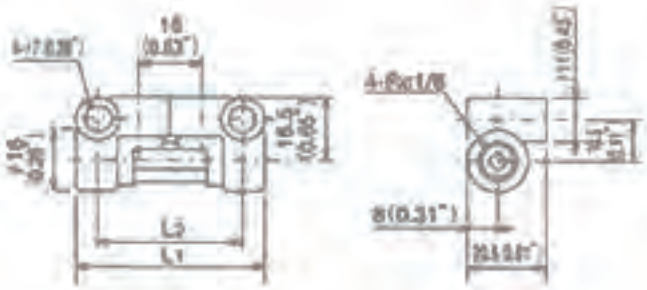


Part Number

Part Number	Model	Specification	Size	
			L1	L2
206471	JV-3	Single type for 1port	-	-

Material:ZDC

Dimensional drawing



Part Number

Part Number	Model	Specification	Size	
			L_1	L_2
206472	JV-4S	Single type for 2ports	49 (1.93")	38 (1.50")
206473	JV-5S	Single type for 3ports	65 (2.56")	54 (2.13")
206474	JV-6S	Single type for 4ports	81 (3.19")	70 (2.76")
206475	JV-7S	Single type for 5ports	97 (3.82")	86 (3.39")
206476	JV-8S	Single type for 6ports	113 (4.45")	102 (4.02")
206479	JV-9S	Single type for 7ports	129 (5.08")	118 (4.65")
206543	JV-10S	Single type for 8ports	145 (5.71")	134 (5.28")

Material: ZDC

Part Number	Model	Specification
206683	JV-4S	Single type for 2ports
206684	JV-5S	Single type for 3ports
206685	JV-6S	Single type for 4ports
206686	JV-7S	Single type for 5ports
206687	JV-8S	Single type for 6ports
206688	JV-9S	Single type for 7ports
206689	JV-10S	Single type for 8ports

Material: ZDC

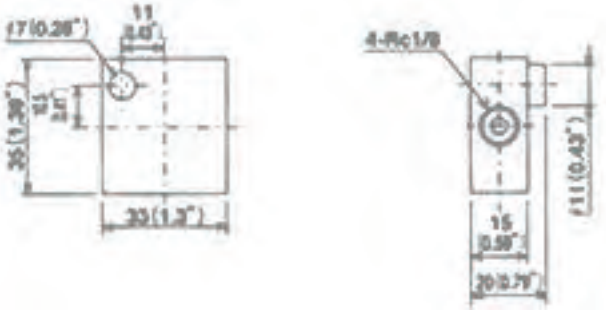
Junctions for Grease PDI Valve

For main tubing connection, branching and valve installation.

206466 JV-8D

Double Junctions

Dimensional drawing

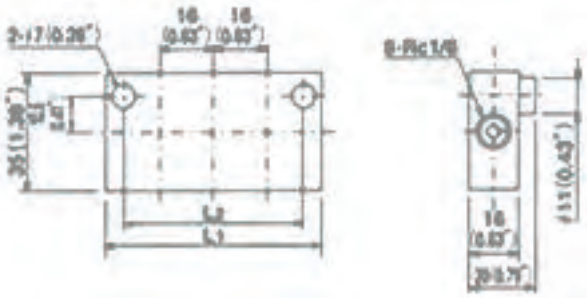


Part Number

Part Number	Model	Specification
206464	JV-4D	Double type for 2ports

Material:C3604

Dimensional drawing



Part Number

Part Number	Model	Specification	Size	
			L1	L2
206465	JV-6D	Double type for 4ports	49 (1.93")	38 (1.50")
206466	JV-8D	Double type for 6ports	65 (2.56")	54 (2.13")
206467	JV-10D	Double type for 8ports	81 (3.19")	70 (2.76")
206468	JV-12D	Double type for 10ports	97 (3.82")	86 (3.39")
206469	JV-14D	Double type for 12ports	113 (4.45")	102 (4.02")

Material:C3604

PDI Valve with Electric Performance Indicator MGLA

The MGLA Valve is a positive displacement injector with an attached micro switch suitable for monitoring the most critical of lubrication points. The signal generated can be used to stop the machine in the event of interruption of proper lubrication. The signal can also be used and counted to determine the time to replace the grease cartridge or replenish the supply of grease to the reservoir.

MGLA

Specifications

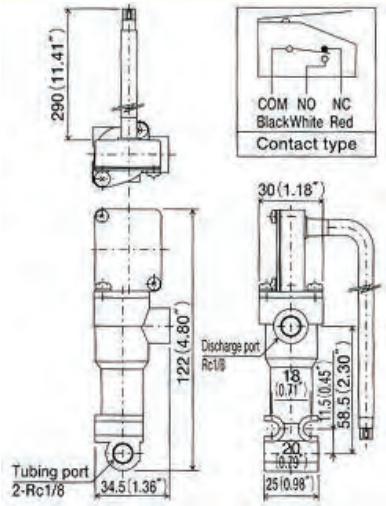
Discharge volume	0.1,0.2,0.3,0.5ml/stroke
Operating pressure	MGLA 2.5MPa
Reset pressure	MGLA 1.2MPa
Contact capacity	AC125V 2A, AC250V 2A, DC30V 2A

Material:Zinc Die Casting (ZDC)

Part Number

Model	Part Number	Discharge volume(ml)	Mark
MGLA-10	205515	0.1	10
MGLA-20	205518	0.2	20
MGLA-30	205588	0.3	30
MGLA-50	205589	0.5	50

Dimensional drawing



Grease Pressure Switch GPL

Highly reliable and long-life pressure switch designed to let grease pass through without stagnation inside.

GPL-30

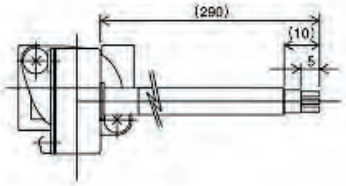
Specifications

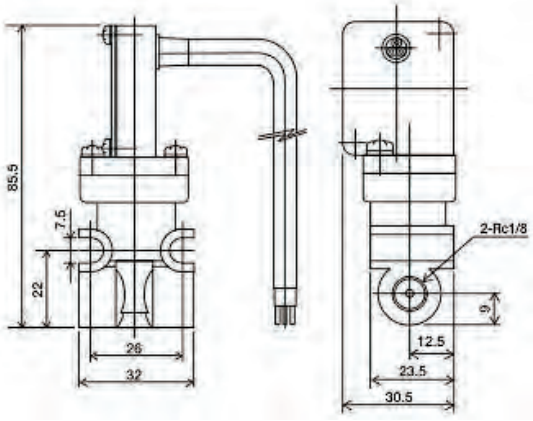
Operating pressure		3.0MPa±20%
Reset pressure		2.5MPa±20%
Max. working pressure		8.0MPa
Microswitch	Contact capacity	AC125V 2A, AC250V 2A, DC30V 2A
	Service life:	200,000 switchings (loaded)
	Structrual protection:	JIS moisture-tight, conforming to IEC IP67

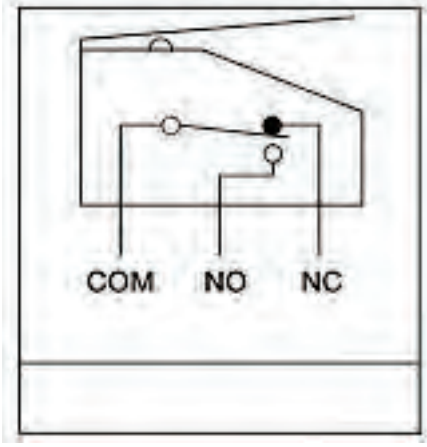
Material:Zinc Die Casting (ZDC)

Part Number

Model	Part Number
GPL-30	209282







Grease PDI Valve MG2/MG2C

The MG2 and MG2C are our most accurate and reliable positive displacement injectors. They employ straight thread with sealing o-ring for easy installation to the junction. The MG2C incorporates the use of a push to connect fitting making the system installation on the machinery

MG2·MG2C

Specifications

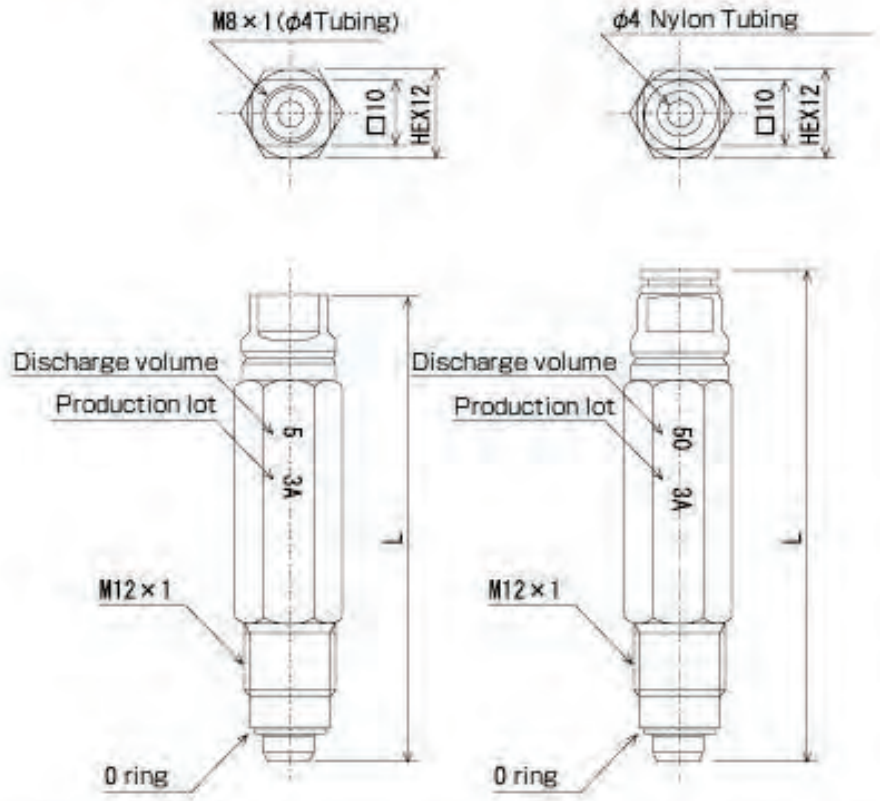
Operating pressure	2.5MPa
Reset pressure	1.4MPa

* Grease valve has the grooving as shown in the picture.

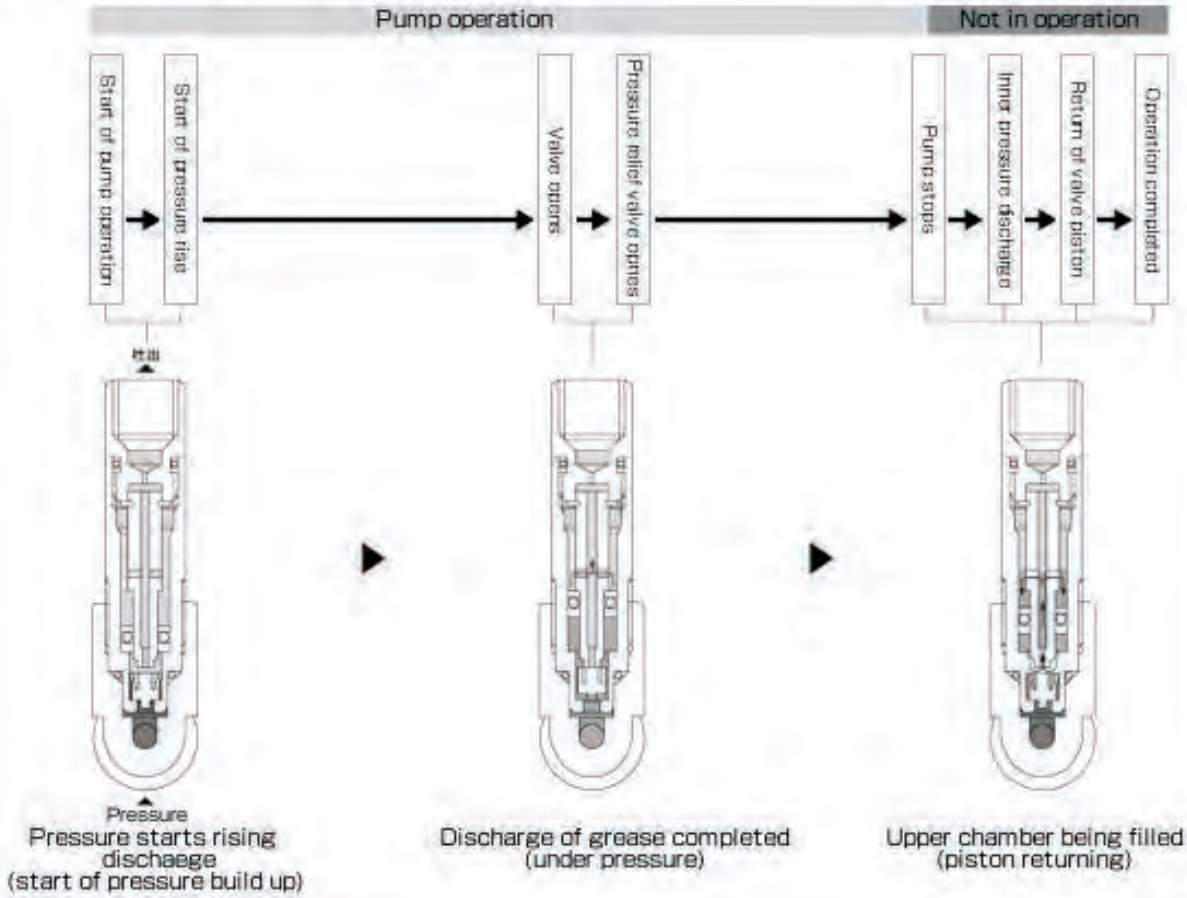
Part Number

Model	Part Number	Discharge volume(ml)	L(mm)	B	Mark
MG2-3	205741	0.03	48	HEX12	3
MG2-5	205742	0.05			5
MG2-10	205743	0.1			10
MG2-20	205744	0.2	64		20
MG2-30	205745	0.3			30
MG2-50	205746	0.5			50
MG2C-3	205731	0.03	53.5		3
MG2C-5	205732	0.05			5
MG2C-10	205733	0.1			10
MG2C-20	205734	0.2	69.5		20
MG2C-30	205735	0.3			30
MG2C-50	205736	0.5			50

Dimensional drawing

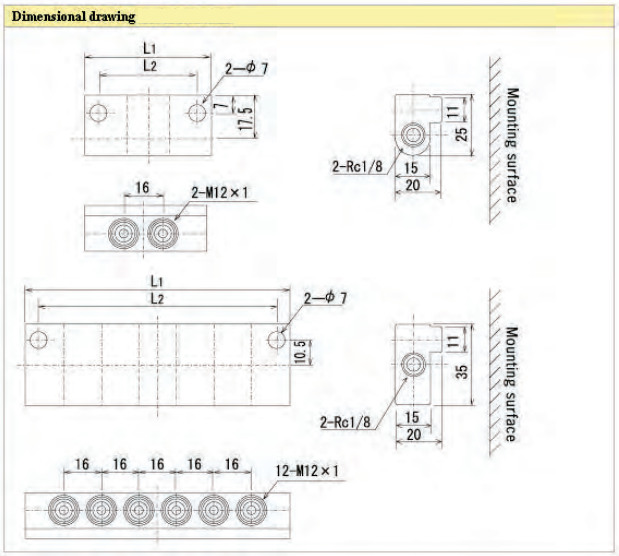


Valve operation chart



Junction for MG2 & MG2C valve JVPA

Junction for MG2 & MG2C valve : Junction used for MG2 & MG2C installation.



Junction
JVPA-2S

Part Number

Model	Part Number	Specifilcation	L1	L2
JVPA- 1S	216001	Single type for 1port	33	22
JVPA- 2S	216002	Single type for 2ports	49	38
JVPA- 3S	216003	Single type for 3ports	65	54
JVPA- 4S	216004	Single type for 4ports	81	70
JVPA- 5S	216005	Single type for 5ports	97	86
JVPA- 6S	216006	Single type for 6ports	113	102
JVPA- 7S	216007	Single type for 7ports	129	118
JVPA- 8S	216008	Single type for 8ports	145	134
JVPA- 9S	216009	Single type for 9ports	161	150
JVPA-10S	216010	Single type for 10ports	177	166

Model	Part Number	Specifilcation	L1	L2
JVPA- 2D	216021	Double type for 2ports	33	11
JVPA- 4D	216022	Double type for 4ports	49	38
JVPA- 6D	216023	Double type for 6ports	65	54
JVPA- 8D	216024	Double type for 8ports	81	70
JVPA-10D	216025	Double type for 10ports	97	86
JVPA-12D	216026	Double type for 12ports	113	102
JVPA-14D	216027	Double type for 14ports	129	118
JVPA-16D	216028	Double type for 16ports	145	134

Material: Aluminum (A6063S-T5)

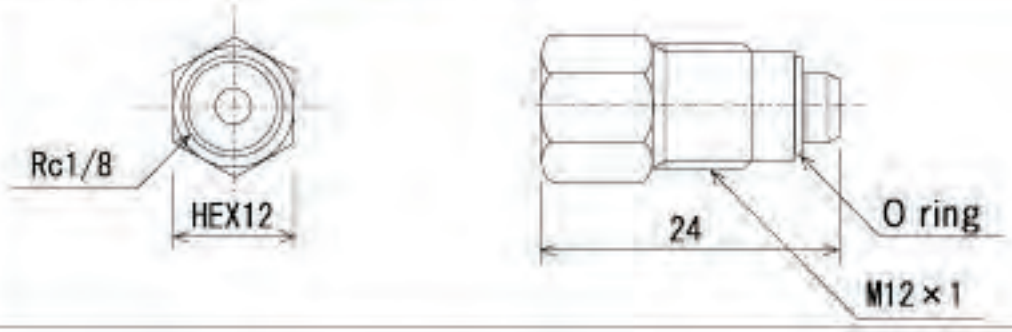
Junction for MG2 & MG2C valve JVPA

Related parts

Part Number

Part Numbr	Model
619803	SCP

Dimensional drawing



Connector Assembly

Part Number

Part Numbr	Model
619802	BPP

Dimensional drawing

Plug Assembly

Performance Indicator Pin

Visual performance indicatorts.

KEN-T KEN-M

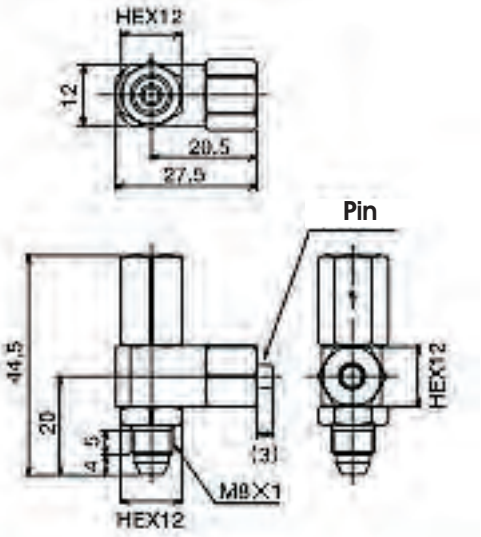
[Directions for use]

- Clogging and/or high back-pressure at the termination points could hinder the lubricant flow.
- Operational temperature range : 0~70c

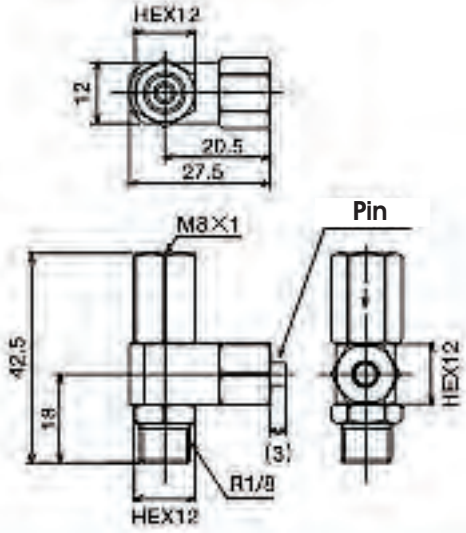
Part Number

Model	Part Number	Specification
KEN-T	106672	For installing on valves
KEN-M	106673	For lubrication point installation

Drawing



[KEN-T]



[KEN-M]

Dual-function mortorized pump EGM-T

Can operate both PDI and series progressive systmes by switching built-in solenoid valve.

EGM-4-7C EGM-10T-4-7C

Specifications

Pump	Discharge volume	10ml/min
	Discharge pressure	10MPa (safety valve set pressure)
Power DC24V	DC24V	
	Mortor	20W/0.8A
	Pressure relief solenoid	26W/1.1A
	Total	46W/1.9A
Pressurization	Max. ON time: 7.5 min.	
Power distribution rate	Max.25% (20°C)	
Working consistency	Cartridge Grerase No.000,00,0,1	
Recommended grease	MP0, FS2, MT1	
Cartridge size	200ml , 400ml , 700ml cartridge	
Weight	1.78kg (2C) , 1.83kg (4C) , 1.8kg (7C)	
Pressure relief	Built-in solenoid	

How to order

EGM－10T－4－□C

Type of Reservoir
- C Cartrige Type

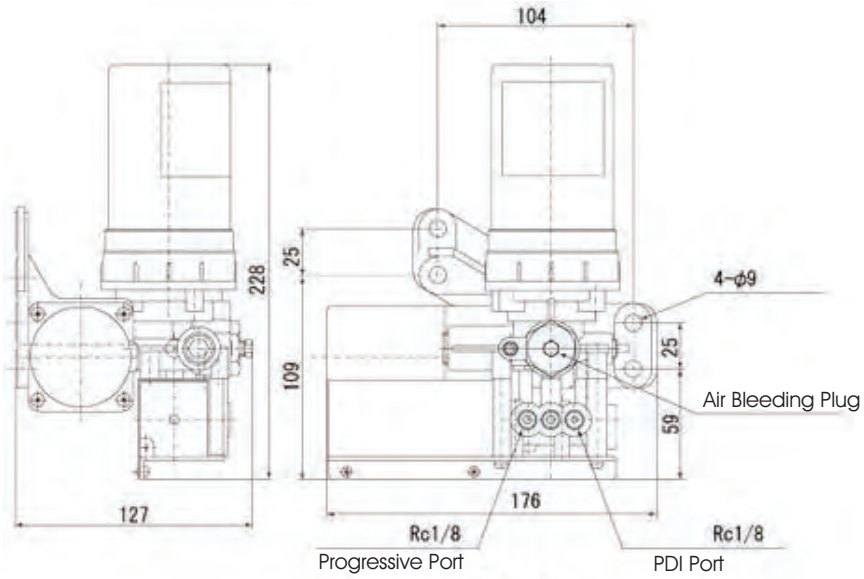
Cartrige
- 2 For 200ml
- 4 For 400ml
- 7 For 700ml

Part Number

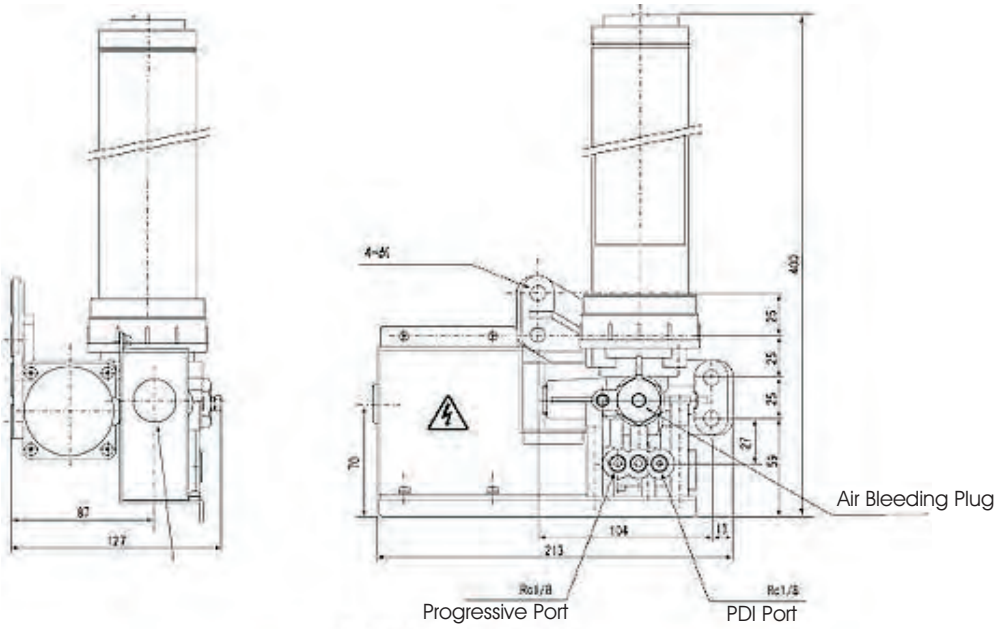
Part Number	Model	Part Number	Model
103833	EGM-10T-4-2C	103835	EGM-10T-4-7C
103834	EGM-10T-4-4C		

[Directions for use]

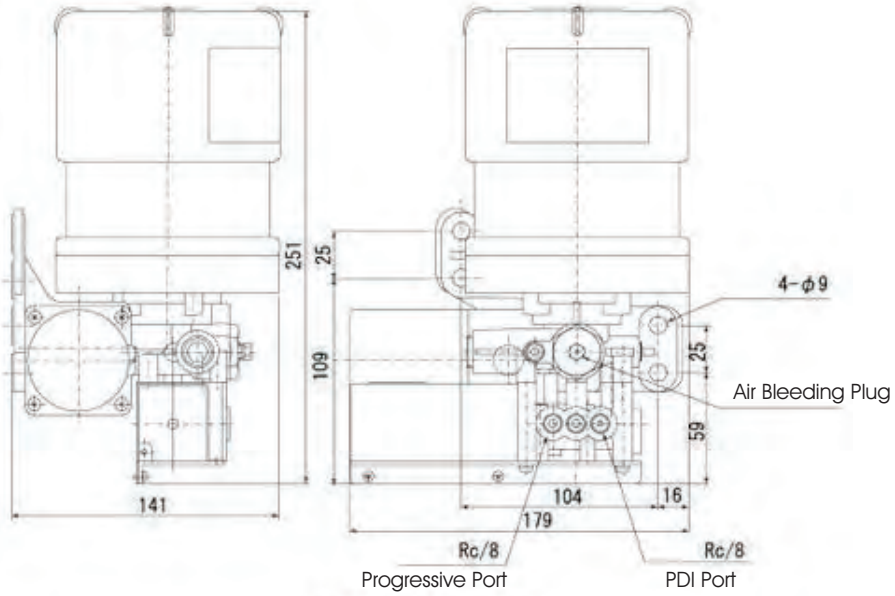
- Use recommended cartridge greases.
- Never use molybdenum disulfide-contained grease.
- Use lithium greases. (Contact us for consultation when other than lithium grease is used.)
- Do not use any greases containing substances that attack brass and rubber.
- When replacing cartridge, take care not to let foreign matter in the pump.
- Avoid continuous operation.
- After replacing cartridge, always press AIR BLEED push button to purge the pump of air.



EGM-10T-4-2C



EGM-10T-4-4C



EGM-10T-4-7C

Dual-function mortorized pump EGME-T

Can operate both PDI and series progressive systmes by switching built-in solenoid valve. Energy-saving pump with the minimal power consumption.

EGME-10T-4-2C

Specifications

Pump	Discharge volume	10ml/min
	Discharge pressure	10MPa (safety valve set pressure)
Power DC24V AC100V , 200V , φ1	DC24V	
	Mortor	20W/0.8A
	Pressure relief solenoid	10W/0.4A
	Total	30W/1.2A
Working consistency	Cartridge Grease No.000,00,0,1	
Recommended grease	MP0, FS2, MT1	
Cartridge size	200ml , 400ml , 700ml cartridge	
Weight	1.8kg (4C) , 2.8kg (7C)	
Pressure relief	Built-in solenoid	

How to order

EGME－10T－4－□C

Type of Reservoir
C Cartrige Type

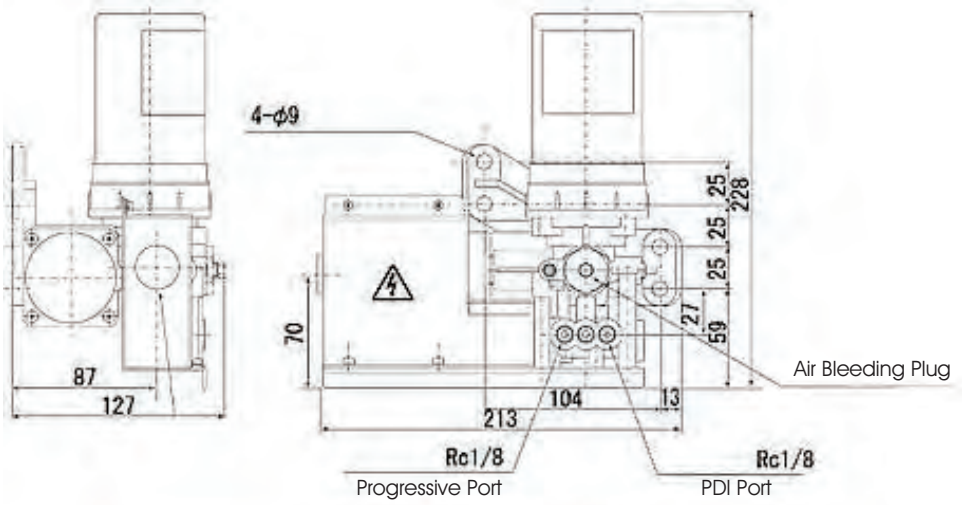
Cartrige
2 For 200ml
4 For 400ml
7 For 700ml

Part Number

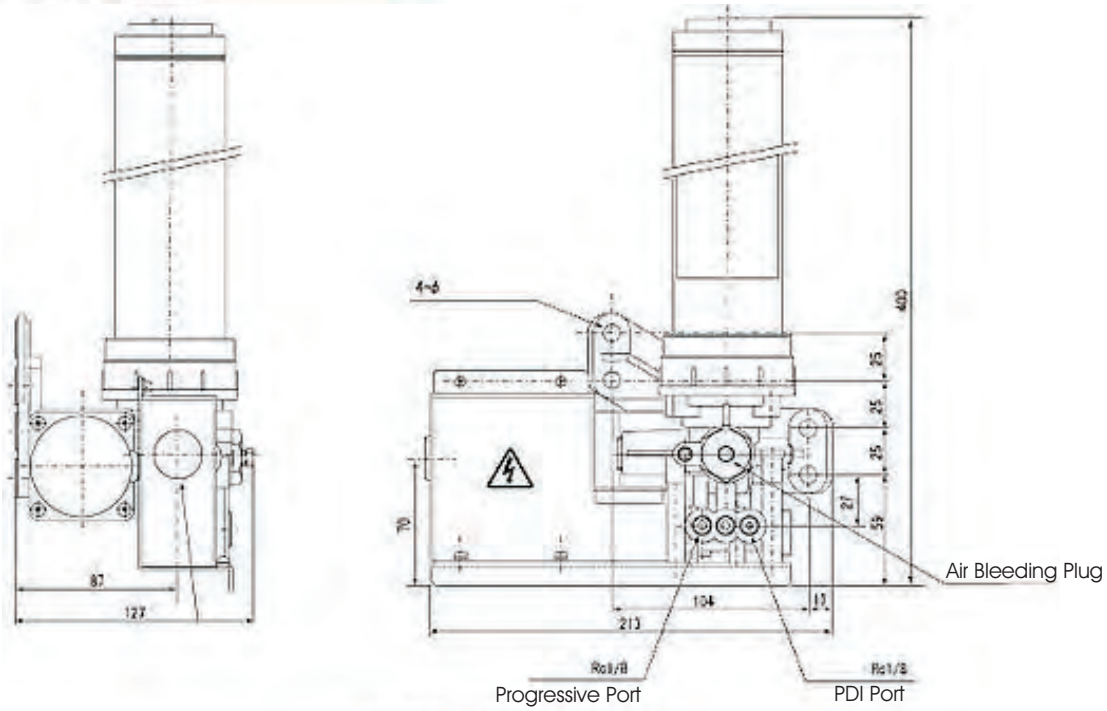
Part Number	Model	Part Number	Model
103902	EGME-10T-4-2C	103904	EGME-10T-4-7C
103903	EGME-10T-4-4C		

[Directions for use]

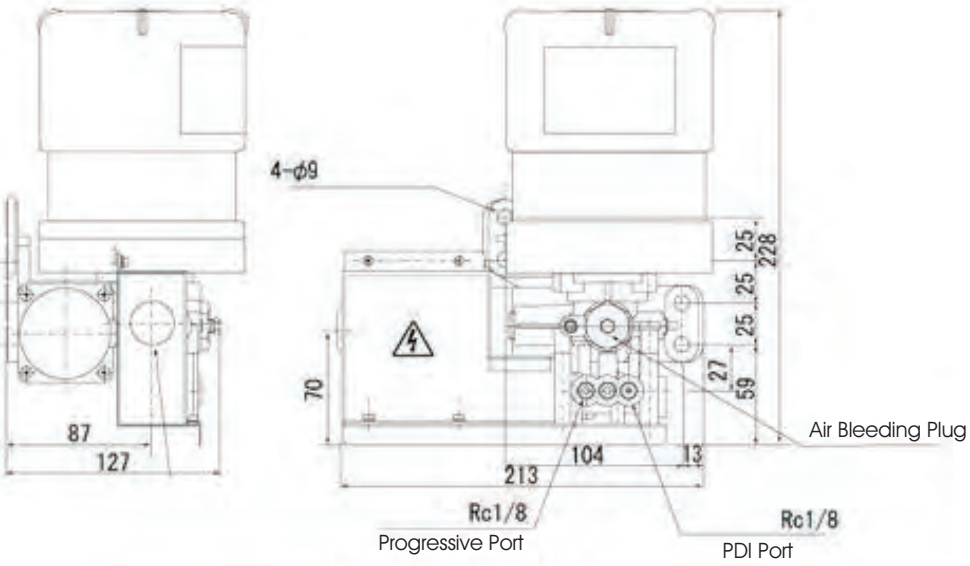
- Use recommended cartridge greases.
- Never use molybdenum disulfide-contained grease.
- Use lithium greases. (Contact us for consultation when other than lithium grease is used.)
- Do not use any greases containing substances that attack brass and rubber.
- When replacing cartridge, take care not to let foreign matter in the pump.
- Avoid continuous operation.
- After replacing cartridge, always press AIR BLEED push button to purge the pump of air.



EGME-10T-4-2C



EGME-10T-4-4C



EGME-10T-4-7C

Motorized grease pump GMN

Use with progressive metering valves makes possible discharge volume adjustment according to pump operation time.

GMN-4-8P

Specifications

Pump	Discharge volume	20ml/min
	Discharge pressure	8.0MPa (safety valve set pressure)
Mortor	Power	DC24V/1A
	Output	15W DC brush motor
Grease level switc	option	
Reservoir capacity	800ml	
Weight	2.8kg	
Working consistency	NLGI No.000,00,0,1 (Lithium grease)	
Recommended grease	LUBER MP0, MP1, FS2	

How to order

GMN－4－8P

Type of Reservoir (effective capacity)

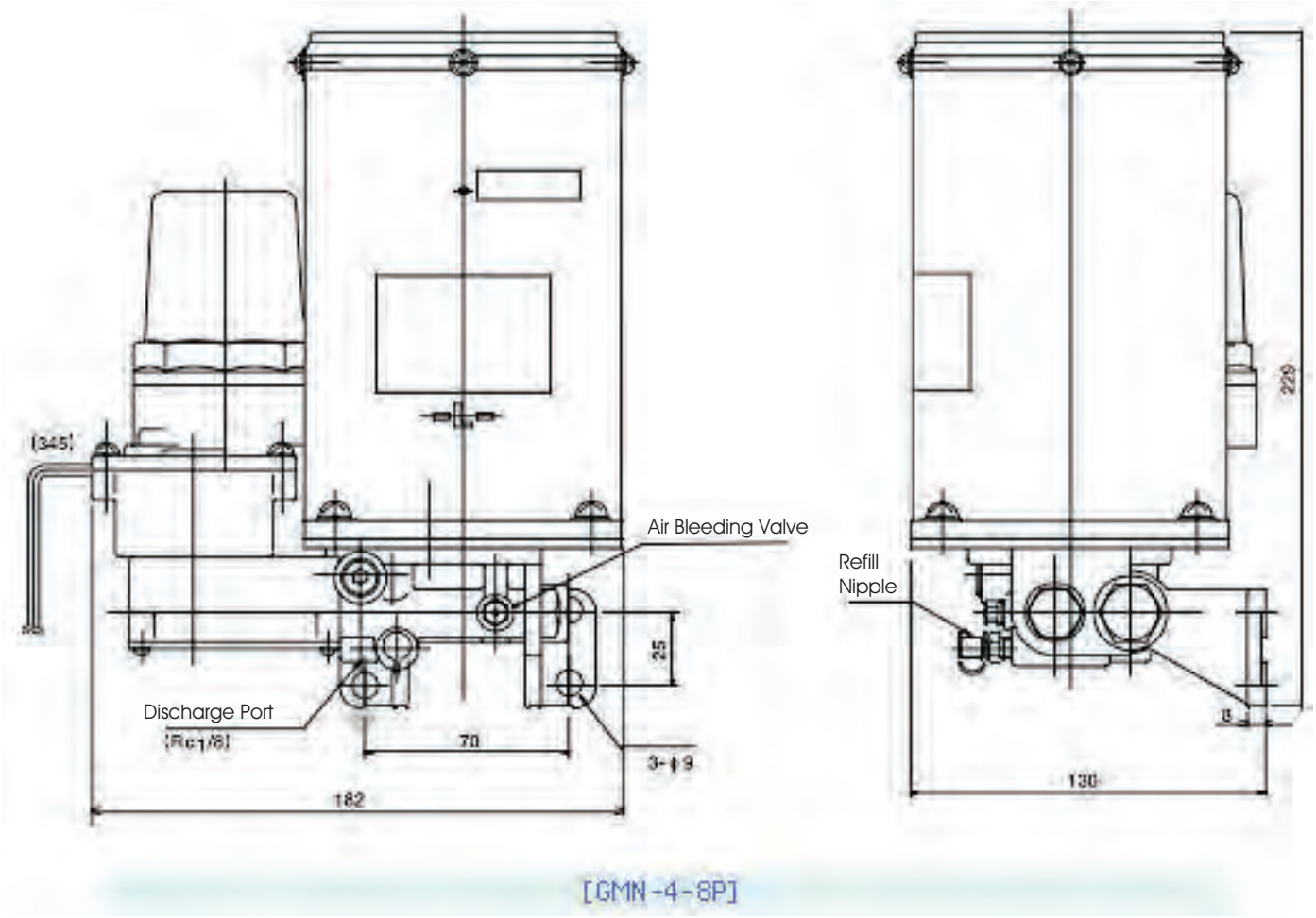
8P	Reservoir Type	800cc

Voltage

4	DC24V

Part Number

Part Number	Model	Part Number	Model
102909	GMN-4-8P		



[GMN-4-8P]

[Directions for use]

- Use recommended cartridge greases.
- Never use molybdenum disulfide-contained grease.
- Use lithium greases. (Contact us for consultation when other than lithium grease is used.)
- Do not use any greases containing substances that attack brass and rubber.
- When replacing cartridge, take care not to let foreign matter in the pump.
- Avoid continuous operation.
- After replacing cartridge, always press AIR BLEED push button to purge the pump of air.

Motorized grease pump GMNH [High pressure type]

Motor-driven cartridge grease pump. Use with progressive metering valves makes possible discharge volume adjustment according to pump operation time.

GMNH-4-4C | GMNH-1-4-GMNH-2-4C | GMNH-4-7C | GMNH-1-7C-GMNH-2-7C

Specifications

Pump	Discharge volume	10ml/min		
	Discharge pressure	20MPa (safety valve set pressure)		
Mortor	Power	DC24Vφ 1/0.65A	AC100Vφ 1/0.65A	AC200Vφ 1/0.65A
	Output	15W DC brush motor	25W ignition motor	
Working consistency	Cartridge grease No.000,00, 0, 1 (lithium grease)			
Recommended grease	LUBER MP0, MP1, FS2			
Cartridge size	400ml, 700ml cartridge			
Weight	2.8kg (DC24V),3.1kg (AC100V,200V)			

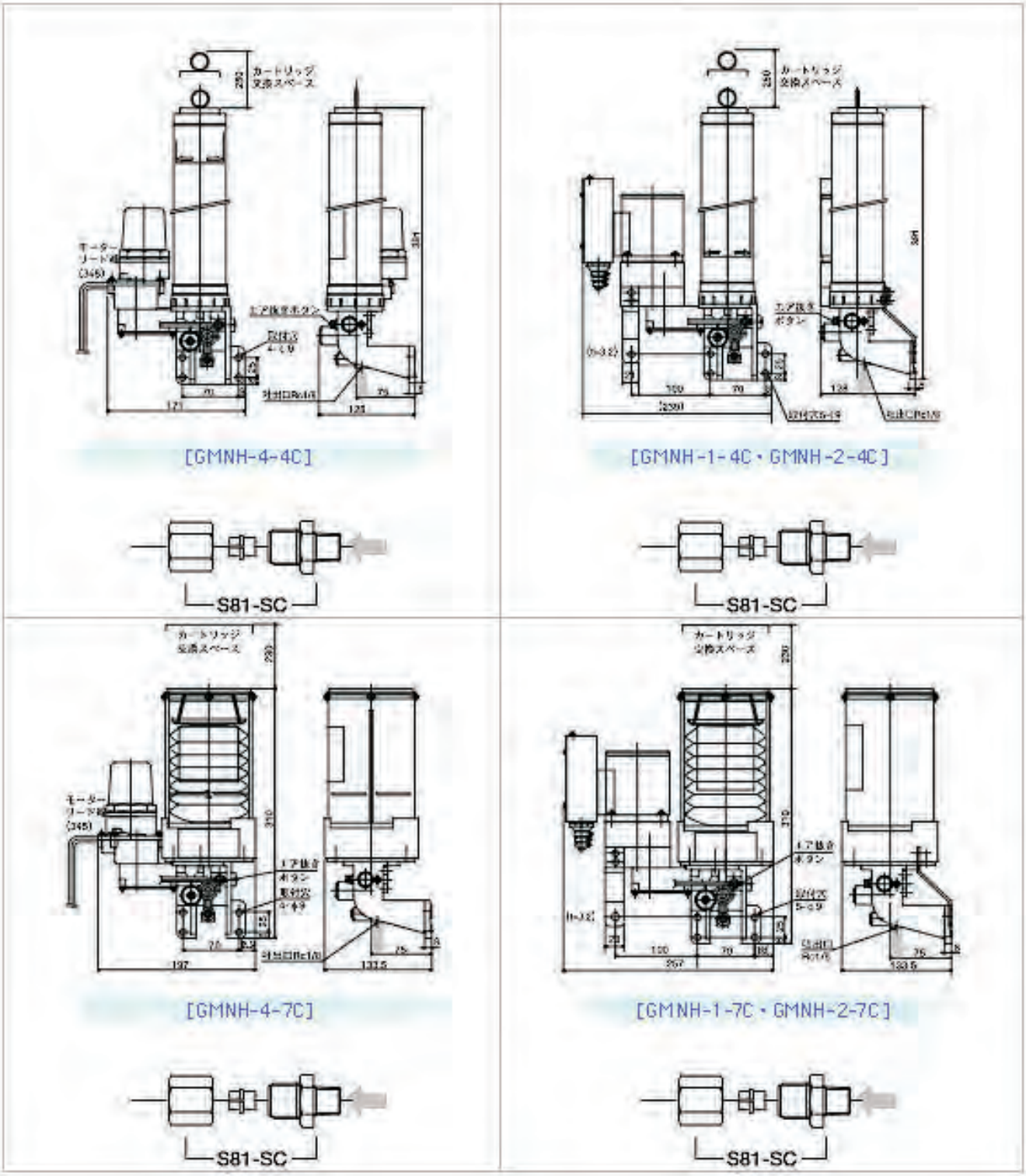
How to order

GMNH−□−□C

- High-pressure type
- Voltage: 1 AC100V, 2 AC200V, 4 DC24V
- Cartrige: 4 For 400cc, 7 For 700cc
- Type of Reservoir: C Cartrige Type

Part Number

Part Number	Model	Part Number	Model
103553	GMNH-1-4C	103551	GMNH-2-7C
103550	GMNH-1-7C	103552	GMNH-4-4C
103554	GMNH-2-4C	103549	GMNH-4-7C



[Directions for use]

- Use recommended cartridge greases.
- Never use molybdenum disulfide-contained grease.
- Use lithium greases. (Contact us for consultation when other than lithium grease is used.)
- Do not use any greases containing substances that attack brass and rubber.
- When replacing cartridge, take care not to let foreign matter in the pump.
- Avoid continuous operation.
- After replacing cartridge, always press AIR BLEED push button to purge the pump of air.

Manual Pump for Series Progressive System EGH

Compact, low-cost manually operated pump

EGH-3P EGH-2C EGH-4C

Specifications

EGH-3P		
Pump	Discharge volume	1m□/stroke
	Discharge pressure	10MPa (safety valve set pressure)
Working consistency		NLGI No.000~00~0~1 (lithium grease)
Recommended grease		MP0~FS2~MT1
Cartridge size		260ml
Weight		1.4kg
Pressure relief		Manual pressure relief lever

EGH-2C EGH-4C		
Pump	Discharge volume	1ml/stroke
	Discharge pressure	10MPa (safety valve set pressure)
Working consistency		Cartridge grease No.000~00~0~1 (lithium grease)
Recommended grease		MP0~FS2~MT1
Cartridge size		200ml~400ml Cartridge
Weight		1.4kg
Pressure relief		Manual pressure relief lever

How to order

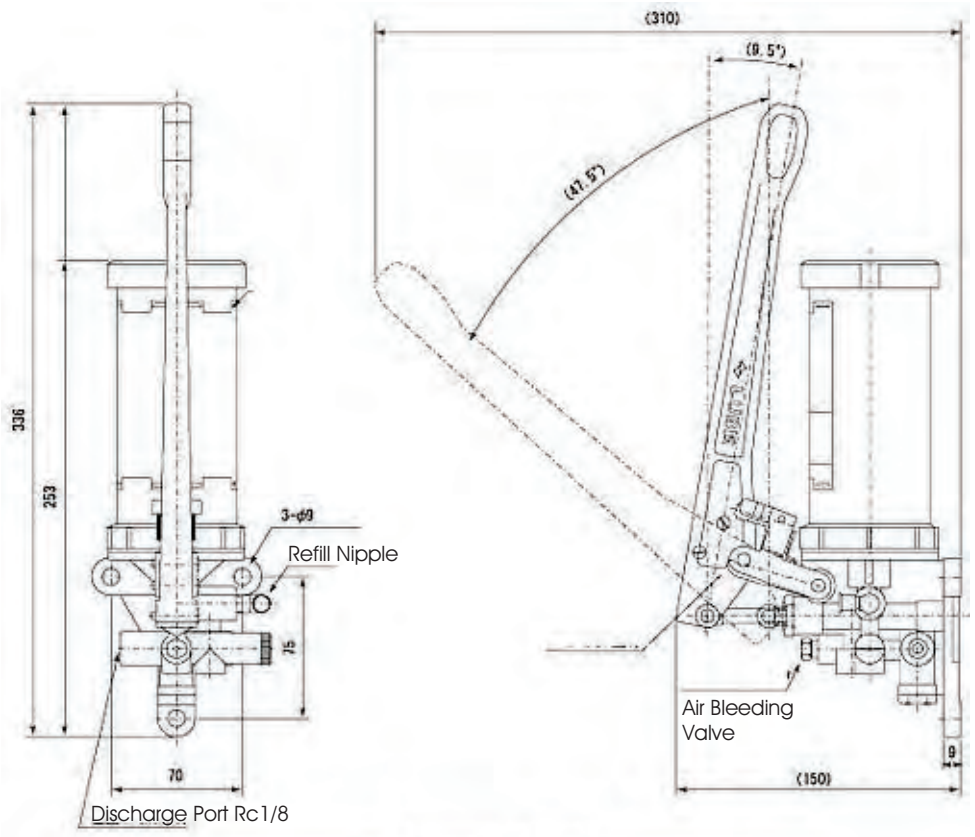
EGH－□□

Type of Reservoir (effective capacity)

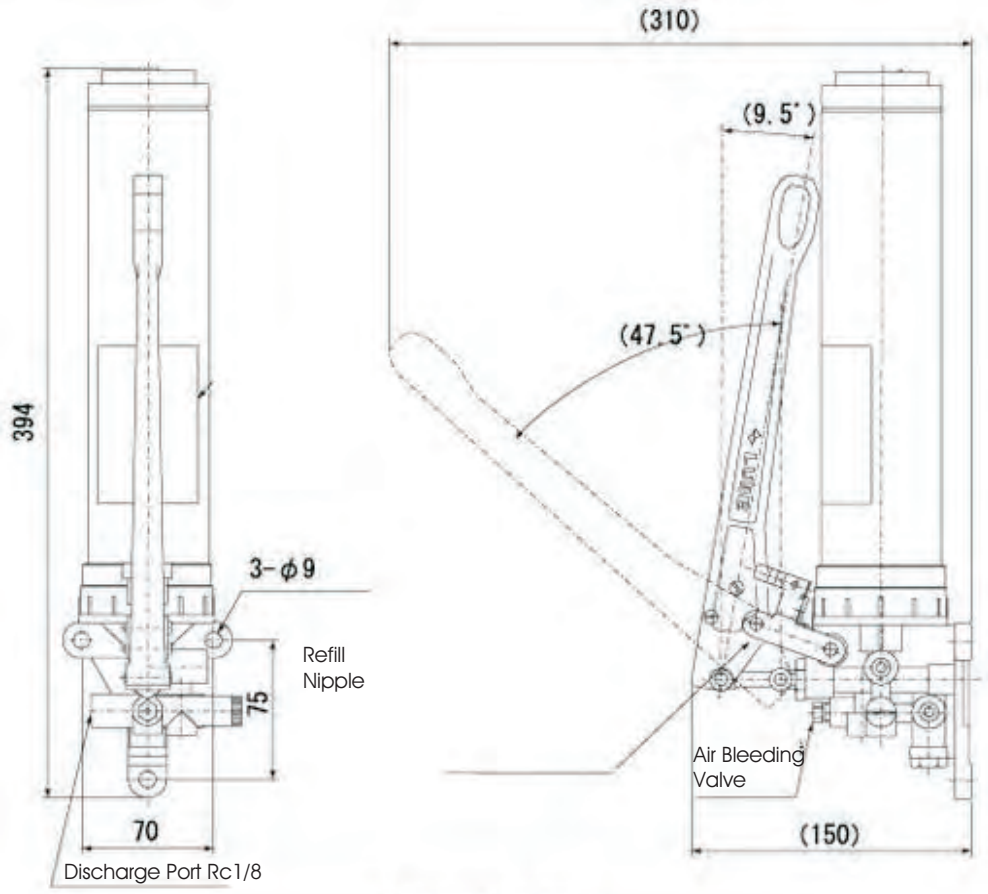
3P	Reservoir Type(For260ml)
2C	Cartridge Type(For200ml)
4C	Cartridge Type(For400ml)

Part Number

Part Number	Model	Part Number	Model
103780	EGH-2C	103783	EGH-3P
103782	EGH-4C		

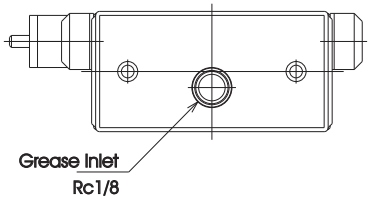


Reservoir type
EGH-3P

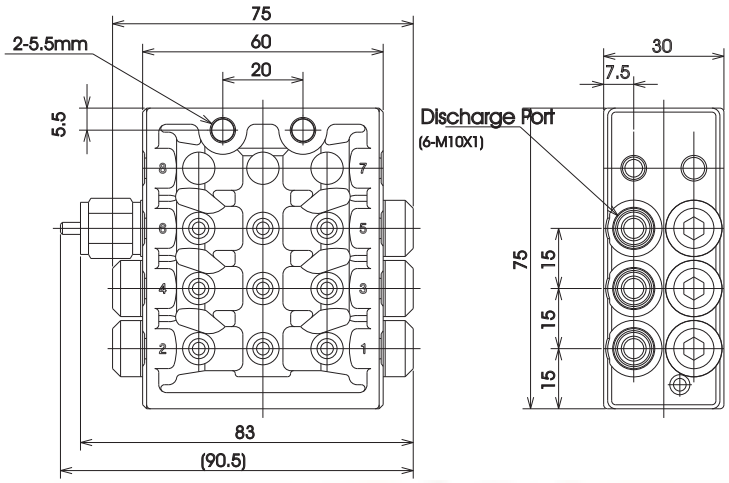


Cartridge type
EGH-4C

Grease progressive valve AP



Specs
Piston Dia.: 6mm
Stroke : 7mm
Discharge Volume : 0.2cc/stroke
No. of Dis. Port : 6 ports
Max. Pressure: 20MPa



AP-6

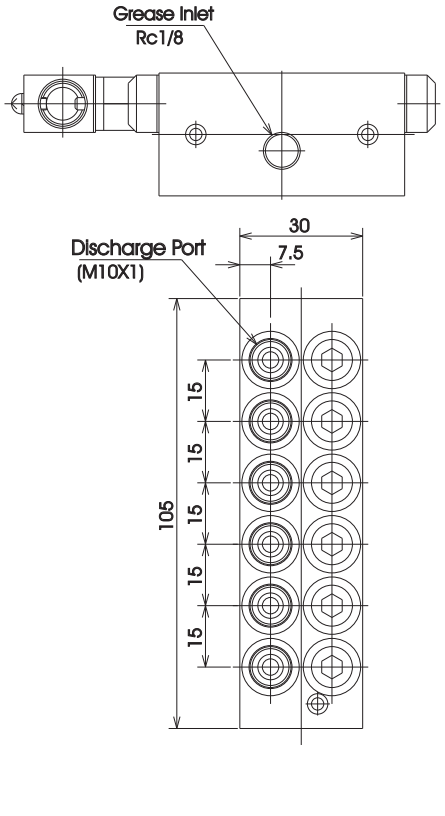
AP-6S

Part Number

Model	Part Number	No. of discharge ports	Valve size(L)
AP-4K	205680	4	75
AP-4	205690		
AP-6K	205681	6	
AP-6	205691		
AP-6S	205686		
AP-8K	205682	8	
AP-8	205692		
AP-8S	205687		
AP-10K	205683	10	105
AP-10	205693		
AP-10S	205688		
AP-12K	205684	12	
AP-12	205694		
AP-12S	205689		

S: With proximity sensor adaptor
*L: See dimensional drawing.

Grease progressive valve SP



Specs

Piston Dia.: 6mm

Stroke:7mm

Discharge Vol.:0.2cc/stroke

No. Discharge Port:12 Ports

Max. Pressure Allowed:20MPa

SP-8

Model	Part Number	No. of discharge ports	Valve size(L)
SP-4K	205530	4	60
SP-4	205540		
SP-6K	205531	6	
SP-6	205541		
SP-6S	205536		
SP-8K	205532	8	75
SP-8	205542		
SP-8S	205537		
SP-10K	205533	10	90
SP-10	203343		
SP-10S	205538		
SP-12K	205534	12	105
SP-12	205544		
SP-12S	205539		

S: With proximity sensor adaptor

*L: See dimensional drawing.

Valve operational chart

Step1

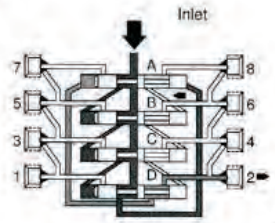


Fig. 1

The grease pressed through by pump or grease gun comes in though the inlet on the top of block. The incoming grease passes through ports marked with dark color reaches to the right side of piston "A" and moves the piston "A" to the left. The grease on the left side of piston "A" is discharged from outlet 2 through the ports marked with light color

Step2

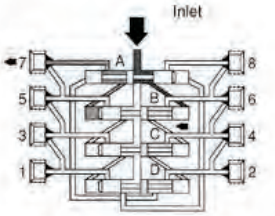


Fig. 2

After piston "A" makes a full stroke to the left, as figure 2 shows, it opens up the port to the right side of the piston "B" which is marked dark color. The grease from the pump traveling through this port moves the piston "B" to the left. At this time, the grease on the leftside of the piston pump "B" is discharged from outlet 7 through the port marked with light color.

Step3

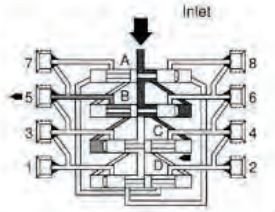


Fig. 3

Same as above. After piston "B" makes a full stroke to the left, as figure 3 shows in dark color, it opens up the port on the right side of piston "C". The grease traveling through this port moves the piston "C" to the left. At this time, the grease on the left iside of the piston "C" is discharged through outlet 5 marked with light color.

Step4

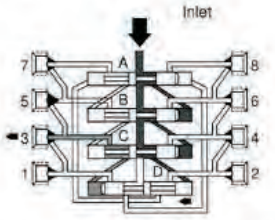


Fig. 4

After piston "C" makes a full stroke, as the right figure shows in dark color, it opens up the port on the right side of the piston "D" and moves the piston "D" to the left. At this time, the grease on the left side of the piston "D" is discharged through outlet 3 marked with light color.

Step5

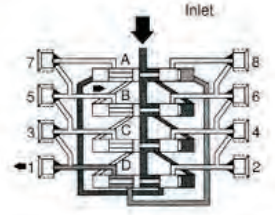


Fig. 5

Now after piston "D" makes a full stroke, as it shows in the figure in the dark color, it opens up the port on the left side of the piston "A" and makes the grease on the right side of piston "A" discharge from outlet 1 through the port marked with light color. From then, grease is discharged repeatedly following the order of 8, 6, 4, 2, 7, 5, 3 and 1.

Set discharge volume

Example4

1. Every SP Block discharge port is marked with number. Do not plug the two farthest discharge ports (left and right) from the inlet. If those two discharge ports are plugged, the whole block will not work.
2. When using SP Block as a Master Block (Master Distribution Valve), use connectors with check valve on the discharge ports.
3. Use special connector on SP Block discharge ports.
4. When connector is installed on the grease discharge port, make sure clamping ring is installed. When installing the plug on the dischaege ports, make sure to remove the clamping ring. The whole block will not work if plugged with clamping ring.
5. To make sure installing the clamping ring firmly in place, tighten firmly the outlet body or compression nut.
6. When screwing the connector into the discharge ports, install in the order of either from top or bottom.
   If starting from the middle or skipping one to next one, it becomes difficult to use the wrench due to limited space.
7. When screwing the plug into the grease discharge port, make sure to tighten firmly.
   Do not use the used copper washer. Replace it with a new one.

Grease progressive valve AP•SP

Valve performance according to indicator pin movement can be electrically monitored through proximity sensor.

AP-6 SP-8

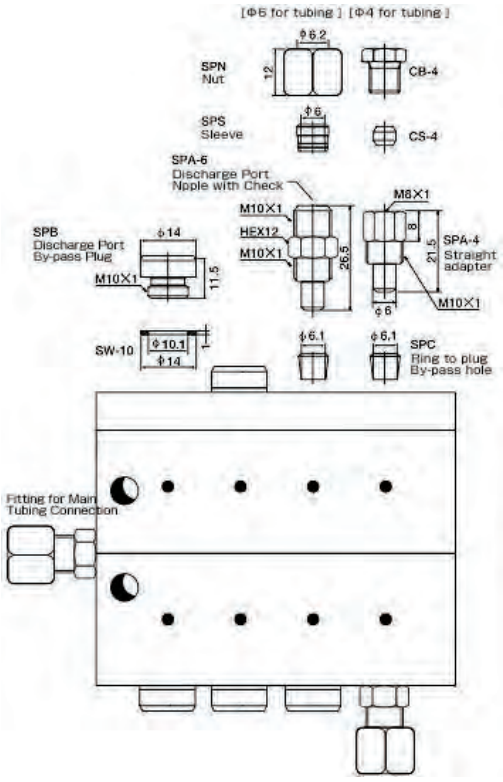
Specifications

Discharge volume	0.2ml/stroke
Discharge port	Tube of 6mm, 4mm O.D used
Grease inlet	Rc1/8
Max. working pressure	20MPa
Minimum operating pressure	2MPa
Working consistency	NLGI No.000~2
Performance monitor	Indicator pin (K type)
Material	AP:Aluminum Die-cast SP:Aluminum

Special parts

Model	Part Number
SPB	611785
SW-10	207611
SPC	611677
SPA-6	619780
SPS	611695
SPN	611784
SPA-4	166005

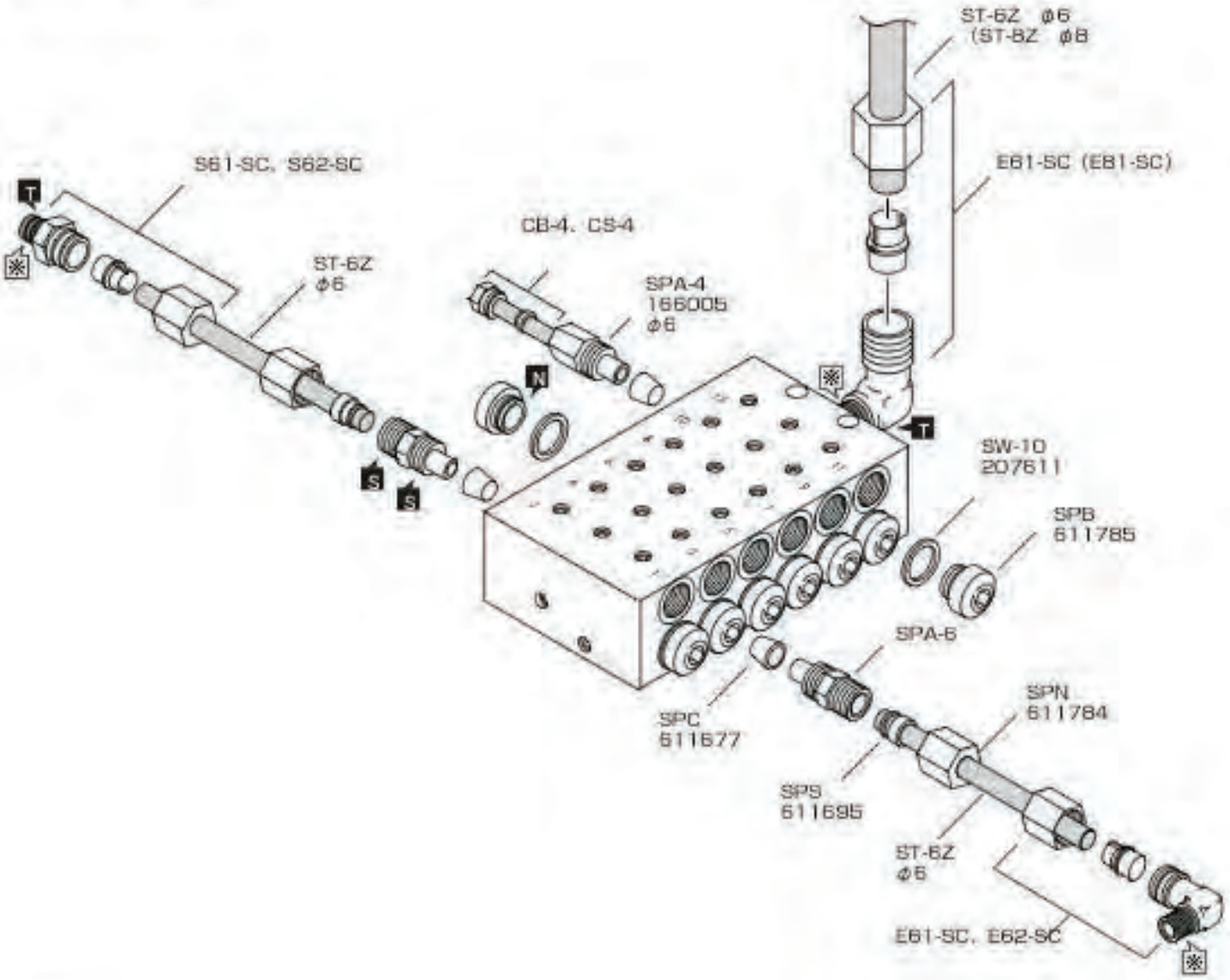
Special Parts are common for both SP and AP progressive blocks



* CAUTION
Do not use plug SPB for discharge port 1,2 by any means.

Grease progressive valve AP•SP

This is just an example.



*** CAUTION**

Do not use plug SPB for discharge port 1,2 by any means.

※ Use an appropriate sealant where mark is shown.

■ mark denotes tightening torque. See the tightening torque list.

Proximity Sensor for Series Progressive Valve

Electrically detects the movement of the indicator pin of progressive valve.

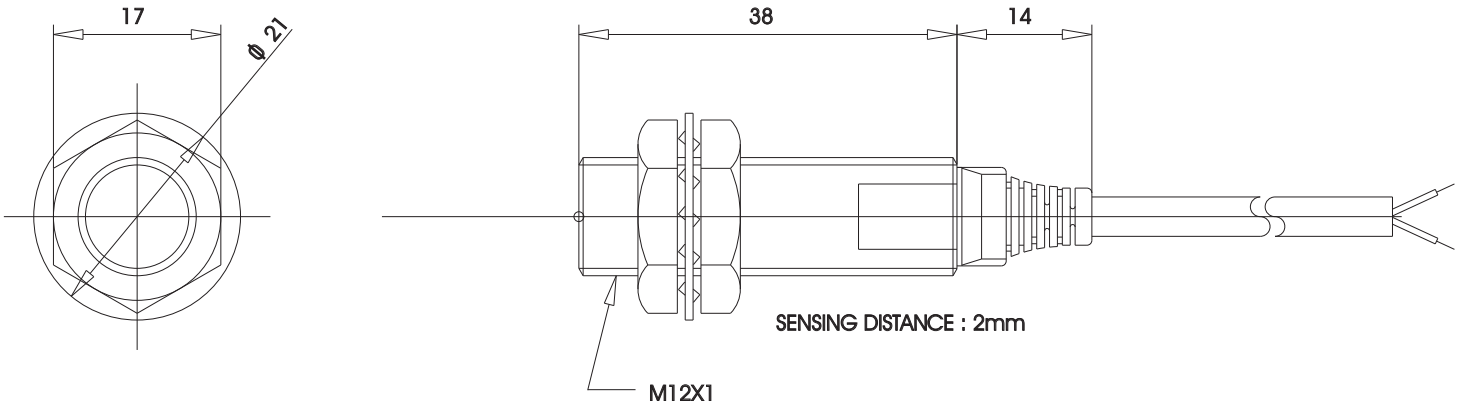
Proximity sensor monitors the movment of the indicator pin and detects a system or valve failure.

Specifications

	E2E-X2E1	E2F-X2E1	E2F-X2Y1
PowerVoltage	DC10~24V		AC24~240V
Working voltage dimension	DC10~40V	DC10~30V	AC20~264V
OutputForm	DC 3 leads NPN		AC 2 leads
Detecting Distance	2mm±10%		
Setting Distance	0~1.6mm		
Detecting Object	Iron12×1mm		
Protection Class	IEC Standards IP67	IEC Standards IP68	

Part Number

Model	Part Number
E2E-X2E1	733225
E2F-X2E1	730797
E2F-X2Y1	730721



Lube Original Grease MP • FS • MT

MP [High class all-around grease of Lithium systems]

Excellent sheaar stability heat resistance, oxidation stability, water resisitance, rust preventive and load carrying capacity

Part Number

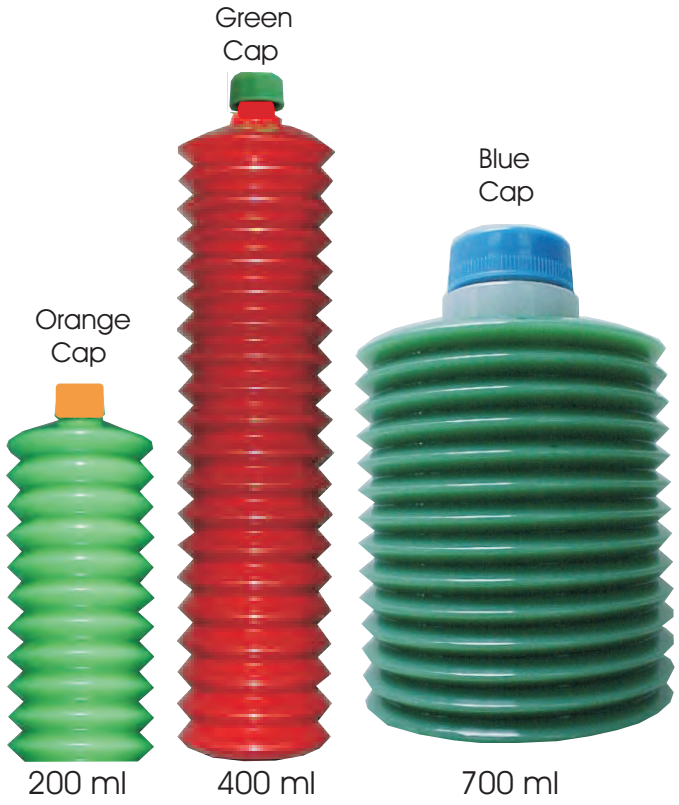
Model	Part Number	Capacity	consistency
MP0-4	249050	400ml	0
MP0-7	249060	700ml	0

Color of Grease : Brown

Lube Original Grease MP • FS • MT

FS [High performance grease for heavy load carrying capacity]

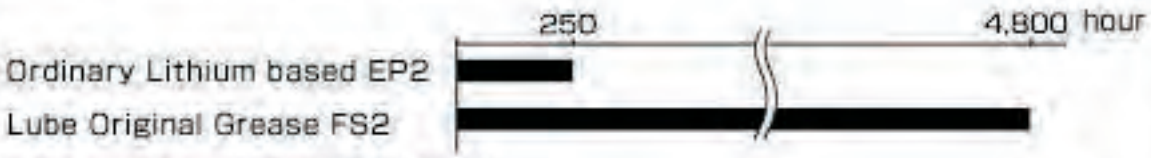
Excellent heavy load carrying capacity , wear resistance , shear stabitity , heat resistance ,oxidation stability , water resistance and rust preventive property .



Part Number

Model	Part Number	Capacity
FS2-2	249069	200ml
FS2-4	249053	400ml
FS2-7	249063	700ml

● Comparison of bearing life test results



Test conditions : ASTM D 1741 B
Temperature : 125℃ (257℃) Bearing : #6303
Revolution : 3,500rpm Load : Thrust-178N, Radial-111N

Lube Original Grease MP • FS • MT

MT [High performance grease for machine tools]

Excellent anti-tenperature-rising property (ie: ball screw) ,
Excellent oxidation stability, water resisitance ,
Excellent dynamic-torque property ,
Excellent fretting property.

Part Number

Model	Part Number	Capacity
MT1-2	249100	200ml
MT1-4	249101	400ml

Color of Grease : White

Pressure gauge

Pressure gauges with reference pointer for visual mounting

PB-7

PB-15

PB-50

TAF-50

PB-35

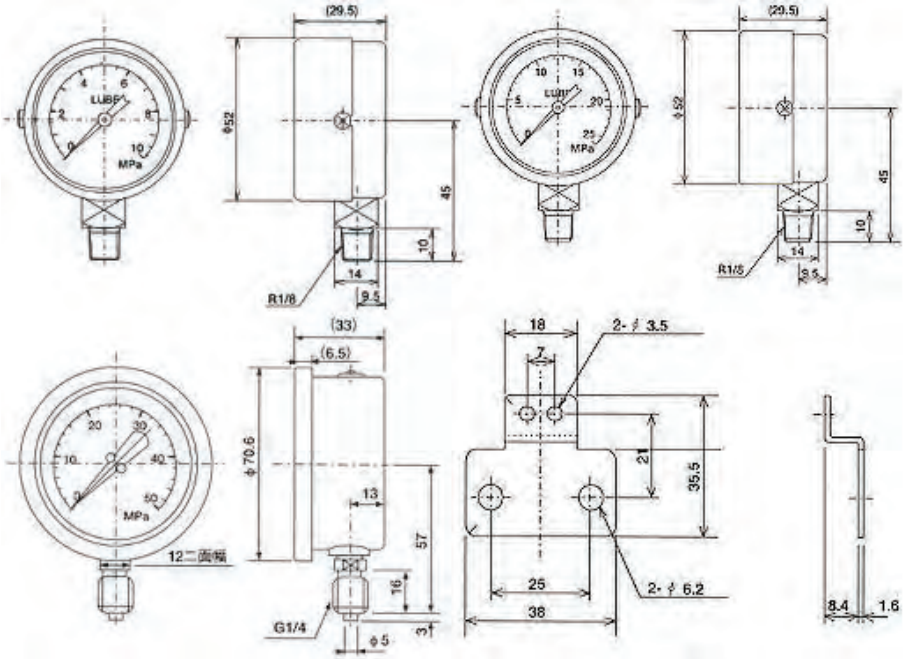
Specifications

Accuracy	±3% F.S
Temperature range	15C ~ 40C
material	Burdon pipe C6872T(over10MPa C5191T) Housing SPCC

Part Number

Pressure gauge

Model	Part Number	Pressure range (MPa)	Thread
PB100	109146	10	R1/8
PB250	109147	25	
GV50-G	209139	50	G1/4
GV50-R	500649	50	R1/4



Compression parts

Used for connecting tubing to junctions,adapters and metering valves

Dimensional drawing

Part Number

Compression nut

Part Number	Model	Tubing O.D.		T	d1	d2	B
		φ4	φ6				
106251	CN-4	O		M8×1	φ4.2	φ10	HEX10
186251	CN-4	O		5/16-24	φ5/32	φ10	HEX10
206251	CN-6	-	O	M10×1	φ6.2	φ12	HEX12

Material : C3604

Compression parts

Dimensional drawing

Part Number

Compression bushing

Part Number	Model	Tubing O.D			T	d	L1	L2	B
		φ4	φ6	φ8					
106252	CB-4(10)	O			M8×1	φ4.2	11.6 (0.46")	4 (0.16")	HEX10
186252	CB-4	O			5/16-24	φ5/32	11.6 (0.46")	4 (0.16")	HEX10
106253	CB-4(8)	O			M8×1	φ4.2	11.6 (0.46")	4 (0.16")	HEX8
186253	CB-4	O			5/1 6-24	φ5/32	11.6 (0.46")	4 (0.16")	HEX8
206252	CB-6		O		M10×1	φ6.2	12.5 (0.49")	4 (0.16")	HEX10
207252	CB-8			O	M14×1.5	φ8.2	16 (0.63")	4.5 (0.18")	HEX14
166253	CB-4	O			M8×1	φ4.2	20 (0.79")	12 (0.47")	HEX8
166255	CB-6		O		M10×1	φ6.2	20 (0.79")	12 (0.47")	HEX10

Note : 166253 and 166255 are for braided tubing.

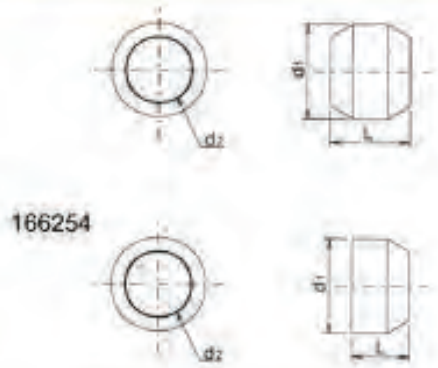
Material : C3604

Part Number	Model	Tubing O.D			T	d	L1	L2	B
		φ4	φ6	φ8					
106279	CB-4(8)	O			M8×1	φ4.2	11.6 (0.46")	4 (0.16")	HEX8
186268	CB-4(8)	O			5/16-24	φ4.2	11.6 (0.46")	4 (0.16")	HEX8

Material : SUS

Compression parts

Dimensional drawing



Part Number

Compression sleeve

Part Number	Model	Tubing O.D			d1	d2	L1
		φ4	φ6	φ8			
106254	CS-4	O			φ6	φ4.1	5(0.20")
206254	CS-6		O		φ8	φ6.1	6(0.24")
207254	CS-8			O	φ10	φ8.1	6.5(0.26")

Material : C3604

Part Number	Model	Tubing O.D			d1	d2	L1
		φ4	φ6	φ8			
106280	CS-4	O			φ6	φ4.1	5(0.20")

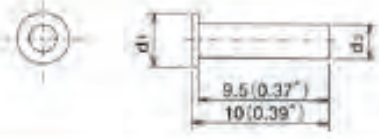
Material : SUS

Half sleeve

Part Number	Model	Tubing O.D			d1	d2	L1
		φ4	φ6	φ8			
166254	CS-4	O			φ4	φ4.1	4.5(0.18")

Material : C3604

Dimensional drawing



Tube insert

Part Number	Model	Tubing O.D			d1	d2
		φ4	φ6	φ8		
106271	TI-4	O			φ3.8	φ2.5
206271	TI-6		O		φ5.8	φ4
207271	TI-8			O	φ7.8	φ6

Material : C2680

Closure plugs/Sealing washers

Dimensional drawing

Part Number

Closure plug

Part Number	Model	L1	L2	T	B
106255	CP-4	16(0.63")	12(0.47")	M8×1	HEX8
186255	CP-4	16(0.63")	12(0.47")	5/16-24	HEX8
206255	CP-6	20(0.79")	15(0.59")	M10×1	HEX10
207255	CP-8	25(0.98")	17(0.67")	M14×1.5	HEX17

Material : C3604

Dimensional drawing

Part Number

Blanking plug

Part Number
540170

Closure plugs/Sealing washers

Dimensional drawing

Part Number

Blanking plug

Part Number	Model	T	L1	L2	B
206275	BP-10	M10×1	10(0.39")	6(0.24")	12
206276	BP-12	M12×1	10(0.39")	6(0.24")	14
207276	BP-14	M14×1.5	13(0.51")	8(0.31")	17

Material : C3604

Dimensional drawing

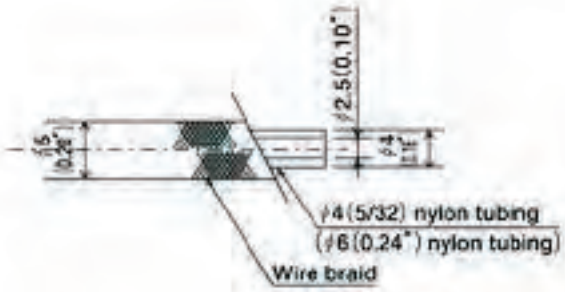
Part Number

Sealing washer

Part Number	Model	D1	D2	t	Thread size
207611	SW-10	φ14	φ10.1	1	M10×1
207612	SW-12	φ16	φ2.1	1.5	M12×1
207613	SW-14	φ18	φ14.1	1.5	M14×1.5

Material : C2600

Tubing



Part Number

Nylon tubing

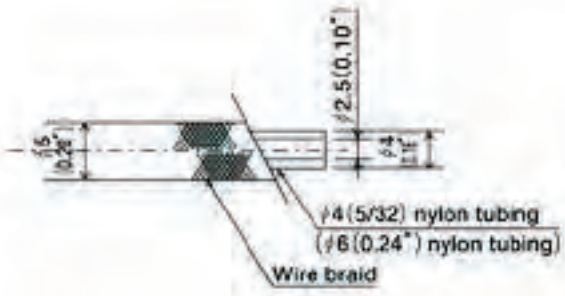
Part Number	Outer dia-meter	Inner dia-meter	Standard length	Working pressure	Burst Pressure	Working tempeature range	Minimum bending radius	Color
106801	φ4	φ2.5	100M (330F)	2.5MPa (25kgf/cm^2) 362psi	9.8MPa (100kgf/cm^2) 1,450psi	-20°C/-40°F ~+70°C/158°F	R12	Opaque white
106806	φ4	φ2.5		4.4MPa (45kgf/cm^2) 652psi	17.6MPa (180kgf/cm^2) 2,610psi		R16	
218005	φ6	φ4		2.2MPa (22kgf/cm^2) 319psi	8.6MPa (88kgf/cm^2) 1,276psi		R24	Opaque white
208006	φ6	φ4		3.7MPa (38kgf/cm^2) 551psi	15.2MPa (155kgf/cm^2) 2,247psi		R27	
218003	φ8	φ6		1.5MPa (15kgf/cm^2) 217psi	6.2MPa (63kgf/cm^2) 913psi		R48	

Material:nylon

Braided tubing

Part Number	Outer diameter	Standard length	Working pressure	Burst Pressure	Working tempeature range	Minumum bending radius	Surface treatment
106803	φ4	100M (330F)	2.5MPa (25kgf/cm^2) 362psi	9.8MPa (100kgf/cm^2) 1,450psi	-20°C/-40°F ~+70°C/158°	R16	EP-Fe/Zn
218007	φ6	100M (330F)	2.2MPa (22kgf/cm^2)319psi	8.6MPa (88kgf/cm^2) 1,276psi	-20°C/-40°F ~+70°C/158°	R27	EP-Fe/Zn

Tubing



Aluminium tubing

Part Number	Outer diameter	Inner diameter	Standard length	Tensile strength	Extension
106811	φ4	φ3	2M (6.5F)	6~10kgf/mm	41%
206811	φ6	φ4.4			

Material:JIS H4080A1050TD-0 (alminium drawn tube)

Copper Tubing

Part Number	Outer diameter	Inner diameter	Standard length	Working pressure	Tensile strength	Inner diameter
106821	φ4	φ3	5M (16F)	6.9MPa (70kgf/cm^2) 1,015psi	20kgf/mm	40%
218015	φ6	φ4.4		7.9MPa (80kgf/cm^2) 1,160psi	21kgf/mm	
206823	φ8	φ6		5.9MPa (60kgf/cm^2) 870psi	23kgf/mm	

Material:JIS H3300C1220T-0L (phosphor deoxydized copper)

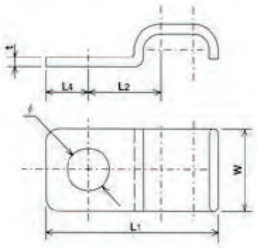
Steel tubing

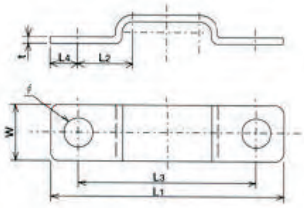
Part Number	Outer dia-meter	Inner dia-meter	Standard length	Standard length	Tensile strength	Extension	Surface treatment
218011	φ4	φ2.6	2M (6.5F)	24.5MPa (250kgf/cm^2) 3,625psi	Over 30kgf /mm	25%	Ep-Fe/Zn 8/CM
218012	φ6	φ4.6					
206836	φ8	φ6.6		19.6MPa (200kgf/cm^2) 2,900psi			
206837	φ10	φ8.6					

Material:JIS G3141 (Equvalent to SPCC)

Tube clips

Dimensional drawing





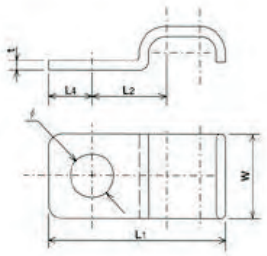
Part Number

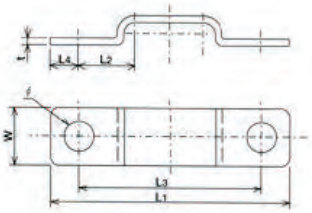
Straight tube end

Part Number	Model	Number and O.D. of tubing		L1	L2	L3	L4	t	W	φ
106301	PC-4-1	φ4×1	One side fixed	17 (0.67")	9 (0.35")	-	5 (0.20")	1.2	10	5.2
106302	PC-4-2	φ4×2		21 (0.87")	9 (0.35")	-				
106303	PC-4-3	φ4×3		25 (0.98")	9 (0.35")	-				
106304	PC-4-4	φ4×4	Two side fixed	42 (1.65")	10 (0.39")	32 (1.26")				
106305	PC-4-5	φ4×5		46 (1.81")	10 (0.39")	36 (1.42")				
106306	PC-4-6	φ4×6		50 (1.97")	10 (0.39")	40 (1.57")				
106311	PC-4-1L	φ4×1	One side fixed	16 (0.63")	9 (0.35")	-				6.2
106312	PC-4-2L	φ4×2		20 (0.79")	9 (0.35")	-				
106314	PC-4-4L	φ4×4	Two side fixed	42 (1.65")	10 (0.39")	32 (1.26")				
106315	PC-4-5L	φ4×5		46 (1.81")	10 (0.39")	36 (1.42")				
106316	PC-4-6L	φ4×6		50 (1.97")	10 (0.39")	40 (1.57")				
106321	PC-4-4-8.5	φ4×1	One side fixed	22 (0.87")	11 (0.43")	-	8 (0.31")		15	8.5
106322	PC-4-2-8.5	φ4×2		26.2 (1.03")	11 (0.43")	-				
106323	PC-4-3-8.5	φ4×3		30.4 (1.20")	11.2 (0.44")	-				
106324	PC-4-4-8.5	φ4×4	Two side fixed	50 (1.97")		34 (1.34")				
106325	PC-4-5-8.5	φ4×5	One side fixed	38.4 (1.51")	11.2 (0.44")	-				

Tube clips

Dimensional drawing





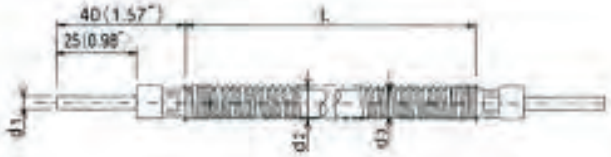
Part Number	Model	Number and O.D. of tubing		L1	L2	L3	L4	t	W	φ
206301	PC-6-1	φ6×1	One side fixed	20 (0.79")	10 (0.39")	-	5 (0.20")	1.2	10	5.2
206302	PC-6-2	φ6×2		25 (0.98")	10 (0.39")	-				
206303	PC-6-3	φ6×3		31 (1.22")	10 (0.39")	-				
206311	PC-6-1L	φ6×1		19 (0.75")	10 (0.39")	-				6.2
2063012	PC-6-2L	φ6×2		24 (0.94")	10 (0.39")	-				
206313	PC-6-3L	φ6×3		30 (1.18")	10 (0.39")	-				
206321	PC-6-1-8.5	φ6×1		24.2 (0.95")	12 (0.47")	-	8 (0.31")		15	8.5
206322	PC-6-2-8.5	φ6×2		30.4 (1.20")	12 (0.47")	-				

Part Number	301Model	Number and O.D. of tubing		L1	L2	L3	L4	t	W	φ
207301	PC-8-1	φ8×1	One side fixed	23.7 (0.93")	12 (0.47")	-	5 (0.20")	1.6	11.5	6.4
207302	PC-8-2	φ8×2		31.8 (1.25")	12 (0.47")	-				
208301	PC-10-3	φ10×3		29.2 (1.15")	14 (0.57")	-	8 (0.31")	1.2	15.4	6.2

Flexible hose

For low pressure

Dimensional drawing



Part Number		L(mm)
φ4	φ6	
106701	206701	125
106702	206702	150
106731	206703	175
106704	206704	200
106705	206705	225
106706	206706	250
106707	206707	300
106708	206708	350
106709	206709	400
106710	206710	450
106711	206711	500
106712	206712	6550
106713	206712	600
106770	206736	625
106771	206735	650
106714	206714	675
106772	206717	700
106715	206715	750
106773	206718	800
106716	206716	825

Flexible hose

For low pressure

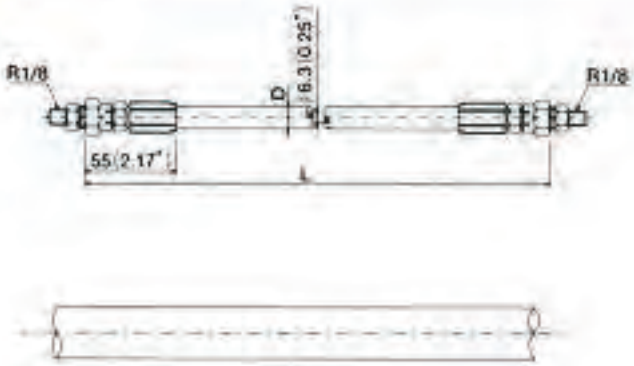
106717	206719	850
106718	206720	900
106764	206721	950
106719	206722	1000
106774	206723	1100
106775	206724	1200
106776	206725	1300
106765	206726	1400
106766	206727	1500
106767	206728	1600
106768	206729	1700
106777	206730	1800
106769	206731	1900
106778	206732	2000
166783	206737	2500
166794	206734	3000
166795	203738	4000
166796	203739	5000

Tubing O.D.	φ4	φ6
Working pressure	2.9MPa(30kgf/cm2)435psi	3.9MPa(40kgf/cm2)580psi
Working temperature range	-20□°C+90～°C(-4°F+194°F)	
Minimum bending radius	R40	R120
d1	φ4	φ6
d2	φ8	φ10
d3	φ10	φ13.5

Flexible hose

For moderate and high pressure

Dimensional drawing



Part Number

For moderate pressure and high pressure
(working temprature -40°C~+100°C/-40°F~+212°F)

Part Number	L(m/m)	WorkingPressure		Minimum bending radius		D	
		10.3MPa (105kgf/cm2) 1,520psi	34.2MPa (350kgf/cm2) 5,075psi	R85	R105	φ13.5	φ15
250151	500	O		O		O	
250152	700	O		O		O	
250153	1000	O		O		O	
250154	1500	O		O		O	
250161	500		O		O		O
250162	700		O		O		O
250163	1000		O		O		O
250164	1500		O		O		O

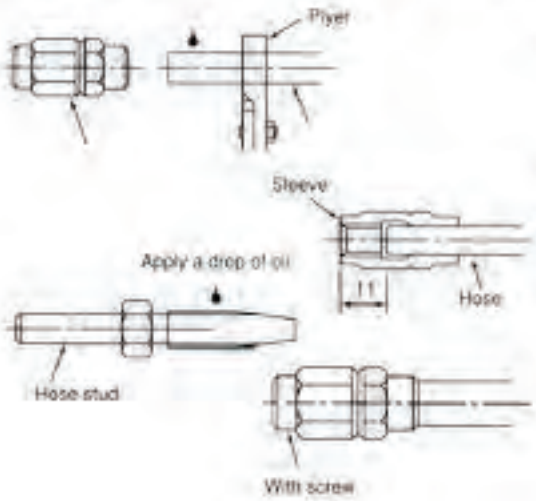
Flexible hose

For high pressure
(working temprature -30°C～+80°C/-22°F～+176°F)

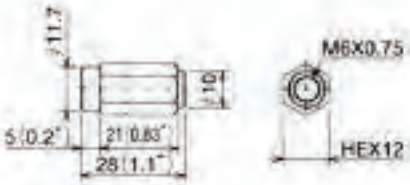
Part Number	Outer diamerter		Inner diameter		Standard length		Working pressure		Burst Pressure		Minimum bending radius		Material	Color
	φ8.4	φ6.0	φ4.2	φ3.0	50m	100m	34.3MPa (350kgf/cm2) 5,075psi	7.4MPa (600kgf/cm2) 1,087psi	58.8MPa (600kgf/cm2) 8,700psi	24.5MPa (250kgf/cm2) 3,625psi	R35	R50	poly-amide	Black
403010	O		O		O		O		O		O		O	O
Mk0102		O		O		O		O		O		O	O	O

●Hose connections (for 403010)

Insert the hose sleeve (403001) into the hose. Then rotate counter-clockwise. Applying some oil on the hose surface will make it easier to handle. Stop when reaching the position 11mm away from the end. Then insert the hose stud by rotating clockwise until the hexagonal portion of the hose stud touches the hose sleeve.

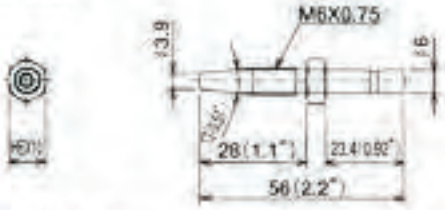


●Hose sleeve



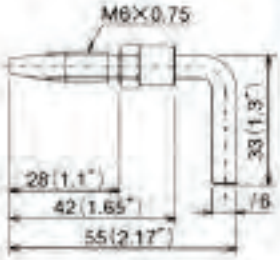
Part Number
403001

●Hose stud



Part Number
403002

●Hose stud elbow



Part Number
403003

Flexible hose

For high pressure

Dimensional drawing

●N3130 Series

· Soft, yet hard to break

Part Number

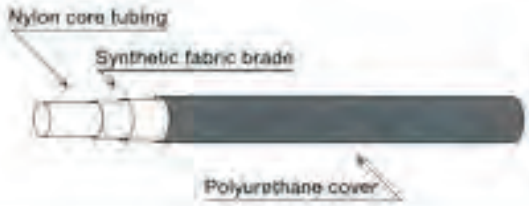
Part Number	Outer diameter	Innerr dirmeter		Max Operating pressure		Max Inpact pressure		Min Burst pressure		Min Bending pressure	Whight
	(mm)	(in)	(mm)	MPa	kgf /cm2	MPa	kgf/cm2	MPa	kgf/cm2	(mm)	(g/m)
N3130-03	10.4	3/16	4.8	21.0	210	26.3	263	840	840	20	65
N3130-04	12.5	4/1	6.3	19.5	195	24.4	244	770	770	40	105
N3130-05	14.7	5/16	7.9	17.5	175	21.9	219	700	770	45	130
N3130-06	16.4	3/8	9.5	16.0	160	20.0	200	630	630	50	150
N3130-08	20.3	1/2	17.7	14.0	140	17.5	175	560	560	75	210
N3130-12	26.6	3/4	19.0	9.0	90	11.3	113	350	350	130	290
N3130-16	33.4	1	25.4	7.0	70	8.8	88	280	280	165	400

Flexible hose

For high pressure

Dimensional drawing

●3130 Series
- Excellent oil -proof and chemical -proof characteristics.



Part Number

Part Nunber	Outer diameter	Innerr dirmeter		Max Operating pressure		Max Inpact pressure		Min Burst pressure		Min Bending pressure	Whight
	(mm)	(im)	(mm)	MPa	kgf/cm2	MPa	kgf/cm2	MPa	kgf/cm2	(mm)	(g/m)
3130-02	8.3	1/8	3.6	20.0	200	25.0	250	72.0	720	15	45
3130-03	10.4	3/16	4.8	20.0	200	25.0	250	72.0	720	30	65
3130-04	12.4	1/4	6.3	20.0	200	25.0	250	72.0	720	40	105
3130-05	13.8	5/16	7.9	18.0	180	22.5	225	65.0	650	50	115
3130-06	16.1	3/8	9.5	18.0	180	22.5	225	65.0	650	60	150
3130-08	19.9	1/2	12.7	16.0	160	20.0	200	58.0	580	80	210
3130-12	26.2	3/4	19.0	10.0	160	12.5	125	36.0	360	160	290

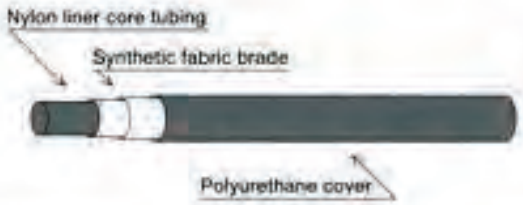
Flexible hose

For high pressure

Dimensional drawing

●3700 Series

・Excellent flexibility and stable performance under low temperature (−55℃).



Part Number

Part Nunber	Outer diameter	Innerr dirmeter		Max Operating pressure		Max Inpact pressure		Min Burst pressure		Min Bending pressure	Whight
	(mm)	(im)	(mm)	MPa	kgf/cm2	MPa	kgf/cm2	MPa	kgf/cm2	(mm)	(g/m)
3003-03	10.4	3/16	4.8	34.0	340	24.5	425	100.0	1000	70	76
3000-04	12.5	1/4	6.3	30.0	300	37.5	375	90.0	900	75	98
3000-06	16.0	3/8	9.5	24.0	240	30.0	300	70.0	700	120	140
3000-08	19.8	1/2	12.7	20.0	200	25.0	250	60.0	600	160	199
3000-12	26.2	3/4	19.0	13.0	130	16.3	163	38.0	380	250	276
3000-16	33.0	1	25.4	10.0	100	12.5	125	30.0	300	300	366

Connectors

Dimensional drawing

Part Number

Straight connector

Part Number	L	T1	T2
106141	20(0.79")	Rc 1/8	R 1/8
186141	20(0.79")	1/8 NPT	1/8 NPT
106142	25(0.98")	Rc 1/8	R 1/8
186142	25(0.98")	1/8 NPT	1/8 NPT
©106143	30(1.18")	Rc 1/8	R 1/8
186143	30(1.18")	1/8 NPT	1/8 NPT
©106144	40(1.57")	Rc 1/8	R 1/8
©106145	50(1.97")	Rc 1/8	R 1/8
©106146	60(2.36")	Rc 1/8	R 1/8
©206141	20(0.79")	Rc 1/8	R 1/4

Dimensional drawing

Part Number

Part Number
106147

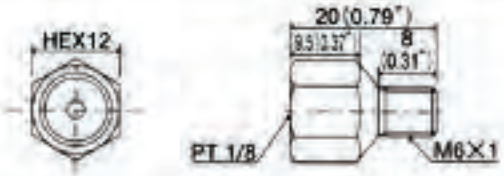
Connectors

Dimensional drawing

Part Number

Part Number	T
106151	2-R1/8
186151	2-1/8NPT

Dimensional drawing



PAGE TOP

Part Number

Part Number
106154

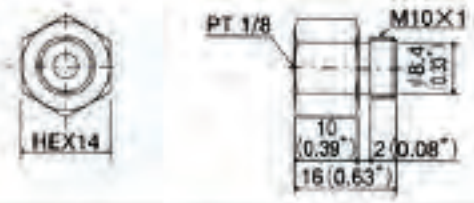
Dimensional drawing

Part Number

Part Number	T1	T2
106174	Rc1/8	M8×1
106231	M8×1	M8×1
186231	5/16-24	5/16-24

Connectors

Dimensional drawing



Part Number

Part Number
106177

Dimensional drawing

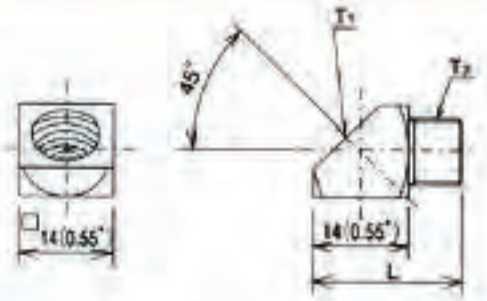
Part Number

Elbow connector

Part Number	L1	L2	L3	T1	T2
106101	22(0.87")	14(0.55")	14(0.55")	Rc 1/8	R 1/8
186101	22(0.87")	14(0.55")	14(0.55")	1/8 NPT	1/8 NPT
106102	25(0.98")	14(0.55")	14(0.55")	Rc 1/8	R 1/8
186102	25(0.98")	14(0.55")	14(0.55")	1/8 NPT	1/8 NPT
106103	30(1.18")	14(0.55")	14(0.55")	Rc 1/8	R 1/8
106104	40(1.57")	14(0.55")	14(0.55")	Rc 1/8	R 1/8
106105	50(1.97")	14(0.55")	14(0.55")	Rc 1/8	R 1/8
106106	60(2.36")	14(0.55")	14(0.55")	Rc 1/8	R 1/8
106107	20(0.79")	12(0.47")	12(0.47")	Rc 1/8	R 1/8

Connectors

Dimensional drawing



Part Number

Part number	L	T1	T2
106121	22(0.87")	Rc 1/8	R 1/8
186121	22(0.87")	1/8 NPT	1/8 NPT
106122	25(0.98")	Rc 1/8	R 1/8
186122	25(0.98")	1/8 NPT	1/8 NPT
106123	30(1.18")	Rc 1/8	R 1/8
106124	40(1.57")	Rc 1/8	R 1/8
106125	50(1.97")	Rc 1/8	R 1/8
106126	60(2.36")	Rc 1/8	R 1/8

PAGE TOP

Dimensional drawing

Part Number

Part Number	L	T1	T2
106181	14(0.55")	R1/8	M6×1
920730	12(0.47")	1/2-28	1/2-28

Connectors

Dimensional drawing

Part Number

Part Number
106182

Dimensional drawing

Part Number

Part Number	L	T
106183	6(0.24")	M5×0.8
106184	6(0.24")	M6×0.75
106185	6(0.24")	M6×1
106189	6(0.24")	M7×1
106192	8(0.31")	M6×0.75
166039	14(0.55")	M6×0.75
186032	8.6(0.34")	1/4-28

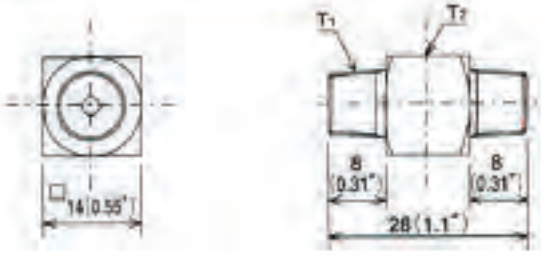
Connectors

Dimensional drawing

Part Number

Part Number	T	d
106186	M6×1	5
106187	M6×1	6
106188	M6×1	7

Dimensional drawing

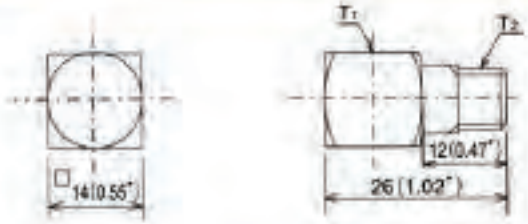


Part Number

Part Number	T1	T2
106161	2-R1/8	Rc1/8
186161	2-11/8 NPT	1/8 NPT

Connectors

Dimensional drawing



Part Number

Part Number	T1	T2
106171	2-Rc 1/8	R 1/8
186171	2-1/8 NPT	1/8 NPT

Dimensional drawing

Part Number

Part Number
W619322

Adapters

Straight adapter

Dimensional drawing

Part Number

Part Number	Tubing O.D			L1	L1	T1	T2	B
	φ4	φ6	φ8					
106001	O			16(0.63")	8(0.31")	M8×1	R1/8	HEX10
186001	O			16(0.63")	8(0.31")	5/16-24	1/8NPT	HEX10
106002	O			20(0.79")	12(0.47")	M8×1	R1/8	HEX10
186002	O			20(0.79")	8(0.31")	5/16-24	1/8NPT	HEX10
106003	O			25(0.98")	17(0.67")	M8×1	R1/8	HEX10
106004	O			30(1.18")	22(0.87")	M8×1	R1/8	HEX10
106005	O			35(1.38")	27(1.06")	M8×1	R1/8	HEX10
166004	O			22(0.87")	10(0.40")	M8×1	I/4-28UNF	HEX10
166142				20(0.79")	10(0.40")	1/8NPT	R1/8	HEX14
206001		O		20(0.79")	8(0.31")	M10×1	R1/8	HEX12
207001			O	25(0.98")	10(0.40")	M14×1.5	R1/4	HEX17

Adapters

Dimensional drawing

Part Number

PartNumber	Tubing O.D	T1	T2
106011	φ4	M8×1	R1/8
186011	φ4	5/16-24	1/8NPT

Dimensional drawing

Part Number

PartNumber	Tubing O.D
106061	φ4

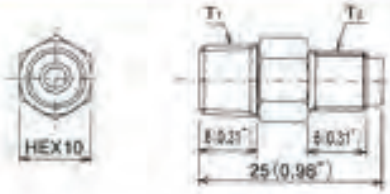
Dimensional drawing

Part Number

PartNumber	Tubing O.D&φ4	L1	L2	T
106062	O	20(0.79")	4(0.16")	M6□×1
106064	O	30(1.18")	14(0.55")	M6×0.75
106065	O	23(0.91")	7(0.28")	M6×0.75

Adapters

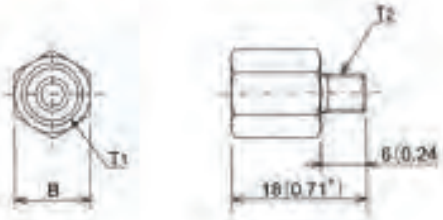
Dimensional drawing



Part Number

PartNumber	Tubing O.DΦ	T1	T2
©106081	φ4	R1/8	M8□×1
186081	φ4	1/8NPT	5/16-24

Dimensional drawing



Part Number

Part Number	Tubing O.D.		T1	T2	B
	φ4	φ6			
©106082	O		M8×1	M5□×0.8	HEX10
©106083	O		M8×1	M5□×0.9	HEX10
©106084	O		M8×1	M6×1	HEX10
©106085	O		M8×1	M6×0.75	HEX10
©106087	O		M8×1	M7×1	HEX10
©106088	O		M8×1	M8×1	HEX10
©106089	O		M8×1	M10×1	HEX12
©106094		O	M10×1	M6×1	HEX12
©106099	O		M8×1	1/4-28UNF	HEX10
©106353		O	M10×1	1/4-28UNF	HEX12
166144	O		R1/8	M6×1	HEX12
010014	O		5/16-24	1/4-28	HEX3/8
920749	O		R1/8	1/4-28	HEX12

Adapters

Dimensional drawing

Part Number

Part Number	Tubing O.D.		T1	T2	L
	φ4	φ6			
106091	O		M8×1	R1/4	18(0.71")
206081		O	M10×1	R1/4	20(0.79")

Dimensional drawing

Part Number

Part Number	Tubing O.D.
106095	φ6

Dimensional drawing

Part Number

Part Number	Tubing O.D.	T	D
	φ6		
106096	O	M8×1	φ5
106097	O	M8×1	φ6.2
106098	O	M8×1	φ6.85

Adapters

Dimensional drawing

Part Number

Part Number	Tubing O.D.	T	D
	φ6		
106096	O	M8×1	φ5
106097	O	M8×1	φ6.2
106098	O	M8×1	φ6.85

Dimensional drawing

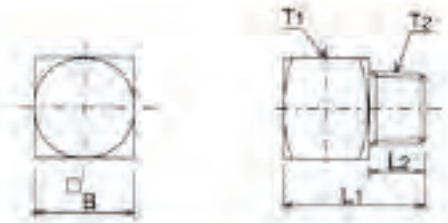
Part Number

Part Number	Tubing O.D.		T	D	L
	φ4	φ6			
206012	O		M8×1	φ3	14 (0.55")
206011		O	M10×1	φ4	16 (0.63")

Adapters

Elbow adaptert-adapter

Dimensional drawing

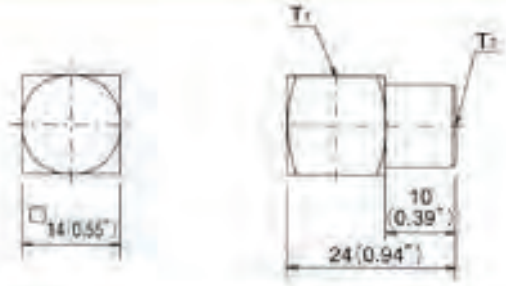


Part Number

Part Number	Tubing O.D.		L1	L2	T1	T2	B
	φ4	φ6					
106021	O		20(0.79")	8(0.31")	M8×1	R1/8	14
106022	O		25(0.98")	13(0.51")	M8×1	R1/8	14
℃106023	O		30(1.18")	18(0.71")	M8×1	R1/8	14
℃106024	O		40(1.57")	28(1.10")	M8×1	R1/8	14
℃106025	O		50(1.97")	38(1.50")	M8×1	R1/8	14
℃106026	O		60(2.36")	48(1.89")	M8×1	R1/8	14
186021	O		20(0.79")	8(0.31")	5/16-24	1/8NPT	14
186022	O		25(0.98")	13(0.51")	5/16-24	1/8NPT	14
℃206091	O		25(0.98")	11(0.43")	M8×1	R1/4	14
206092		O	22(0.87")	8(0.31")	M10×1	R1/8	16

Adapters

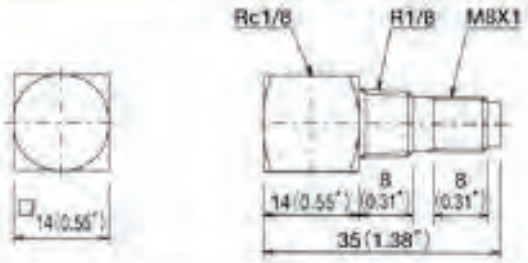
Dimensional drawing



Part Number

Part Number	Tubing O.D.	T1	T2
106031	φ4	Rc1/8	M8×1
186031	φ4	1/8NPT	5/16-24UNF

Dimensional drawing



Part Number

Part Number	Tubing O.D.
106071	φ4

Note:Call for other dimensions.

Dimensional drawing

Part Number

Part Number	Tubing O.D.
106028	φ4

Adapters

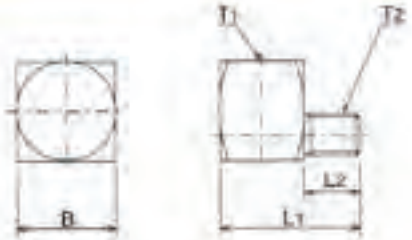
Dimensional drawing

Part Number

Part Number	Tubing O.D.
106029	φ4

PAGE TOP

Dimensional drawing

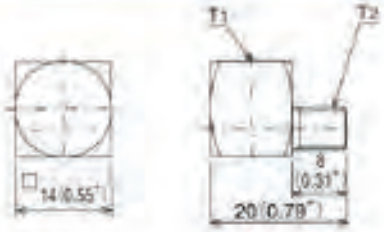


Part Number

Part Number	Material	L1	L2	T1	T2	B
106074	SS330B	20(0.79")	8(0.31")	M8×1	M6×1	14
166036	SUM-21	20(0.79")	8(0.31")	M8×1	1/4-28UNF	14
106033	C3604	20(0.79")	8(0.31")	M8×1	M8×1.25	14
166035	C3604	22(0.87")	8(0.31")	M10×1	M10×1	16
166040	C3604	22(0.87")	8(0.31")	M10×1	1/4-28UNF	16

Adapters

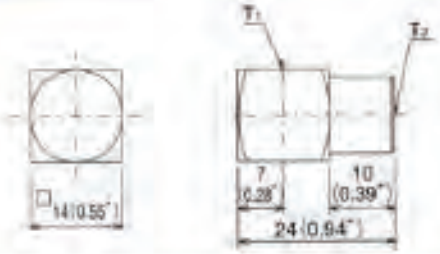
Dimensional drawing



Part Number

Part Number	Tubing O.D.	T1	T2
106075	O	M8×1	M6×0.75
106076	O	M8×1	M6×1

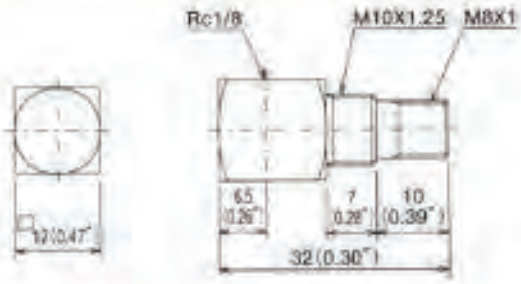
Dimensional drawing



Part Number

Part Number	T1	T2
℄106041	2-Rc1/8	M8×1
186041	2-1/8NPT	5/16-24

Dimensional drawing

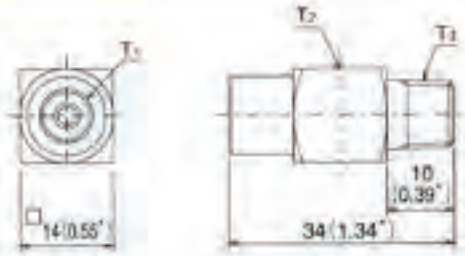


Part Number

Part Number
℄106049

Adapters

Dimensional drawing



Part Number

Part Number	T1	T2	T3
106051	M8×1	Rc1/8	Rc1/8
186051	5/16-24UNF	1/8NPT	1/8NPT

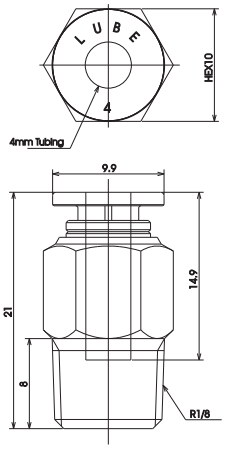
Push to Connect Fittings

Push-to-connect Fitting (Straight)

Model	Part Number	Tubing O.D. (φ)	L1(φ)	L2(φ)	B
KBC4-01	209503	4mm	23	21	10
KBC6-01	209513	6mm	23	21	10

Material: The tubing that can be used is nylon tubing.

Drawing

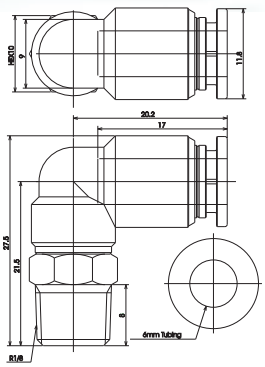


Push-to-connect Fitting (Elbow)

Model	Part Number	Tubing O.D. (φ)	B
KBL4-01	209508	4mm	11.8
KBL6-01	209518	6mm	11.8

Material: The tubing that can be used is nylon tubing.

Drawing

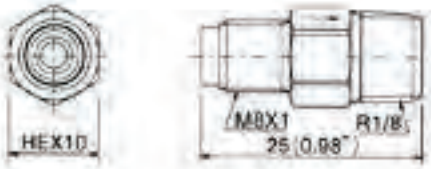


Check valves/Swivel elbow/Banjo elbow

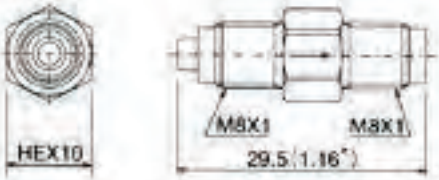
Dimensional drawing

●Check valve

109407



109415



109416

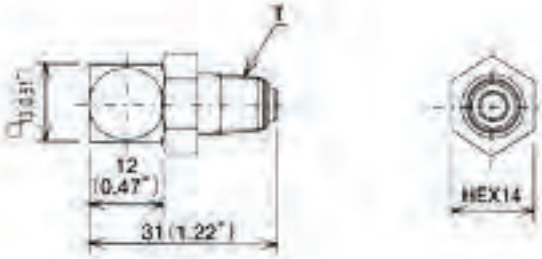
Part Number

Part Nunber	Model	Operating puressure
109407	HSA	0.034MPa (0.35kgf/cm2)
109415	HJB	0.034MPa (0.35kgf/cm2)
109416	HTU	0.016MPa (0.16kgf/cm2)

Check valves/Swivel elbow/Banjo elbow

Dimensional drawing

●Swivel elbow



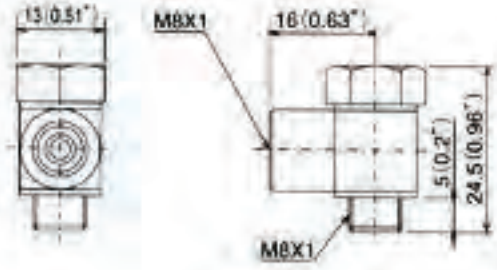
Part Number

Part Number	Model	Operating puressure
109412	100rpm/MAX	R 1/8
189402	100rpm/MAX	1/8NPT

PAGE TOP

Dimensional drawing

●Banjo elbow

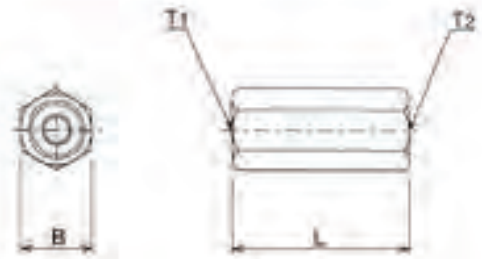


Part Number

Part Number
106027

Couplers/Unions

Dimensional drawing



Part Number

Part Number	Tubing O.D.	T1	T1	L	B
106201	φ4×φ4	M8×1.0	M8×1.0	25(0.98")	HEX10
186201	φ4	5/16-24	5/16-24	25(0.98")	HEX10
106202	φ4×φ6	M8×1.0	M8×1.0	27(1.06")	HEX12
©106291	φ4	M8×1.0	Rc 1/8	25(0.98")	HEX14
©106292	φ6×φ6	M10×1.0	M10×1.0	29(1.14")	HEX14
©106293	φ6	M10×1.0	Rc 1/8	25(0.98")	HEX14
©106294	-	Rc 1/8	Rc 1/8	25(0.98")	HEX14
©207201	φ8×φ8	M14×1.5	M14×1.5	40(1.57")	HEX17
©207202	-	Rc 3/8	Rc 1/8	25(0.98")	HEX21

Material:C3604

Dimensional drawing

Part Number

Part Number	Tubing O.D.	T
106211	φ4	2-M8×1
186211	5/32"	2-5-16-24 UNF

Material:C3604

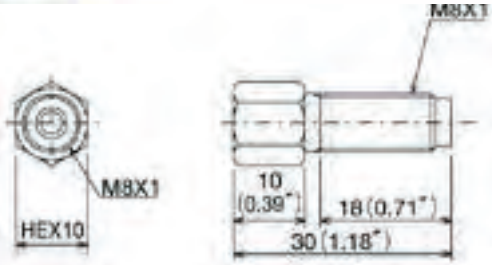
Dimensional drawing

Part Number

Part Number	Ttbing O.D.	L
106221	φ4	32(1.26")
106222	φ4	40(1.57")

Material:C3604

Dimensional drawing

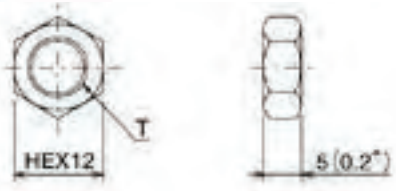


Part Number

Part Number	Tubing O.D.
106231	φ4

Material:C3604

Dimensional drawing



Part Number

Part Number	T
106232	M8×1
186234	5/16-24 UNF

Material:SS400

Drive bushing/Barb fittings

Dimensional drawing

Part Number

Part Number	Tubing O.D.	d1	d2	B
106257	φ4	φ4.7	φ4.5	6
106256	φ4	φ6	φ6	8
106258	φ4	φ7	φ6.8	8

Dimensional drawing

Part Number

Straight tube end

Part Nunber	Specification	T	L	B
106931	Threaded type	M4×0.75	16(0.63")	6
106933		M5×0.8	16(0.63")	6
℄106934		M5×0.9	16(0.63")	6
℄106935		M6×0.75	16(0.63")	8
106936		M6×1	16(0.63")	8
℄106937		M8×1.25	16(0.63")	9

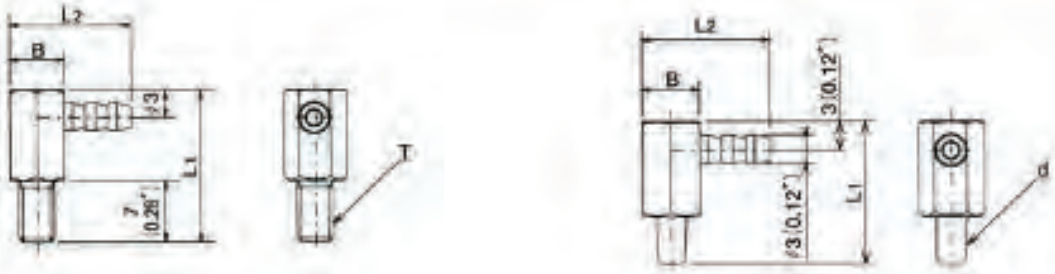
Drive bushing/Barb fittings

Dimensional drawing

Part Number	Specification	d	L	B
106921	Driving type	φ3	16(0.63")	6
106923		φ4	16(0.63")	6
106924		φ4.5	16(0.63")	7
106925		φ5	16(0.63")	6
106926		φ5.5	16(0.63")	8
106927		φ6	16(0.63")	7
106928		φ7	16(0.63")	9
106929		φ8	16(0.63")	10
106930		φ6.5	16(0.63")	8
106931		0.125	16(0.63")	6

Drive bushing/Barb fittings

Dimensional drawing



Part Number

Part Nunber	Specification	T	L1	L2	B
106911	Threaded type	M4	17(0.98")	13.5(0.53")	6
106912		M4.5	17(0.98")	13.5(0.53")	6
106913		M5×0.8	17(0.98")	15(0.59")	8
106914		M5×0.9	17(0.98")	13.5(0.53")	6
106915		M6×0.75	17(0.98")	15(0.59")	8
106916		M6	17(0.98")	15(0.59")	8
106917		M8	17(0.98")	16(0.63")	9
106954		M4×0.75	15(0.59")	13(0.51")	6
106955		M4.5×0.7	15(0.59")	13(0.51")	6
106956		M5×0.8	15(0.59")	15(0.59")	8

Part Nunber	Specification	d	L1	L2	B
106901	Driving type	φ3	15(0.59")	13.5(0.53")	6
106902		φ3.5	15(0.59")	13.5(0.53")	6
℄106903		φ4	15(0.59")	13.5(0.53")	6
℄106904		φ4.5	15(0.59")	13.5(0.53")	6
℄106905		φ5	14(0.55")	13.5(0.53")	6
℄106907		φ6	15(0.59")	15(0.59")	8
℄106908		φ3	15(0.59")	15(0.59")	10
℄106909		φ8	14(0.55")	17(0.98")	8
106910		φ6.5	15(0.59")	15(0.59")	8

LUBE USA

Subsidiary of Lube Corporation

■Centralized lubrication system planning

(1) System planning sequence

Objective of lubrication : Decrease friction, cooling and extend bearing life.

- **Locate all wear surfaces that need to be lubricated :** bearings, slides, cams, gears, chains etc. Take into consideration RPM, load, ambient temperature and nearby hazard.
- **Selecting lubricant :** Determine frequency required (min. -hrs. -days). Select lubricant oil or grease, and note viscosity
- **Selecting Desired Delivery Method :** Automatic or manual. Intermittent or continuous. Single Line Resistance, Positive Displacement Injector, Series Progressive.
- **Calculate Lubricant Requirements :** For each lubrication point, calculate the necessary requirement of lubricant in cubic centimeters per hour. Then multiply or divide by desired frequency to determine necessary requirement per interval cycle. Add all the requirements together to get the total system requirement.
- **Select Distributor :** Based on the desired delivery method, choose the correct distributor for that method that will deliver the amount of lubricant required per interval period.
- **Select Pump and Tank :** Based on the desired delivery method and the system total requirements, choose a pump that meets those requirements. Take into consideration it is not recommended to use more than 80% of the pump output. Choose a tank that will meet the desired refilling interval.
- **Select any Protection and Monitoring Device :** Based on the type of system there are different monitoring devices that could be used if desired, flow sensor, pressure switch, cycle switch, low level switch or visual indication.
- **Select Controlling Method :** Determine if an external system controller will be required and select controls that will not only meet the system requirements, but also the chosen monitoring device if necessary.
- **System Layout :** Arrange nearby lubrication points into groups if desired. Based on the particular distributor chosen, arrange the distributors into same groups. Based on the system delivery method and necessary main and branch tubing, engineer the tubing layout and distributor locations.
- **Select Necessary Tubing Parts :** After system layout is complete, choose the correct amount of desired fittings, adapters, compression hardware, tubing etc. that will be required to plumb the system.

(2) Calculating oil requirements

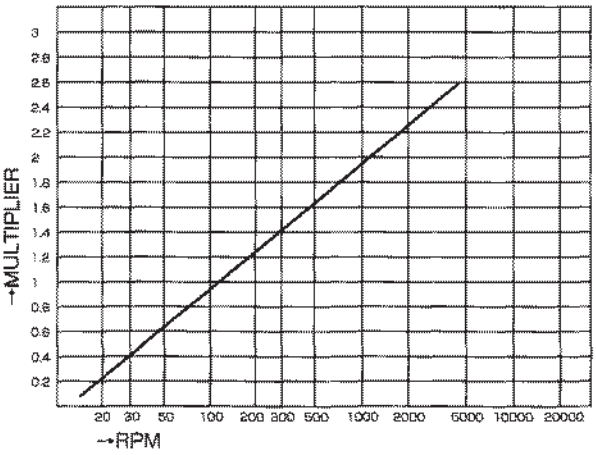
The amount of oil that is required for lubrication point is calculated by the following formulas and are based on experience and actual testing.

The necessary requirement is calculated in cubic centimeters per hour. These formulas are based on an average of of 120 RPM. In general, the requirement should be doubled for every ten fold speed increase. There have been many calculating formulas published before that use surface smoothness, different operating conditions, RPM, load, ambient temperature, oil type, hazardous conditions, sealing conditions etc. Thus, the formulas below for calculating the oil requirements are not absolute. They are rather a benchmark, and based on the actual operating conditions should be adjusted for each particular application.

● Oil requirements calculation formulas

AF.	Anti-friction bearing (Ball bearing, roller bearing, needle bearing) Oil volume Q(cc/h) =0.04×diameter×rows	BW.	Ball bearing way Oil volume Q(cc/h)=0.012×length×rows
P.	Plain bearing Oil volume Q(cc/h)=0.023×shaft diameter×bearing length	CA.	Cam Oil volume Q(cc/h)=0.0017×Contacting circumference ×width
FW.	Flat slide a. Oil volume Q(cc/h)=0.0017×length×width(horizontal slide) b. Oil volume Q(cc/h)=0.006×length ×width(vertical slide)	G.	Gear Oil volume Q(cc/h)=0.013×pitch circle diameter×width of gear
CW.	Cylinder slide Oil volume Q(cc/h)=0.023×diameter×length	CH.	Chain Oil volume Q(cc/h)=0.008×length

● The relationship between rpm and multiplier



LUBE USA

Subsidiary of Lube Corporation

■Grease system

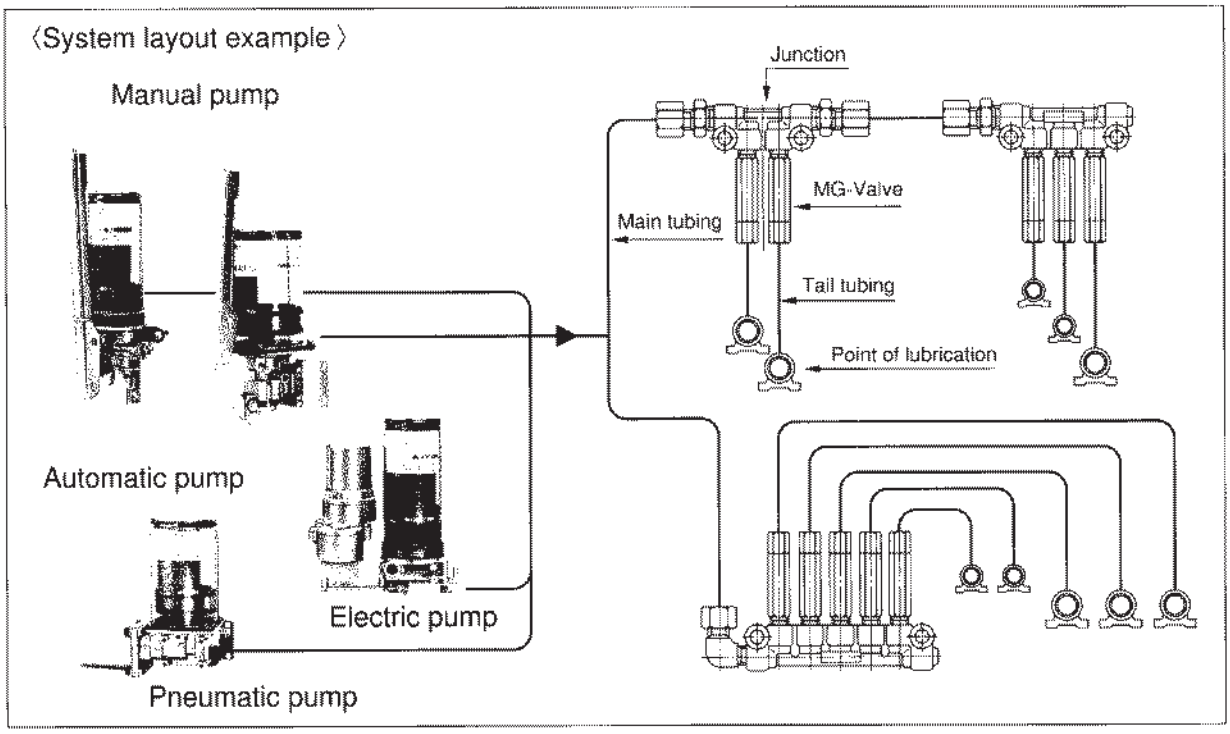
Positive Displacement Injector(PDI) - (GRELUBER system)

(1)System Overview

The Greluber centralized lubrication systems will deliver precise amounts of grease to all of your lubrication points, and have the flexibility to be adapted to just about any application imaginable. The Greluber System have a wide assortment of manual, pneumatic and electric pumps to satisfy any feeding method that you choose. The integrity of these systems stems from its metering device the MG-Valve injector. There is also the option of an MGI-Valve which incorporates the use of a visual indicator pin at the valve which will pop out in the event of a clogged tail tube. The MG and MGI-Valve injectors are precisely calibrated piston distributors that will deliver an exact amount of grease upon main line pressure rise from the pump you choose. The MG and MGI-Valve injectors will re-set and re-load when main line pressure returns to zero. These

General view of specifications of major types of pump

Lubrication system		Positive displacement injector system			
Tubing		Single line (main tubing ϕ8, tail tubing ϕ4)			
Pump		Manual		Pneumatic	Motor driven
	Model	GHS-1-100	GHS-10-50	GAS-16-40	GMS-20-80
	Discharge volume	1cc/stroke	10cc/stroke	16cc/stroke	20cc/min
	Discharge pressure	10MPa(100kgf/cm²)1,450psi	5MPa(50kgf/cm²)725psi	4MPa(40kgf/cm²)580psi	8MPa(80kgf/cm²)1,160psi
Reservoir		0.4ℓ	0.4, 1	1	0.4, 1
Controller		——	……	……	Available
Distributor MG valve	Model	Positive displacement injector			
	Operating pressure	1.5Mpa(15kgf/cm²)217.5psi			
	Reset pressure	0.5Mpa(5kgf/cm²)72.5psi			
	Discharge volume	0.03, 0.05, 0.1, 0.2, 0.3, 0.5, 1.0, 1.5cc stroke			
	Reset grease time	3sec			
Working lubricant		NLGI No.000, 00, 0, 1			
Working environment temperature		+10℃/+50°F for NLGI No.1 and above 0℃/+32°F for NLGI No.000, 00 and 0			



systems have been designed and proven to work effectively with grease ranging from NLGI-000 to NLGI-1.

Characteristics:

1. There are numerous manual, pneumatic and electric pump with ranging output delivery per cycle and per minute, to satisfy not only your chosen delivery method, but more importantly to satisfy your bearing requirements.
2. MG-Valve injectors have 8 different discharge volumes to select from to meet the lubrication points actual cycle requirement.
3. MGI-Valve injectors have 6 different discharge volumes to select from to meet the lubrication points actual cycle requirement, as well as having a visual indication pin for clogged tail tubes.
4. Both MG and MGI-Valves are junction mounted distributors that can be arranged in just about any configuration imaginable.
5. Because the Greluber Systems have the flexibility of individual distributor junction assemblies and one main line feeding tube, makes the engineering of the system layout and installation of the system as easy as possible.

Required grease volume

There is a tendency that people oversupply grease due to a concern that grease supply may not be enough : Excessive grease will increase power consumption and heat produced by excessive load of the grease and it may also cause grease leakage. So everything should be taken into consideration when deciding the grease volume. There is a large gap between the least amount grease given to bearing without damaging the bearing and the largest amount of grease given to the bearing without grease leaking out of the bearing. But what is the best grease volume? This ideal grease volume can be described in several ways. In general,

(1) 1/2~3/4 of the space between the bearing and its housing.
(2) 2/3~3/4 of the space between the bearing and bearing cover, when the bearing is installed horizontally;
(3) 1/2 of the space between the bearing and its top cover and 3/4 of the space between the bearing and its bottom cover, when the bearing is installed vertically;
(4) Fill grease in the bearing and bearing cover for the low and midium speed bearing if in dusty atmosphere;
(5) When replacing the grease in bearing, the grease volume should be calculated by the following formular

$Q=D2.5/K\cdots\cdots$ (1)
D:Bearing diameter (mm)
K:Constant Ball bearing K=900
Roller bearing K=350

These formulas are just basics. Actual grease volume need to be adjusted by rpm, load, and the bearing housing size in actual use

(2) System planning sequence

Variables to be considered

1. Total tubing length··· m

Total tubing length is the combined length of steel tubing (copper tubing) and flexible hose of the main tubing.

2. Total grease output metering valve ···cc

Total grease output of metering valve is the total discharge volume of the valves.

3. Pressure relief time:

The time required for the pressure relief mechanism to relieve the pressure at the end of the main tubing down to valve reset pressure (0.5MPa(5kgf/cm²)72.5psi) after all valves have discharged. It is determined by the total length of tubing and the grade of the grease.

4. Interval time:

The time between one discharge and the next discharge. The interval time should be longer than the time required for pressure relief and valve reset time combined.

5. Pump pressure rise time

The time required for the pump to raise the pressure at the end of the main tubing up to 2MPa(20kgf/cm²)29psi.

6. Operating environment temperature

The operating environment temperature for NLGI No.1 is over +10 ℃/+50°F and above 0 ℃/+32°F for 000, 00 and 0 grade grease.

7. Grease specifications

Use lithium based grease with NLGI No. 000~1 grade.

Note : When the base oil viscosity is too low, it may not be used. Please consult us.

LUBE USA

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Designing GHS-1-100 Pump System

Selection of valve

1. Select the valves based on the grease volume required to each lubrication point.
2. The total valve grease discharge volume is restricted by the number of handle operation. Also the total length of the tubing should be within 20m(65.6 feet).

Interval lubrication time

Interval time should be longer than the time required for presure relief and valve reset time (3sec) combined.

●Pressure reducing time (Table 13)

Grease / Temperature / Total length of tubing	No.000			No.00			No.0			No.1	
	0℃/+32˚F	+10℃/+50˚F	+20℃/+68˚F	0℃/+32˚F	+10℃/+50˚F	+20℃/+68˚F	0℃/+32˚F	+10℃/+50˚F	+20℃/+68˚F	+10℃/+50˚F	+20℃/+68˚F
2m/6.5F	25″	15″	2″	1′ 00″	45″	25″	11′ 00″	6′ 00″	1′ 00″	11′ 00″	6′ 00″
4m/13.1F	45″	25″	2″	2′ 00″	1′ 20″	45″	22′ 00″	12′ 00″	2′ 00″	22′ 00″	12′ 00″
6m/19.7F	1′ 00″	30″	2″	3′ 00″	2′ 15″	1′ 00″	36′ 30″	20′ 00″	3′ 00″	36′ 30″	20′ 00″
8m/26.2F	1′ 30″	45″	2″	5′ 30″	3′ 30″	1′ 30″	50′ 30″	28′ 00″	5′ 30″	50′ 30″	28′ 00″
10m/32.8F	2′ 00″	1′ 00″	2″	8′ 00″	5′ 00″	2′ 00″	1˚04′ 00″	36′ 00″	8′ 00″	1˚04′ 00″	36′ 00″
12m/39.4F	3′ 00″	1′ 30″	3″	11′ 30″	7′ 15″	3′ 00″	1˚20′ 30″	46′ 00″	11′ 30″	1˚20′ 30″	46′ 00″
14m/45.9F	5′ 00″	2′ 30″	3″	16′ 30″	10′ 45″	5′ 00″	1˚47′ 30″	1˚02′ 00″	16′ 30″	1˚47′ 30″	1˚02′ 00″
16m/52.5F	10′ 00″	5′ 00″	3″	24′ 00″	17′ 00″	10′ 00″	2˚26′ 40″	1˚26′ 00″	24′ 00″	2˚26′ 40″	1˚26′ 00″
18m/59.0F	17′ 00″	8′ 30″	4″	50′ 00″	33′ 30″	17′ 00″	3˚22′ 00″	2˚06′ 00″	50′ 00″	3˚22′ 00″	2˚06′ 00″
20m/65.6F	25′ 00″	12′ 30″	4″	1˚46′ 00″	1˚02′ 30″	25′ 00″	6˚20′ 00″	4˚00′ 00″	1˚40′ 00″	6˚20′ 00″	4˚00′ 00″

Note : [∘] = Hours, [′] = Minutes, [″] = Seconds

Designing GHS-10-50 Pump System

Selection of valve

1. Select the valves based on the grease volume required to each lubrication point.
2. The maximum output of the pump is restricted by the total length of tubing, grade of grease and ambient temperature.

●Maximum pump output (cc) (Table 14)

Grease / Temperature / Total length of tubing	No.000			No.00			No.0			No.1	
	0℃/+32˚F	+10℃/+50˚F	+20℃/+68˚F	0℃/+32˚F	+10℃/+50˚F	+20℃/+68˚F	0℃/+32˚F	+10℃/+50˚F	+20℃/+68˚F	+10℃/+50˚F	+20℃/+68˚F
2m/6.5F	8	8	8.5	8	8	8	7	7.5	8	7	7.5
4m/13.1F	7.5	8	8.5	7.5	7.5	7.5	6.5	7	7.5	6.5	7
6m/19.7F	7.5	8	8	7	7.5	7.5		6.5	7		6.5
8m/26.2F	7	7.5	8	7	7	7			7		
10m/32.8F	7	7.5	7.5	6.5	7	7			6.5		
12m/39.4F	7	7	7.5	6.5	6.5	7			6.5		
14m/45.9F	7	7	7.5	6.5	6.5	7			6.5		
16m/52.5F		7	7.5								
18m/59.0F			7.5								
20m/65.6F			7.5								

3. The total grease output of the valves should be restricted within pump maximum output. However, flexible hose is used in the main tubing, the flexible hose expansion volume should be calculated into the total grease output of the valves. Also, the valve maximum pump output should be larger than the total expansion volume and total grease output of the valves combined.

Pump maximum output > total grease output of the valves+(1.5×L′m) L′~Flexible hose length(m)

Interval time

Interval time should be longer than the time required for presure relief and valve reset time (3sec) combined.

●Pressure relief time (Table 15)

Grease / Temperature / Total length of tubing	No.000			No.00			No.0			No.1	
	0℃/+32°F	+10℃/+50°F	+20℃/+68°F	0℃/+32°F	+10℃/+50°F	+20℃/+68°F	0℃/+32°F	+10℃/+50°F	+20℃/+68°F	+10℃/+50°F	+20℃/+68°F
2m/6.5F	2′ 00″	1′ 00″	2″	3′ 00″	2′ 30″	2′ 00″	21′ 00″	12′ 00″	3′ 00″	21′ 00″	12′ 00″
4m/13.1F	3′ 00″	1′ 30″	2″	6′ 00″	4′ 30″	3′ 00″	36′ 00″	21′ 00″	6′ 00″	36′ 00″	21′ 00″
6m/19.7F	4′ 30″	2′ 15″	3″	9′ 30″	6′ 45″	4′ 30″		32′ 00″	9′ 00″		32′ 00″
8m/26.2F	6′ 00″	3′ 00″	3″	14′ 00″	10′ 00″	6′ 00″			14′ 00″		
10m/32.8F	8′ 00″	4′ 00″	3″	20′ 00″	14′ 00″	8′ 00″			20′ 00″		
12m/39.4F	12′ 00″	6′ 00″	4″	30′ 00″	21′ 00″	12′ 00″			30′ 00″		
14m/45.9F	19′ 00″	9′ 30″	4″	46′ 00″	32′ 30″	19′ 30″			46′ 00″		
16m/52.5F		16′ 30″	5″								
18m/59.0F			5″								
20m/65.6F			5″								

Note : [°] = Hours, [′] = Minutes, [″] = Seconds

Designing GHS-16-40 Pump System

Selection of valve

1. Select the valves based on the grease volume required to each lubrication point.
2. The total length of tubing should be within 20m(65.6feet). The maximum output of the pump is restricted by the total length of tubing, grade of grease and ambient temperature.

●Maximum pump output (cc) (Table16)

Grease / Temperature / Total length of tubing	No.000			No.00			No.0			No.1	
	0℃/+32°F	+10℃/+50°F	+25℃/+78°F	0℃/+32°F	+10℃/+50°F	+25℃/+78°F	0℃/+32°F	+10℃/+50°F	+25℃/+78°F	+10℃/+50°F	+25℃/+78°F
2m/6.5F	10	10	10.5	9.5	10	10	7.5	8.5	9.5	7.5	8.5
4m/13.1F	9.5	9.5	10	9	9.5	9.5	7.5	8.5	9	7.5	8.5
6m/19.7F	9	9	9.5	8.5	9	9	7	8	8.5	7	8
8m/26.2F	9	9	9.5	8	8.5	9	7	8	8	7	8
10m/32.8F	9	9	9.5	8	8.5	9	7	8	8	7	8
12m/39.4F	8.5	8.5	9	8	8	8.5	7	8	8	7	8
14m/45.9F	8.5	8.5	9	8	8	8.5	7	8	8	7	8
16m/52.5F	8.5	8.5	9	8	8	8.5	7	8	8	7	8
18m/59.0F	8.5	8.5	9	8	8	8.5	7	8	8	7	8
20m/65.6F	8.5	8.5	9	8	8	8.5	7	8	8	7	8

3. The total grease output of the valves should be restricted within pump maximum output. However, flexible hose is used in the main tubing, the flexible hose expansion volume should be calculated into the total grease output of the valves. Also, the valve maximum pump output should be larger than the total expansion volume and total grease output of the valves combined.

Pump maximum output > total grease output of the valves+(1.5×L′m) L′~Flexible hose length(m)

Pump pressure rising time (Pump operation time)

The time required for the pump to raise the pressure at the end of the main tubing up to 20kgf/cm² (2MPa)290psi. Thus, pump should be in opration longer than this.

●Pump pressure rising time (Table 17)

Grease / Temperature / Total length of tubing	No.000			No.00			No.0			No.1	
	0℃/+32°F	+10℃/+50°F	+25℃/+78°F	0℃/+32°F	+10℃/+50°F	+25℃/+78°F	0℃/+32°F	+10℃/+50°F	+25℃/+78°F	+10℃/+50°F	+25℃/+78°F
2m/6.5F	4″	4″	4″	7″	6″	4″	33″	20″	7″	33″	20″
4m/13.1F	5″	5″	4″	8″	7″	5″	42″	25″	8″	42″	25″
6m/19.7F	5″	5″	5″	9″	7″	5″	51″	30″	9″	51″	30″
8m/26.2F	6″	6″	5″	10″	8″	6″	1′ 00″	35″	10″	1′ 00″	35″
10m/32.8F	6″	6″	5″	10″	8″	6″	1′ 10″	40″	10″	1′ 10″	40″
12m/39.4F	7″	7″	6″	12″	10″	7″	2′ 18″	1′ 15″	12″	2′ 18″	1′ 15″
14m/45.9F	9″	8″	7″	14″	12″	9″	3′ 45″	2′ 00″	14″	3′ 45″	2′ 00″
16m/52.5F	10″	9″	8″	16″	13″	10″	6′ 40″	3′ 30″	16″	6′ 40″	3′ 30″
18m/59.0F	11″	10″	9″	18″	15″	11″	9′ 40″	5′ 00″	18″	9′ 40″	5′ 00″
20m/65.6F	12″	11″	10″	20″	16″	12″	13′ 40″	7′ 00″	20″	13′ 40″	7′ 00″

Note : [°] = Hours, [′] = Minutes, [″] = Seconds

Interval time

The time between one discharge end the next discharge. The interval time should be longer than the time required for oressure relief and valve reset time(3sec.) combined.

●Pressure relief time (Table 18)

Grease / Temperature / Total length of tubing	No.000			No.00			No.0			No.1	
	0℃/+32°F	+10℃/+50°F	+20℃/+68°F	0℃/+32°F	+10℃/+50°F	+20℃/+68°F	0℃/+32°F	+10℃/+50°F	+20℃/+68°F	+10℃/+50°F	+20℃/+68°F
2m/6.5F	2′ 00″	1′ 00″	2″	3′ 00″	2′ 30″	2′ 00″	21′ 00″	12′ 00″	3′ 00″	21′ 00″	12′ 00″
4m/13.1F	3′ 00″	1′ 3″	2″	6′ 00″	4′ 30″	3′ 00″	38′ 00″	21′ 00″	6′ 00″	36′ 00″	21′ 00″
6m/19.7F	4′ 30″	2′ 15″	3″	9′ 00″	6′ 45″	4′ 30″	55′ 00″	32′ 00″	9′ 00″	55′ 00″	32′ 00″
8m/26.2F	6′ 00″	3′ 00″	3″	14′ 00″	10′ 00″	6′ 00″	1° 14′ 00″	44′ 00″	14′ 00″	1° 14′ 00″	44′ 00″
10m/32.8F	8′ 00″	4′ 00″	3″	20′ 00″	14′ 00″	8′ 00″	1° 40′ 00″	1° 00′ 00″	20′ 00″	1° 40′ 00″	1° 00′ 00″
12m/39.4F	12′ 00″	6′ 00″	4″	30′ 00″	21′ 00″	12′ 00″	2° 10′ 00″	1° 20′ 00″	30′ 00″	2° 10′ 00″	1° 20′ 00″
14m/45.9F	19′ 00″	9′ 30″	4″	46′ 00″	32′ 30″	19′ 00″	2° 50′ 00″	1° 48′ 00″	46′ 00″	2° 50′ 00″	1° 48′ 00″
16m/52.5F	33′ 00″	16′ 30″	5″	1° 18′ 00″	55′ 30″	33′ 00″	3° 52′ 00″	2° 35′ 00″	1° 18′ 00″	3° 52′ 00″	2° 35′ 00″
18m/59.0F	58′ 00″	29′ 00″	5″	2° 30′ 00″	1° 44′ 00″	58′ 00″	5° 50′ 00″	4° 10′ 00″	2° 30′ 00″	5° 50′ 00″	4° 10′ 00″
20m/65.6F	1° 48′ 00″	54′ 00″	5″	6° 30′ 00″	2° 40′ 00″	1° 48′ 00″	12° 30′ 00″	8° 00′ 00″	6° 30′ 00″	12° 30′ 00″	8° 00′ 00″

Note : [°] = Hours, [′] = Minutes, [″] = Seconds

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Disigning GMS-20-80 Pump System

Selection of valve

1. Select the valves based on the grease volume required to each lubrication point.
2. The total length of the tubing should be within 20m(65.6 feet).

Pump operating time(T)

Pump operation time (T)

Calculate the operation time (T) by adding the pressure rising time (T′) and valve action time (T″).

$T=T'+T''$

1. Pressure rising time

●Steel tubing (ϕ 8) (Table 19)

Total length of tubing	Pressure rising time
Under 10m(32.8 feet)	15sec
Under 20m(65.6 feet)	30sec

※If using flexible hose, because the pressure rising time for flexible hose (350K/77lbs) is 4 seconds for 1M(3.2 feet), it should be added into the pressure rising time. Also, the combined length of steel and flexible hoses should be limited within 20m(65.6 feet).

2. Valve operating time (T″)

Calculate the valve operating time from the valve total output.

$$T''=\frac{V\times 72}{Q'}\fallingdotseq 5\,V$$

V:Valve total output (cc).
Q:Pump discharge volume when valve in operation (15cc/minute)

Interval time

The time between one discharge and the next discharge. The interval time should be longer than the time required for oressure relief and valve reset time(3sec.) combined.

●Pressure relief time (Table 20)

1.Steel tubing

●(Table 20)

Grease / Total length of tubing	No.000	No.00	No.0	No.1
Under 10m/32.8F	15″	15′	30′	60
Under 20m/65.6F	30″	30′	60′	120′

2.When using flexible hose

The pressure relief time for the steel tubing, plus it for the flexible hose.

●(Table 20)

Grease / Total length of tubing	No.000	No.00	No.0	No.1
1m/3.28F	3″	7.5′	15′	30
2m/6.56F	6″	15′	30′	60′
4m/13.1F	12″	30′	60′	120′
6m/19.6F	18″	45′	90′	180′
8m/26.2F	24″	60′	120′	240′
10m/32.8F	30″	75′	150′	300′

Note : [°] = Hours, [′] = Minutes, [″] = Seconds

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Grease types (classified by JIS standard)

●Grease types (classified by JIS standard)

Type			Temperature range of application	Reference				
				Propriety to working condition				
				Load			Contact with water	Example of application
Application	Type	Grade number		Low	High	Impact		
General grease	1	No.1, No.2, No.3, No.4	−10℃/+14°F~ +60℃/+140°F	Yes	No	No	Yes	For general low load
	2	No.2, No.3	−10℃/+14°F~+100℃/+212°F	Yes	No	No	No	For intermediate load
Roller bearing grease	1	No.1, No.2, No.3	−20℃/ −4°F~+100℃/+212°F	Yes	No	No	Yes	General
	2	No.0, No.1, No.2	−40℃/−40°F~ +80℃/+176°F	Yes	No	No	Yes	For low temperature
	3	No.1, No.2, No.3	−30℃/−22°F~+130℃/+266°F	Yes	No	No	Yes	For wide range of temperature
Centralized lubricating grease	1	No.00, No.0, No.1	−10℃/+14°F~ +60℃/+140°F	Yes	No	No	Yes	For centralized lubrication(Medium load)
	2	No.0, No.1, No.2	−10℃/+14°F~+100℃/+212°F	Yes	No	No	Yes	For centralized lubrication(Medium load)
	3	No.0, No.1, No.2	−10℃/+14°F~ +60℃/+140°F	Yes	Yes	Yes	Yes	For centralized lubrication(High load)
	4	No.0, No.1, No.2	−10℃/+14°F~+100℃/+212°F	Yes	Yes	Yes	Yes	For centralized lubrication(High load)
High load grease	1	No.0, No.1, No.2, No.3	−10℃/+14°F~+100℃/+212°F	Yes	Yes	Yes	Yes	For high impact load
Gear compound	1	No.1, No.2, No.3	−10℃/+14°F~+100℃/+212°F	Yes	Yes	Yes	Yes	Open gear and wire rope

Oil viscosity

●ISO viscosity classification (JIS·K2001-1983)

ISO viscosity grade	Dynamic viscosity range cSt (mm/sec)+40℃/+104°F	Central value	ISO viscosity grade	Dynamic viscosity range cSt (mm/sec)+40℃/+104°F	Central value
ISO VG1500	1350~1650	1500	ISO VG46	41.4~50.6	46
VG1000	900~1100	1000	VG32	28.8~35.2	32
VG 680	612~ 748	680	VG22	19.8~24.2	22
VG 460	414~ 506	460	VG15	13.5~16.5	15
VG 320	288~ 352	320	VG10	9.0~11.0	10
VG 220	198~ 242	220	VG 7	6.12~7.48	7
VG 150	135~ 165	150	VG 5	4.14~5.06	5
VG 100	90~ 110	100	VG 3	2.88~3.52	3
VG 68	61.2~ 74.8	68	VG 2	1.98~2.42	2

ISO=International Organization for Standardization

●Grade of grease classification (JIS·K2220-1980)

Grade number (NLGI NO)	Worked penetration	Appearance
000	445~475	Fluid state
00	400~430	Semifluid state
0	355~385	Semifluid state
1	310~340	Soft
2	265~295	Soft
3	220~250	Semi hard
4	175~205	Semi hard
5	130~160	Hard
6	85~115	Solid

NLGI=National Lubricating Grease Institute

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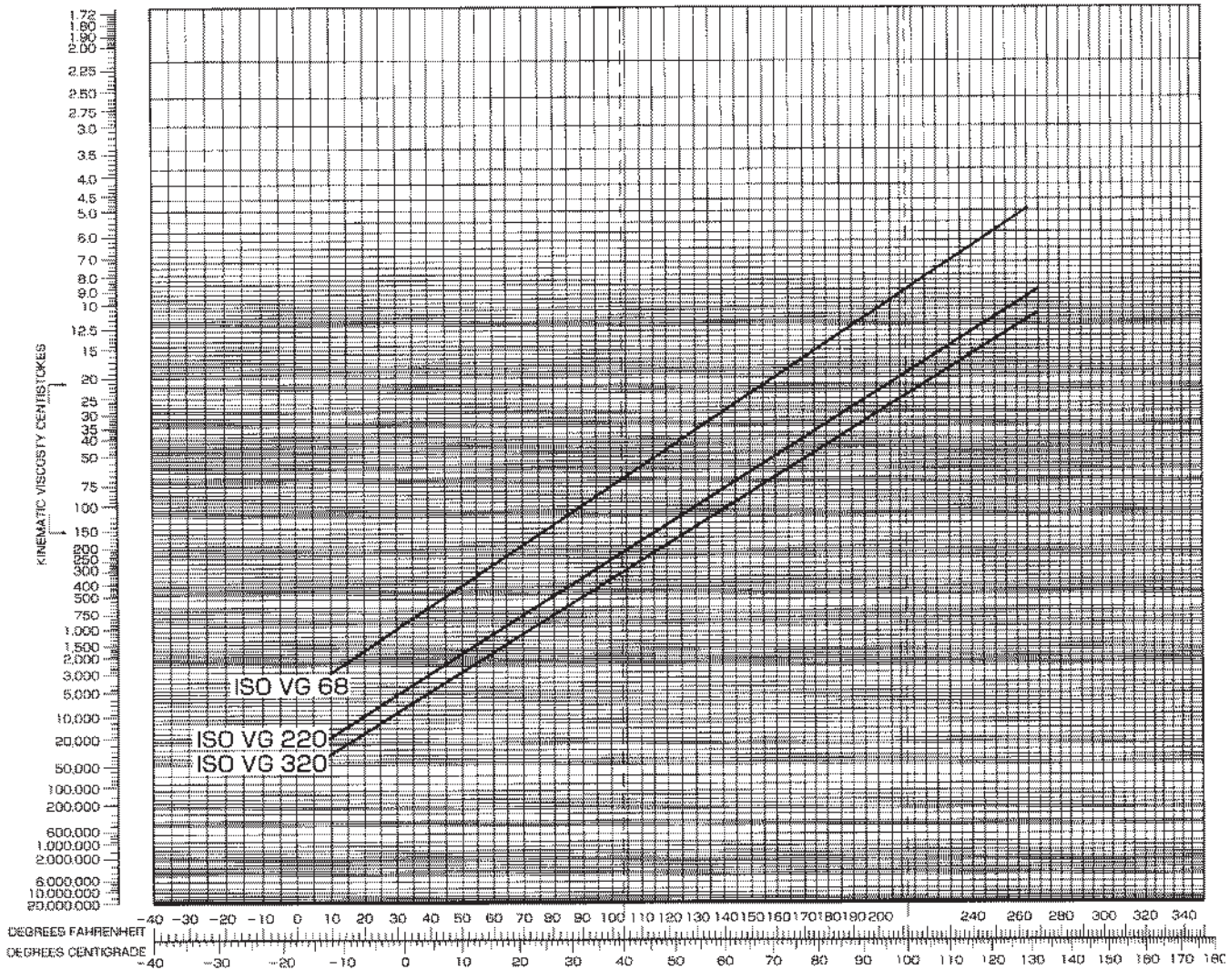
●Viscosity-temperature Chart



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Safety and trouble shooting

● For grease

No grease coming out of the pump

○Low grease level in the reservoir —— add the same grade grease you are currently using
○Change in grease consistency, too thick to pump —— check grease grade and temperature
○Only sucks air —— open the air release valve to expel the air
○Motor turns in wrong direction —— check motor wiring connections
○Check for insufficient air pressure (GA model pump) —— adjust to correct air pressure
○Incomplete operation of handle (Manual pump) —— operate the handle a full stroke

No pressure rise in the main line

○Relief valve is dirty —— clean relief valve
○Air in tubing —— loosen closure plug at the furthest point and run the pump to expel the air
○Check for incorrect connections in the system —— repair any problems
○Tubing damage —— repair or replace damaged tubing

No grease coming out of the valves

○Pressure relief valve is not working —— for GHS model (manual relief) check valve position,
for automatic relief model —— check valve
○Valve is clogged —— repalce the valve
○The secondary line (from valve to bearing) has no grease in it —— fill with grease at initial installation

Air in main line

○Air coming from suction side —— low grease level in the reservoir, fill reservoir with correct grade of grease
○Tubing damage —— repair or replace tubing

Pump is not running, but indication light is on

○Wrong wiring connections —— check motor wiring
○Circuit protector is in off position —— press the reset button

Trouble indication light is on

○Pump on time is not set correctly —— check discharge setting
○Grease level in reservoir is too low —— fill reservoir with correct grade of grease

Reservoir has correct grease level, but indicator light is still on

○Incorrect wiring of low level switch —— check with us

Can not turn off the trouble indication light

○Reset button has not been pressed —— press the reset button
○Rservoir was not refilled —— add correct grade grease