LUBE original catalog
Automatic lubrication systems

With the progress of the industrial society, the progress in automation, and the expansion of manufacturing facilities, the function of all kinds of machinery has enjoyed a tremendous leap-forward. Lubrication technology has contributed in many ways to this everlasting technical evolution. Automatic Lubrication System can consolidate multiple lubrication areas and control lubricant usage. LUBE Centralized Lubrication Equipment, as major part of preventive maintenance, helps our customers increase their profit.

LUBE Automati Lubrication System

- Aiming to combine an affluent society with a reliable corporate citizen through the development of the company and improvement of an employees quality while contributing to the markets in Japan and the world.
- To create corporate culture which promotes creativity of respective employees and team work, and provides appealing products which meet the needs of users.
- To conduct business activities in harmony with the local communities and the countries where we are located, strengthen the capabilities of sales offices, and establish a network which can provide high quality services.

ISO14001

Certificated

DNV MGMT. SYS. RvA C 024

ISO14001 REGISTERED FIRM

DNV Certification B.V., THE NETHERLANDS

Company evolution

July 1963	Incorporated in Shiba Tamura-cho, Minato-ku, Tokyo with the paid-up capital at ¥300,000
November 1967	Increased investment capital to ¥1,000,000
October 1968	Opened Osaka and Nagoya Sales Offices
November 1968	LUBE Matic won Outstanding Product Prize on 9th PM
October 1969	Increased investment capital to ¥3,000,000
March 1971	Opened Hiroshima Sales Office
June 1971	Increased investment capital the capital to ¥12,000,000
April 1973	Opened Kanazawa Sales Office
November 1977	Increased investment capital to ¥24,000,000
December 1978	Opened Shizuoka Sales Office
March 1979	Opened Niigata Sales Office
June 1979	Increased investment capital to ¥36,000,000
November 1979	Opened Kita-Kanto Sales Office and Kanagawa Sales Office
June 1982	Ibaraki Plant was moved to newly constructed Iwase-cho, Nagakata Industrial Park
January 1985	Opened Ibaraki Sales Office
March 1986	Opend Komaki Sales Office
July 1986	Opened Nishi-Tokyo, Chiba and Hamamatsu Sales Office
May 1987	Set Up LUBE USA Inc (South Carolina, USA)
December 1987	Increased investment capital to ¥70,200,000
August 1988	Opened Nagano Sales Office
March 1989	Opened Nagano Plant
July 1990	Opened Kobe and Tochigi Sales Offices
January 1992	Ibaraki Plant was expanded
March 1992	Computer network completed
July 1992	Opened Toyota Sales Office
June 1994	Set up LUBE Machine Lubricant Co, Ltd, a joint-stock company, in China
March 1995	Opened Toyama Sales Office
July 1995	Ibaraki and Tochigi Sales Offices merged and renamed Higashikanto Sales Office
December 1996	Passed NACCB ISO 9001
December 1997	Ibaraki Plant expansion
June 1998	Nagano Plant expansion
March 2000	Kita Kanto Sales Office was integrated into Tokyo Sales Office
July 2000	Komaki Sales Office was integrated into Nagoya Sales Office
June 2001	Passed RvA ISO 14001
September 2003	Toyama and Kanazawa Sales Offices merged and renamed Hokuriku Sales Office
December 2003	Passed UKAS ISO9001, ISO 2000.
January 2004	Kobe Sales Office was integrated into Osaka Sales Office
January 2005	Set up LUBE LUBRICATING SYSTEM CO.,LTD. (China)
August 2007	Increased investment capital to ¥100,000,000
September 2008	Set up LUBE AUTOMATIC SYSTEMS PRIVATE LIMITED (India)
January 2009	Nishi-tokyo and Chiba Sales Office was integrated into Tokyo Sales Office
February 2009	Toyota Sales Office was integrated into Nagoya Sales Office
March 2009	Hamamatsu Sales Office was integrated into Shizuoka Sales Office
July 2009	Set up KAA-Europa GmbH (Germany)
March 2010	Opened LHL service support station Ota
June 2010	Opened LHL service support station Anjo
April 2011	Opened Mie Plant

Company profile

Corporation name	LUBE CORPORATION
Incorporation	July 8,1964
Head Office	Horizon 1, 3-30-16 Nishi Waseda, Shinjuku-ku, Tokyo
Paid-up Capital	¥100,000,000
CEO	Eijiro Horikoshi, Representative Director
Purposes of Business	Manufacture, sales and installation of centralized lubrication equipment
Banks	Mizuho Bank The Bank of Tokyo-Mitsubishi UFJ Sumitomo Mitsui Bank
Settlement Term	Once a year (June)
Number of Employees	161 (as of June 30, 2009)
Sales Amount	6,100,000,000 yen (Year 2008)
Major clients	Amada Group Co., Ltd., Aida Engineering Co., Ltd., Akasaka Steel Co., Ltd., Asahi Seiki Manufacturing Co., Ltd., Ube Industries Ltd., ENSHU Limited, O-M Ltd., Okuma Corporation, OKK Corporation, Oshikiri Machinery Ltd., Kawasaki Heavy Industries, Ltd., Kitamura Machinery Co., Ltd., Kuraki Co., Ltd., JTEKT Corporation, Komatsu Ltd., Shoda Iron Works Co., Ltd., Citizen Watch Co., Ltd., Showa Seiko Co., Ltd., Suzuki Motor Corporation, SUGINO MACHINE Ltd., Star Micronics Co., Ltd., Sumitomo Heavy Industries, Ltd., Seiko Instruments Inc., Taisei Rotec Corporation, Daihatsu Motors Co., Ltd., TAIYO KOKI Co., Ltd., TAKAHASHI MACHINERY Ltd., Tsugami Corporation, TSUDAKOMA Corp., SHIN NIHON MACHINE MFG. Co., Ltd., Toshiba Machine Co., Ltd., TOYO MACHINERY & METAL Co., Ltd., Toyota Motor Corp., Nagata Seiki Co., Ltd., NIIGATA MACHINE TECHNO Co., Ltd., Nissan Motor Co., Ltd.,NISSEI PLASTIC INDUSTRIAL Co., Ltd., Japan Steel Works, Nippei Toyama Corporation, FANUC Ltd., Fuji Heavy Industries Ltd., Honda Motor Co., Ltd., Matsuura Machinery Corporation, Mazda Motor Corp., Mitsubishi Heavy Industries Ltd.,Mitsubishi Heavy Industries Plastic Technology Co., Ltd., Mitsubishi Motors Corporation, Mitsui Seiki Co., Ltd., MEIKI Co., Ltd., Meidensha Corporation, Yamazaki Mazak Corporation, Yamazaki Baking Co., Ltd., Yamaha, Yanmar Co., Ltd., Y.K.K.

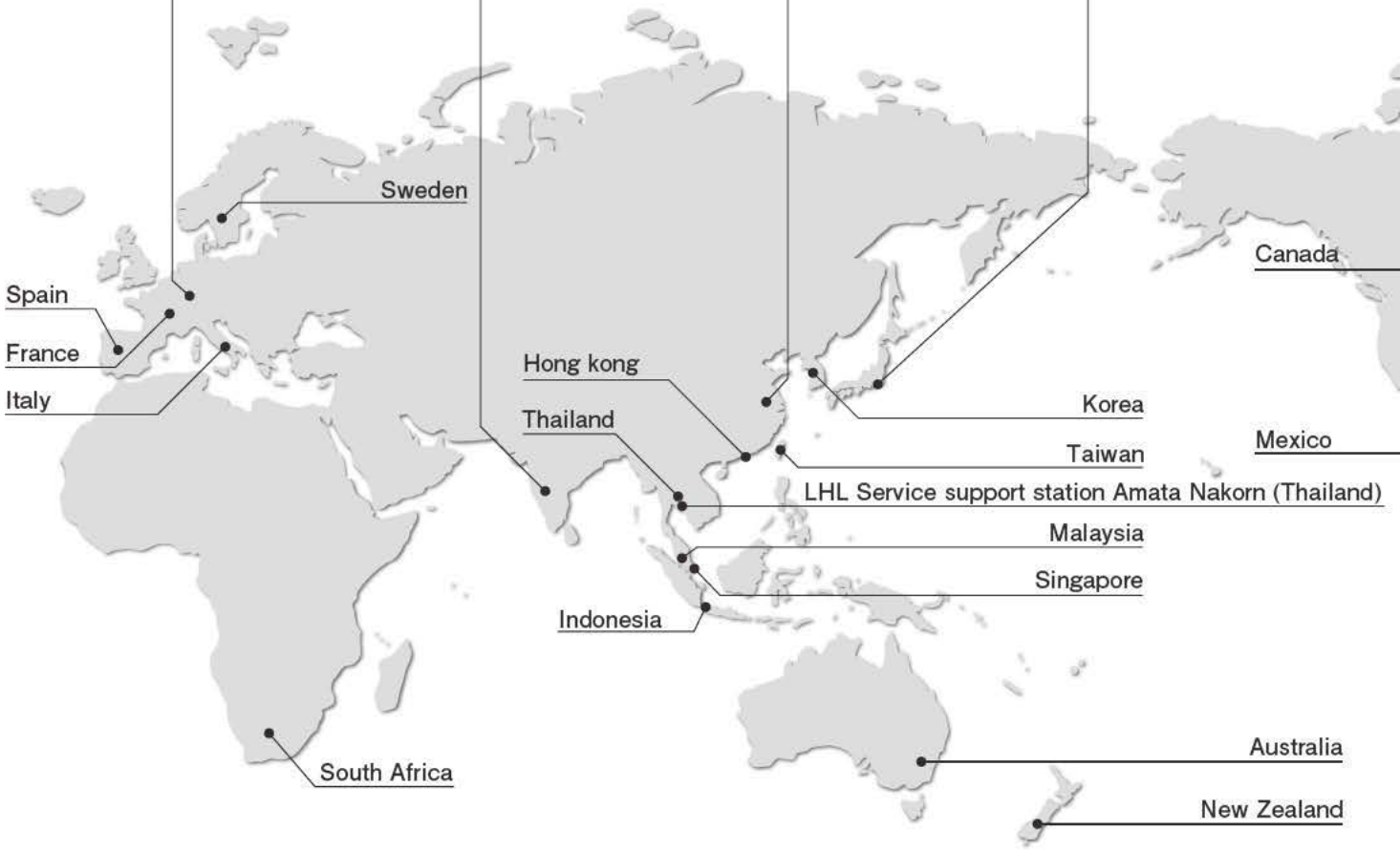
LUBE GLOBAL SERVI

●**Germany**
KAA-Europa GmbH

●**India**
LUBE AUTOMATIC
SYSTEMS PRIVATE LTD.

●**China**
LUBE LUBRICATING SYSTEMS
(SHANGHAI) CO., LTD.

■**Japan**
Tokyo World Head Quarters
Ibaraki Plant / Nagano Plant / Mie



Overseas representatives

Country	Company	TEL	FAX
France	CODAITEC	01 64 26 18 88	01 60 20 41 35
Sweden	AC Maskin Service AB	0587-151 00	0587-151 25
Spain	LAUTECNIC CNC.S.L	093 504 1689	093 504 1051
Italy	Mallardi S.r.l	055-8877767	055-882163
Thailand	World Pumps (Thailand) Co., Ltd	02 993-6835 02 993-5858	02 993-6278
Hong Kong	Gangfa International Trading Co.,Ltd.	02806-3220 02806-3226	02510-7978
Taiwan	Jian Yang International Corp	02-8712-7066	02-8712-7062
Singapore	Adex Zonex Pte. Ltd.	06-558-7789	06-558-7977
Malaysia	INNOMOTION INDUSTRIES (M) SDN BHD	03-8961-3079 03-8961-3080	03-8961-3081
Indonesia	PT.SOMAGEDE INDONESIA	021-641-0730	021-640-1572
Australia	Alltek Machine Tool Service	03-9588-1870	03-9588-1851
New Zealand	CNC Service. Ltd	09-5216366	09-5216367

CE NETWORK

Plant

●USA
LUBE USA, INC.

LUBE Global network

■LUBE CORPORATION
Tokyo World Head Quarters
Horizon 1, 3-30-16, Nishi Waseda, Shinjyuku-ku, 169-0051 Tokyo Japan
TEL. +81 (0) 3-3204-8431　FAX. +81 (0) 3-3204-8520

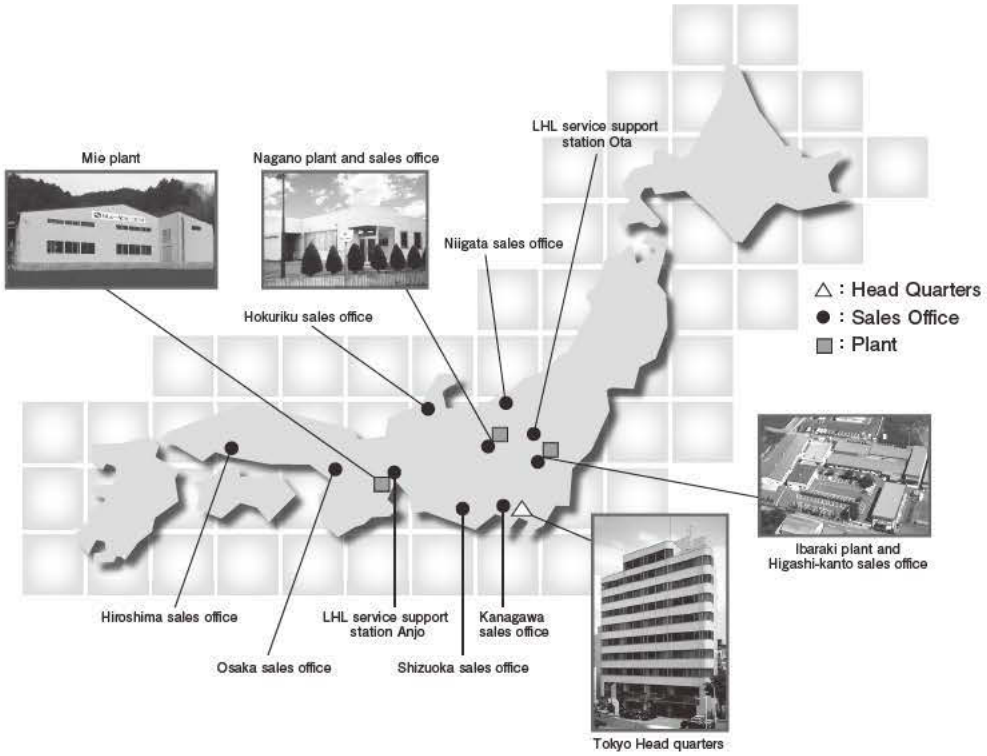
Overseas Subsidiaries

■KAA-Europa GmbH
Am Stauweiher 1, 51688 Wipperfürth Germany
TEL. +49 (0) 2267-8729-13　FAX. +49 (0) 2267-8729-26
E-mail: info@kaa-europa.com

■LUBE AUTOMATIC SYSTEMS PRIVATE LIMITED
ANTHONY, Thakur Wadi, Girij Talao. Opp. Namrata Auto Garage Tal.
Vasai, Dist. Thane. Maharashtra-401201 India
TEL. +91 (0) 250-232-0903　FAX. +91 (0) 250-232-0903
E-mail: support@lubeindia.co.in

■LUBE LUBRICATING SYSTEMS（SHANGHAI） CO.,LTD
C3, F88 Taigu Waigaoqiao Free Trade Zone, Shanghai, China
TEL. +86 (0) 21-5868-3818　FAX. +86 (0) 21-5868-3880
E-mail: y.fujishiro@lubechina.com.cn

■LUBE USA,INC.
781 Congaree Road, Greenville, S.C. 29607 USA
TEL. +1 (800) 326-3765　FAX. +1 (864) 242-1652
E-mail: sales@lubeusa.com　www.lubeusa.com



http://www.lube.co.jp

Sales Office
Tokyo/Kanagawa/Higashi-kanto/Niigata/Nagano/Nagoya/Shizuoka/Osaka/Hokuriku/Hiroshima

LHL service support station
Anjo/Ota

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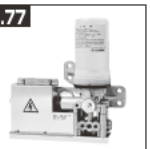

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LHL®

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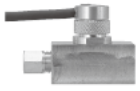
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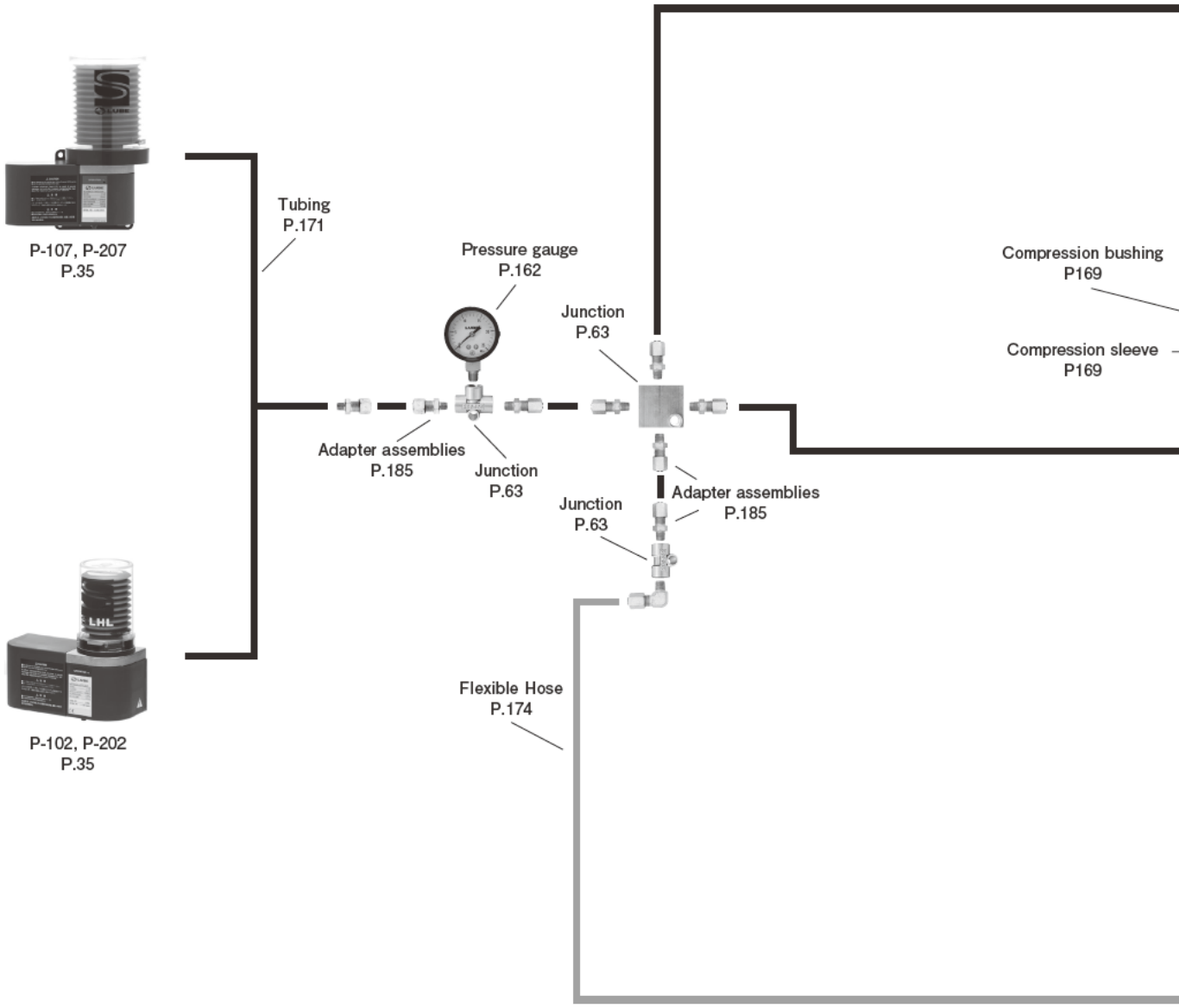
LHL/Grease System Layout

Oil System Layout

LUBE Hybrid Lubrication System (LHL)



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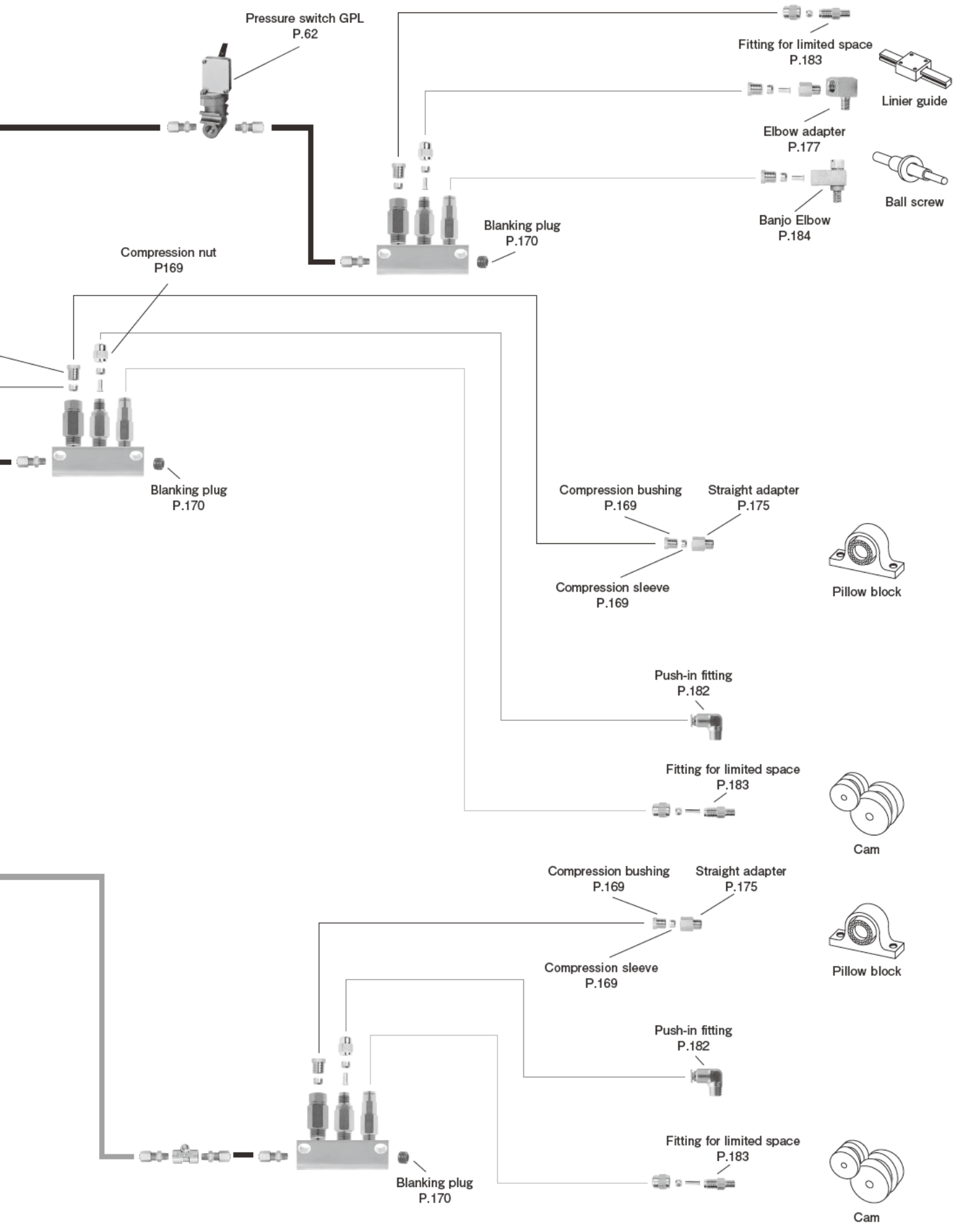
●Tubing
- ϕ6 Steel tubing
- ϕ4 Steel tubing
- ϕ4 Nylon tubing
- Flexible hose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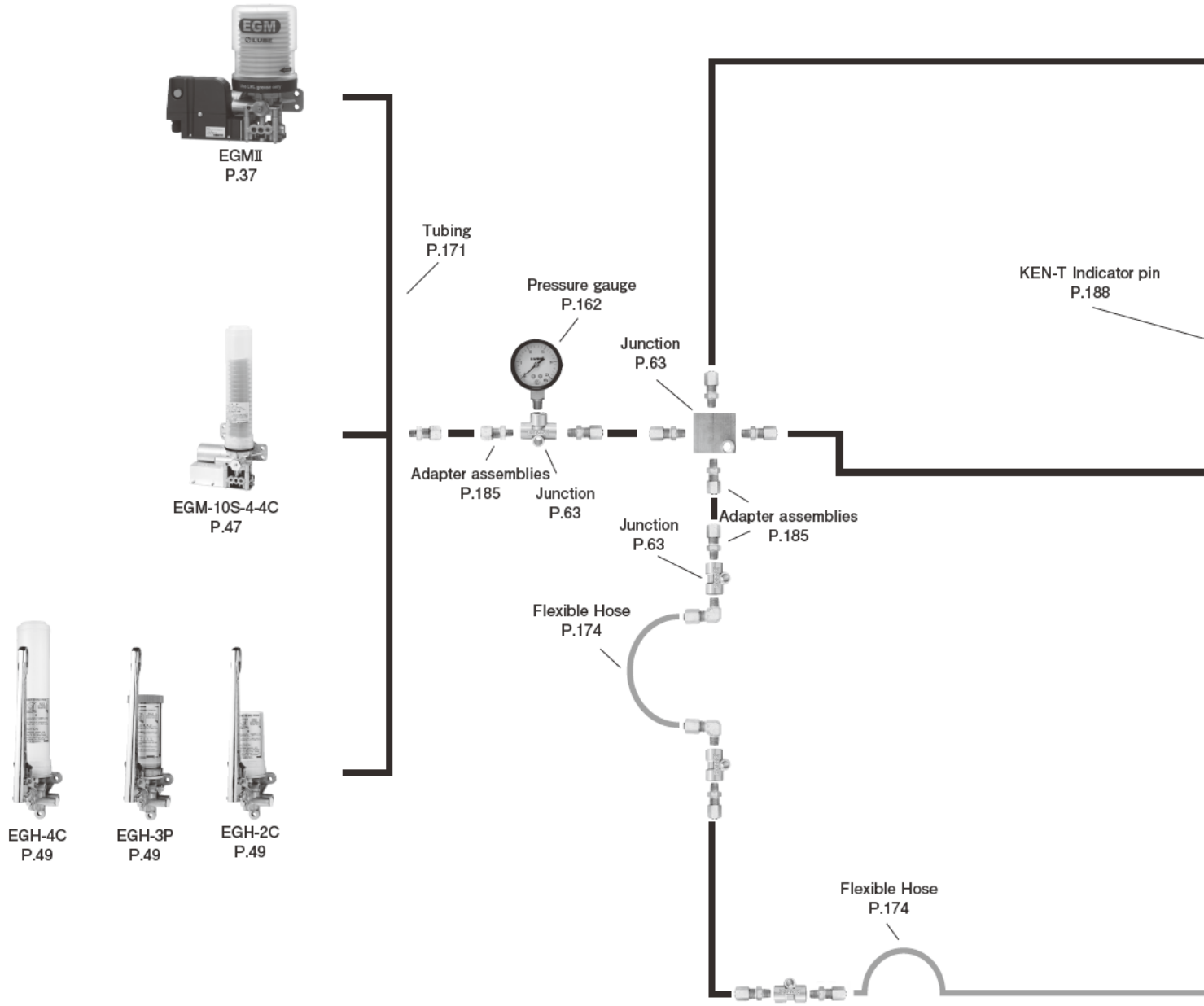

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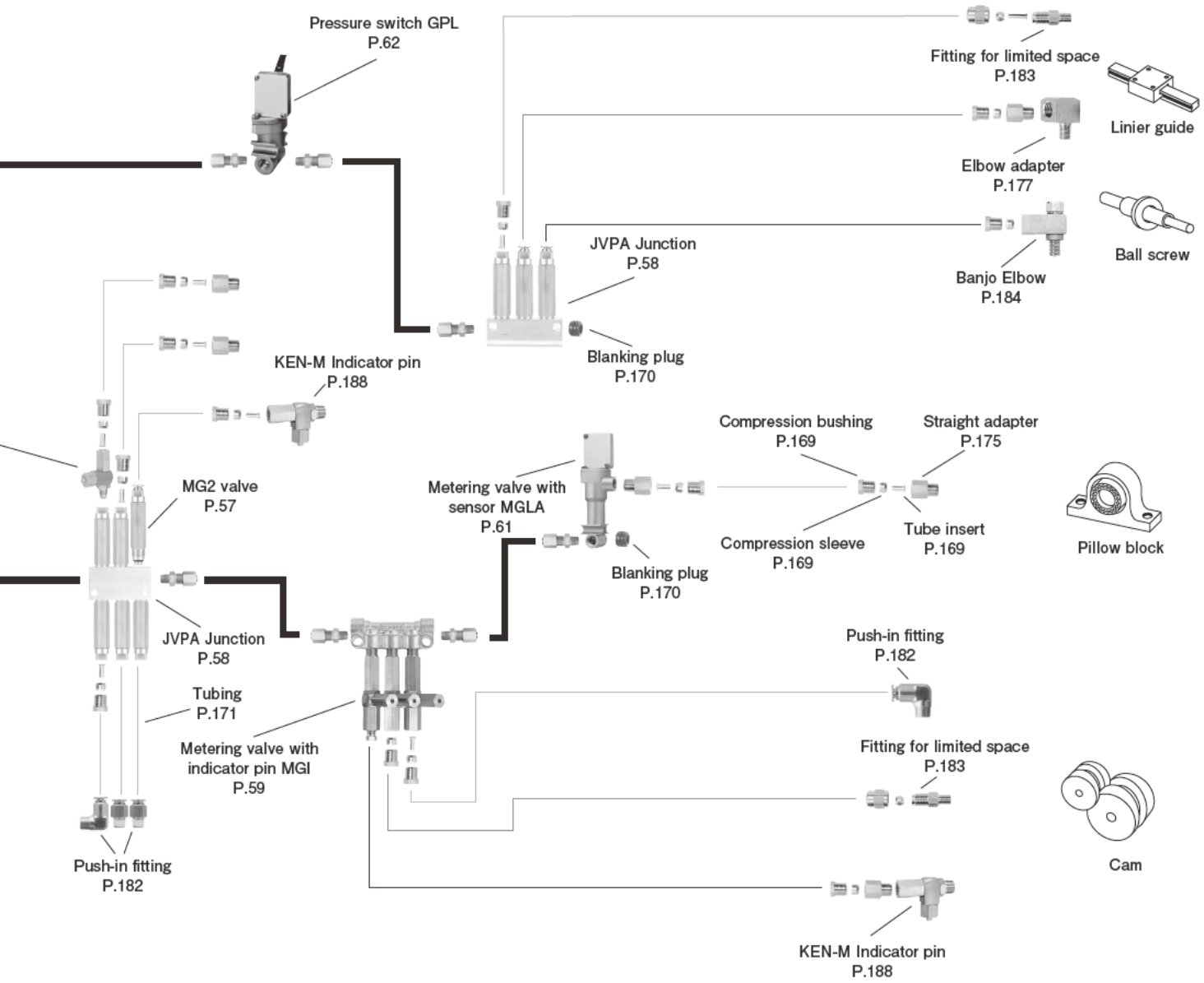
●Tubing
- ϕ8 Steel tubing
- ϕ4 Steel tubing
- ϕ4 Copper tubing
- ϕ4 Nylon tubing
- Flexible hose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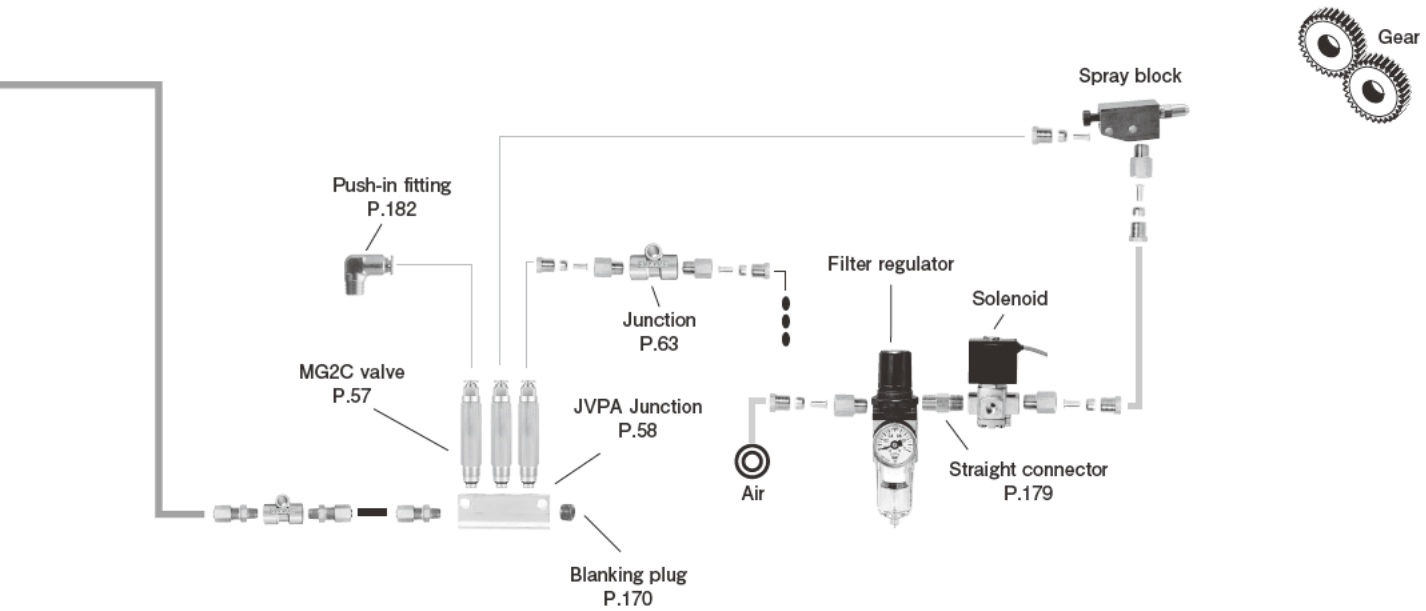
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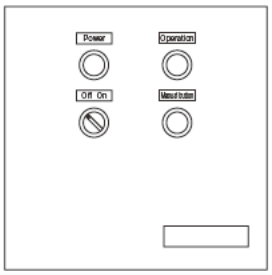

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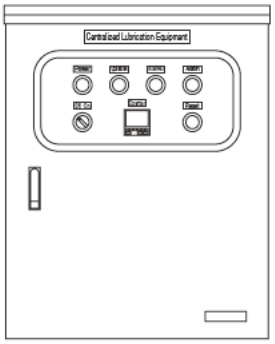

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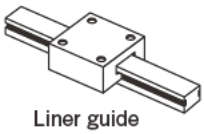
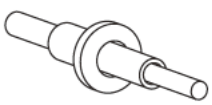
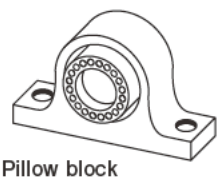


Liner guide



Ball screw



Pillow block

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Pneumatic pump
for pail
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●Original Parts

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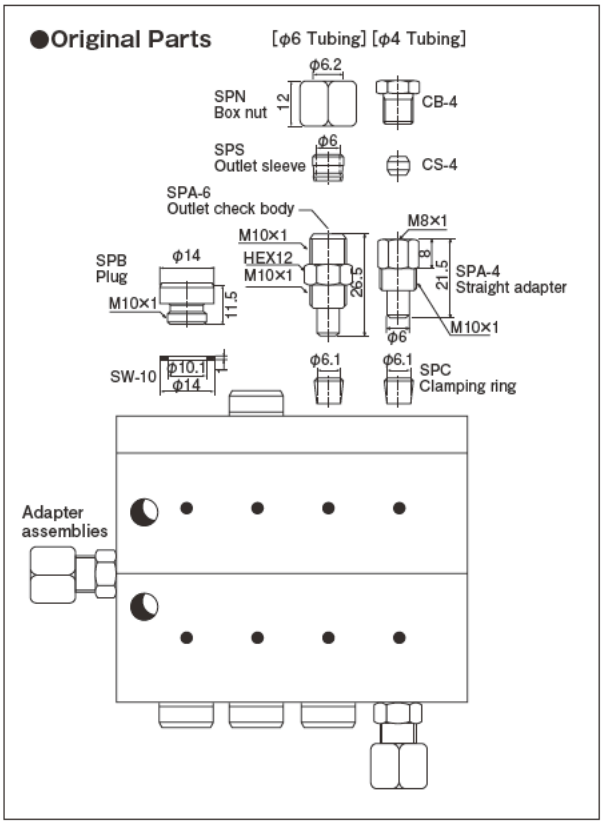

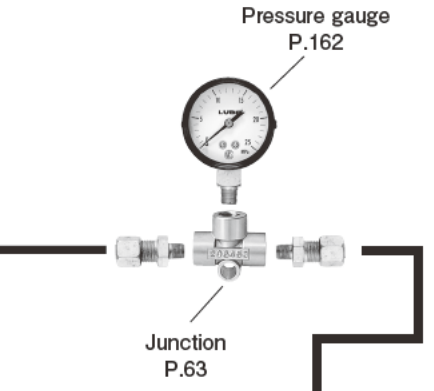
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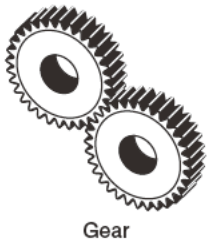
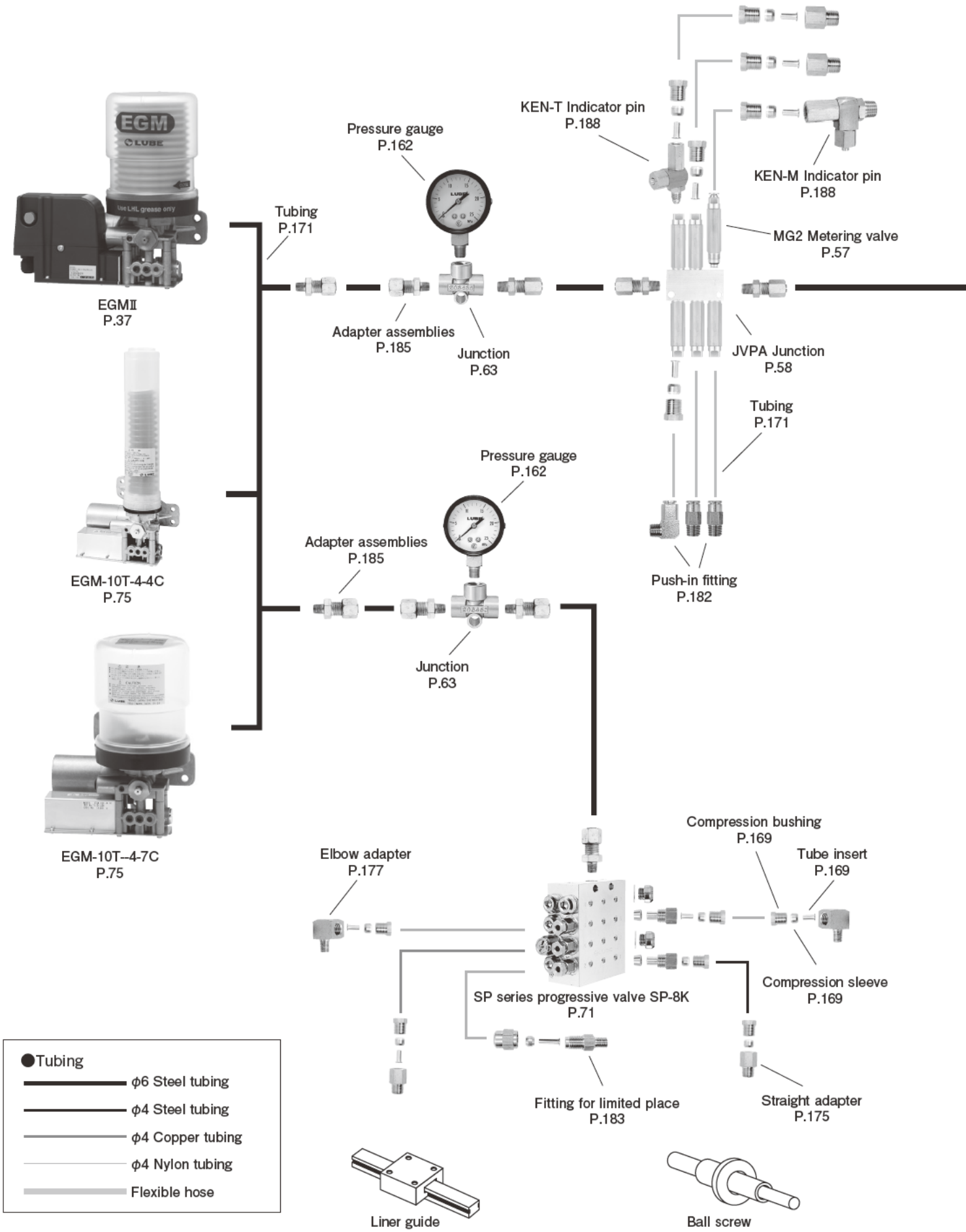

Gear

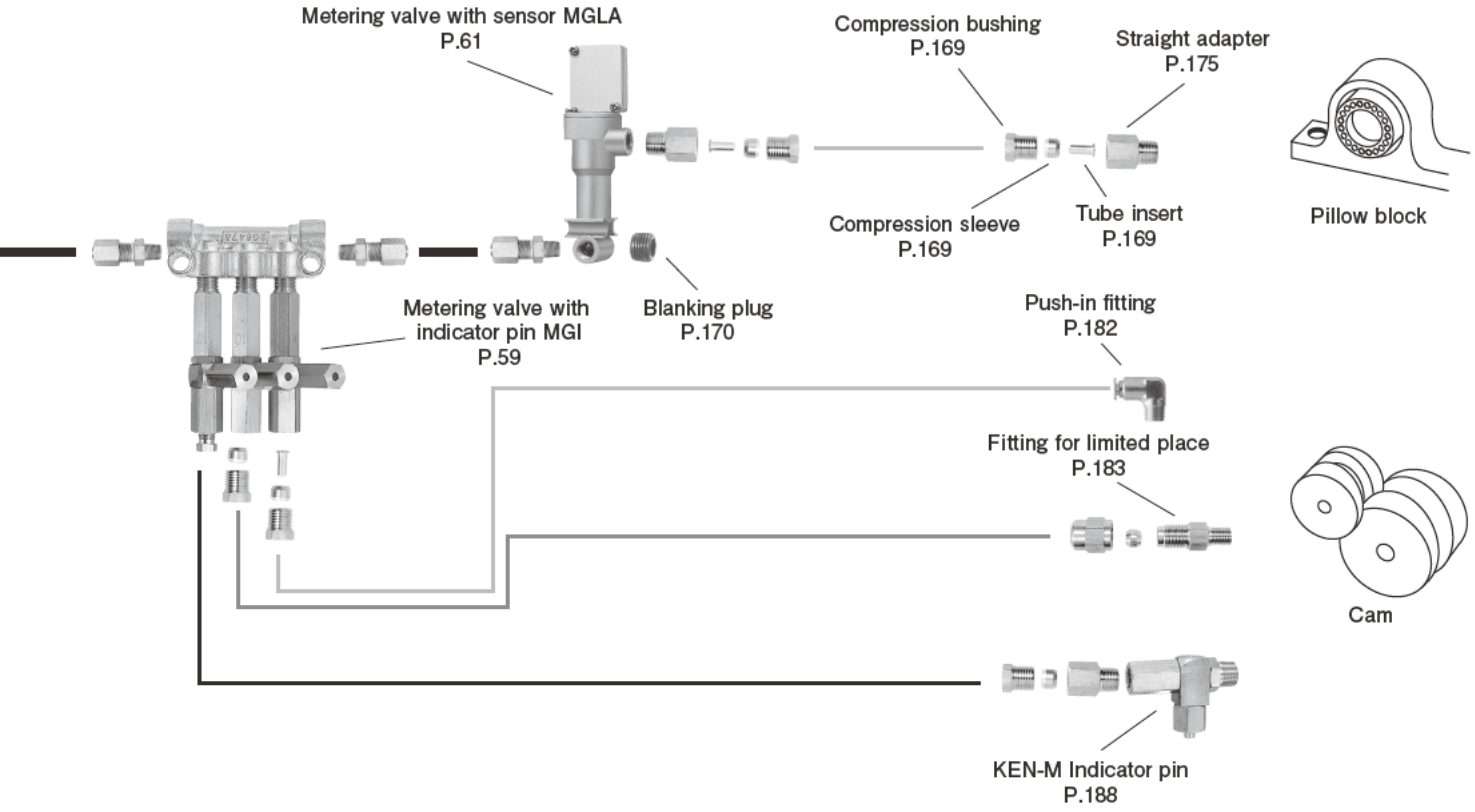

Cam

●Tubing

- φ6 Steel tubing
- φ4 Steel tubing
- φ4 Copper tubing
- φ4 Nylon tubing
- Flexible hose

Compatible with both PDI and series progressive metering valve system for small





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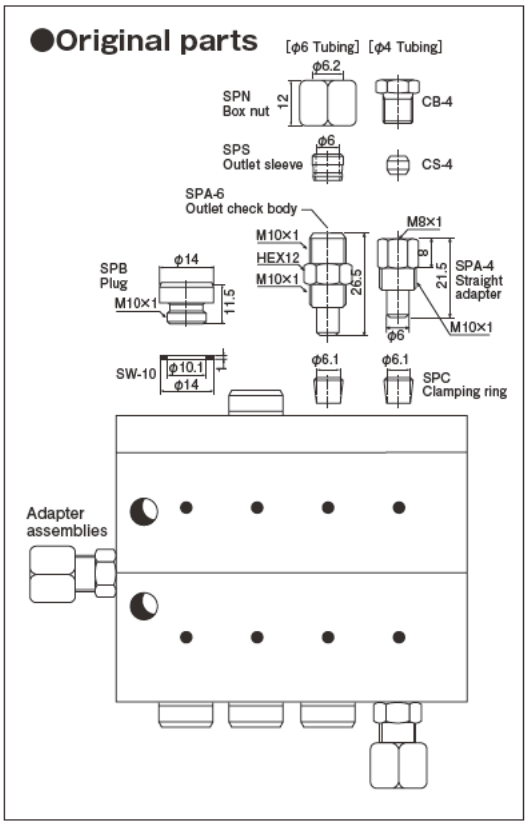
●Original parts



Positive Displacement Injector (PDI) System for Large Machines

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●Tubing
- φ6 Nylon tubing
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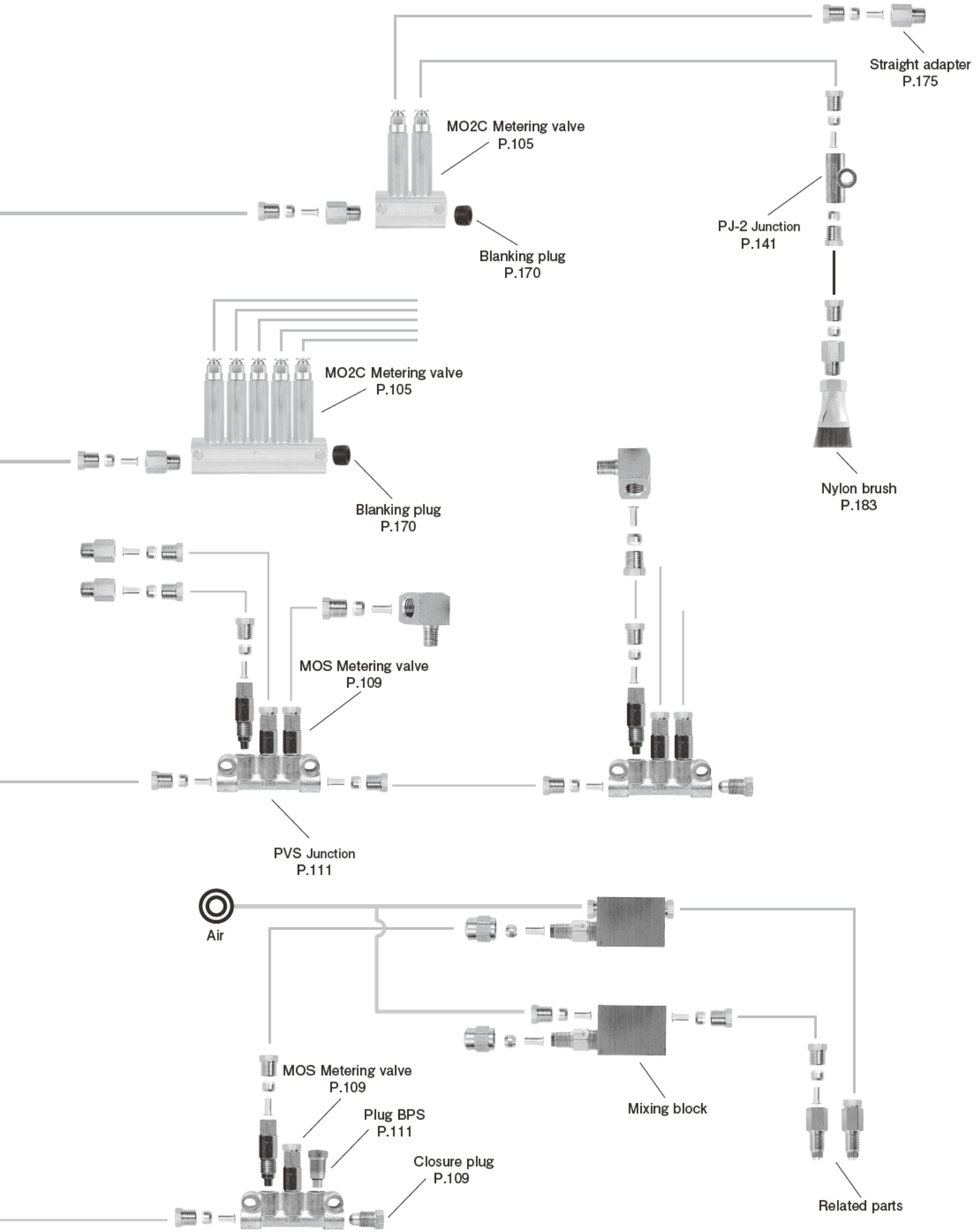
- φ4 Steel tubing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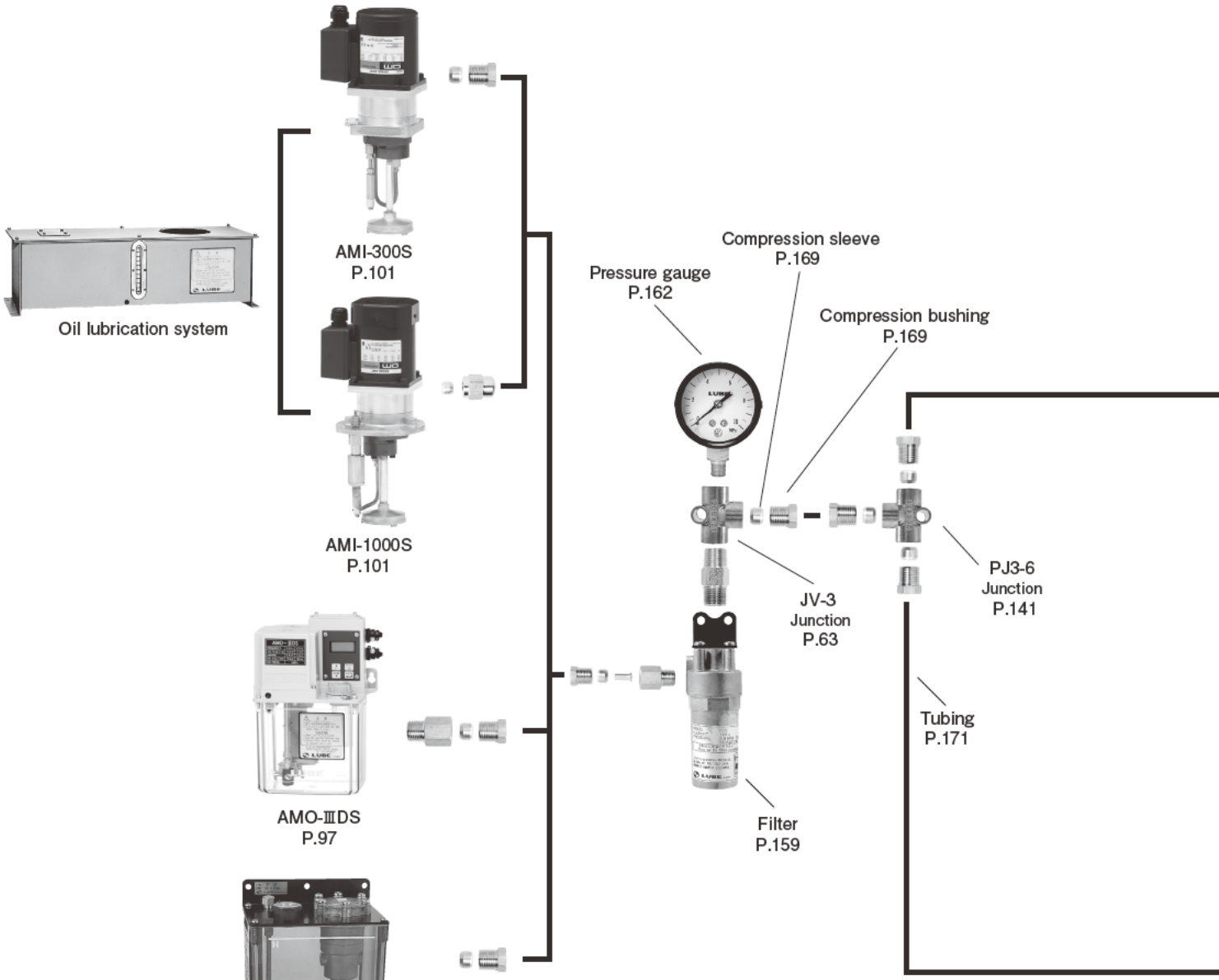
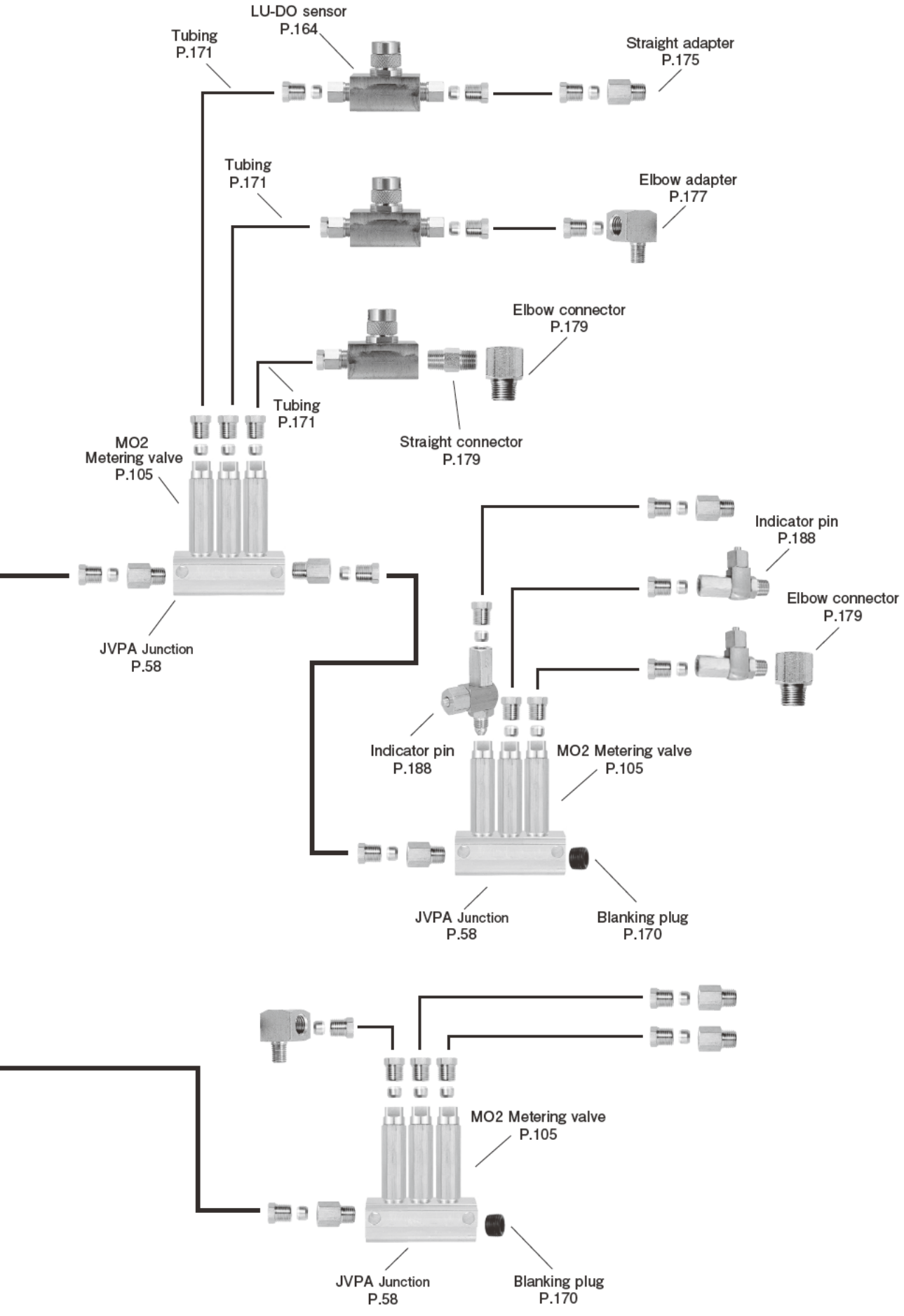
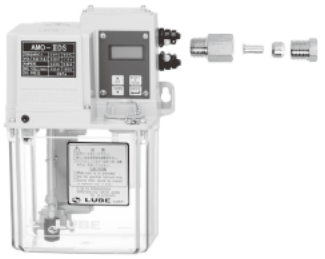
Related parts

Positive Displacement Injector (PDI) System for Large Machines

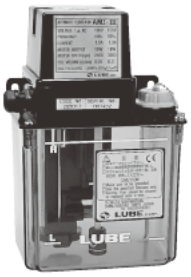



LU-DO sensor
P.164
Tubing
P.171
Straight adapter
P.175
Tubing
P.171
Elbow adapter
P.177
Elbow connector
P.179
Tubing
P.171
Straight connector
P.179
MO2
Metering valve
P.105
Indicator pin
P.188
Elbow connector
P.179
JVPA Junction
P.58
Indicator pin
P.188
MO2 Metering valve
P.105
JVPA Junction
P.58
Blanking plug
P.170
MO2 Metering valve
P.105
JVPA Junction
P.58
Blanking plug
P.170

Positive Displacement Injector (PDI) System for Large Machines



AMO-ⅢDS
P.97



AMZ-Ⅲ
P.93

PM-8S
P.95

Pressure gauge
P.184

JV-3 Junction
P.122

Straight adapter
P.175

Compression bushing
P.169

Elbow adapter
P.177

PJ3-6 Junction
P.141

Compression sleeve
P.169

Tube insert
P.169

Tubing
P.171

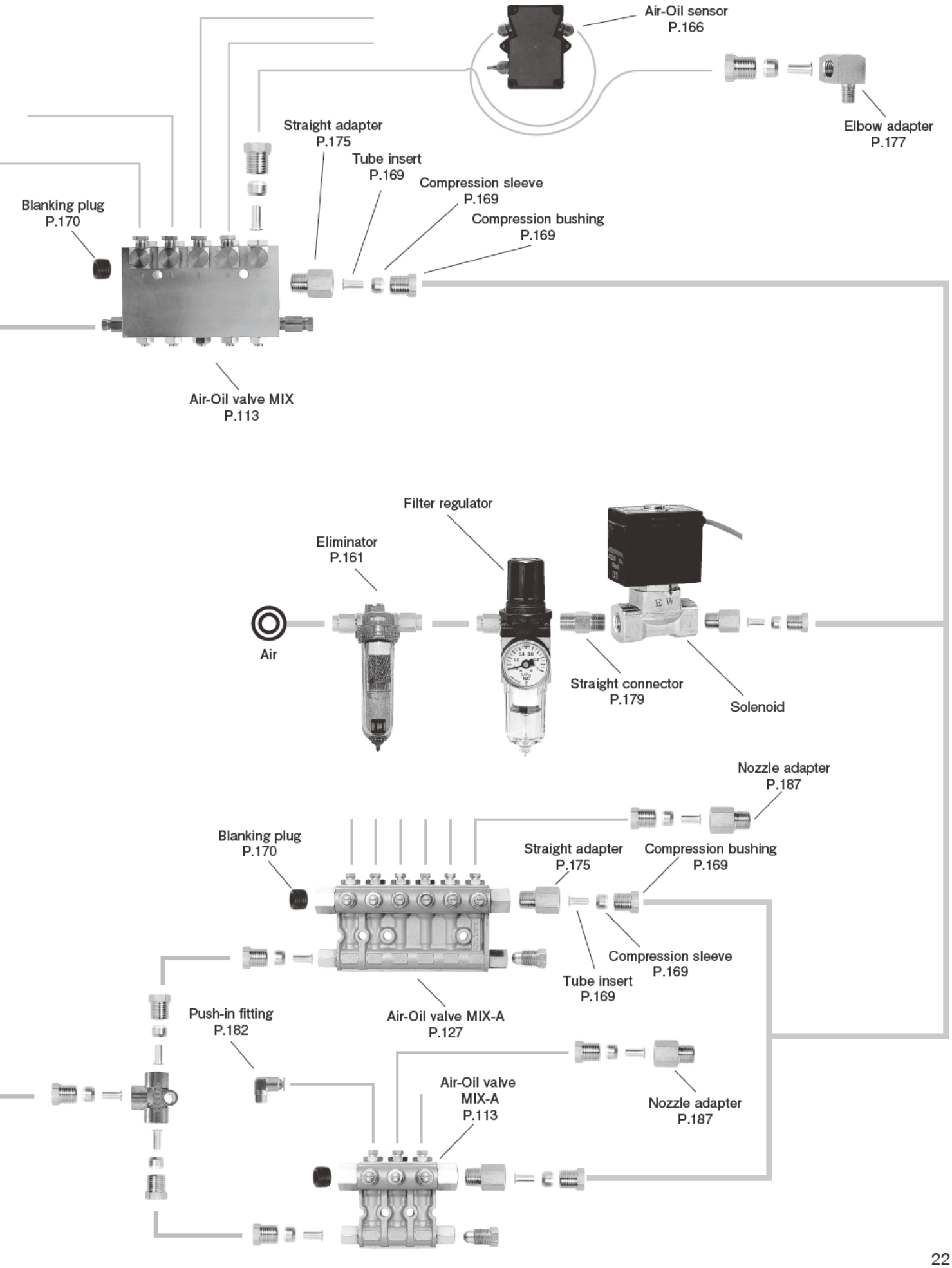
Filter
P.159

Tubing
P.171

●Related parts

LRA analysis
P.197

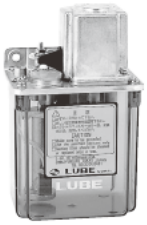
●Tubing
- ϕ8 Nylon tubing
- ϕ6 Nylon tubing
- ϕ4 Nylon tubing


Air-Oil sensor
P.166
Elbow adapter
P.177
Straight adapter
P.175
Tube insert
P.169
Compression sleeve
P.169
Compression bushing
P.169
Blanking plug
P.170
Air-Oil valve MIX
P.113
Filter regulator
Eliminator
P.161
Air
Straight connector
P.179
Solenoid
Nozzle adapter
P.187
Blanking plug
P.170
Straight adapter
P.175
Compression bushing
P.169
Compression sleeve
P.169
Tube insert
P.169
Air-Oil valve MIX-A
P.127
Push-in fitting
P.182
Air-Oil valve
MIX-A
P.113
Nozzle adapter
P.187

(SLR) Single Line Resistance compact system for Small Machines with intermittent delivery

AMR-ⅢDS
P.125

MMXL-Ⅲ[CE]
P.121



MLZ
P.119

MMX-Ⅱ
P.123

Elbow connector
P.179

Pressure gauge TAF-7
P.85

Pipe clip
P.172

PJ-3 Junction
P.141

Compression bushing
P.169

Compression sleeve
P.169

Couplers
P.181

Sensor
P.164

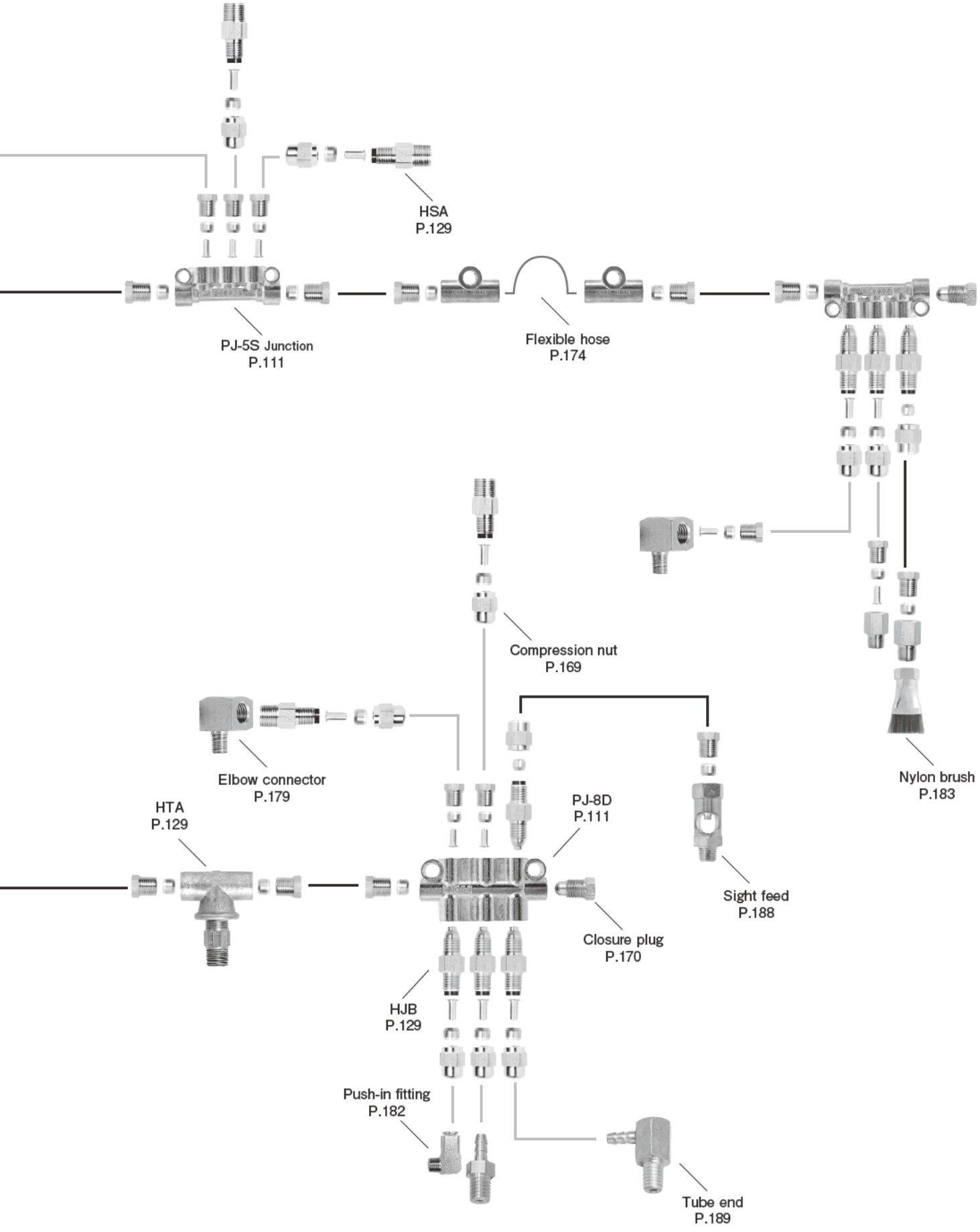
Filter
P.159

Filter
P.159

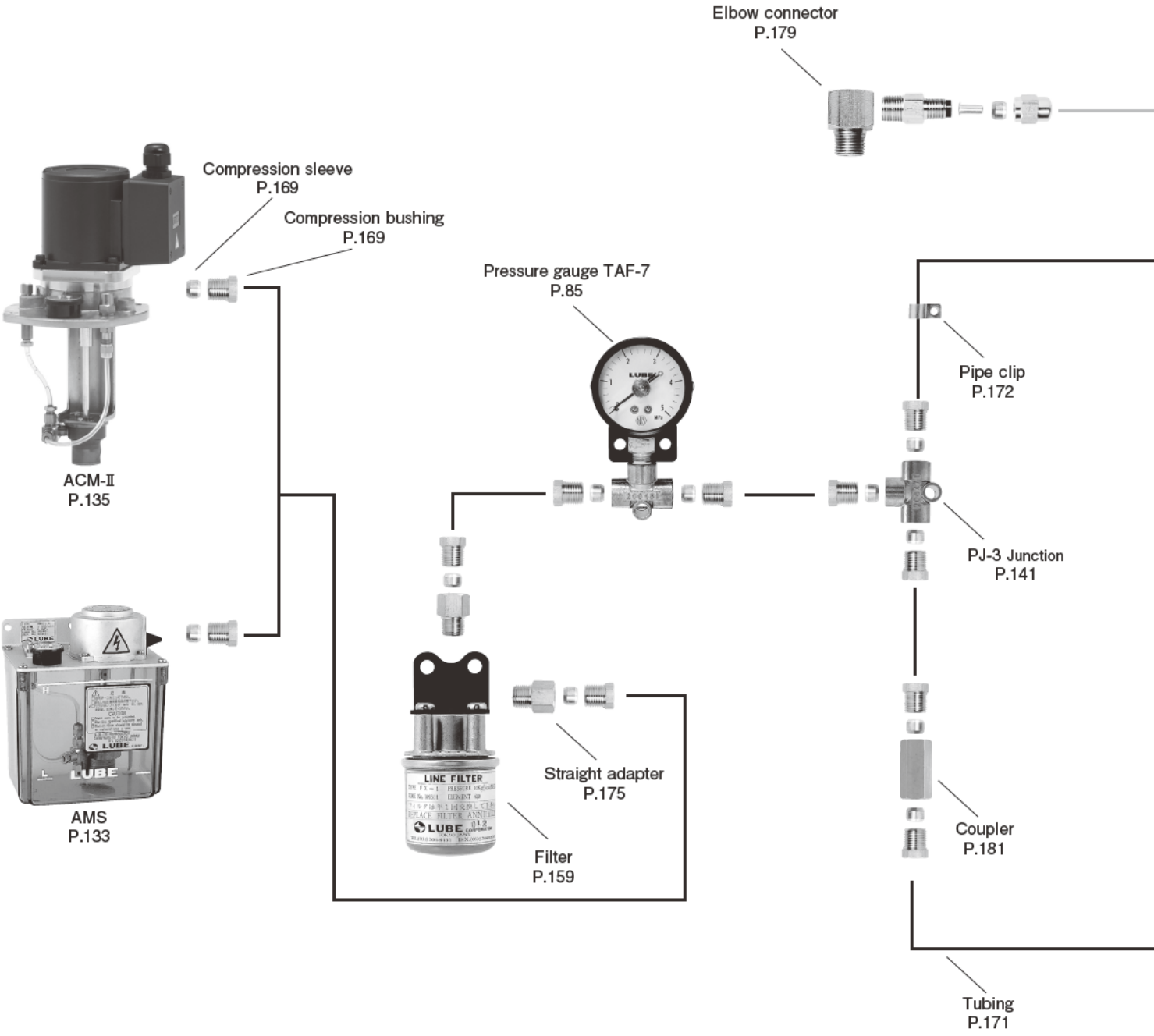
●Related parts

LRA analysis
P.197

●Tubing
- φ4 Steel tubing
- φ4 Nylon tubing


HSA
P.129
PJ-5S Junction
P.111
Flexible hose
P.174
Compression nut
P.169
Nylon brush
P.183
Elbow connector
P.179
HTA
P.129
PJ-8D
P.111
Sight feed
P.188
Closure plug
P.170
HJB
P.129
Push-in fitting
P.182
Tube end
P.189

(SLR) Single Line Resistance compact system for Small to Large Machines with

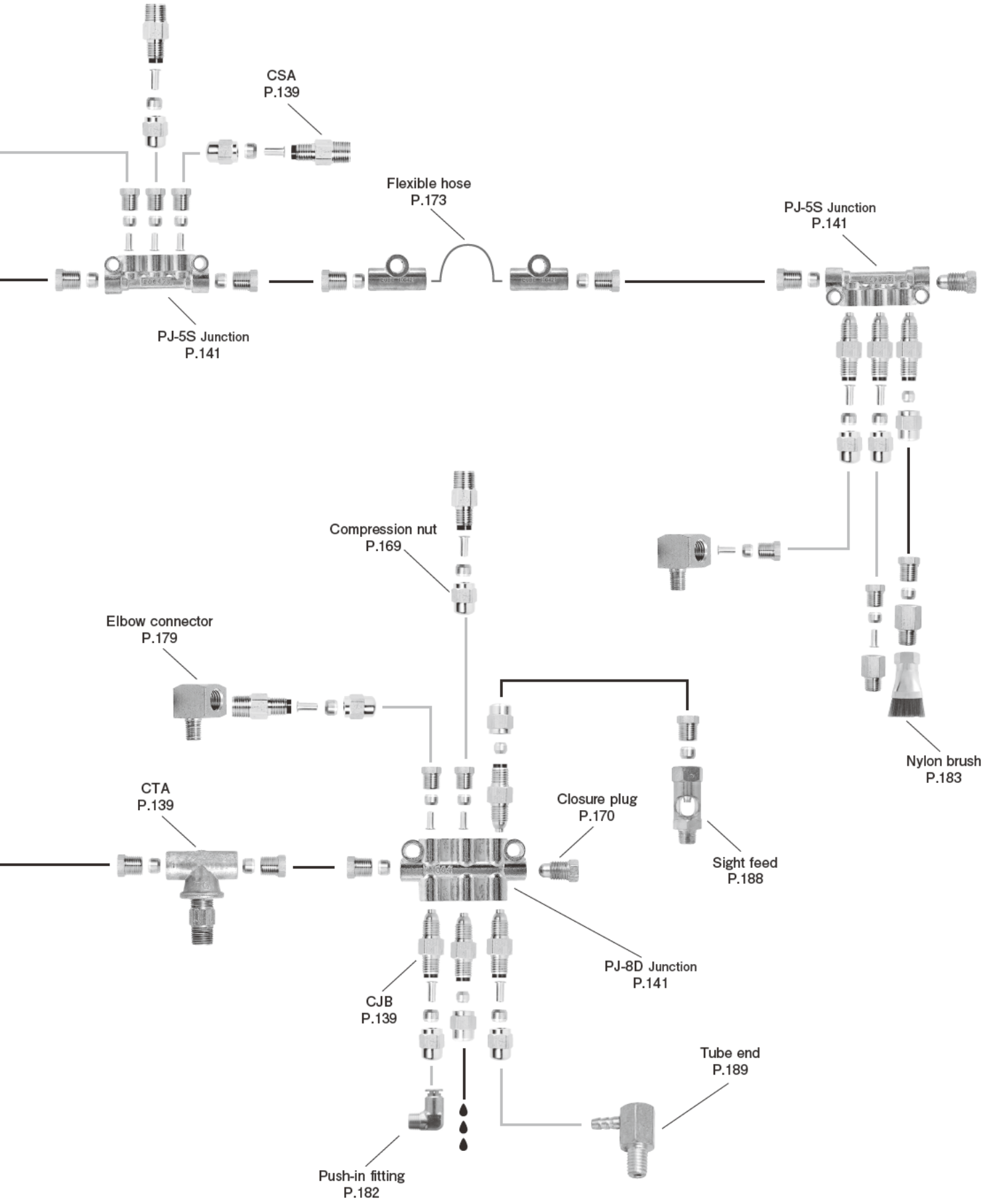


●Related parts

LRA Analysis
P.197

●Tubing
- ϕ4 Steel tubing
- ϕ4 Nylon tubing

continuous (recirculation) delivery



General Catalog
Centralized Lubrication Systems

Right time, Right amount, Right lubricant

LHL/Grease System

LUBE Hybrid Lubrication system

●

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

●

Series Progressive System for Small-Large Machines

LUBE Hybrid Lubrication Systems LHL

LUBE Hybrid Lubricants - LHL
Developed Based on Our 45-year History of Failures and Successes

Problems with oil lubrication

- Oil washed away by cutting fluid (Causing rust).
- Oil mixed into cutting fluid causing deterioration and/or decomposition of cutting fluid.
- Frequent oil refilling and large consumption of oil boosting up the operational costs.

Problems with grease lubrication

- Grease solidification.
- Used grease accumulated in guides or other parts that requires clean-up.
- Reintroduction of metal chips caught by piled up grease into machines.

Advantages of Oil
Liquidity, Excellent Transport Property, No Solidification

Integrating the Advantages of Oil and Grease

Advantages of Grease
High Load-carrying Capacity, Wear Resistance, Water Resistance, Excellent Oil Film Maintenance Property, Adherent Property

Comparison of Lubricant of Consumption and Associated Costs of for Machine Tools

Comparison with oil

Small Machining Center manufacturing hydraulic system parts

●TOOL SIZE #30

●Number of lubrication points (X,Y,Z) 23 points in total

Lubrication System	Oil/ SLR System	LHL System
Number of lubrication points	23	
Lubricant	Oil#68	LHL X-100/300
Cutting Fluid	Water-soluble	
Total lubricant volume/time	2.5mℓ	1.45mℓ

Comparison of Lubricant of Consumption and Associated Costs

	Oil	LHL
Annual lubricant consumption	87.6ℓ	2.1ℓ
Annual lubricant refilling time	96Times	3Times
Annual CO2 Emissions	649kg	11.9kg
Comparison of cost between oil and LHL	$2,300.00	$638.50

<Condition for calculation>

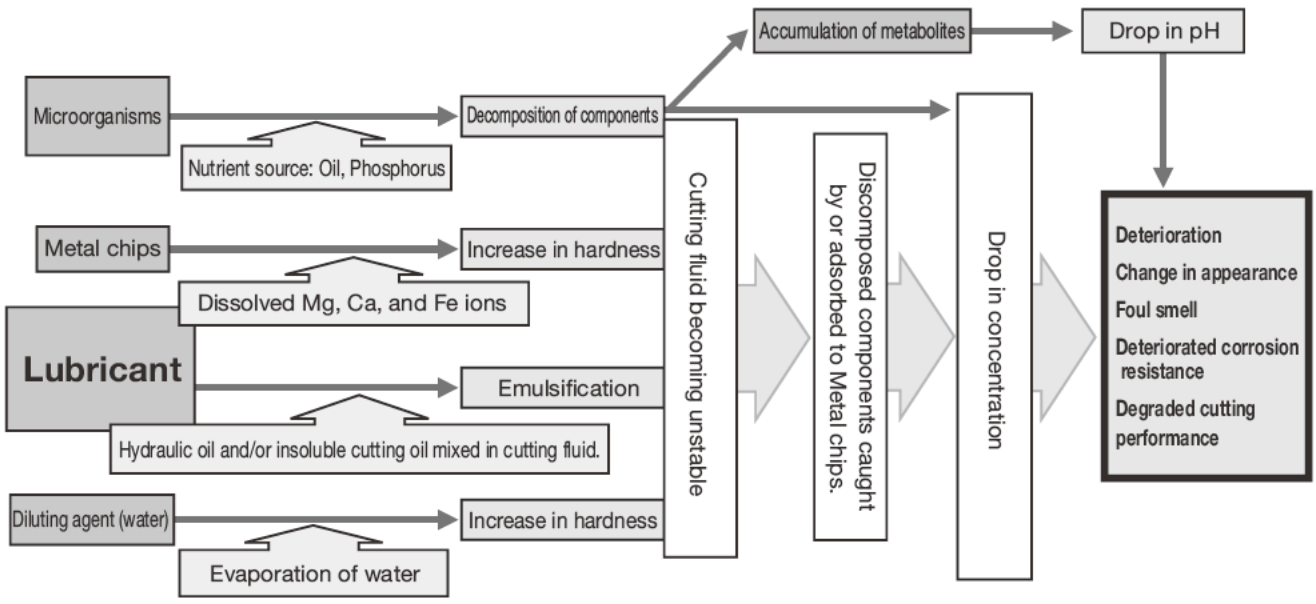
Quantity of LHL consumed: Based on our standard LHL quantity & interval Table. 60m/min. Traveling speed gives 5 hours interval.

- The comparison above is just for reference. Actual oil and LHL quantities required for each lubrication cycle, the annual consumptions and costs vary depending on the actual machine operating conditions, lubrication conditions, essential parts size and other factors.

Operating Life of Cutting Fluid

The deterioration and/or shortened operating life of cutting fluid is partly caused by lubrication oil and/or hydraulic oil mixed in the cutting fluid.
The LHL systems minimize the amount of lubricant mixed in the cutting fluid, reducing to less than one-tenth of that of oil.

Relationship between the deterioration of cutting fluid and tramp oil in the cutting fluid

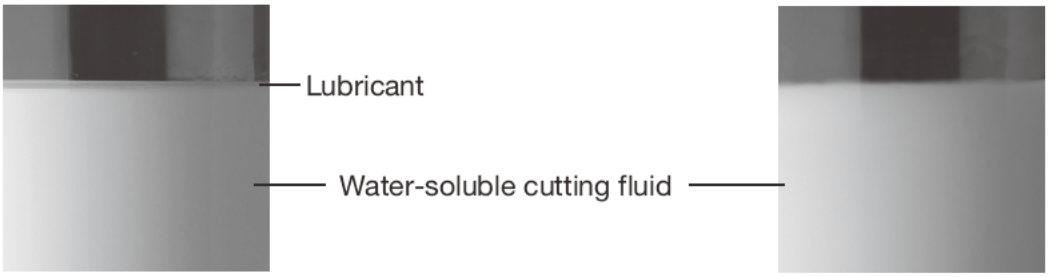


Source: Materials provided by Kyodo Yushi Co., Ltd.

Machine User A: Investigation of tramp oil in cutting fluid

*The results may be different from what shown in the photo below depending on conditions.

Details of investigation: Investigating the conditions of the cutting fluid sampled out of the machining centers located in the same machining line.



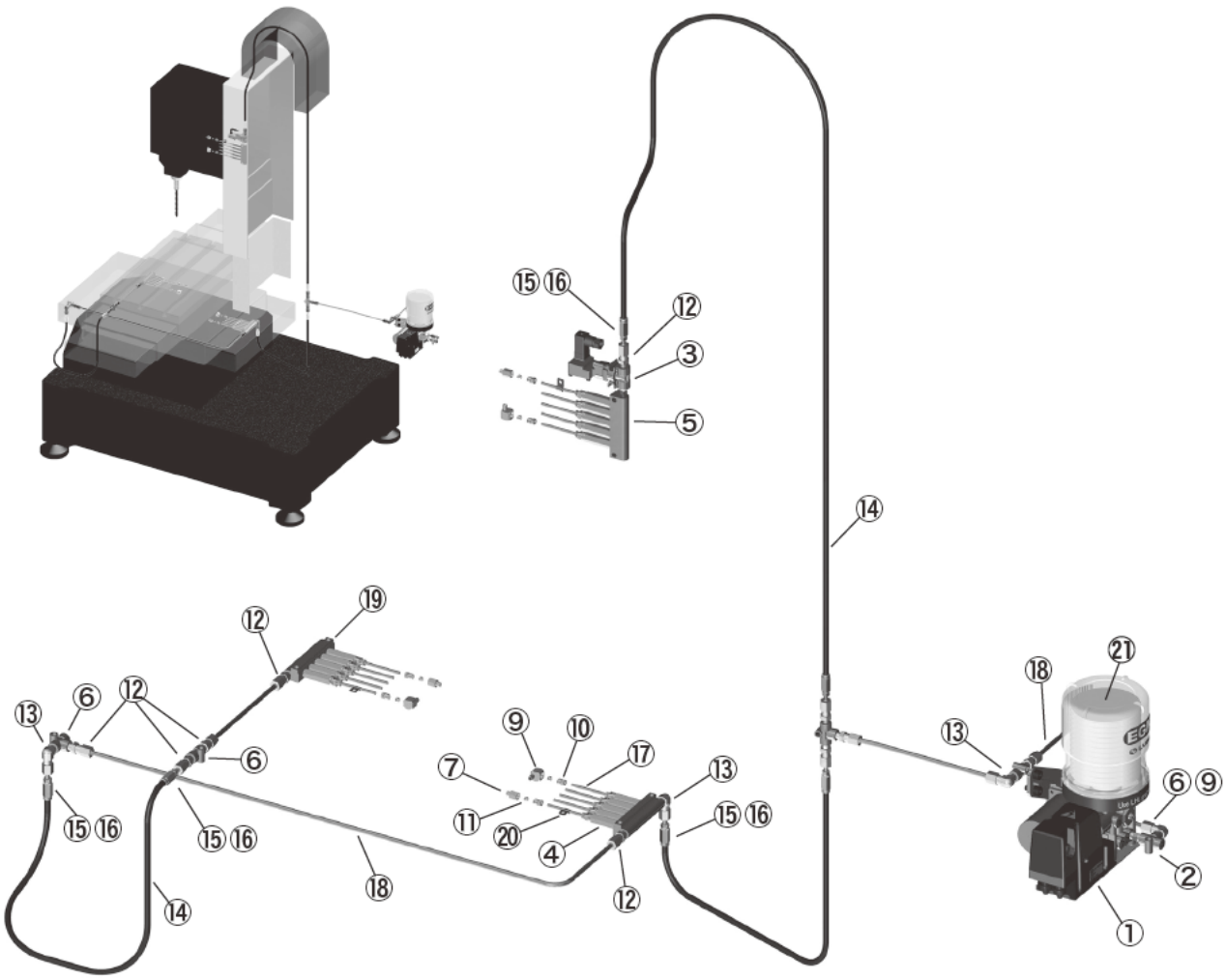
<Cutting fluid sampled from a machine lubricated with oil >
Equipped with a centralized oil lubrication system
(Lubricant: Daphne Multiway 68MT)
Cutting fluid of company N's machining unit

< Cutting fluid sampled from a machine lubricated with LHL>
Installed LHL system in December 2006.
Cutting fluid of company S's machining unit

Being in the same machining line, maintenance for the cutting fluid of these two machines were done at the same time. The cutting fluid samples were collected randomly while the coolant pumps were running followed by being left to rest for three days. Tramp oil was observed in the sample from the machine with oil lubrication system while it was hardly observed in the sample from the machine with LHL lubrication system.

The amount of lubricant delivered by LHL system is 5% to 10% of that of the oil system. However, when it comes to the amount of lubricant actually mixed in the cutting fluid, considering LHL's water resistance and adhesive property, the amount of LHL mixed in the cutting fluid would be even smaller.

“Positive Displacement Injector System”



No.	Part Description	Quantity
1	Motor-driven grease pump	1
2	Pressure gauge	1
3	Pressure switch	1
4	Metering valve	15
5	Junction	3
6	Junction	3
7	Elbow adapter	3
8	Straight adapter	12
9	Straight connector	2
10	Compression bushing	30
11	Compression sleeve	30
12	High-pressure straight fitting	6
13	High-pressure elbow fitting	4
14	High-pressure flexible hose	8m
15	Hose sleeve	6
16	Hose stud	6
17	Steel tubing 4mm	8m
18	Steel tubing 6mm	2m
19	Plug	3
20	Pipe clip	6
21	Grease cartridge	1

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

S Series

EGM Ⅱ

【Pump】

Positive Displacement Electric Pump

PDI plus Progressive Electric Twin Pump
(for "T" series pumps)

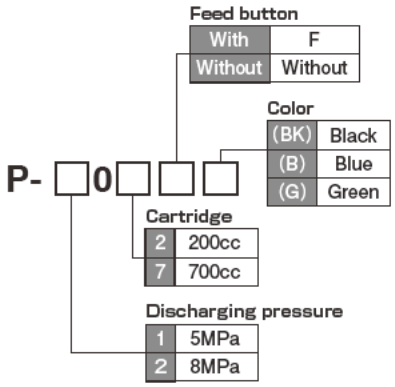
Electric Pump for LHL

P-102/107/202/207

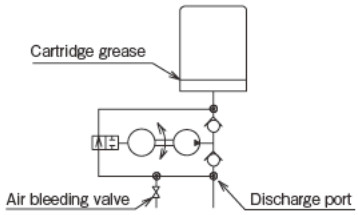
This pump is small, low cost, and only for our LHL original cartridge grease.

[P-107]

HOW to order



Hydraulic circuit diagram



Specifications

Power	DC24V
Power Consumption	24W
Discharging pressure	5MPa/8MPa
Discharging time	No restriction
Interval time	More than 10 seconds
Wiring method	Terminal connection
Manual override switch	With (Optional)
Grease level switch	With
Cover	Non combustible plastic (UL94-V0)
Protection class	IP54
CE approval	With
Pump air bleeding	No restriction

Directions for use

- Usage cartridge: LHL
- Use LUBE original LHL cartridge
- When the cartridge is changed, pay attention that foreign particles are not getting inside.
- Do not discharge continuously.
- After changing the cartridge, bleed the air inside the pump by opening the air bleeding valve.

● Related parts


MU valve
: P.53


MUJ junction
: P.54


MDP valve
: P.55


GPL Pressure Switch
: P.62

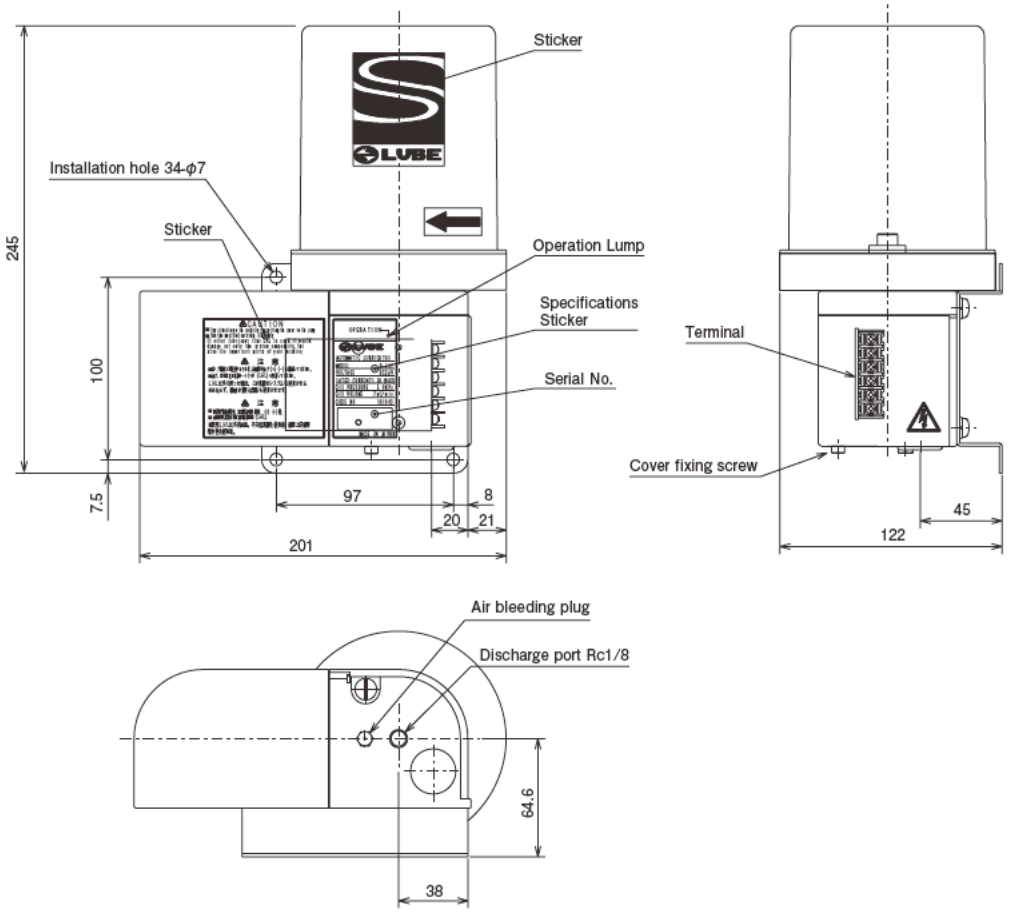

Pressure gauge
: P.85


Main tubing
: P.174

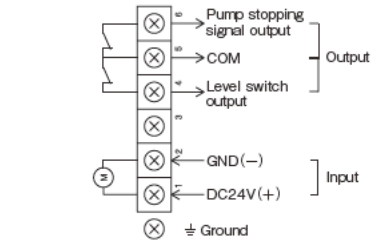

Adapter assemblies
: P.185


LHL
: P.82

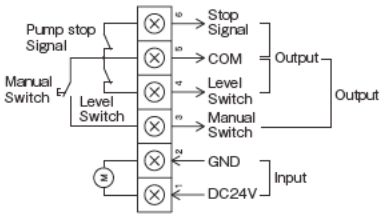
Dimensional drawing



Wiring diagram

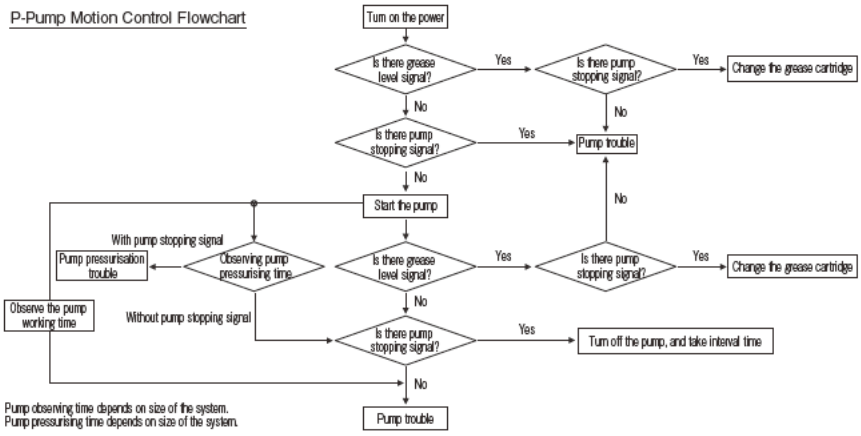


Without feed button



With feed button

P-107 Pump motion control flowchart



Positive Displacement Injector Electric Pump PDI plus Progressive Twin Electric Pump (for "T" series pumps)

EGM Ⅱ

This pump is small, low cost, and only for our original cartridge grease.

[EGM Ⅱ]

HOW to order

Feed button

With	FB
Without	Without

※ If it is T-type, it hasn't got manual override switch.

EGMⅡ-□□-4-7CL□-(LHL)

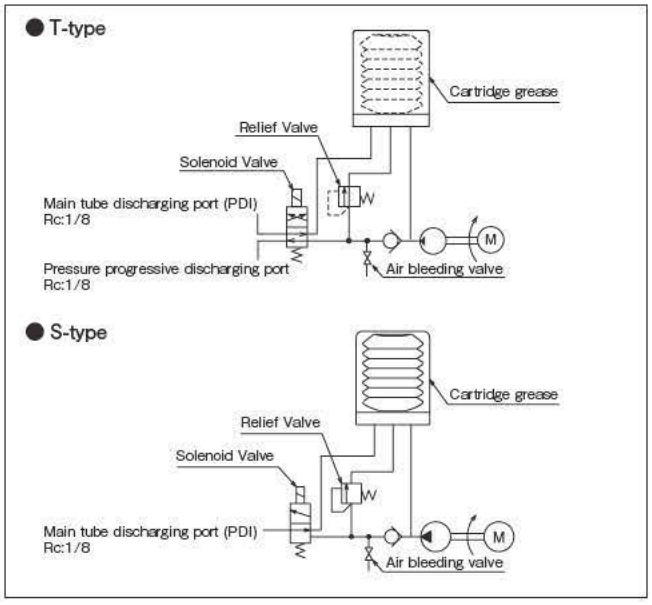
※②: Only if it's 8MPa.

S	Positive Displacement Injector(PDI) System
T	Positive Displacement Injector(PDI) System and Progressive System

※If it's 8MPa, it must be only Positive Displacement Injector(PDI) System

8	8MPa (Only for LHL System)
10	10MPa

Hydraulic circuit diagram



Specifications

Power	DC24V
Power Consumption	45.6W
Discharging pressure	8MPa (Only for LHL System)
	10MPa
Maximum discharging time	Below 7m 30s
Interval time	3 times discharging time
Wiring method	Terminal connection
Manual override switch	With(Optional: Only PDI system) ※1
Grease level switch	With
Solenoid cover	Non combustible plastic (UL94-V0)
Protection class	IP54
CE approval	With
Pump air bleeding	With restriction

※1 Although the Manual Override Switch provides a dry contact to activate the pump, its capacity is not sufficient to sustain the power required to operate the pump. Therefore, the power needs to be provided directly to the pump from the machine control panel.

Directions for use

- Use recommended grease.
- 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 the cartridge is changed, pay attention that foreign particles are not getting inside.
- Do not discharge continuously.
- After changing the cartridge, bleed the air inside the pump by opening the air bleeding valve.

● Related parts


MG2 metering valve : P.57


MG2C metering valve : P.57


JVPA junctions : P.58


MGI metering valve : P.59


MGLA metering valve : P.61


GPL pressure switch : P.62


Pressure gauge : P.85


Main tubing : P.174

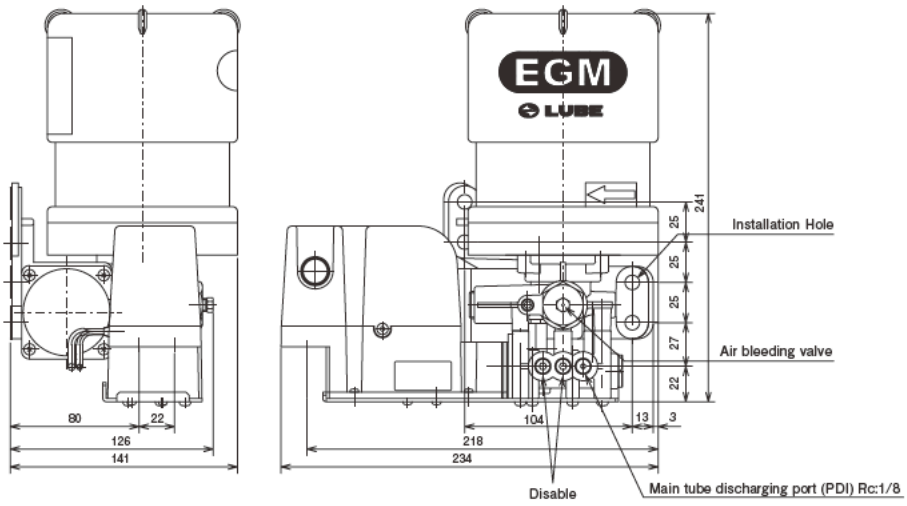

Adapter assemblies : P.185


LUBE original grease : P.81

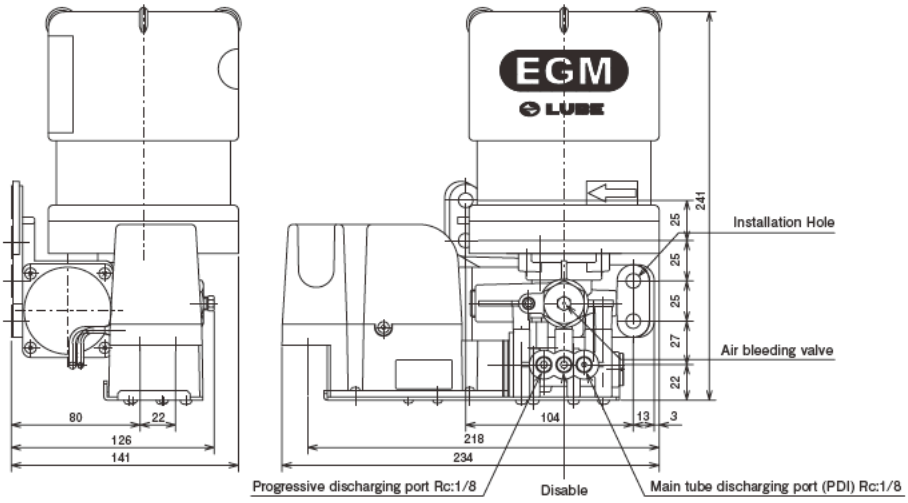

LHL : P.82

Dimensional drawing

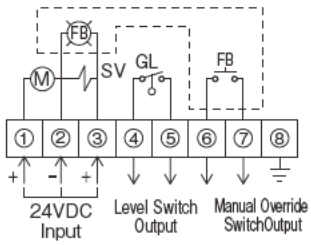
[EGM Ⅱ-10S-4-7CLFB]



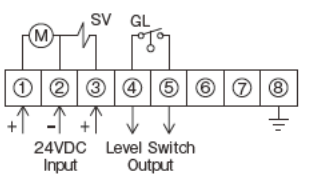
[EGM Ⅱ-10T-4-7CL]



Wiring diagram

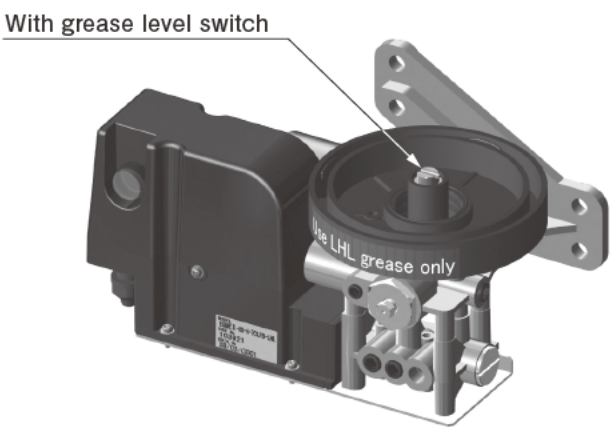


With feed button



Without feed button

Grease level switch



Positive Displacement Injector Electric Pump with solenoid protection

PDI plus Progressive Twin Electric Pump (for "T" series pumps)

EGME Ⅱ

This pump is a small, low cost pump only for our original cartridge grease. EGME-II pumps have a built in solenoid protection circuit which eliminates the 7.5 min maximum running time of other EGM pumps.

[EGME Ⅱ]

HOW to order

Feed button

With	FB
Without	Without

※ If it is T-type, it hasn't got manual override switch.

EGMEⅡ-□□-4-7CL□-(LHL)

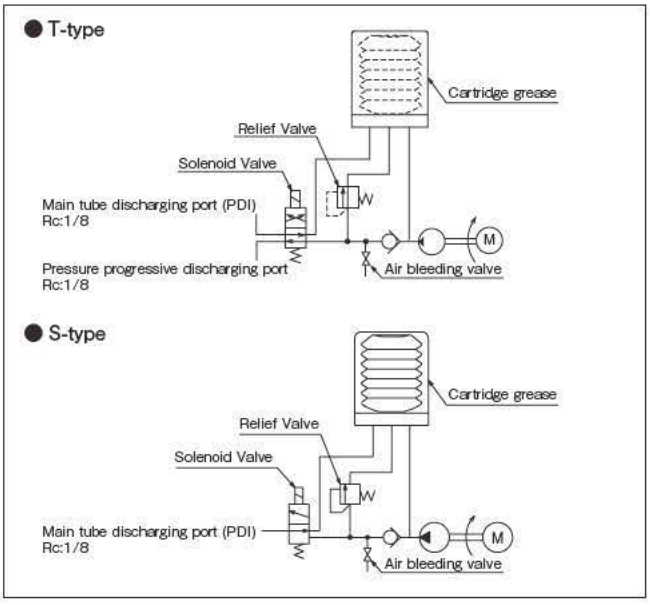
※②: Only if it's 8MPa.

S	Positive Displacement Injector(PDI) System
T	Positive Displacement Injector(PDI) System and Progressive System

※If it's 8MPa, it must be only Positive Displacement Injector(PDI) System

8	8MPa (Only for LHL System)
10	10MPa

Hydraulic circuit diagram



Specifications

Power	DC24V
Power Consumption	28.8W
Discharging pressure	8MPa (Only for LHL System)
	10MPa
Maximum discharging time	No restriction
Interval time	More than 10 seconds
Wiring method	Terminal connection
Manual override switch	With(Optional: Only PDI system) ※1
Grease level switch	With
Solenoid cover	Non combustible plastic (UL94-V0)
Protection class	IP54
CE approval	With
Pump air bleeding	With restriction

※1 Although the Manual Override Switch provides a dry contact to activate the pump, its capacity is not sufficient to sustain the power required to operate the pump. Therefore, the power needs to be provided directly to the pump from the machine control panel.

Directions for use

- Use recommended grease.
- 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 the cartridge is changed, pay attention that foreign particles are not getting inside.
- Do not discharge continuously.
- After changing the cartridge, bleed the air inside the pump by opening the air bleeding valve.

● Related parts


MG2 metering valve : P.57


MG2C metering valve : P.57

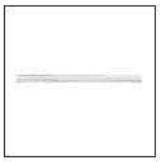

JVPA junctions : P.58


MGI metering valve : P.59


MGLA metering valve : P.61


GPL pressure switch : P.62


Pressure gauge : P.85


Main tubing : P.174

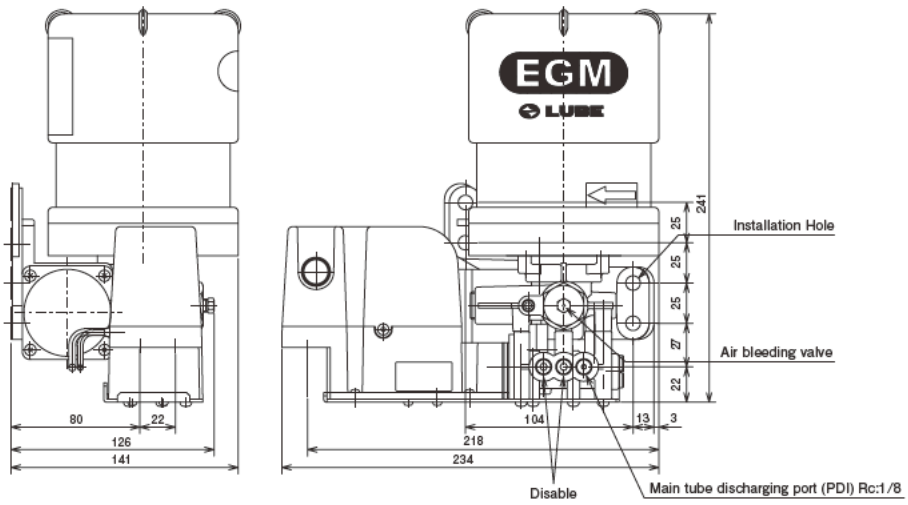

Adapter assemblies : P.185


LUBE original grease : P.81

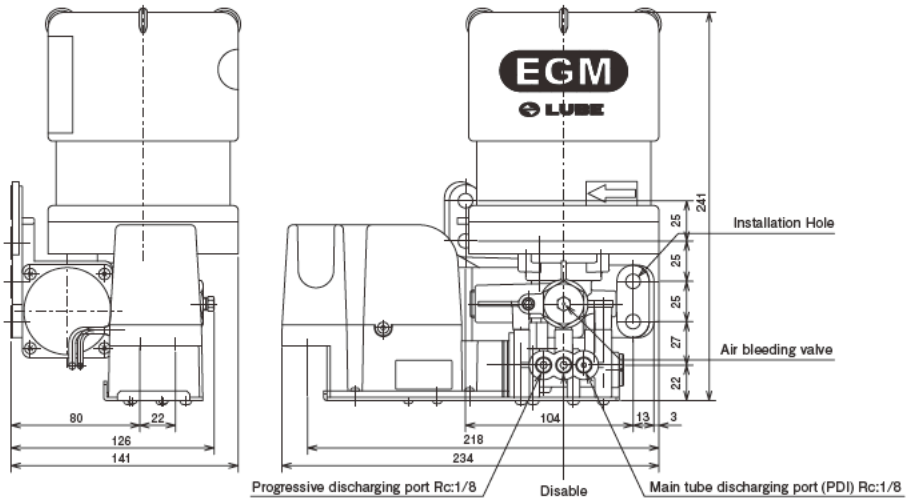

LHL : P.82

Dimensional drawing

[EGME Ⅱ-10S-4-7CLFB]

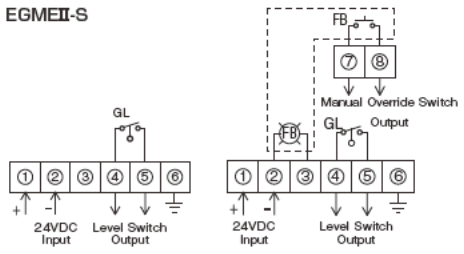


[EGME Ⅱ-10T-4-7CL]

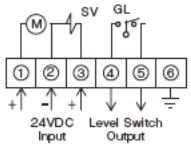


Wiring diagram

EGMEⅡ-S

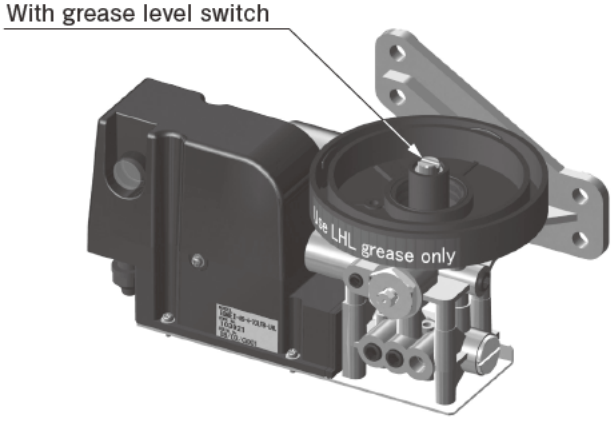


EGMEⅡ-T



Without feed button

Grease level switch



Multi-Port Centralized Lubrication System

YMT

【YMT】

Cartridge type grease pump

YMT

YMT is the only centralized lubrication system that offers grease cartridges suitable to lubricate industrial machines working in the various and yet severe environments.

HOW to order

Pumping unit

6	Discharge volume 2ml/min(539291)
8	Discharge volume 3.9ml/min(539292)

YMT-□-□T-□

Quantity of pumping unit 1~5

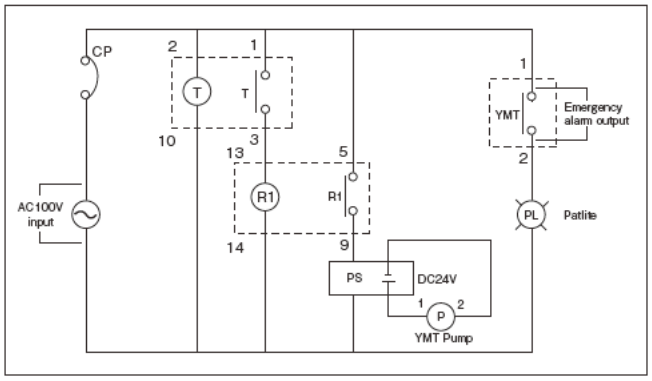
Capable of controlling up

3	Maximum 3
5	Maximum 5

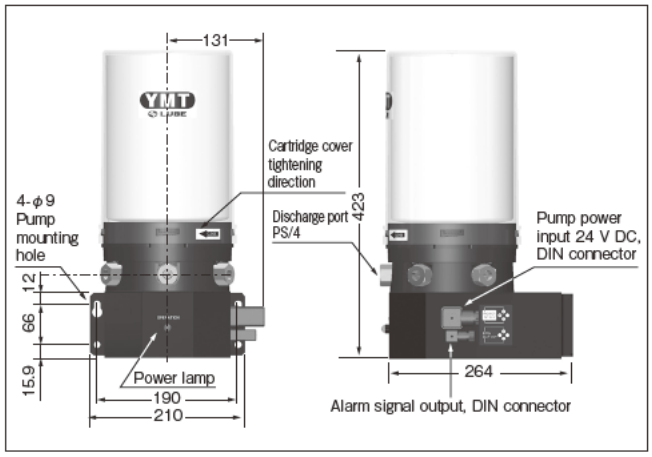
Specifications

Discharge Pressure	Rated 25MPa, Maximum 35Mpa
Discharge Volume	2ml/min. (with 6mm Dia. Pumping Unit)
Number of Pumping Unit	1 to 3 Units or 1 to 5 Units(The number of the pumping units varies depending on the model.)
Voltage	24VDC ± 10%
Reservoir Capacity	4 Liters Lube Original Grease Cartridge
Grease	Specified grease for YMT (NLGI No. 000 to 2)
Alarm Output	Grease Level Alarm , No Cartridge Alarm

Hydraulic circuit drawing



Dimensional 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.
- Avoid continuous operation

● Related parts


SP series progressive valve : P.71

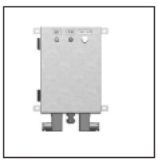

AP series progressive valve : P.71


Main tubing : P.174

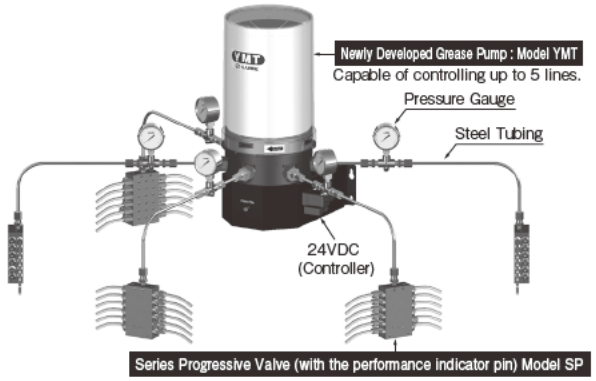

Adapter assemblies : P.185


Pneumatic pump for pail : P.86


Cartridge : P.44


Controller : P.44

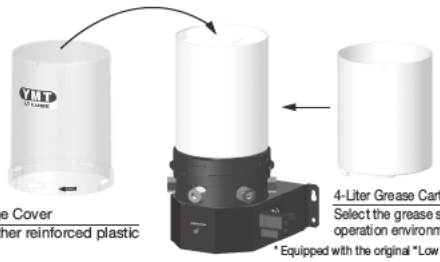
Multi-Port Centralized Lubrication System YMT



Lube offers ferrography analysis to check lubrication conditions.
* Free of charge for the first analysis.

Why Grease Cartridges ?

Grease cartridges are not only easy to replace but also prevent the introduction of air and/or foreign substances into the system during grease refilling, thus insuring a steady delivery of clean grease to lubrication points. These are the reasons why we highly recommend the Lube grease cartridge pump system.



Cartridge Cover
All-weather reinforced plastic

4-Liter Grease Cartridge (Standard)
Select the grease suitable for machine operation environment and conditions.

* Equipped with the original "Low Grease Level Switch".

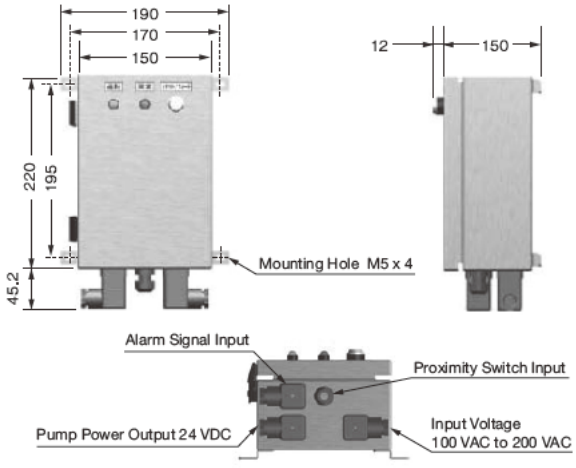
Advantages of LUBE Cartridge Pump
- Significantly reduces grease refilling time comparing to the conventional reservoir pump.
- Eliminates the introduction of air and/or foreign substances during storage and/or refilling.
- Prevents mixing different kinds of grease which causes performance degradation and/or solidification of grease.
- Prevents contamination to working environment around machines often seen during a messy refilling procedure for a conventional reservoir pump.

Lube Original Grease Cartridge Specified for the YMT Centralized Lubrication System (Less frequent replacement work required. Thanks to 4 liters large cartridge capacity.)

The original grease cartridges for LUBE centralized lubrication systems were developed from 30 years of trials and errors.

MP2 High-performance Grease for General Industrial Machines.	Lithium-based grease for general industrial machines with extreme pressures property and a wide range of application.
YM2 High Load and High Pressure Grease	Grease containing organic molybdenum with excellent heavy load carrying capacity, abrasion resistance and seizure resistance.
LHL300 Excellent in Lubricating Tight Lubrication Points with a Small Amount and Low System Pressure	High-fluidity grease with excellent migration property and heavy load carrying capacity.
LUL-2H High Temperature and Water Resistant Grease	Grease for severe environments with excellent heat and water resistance.
LBL-2 Biodegradable Grease	Environmentally-friendly grease reducing soil and water pollution.
LFL-H1 Food Grade Grease Certified by NSF as H1 Lubricant	LFL-H1 is certified as a H1 grade lubricant by NSF, the organization approved by the ANSI, and safe to use in food, beverage and pharmaceutical industries. **[H1 Grade Grease]** is defined as the grease that is safe to be in accidental contacts with food.

YMT Pump Controller

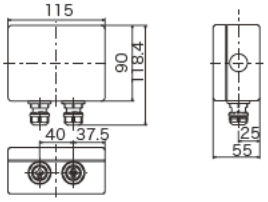


Controller Specifications

Input Voltage	AC100V, AC200V 50/60Hz
Discharge Volume Control	Timer or Count
Discharge Time	(Selectable by the Selecting Switch)1 to 99 minutes (1-minute step)
Number of Count	1 to 99 counts (1-count step)
Interval	1 to 99 hours (1-hour step)
Alarm Detection	- Grease Level - No Cartridge - Pressure Alarm - Valve Malfunction (Count Mode only)
Alarm Signal Output	Normally Open or Normally Closed Rated Load : 200V 2A or less
Input Signal	Proximity Switch Number of Signal Input : 1 to 5
Protection Class and Standards	CE (Applied), IP65

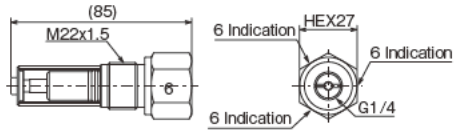
Model	Part Number
YMT-C-E-S-AC	300421-088-200

Terminal box



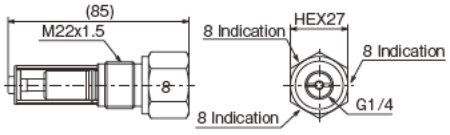
Model	Part Number
YMT-TBOX	300423

Pumping unit



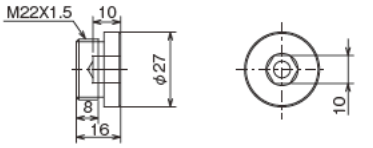
Model	Part Number
PUY-6	539291

●Material: SCM435H



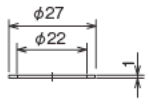
Model	Part Number
PUY-8	539292

●Material: SCM435H



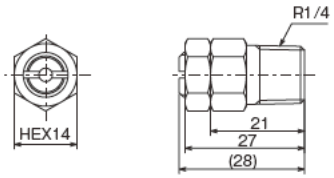
Model	Part Number
BPY	530911

●Material: A2011



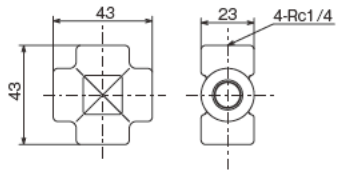
Model	Part Number
SWY	530910

●Material: Teflon



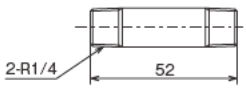
Model	Part Number
RTY	539310

●Material: S45C



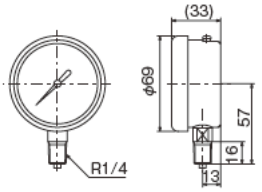
Model	Part Number
JVY	530937

●Material: S45C



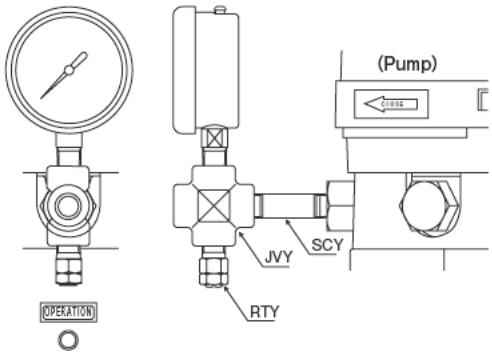
Model	Part Number
SCY	550130

●Material: SGP



Model	Part Number
GV50-R	500649

Assembly



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

EGM-10S-4-7C

EGH-3P

EGH-4C

【Pump】

Positive Displacement Injector (PDI) System

EGM

Motor driven piston pump

[EGM-10S-4-4C]

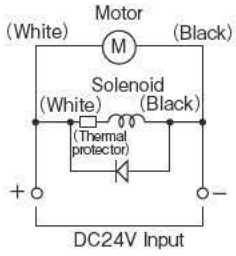
[EGM-10S-4-7C]

HOW to order

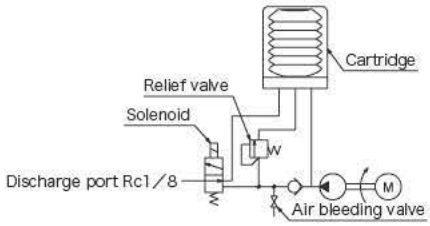
EGM−10S−4−□C

Cartridge	
2	200mℓ
4	400mℓ
7	700mℓ

Wiring diagram



Hydraulic circuit drawing



Specifications

Pump	Discharge volume	10mℓ/min
	Discharge pressure	10MPa
Power DC24V	Motor	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℃)	
Working Viscosity	Cartridge grease No.000,00,0,1	
Recommended grease	MP0, FS2, MT1	
Cartridge size	200mℓ , 400mℓ , 700mℓ	
Weight	1.8kg (4C) , 2.8kg (7C)	
Pressure relief	Built-in solenoid	

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
- For normal operation or when filling grease into the main tubing, please remember to adhere to the 3 to 1 ratio for off time to running time not exceeding 7.5 minutes. Failure to follow this could result in permanent damage to the solenoid not allowing the pump to ever build pressure.

● Related parts


MG2 metering valve
: P.57


MG2C metering valve
: P.57


JVPA junctions
: P.58


MGI metering valve
: P.59


MGLA metering valve
: P.61


GPL pressure switch
: P.62


Pressure gauge
: P.85

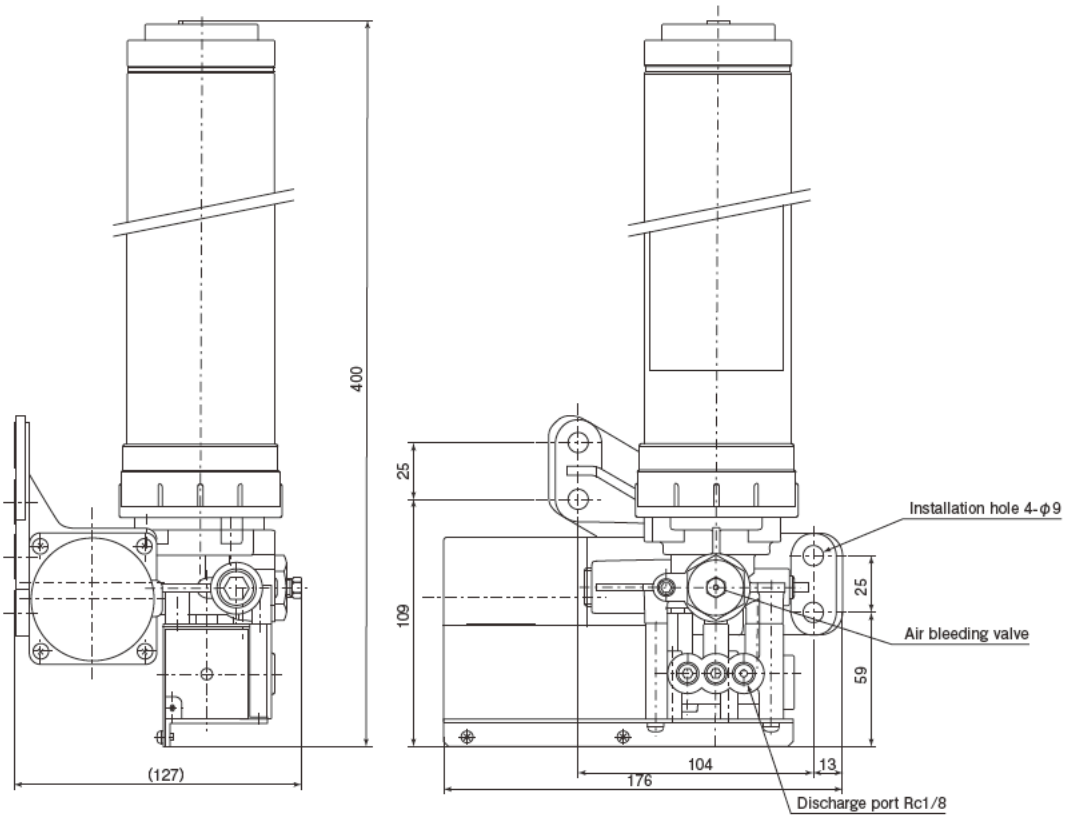

Main tubing
: P.174


Adapter assemblies
: P.185

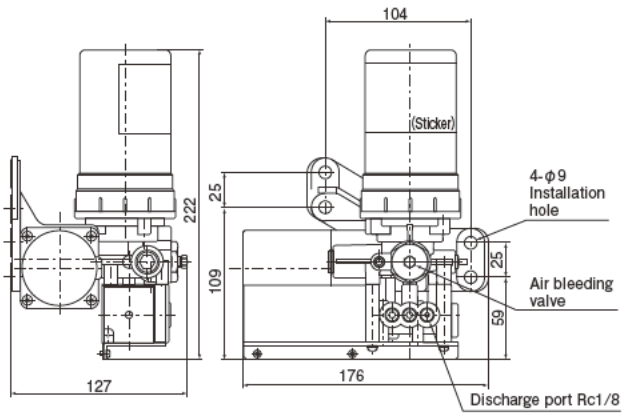

LUBE original grease:
P.81


LHL
: P.82

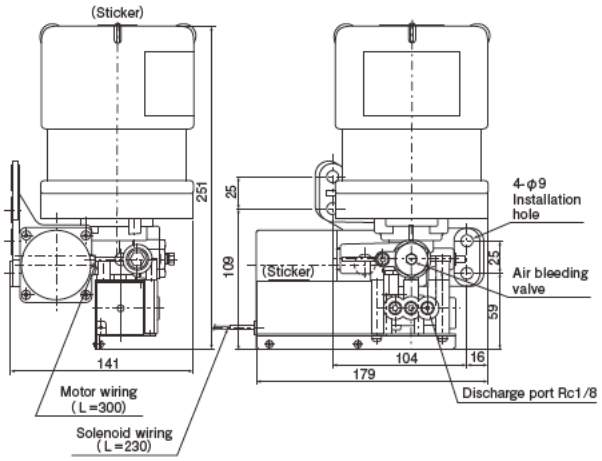
Dimensional drawing



[EGM-10S-4-4C]



[EGM-10S-4-2C]



[EGM-10S-4-7C]

Positive Displacement Injector (PDI) System

EGH

Compact, low-cost manually operated pump

Reservoir type
[EGH-3P]

Cartridge type
[EGH-2C]

Cartridge type
[EGH-4C]

HOW to order

EGH-□□

Type of reservoir (effective capacity)

3P	Reservoir type(260mℓ)
2C	Cartridge type(200mℓ)
4C	Cartridge type(400mℓ)

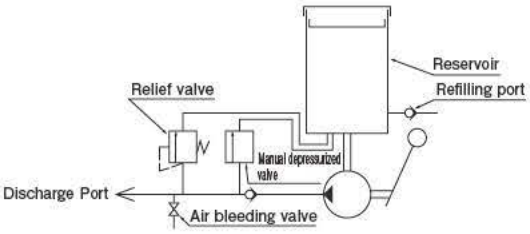
Directions for use

- Use recommended cartridge greases
- Never use molybdenum disulfide-contained grease.
- Use lithium greases.
- Do not use any greases containing substances that attack brass and rubber.
- When refilling or replacing cartridge, take care not let foreign matter in the grease or pump.
- After refilling or replacing cartridge, always loosen the air bleed valve to purge the pump of air.
- Use the pressure relief lever correctly.

Specifications

EGH-3P		
Pump	Discharge volume	1mℓ/stroke
	Discharge pressure	10MPa (safety valve set pressure)
Working Viscosity		NLGI No.000、00、0、1 (lithium grease)
Recommended grease		MP0、FS2、MT1
Reservoir 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

Hydraulic circuit drawing



● Related parts

MG2 metering valve
: P.57

MG2C metering valve
: P.57

JVPA junctions
: P.58

MGI metering valve
: P.59

Pressure gauge
: P.85

Main tubing
: P.174

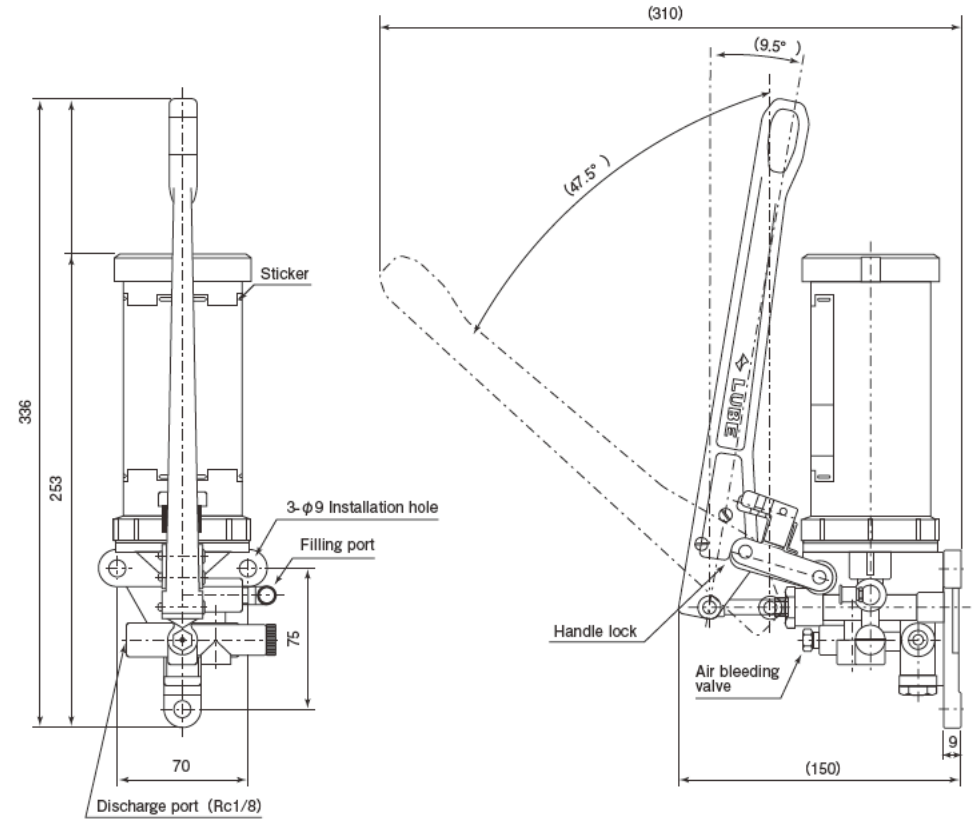
Adapter assemblies
: P.185

Pneumatic pump for pail
: P.86

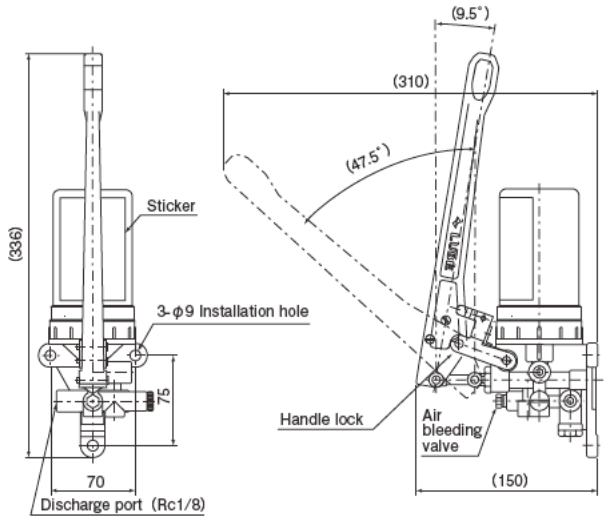
Hand grease gun
: P.86

LUBE original grease :
P.81

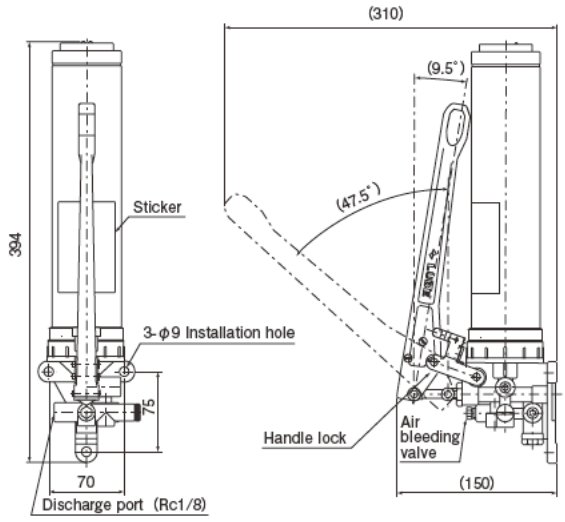
Dimensional drawing



Reservoir type
[EGH-3P]



Cartridge type
[EGH-2C]



Cartridge type
[EGH-4C]

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

MU・MDP

MG2・MG2C

JVPA

MGI

MGLA

GPL

[Valve]

Metering valves for LHL system

S Series MU

The MU style valves are junction mounted Positive Displacement Injectors. Designed with lower operating pressure suitable for use only with LHL and the P-107 pump. 3 types are available for 4mm tail tubing connection. MU has a female hole for a compression bushing, MU-N Type have a male stem for a compression nut, and the MU-C type incorporate a push to connect fitting.

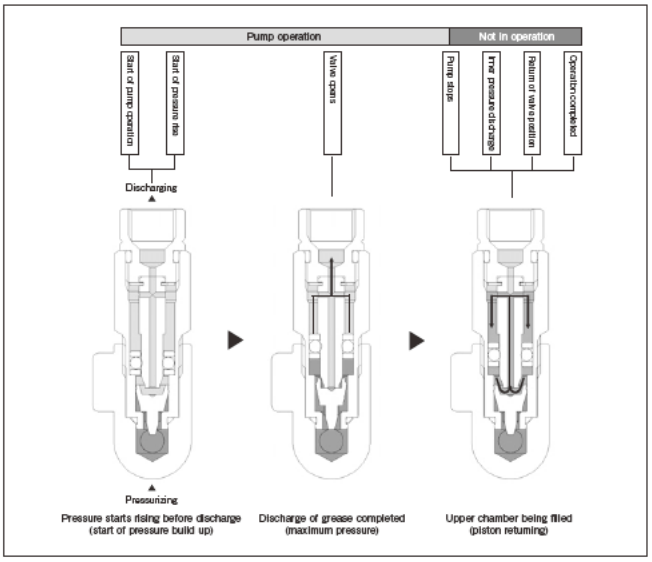
Specifications

Operating pressure	1.5MPa
Reset pressure	0.4MPa

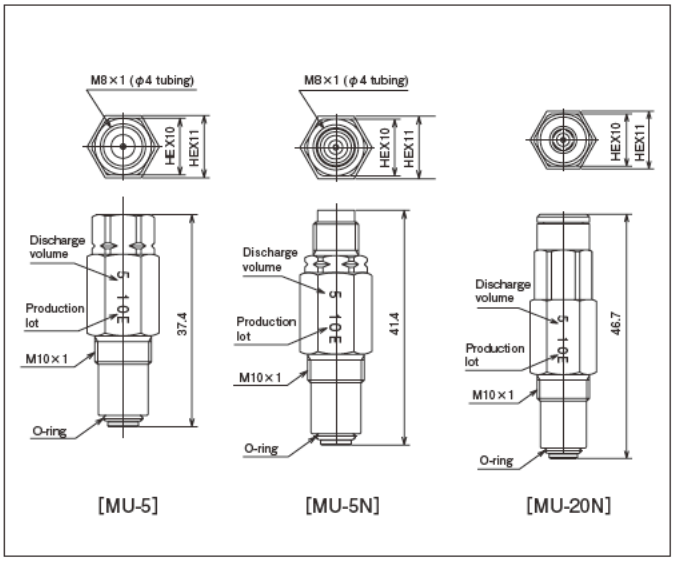
Model

Model	Part Number	Discharge volume (mℓ)	L (mm)	Mark	
MU-5	205872	0.05	37.4	5	HEX12
MU-10	205873	0.1		10	
MU-20	205874	0.2	50.4	20	
MU-5N	205912	0.05	41.4	5	
MU-10N	205913	0.1		10	
MU-20N	205914	0.2	54.4	20	
MU-5C	205922	0.05	46.7	5	
MU-10C	205923	0.1		10	
MU-20C	205924	0.2	59.7	20	

Operation chart



Dimensional drawing



● Related parts


P-107
: P.35


Pressure gauge
: P.85


Main tubing
: P.174


Branch tubing
: P.171


Adapter assemblies
: P.185


Compression parts
: P.169


Adapters
: P.175

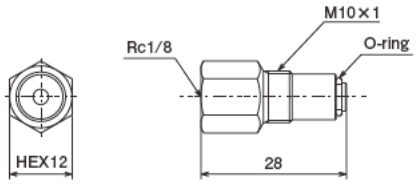

KEN-T
: P.188


KEN-M
: P.188

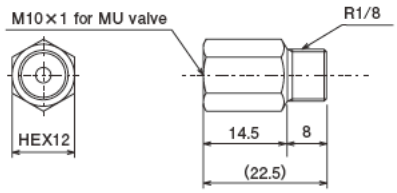
MU Valve Junctions & Special Fittings

For MU small metering valve installation

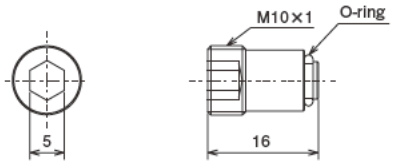
Dimensional drawing



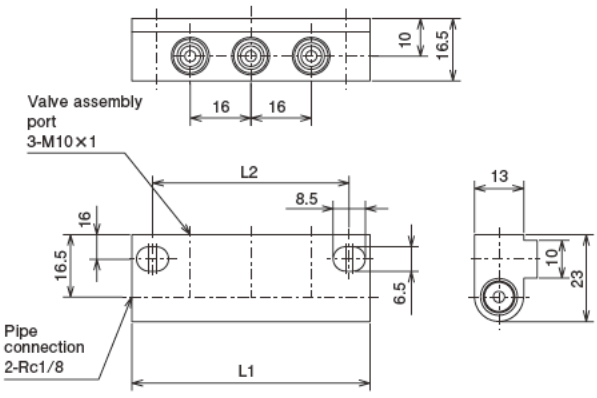
[Connector assembly]



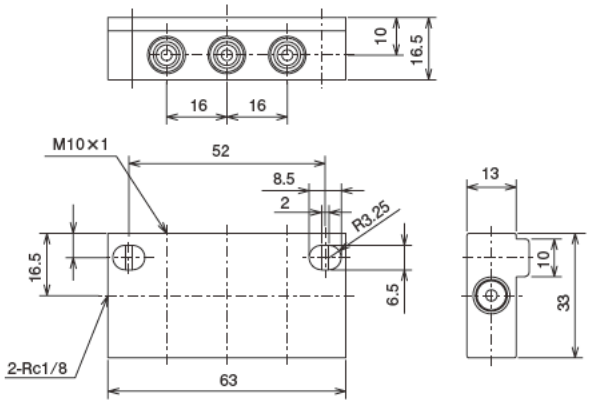
[Adapter]



[Plug assembly]



[Junction MUJ-3S]



[Junction MUJ-6D]

Model

Model	Part Number
MU-SC	619841

●Material: Brass (C3604)

Model	Part Number
MUA	611850

●Material: Brass(C3604)

Model	Part Number
MU-BP	619840

●Material: Steel (SUM24)

Model	Part Number	Specifilcation	L_1	L_2
MUJ- 1S	216101	Single type for 1 port	31	20
MUJ- 2S	216102	Single type for 2 ports	47	36
MUJ- 3S	216103	Single type for 3 ports	63	52
MUJ- 4S	216104	Single type for 4 ports	80	68
MUJ- 5S	216105	Single type for 5 ports	96	84
MUJ- 6S	216106	Single type for 6 ports	112	100
MUJ- 7S	216107	Single type for 7 ports	128	116
MUJ- 8S	216108	Single type for 8 ports	144	132
MUJ- 9S	216109	Single type for 9 ports	160	148
MUJ-10S	216110	Single type for 10 ports	175	164

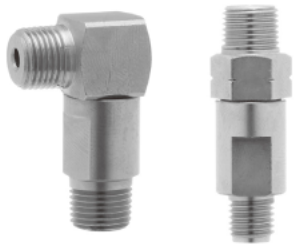
Model	Part Number	Specifilcation	L_1	L_2
MUJ- 2D	216121	Double type for 2 ports	31	36
MUJ- 4D	216122	Double type for 4 ports	47	52
MUJ- 6D	216123	Double type for 6 ports	63	68
MUJ- 8D	216124	Double type for 8 ports	79	84
MUJ-10D	126125	Double type for 10 ports	95	100
MUJ-12D	216126	Double type for 12 ports	111	116
MUJ-14D	216127	Double type for 14 ports	127	132
MUJ-16D	216128	Double type for 16 ports	143	148

●Material: Aluminium (A6063S-T5)

Metering valves for LHL system

S Series MDP

MDP Metering Direct Plunger valves are designed to be installed at the lubrication point. By doing so minimizes the ability for clogging do to separation and allows even further monitoring of the main line pressure.



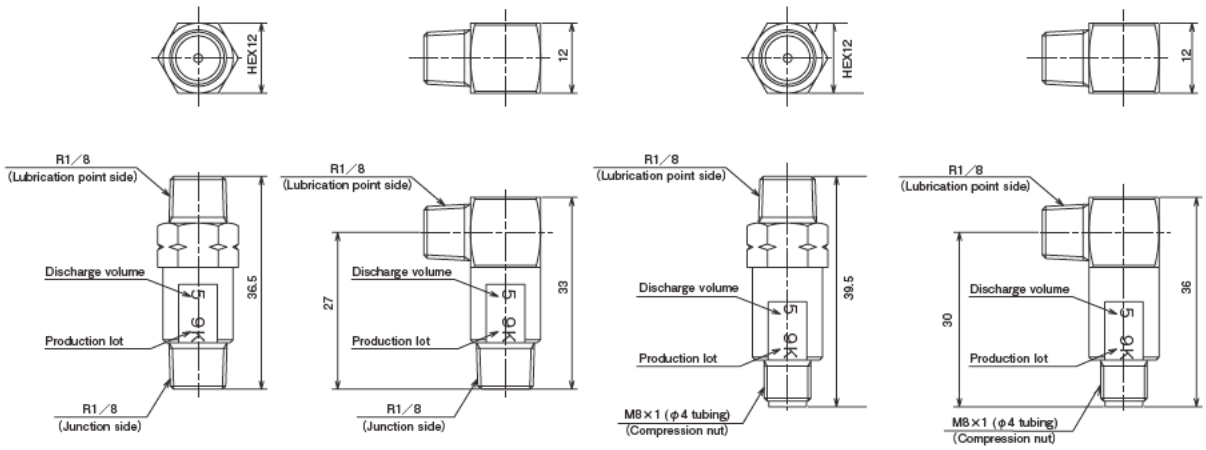
Specifications

Operating pressure	1.5MPa
Reset pressure	0.4MPa

Model

Model	Part Number	Discharge volume (mℓ)	L (mm)	Mark
MDP- 3S	205891	0.03	39.5	3
MDP- 5S	205892	0.05		5
MDP-10S	205893	0.1		10
MDP- 3E	205896	0.03	36	3
MDP- 5E	205897	0.05		5
MDP-10E	205898	0.1s		10
MDP- 3HS	205901	0.03	36.5	3
MDP- 5HS	205902	0.05		5
MDP-10HS	205903	0.1		10
MDP- 3HE	205906	0.03	33	3
MDP- 5HE	205907	0.05		5
MDP-10HE	205908	0.1		10

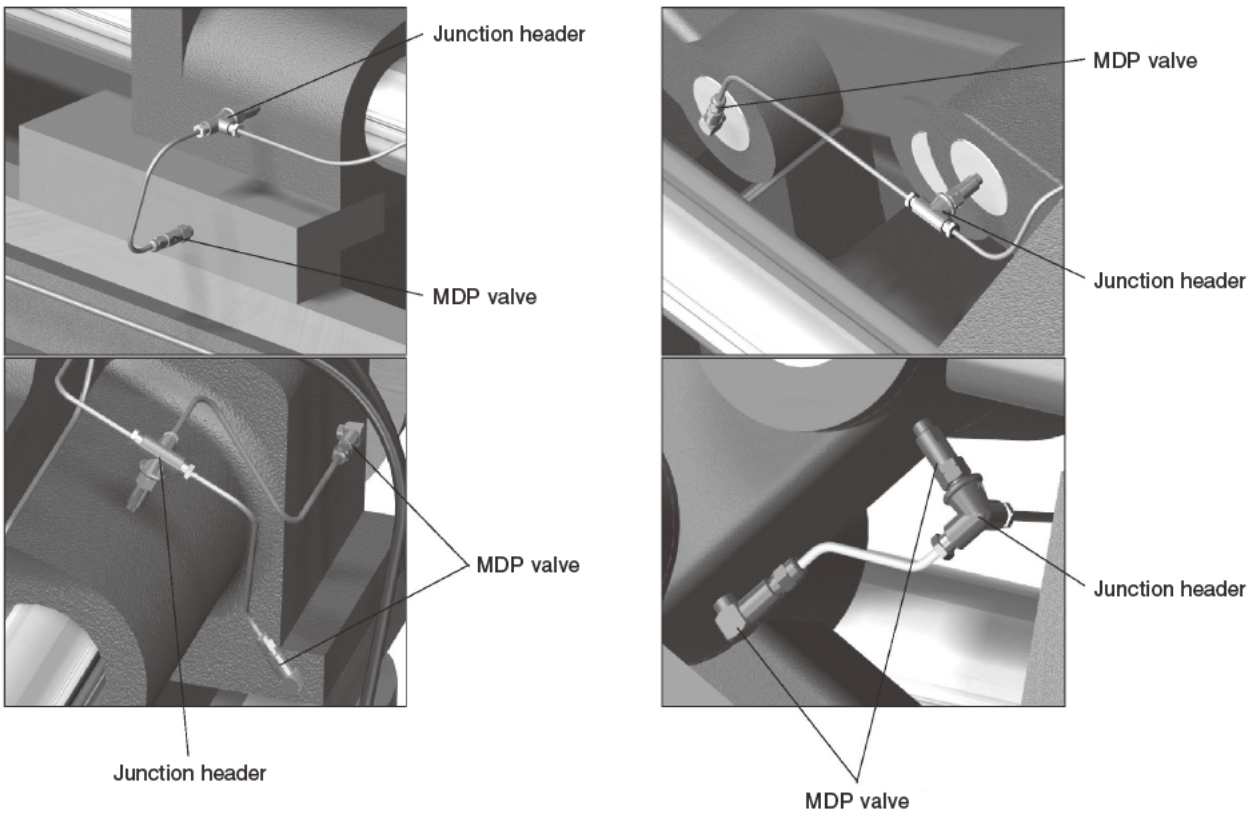
Dimensional drawing

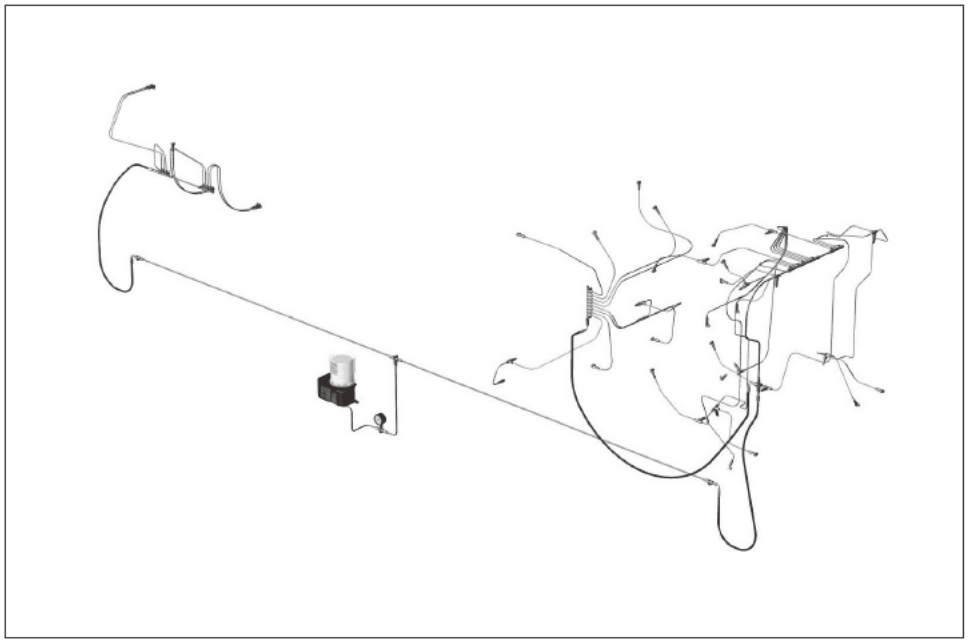


● Related parts

P-107 : P.35 | Pressure gauge : P.85 | Main tubing : P.174 | Branch tubing : P.171 | Adapter assemblies : P.185 | Compression parts : P.169 | Adapters : P.175

Example


Junction header
MDP valve
MDP valve
Junction header
MDP valve
Junction header
Junction header
MDP valve



Grease metering valve

MG2 · MG2C

MG2 valves are positive displacement injectors which use compression hardware for connecting metal or nylon tail tubing. MG2C valves are push to connect style for nylon tubing only.

[MG2 · MG2C]

Specifications

Operating pressure	2.5MPa
Reset pressure	1.4MPa

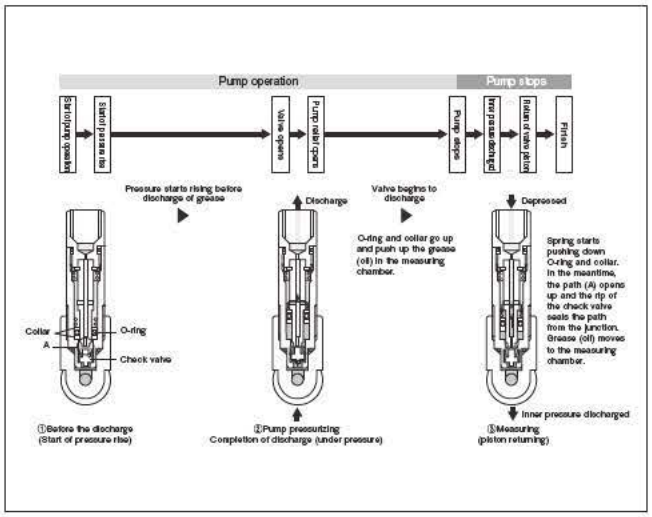
Grooving

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

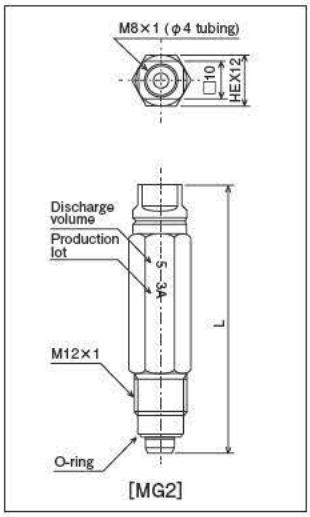
Model

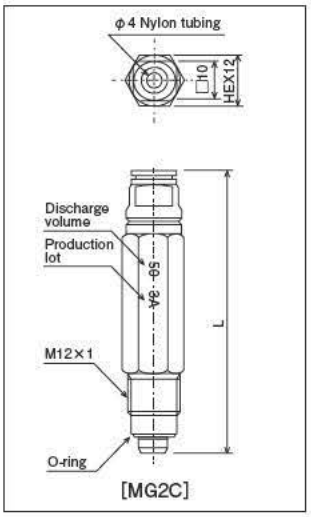
Model	Part Number	Discharge volume (mℓ)	L (mm)	Mark	
MG2-3	205741	0.03	48	3	HEX12
MG2-5	205742	0.05		5	
MG2-10	205743	0.1		10	
MG2-20	205744	0.2	64	20	
MG2-30	205745	0.3		30	
MG2-50	205746	0.5		50	
MG2C-3	205731	0.03	53.5	3	
MG2C-5	205732	0.05		5	
MG2C-10	205733	0.1		10	
MG2C-20	205734	0.2	69.5	20	
MG2C-30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

Operation chart



Dimensional drawing





● Related parts

EGM-10S-4-7C
: P.47

EGH-3P
: P.49

EGH-4C
: P.49

Pressure gauge
: P.85

Main tubing
: P.171

Branch tubing
: P.171

Adapter assemblies
: P.185

Compression parts
: P.169

Adapters
: P.175

KEN-T
: P.188

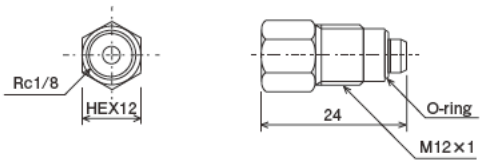
KEN-M
: P.188

MG2 Valve Junctions & Special Fittings

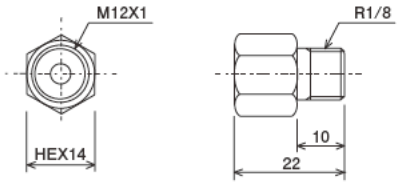
For MG2・MG2C metering valve installation

For piping connection parts, see P. 51

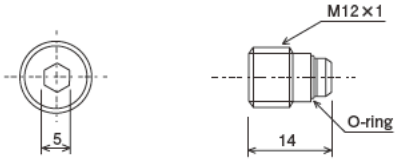
Dimensional drawing



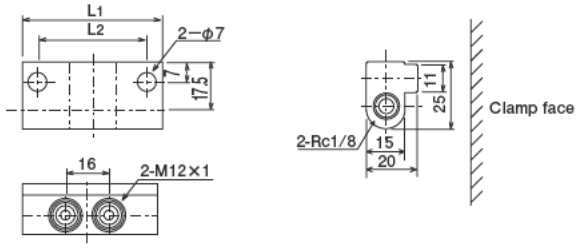
[Connector assembly]



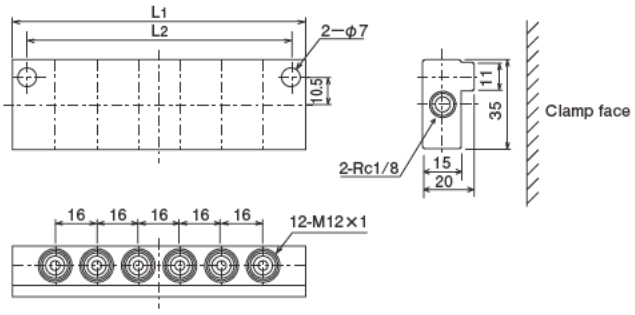
[Adapter]



[Plug assembly]



[Junction JVPA-2S]



[Junction JVPA-12D]

Model

Model	Part Number
SCP	619803

●Material: Brass (C3604)

Model	Part Number
Adapter for MG2 or M02	611825

●Material: Brass (C3604)

Model	Part Number
BPP	619802

●Material: Steel (SUM24)

Model	Part Number	Specifilcation	L_1	L_2
JVPA- 1S	216001	Single type for 1 port	33	22
JVPA- 2S	216002	Single type for 2 ports	49	38
JVPA- 3S	216003	Single type for 3 ports	65	54
JVPA- 4S	216004	Single type for 4 ports	81	70
JVPA- 5S	216005	Single type for 5 ports	97	86
JVPA- 6S	216006	Single type for 6 ports	113	102
JVPA- 7S	216007	Single type for 7 ports	129	118
JVPA- 8S	216008	Single type for 8 ports	145	134
JVPA- 9S	216009	Single type for 9 ports	161	150
JVPA-10S	216010	Single type for 10 ports	177	166
JVPA-11S	216011	Single type for 11 ports	193	182
JVPA-12S	216012	Single type for 12 ports	209	198

Model	Part Number	Specifilcation	L_1	L_2
JVPA- 2D	216021	Double type for 2 ports	33	11
JVPA- 4D	216022	Double type for 4 ports	49	38
JVPA- 6D	216023	Double type for 6 ports	65	54
JVPA- 8D	216024	Double type for 8 ports	81	70
JVPA-10D	216025	Double type for 10 ports	97	86
JVPA-12D	216026	Double type for 12 ports	113	102
JVPA-14D	216027	Double type for 14 ports	129	118
JVPA-16D	216028	Double type for 16 ports	145	134

●Material: Aluminium (A6063S-T5)

Metering valve for grease with clogged line detection

MGI

MGI valves are Positive Displacement Injectors with clogging indication. When there is a clogging issue, the red pin pops out for visual indication of a problem.

[JV-4S-MGI-10-10]

Specifications

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

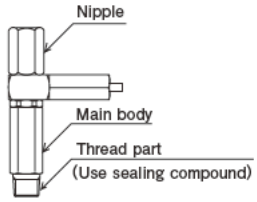
※ Material: Brass

Model

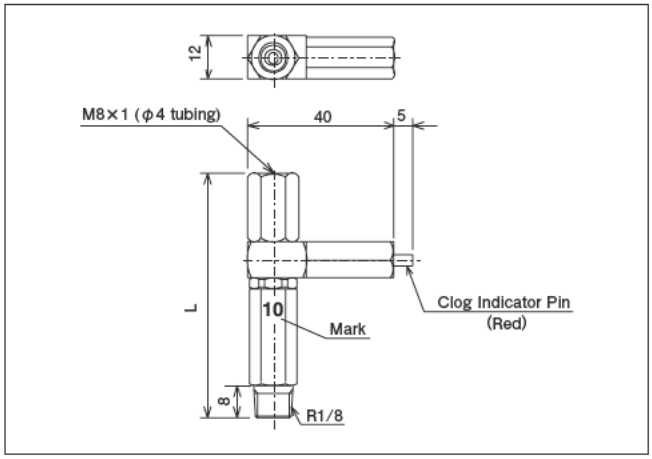
Model	Part Number	Discharge volume (mℓ)	L (mm)	Mark
MGI-3	205174	0.03	66.5	3
MGI-5	205175	0.05		5
MGI-10	205176	0.1		10
MGI-20	205177	0.2	74	20
MGI-30	205178	0.3		30
MGI-50	205182	0.5	85.5	50

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



● Related parts


EGM-10S-4-7C
: P.47


EGH-3P
: P.49


EGH-4C
: P.49


JV Junction
: P.63


Pressure gauge
: P.85


Main tubing
: P.171

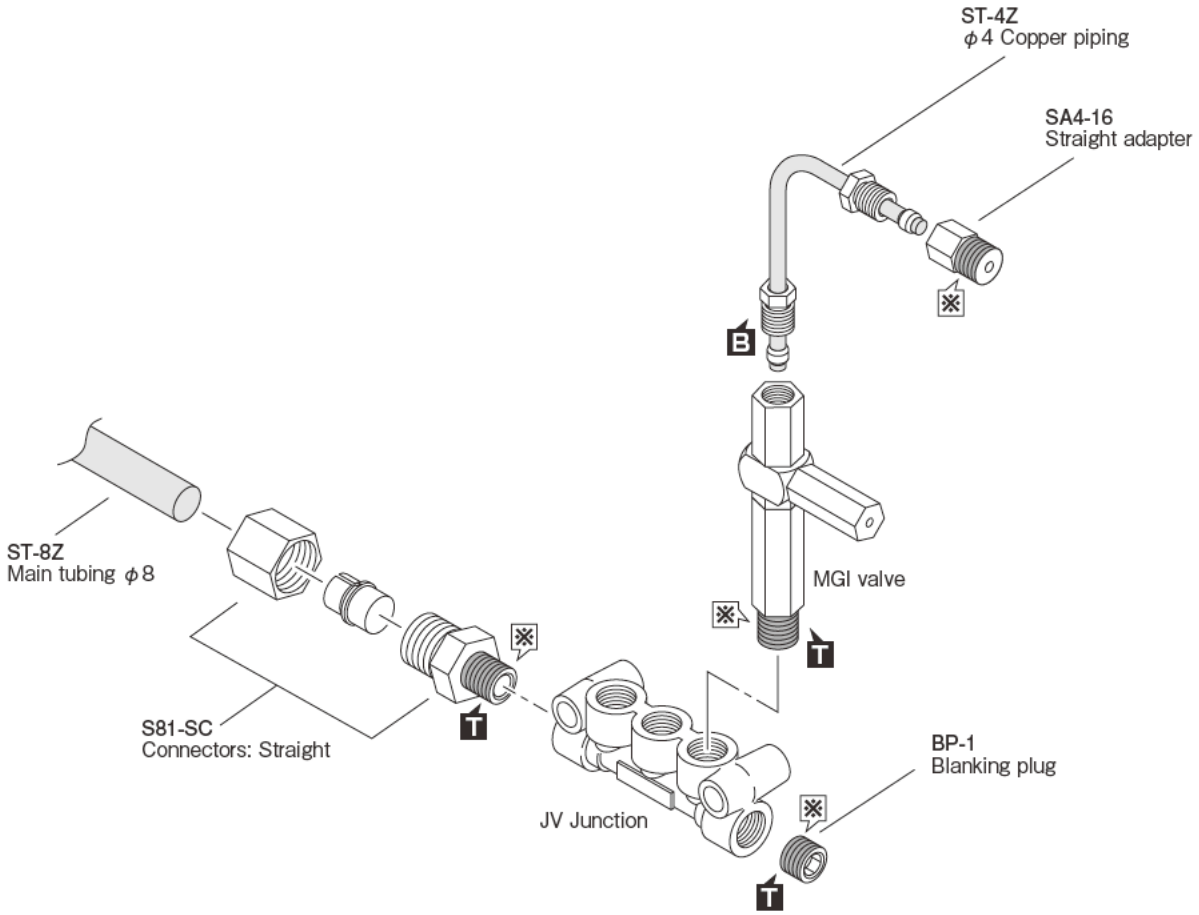

Branch tubing
: P.171


Adapter assemblies
: P.185


Compression parts
: P.169


Adapters
: P.175

Piping layout (Example)



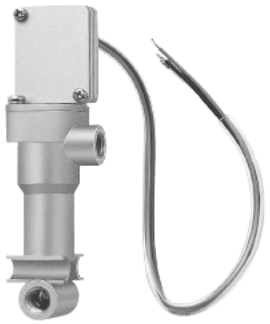
※ **At this mark, use sealing compound at the point.**

At this mark, it means tightening torque (See the mark in tightening torque chart on P. 219).

Metering valve for grease with electronic performance indication

MGLA

MGLA Valves are designed to be used with grease and incorporate the use of a Micro Switch to allow monitoring of the most critical of lubrication points on the machine. They can be wired either normally open, normally closed or both to monitor both pressure rise and pressure relief. If installed very near the end of the main tubing can also be used as a pressure switch monitoring the integrity of the main line tubing.



[MGLA]

Specifications

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

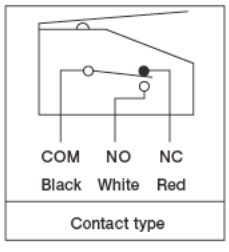
Material:Zinc Die Casting (ZDC)

Model

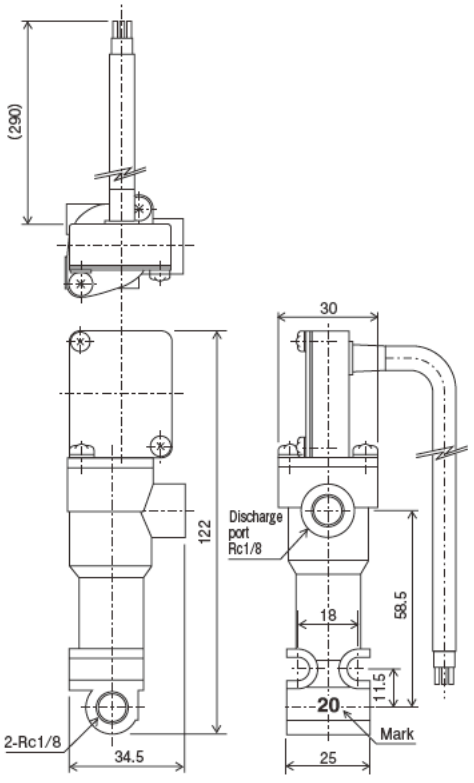
MGLA

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

Wiring diagram



Dimensional drawing



[MGLA-20]

● Related parts

EGM-10S-4-7C
: P.47

EGH-3P
: P.49

EGH-4C
: P.49

Pressure gauge
: P.85

Main tubing
: P.171

Branch tubing
: P.171

Adapter assemblies
: P.185

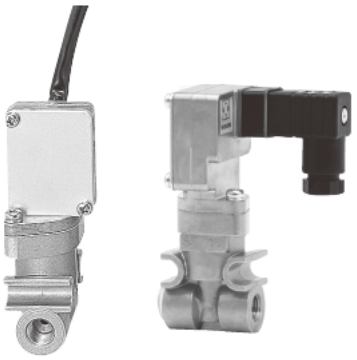
Compression parts
: P.169

Adapters
: P.175

Pressure switch for grease system

GPL

GPL pressure switches are designed to be used with grease and are intended to be installed very near the end of the main line tubing. The design of the GPL removes all the grease from inside the body of the switch making them extremely reliable and long lasting. GPL pressure switches are also available with a din plug option.



[GPL-30]

Specifications

GPL-30

Operating pressure		3.0MPa±20%
Reset pressure		2.5MPa±20%
Max. working pressure		10MPa
Micro switch spec	Rated voltage	AC250V, DC30V
	Resistance load	2A (AC250V, DC30V)
	Service life:	200,000 switchings (loaded)
	Structrual protection:	JIS moisture-tight, conforming to IEC IP67

GPL-55

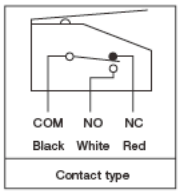
Operating pressure		5.5MPa±0.4MPa
Micro switch spec	Rated voltage	AC250V, DC30V
	Resistance load	2A (AC250V, DC30V)
	Service life:	200,000 switchings (loaded)
	Structrual protection:	JIS moisture-tight, conforming to IEC IP67

※ Production lot indicates bottom number of the year and month.
[A(January)～L(December)]

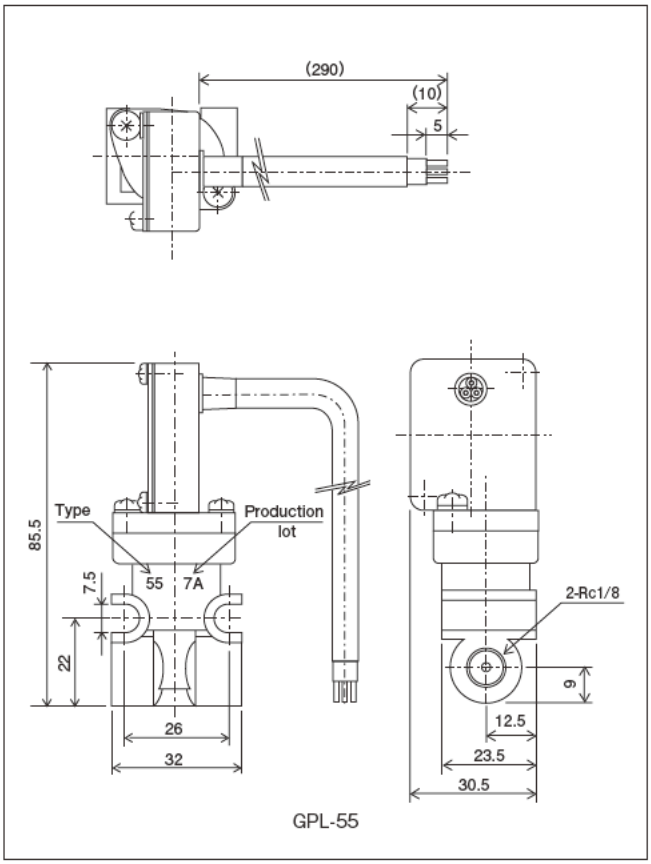
Model

Model	Part Number
GPL-30	209282
GPL-55	209392

Wiring diagram



Dimensional drawing



GPL-55

Material: Alminium Die-casting (ADC)

● Related parts


EGM-10S-4-7C
: P.47


EGH-3P
: P.49


EGH-4C
: P.49


Pressure gauge
: P.85


Main tubing
: P.171


Branch tubing
: P.171


Adapter assemblies
: P.185


Compression parts
: P.169


Adapters
: P.175


KEN-T
: P.188

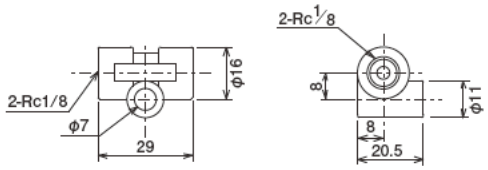

KEN-M
: P.188

Junction

For main piping, separating and MGI metering valve installation

[JV-6S]

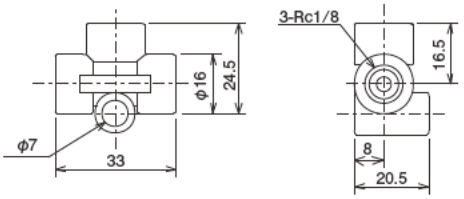
Dimensional drawing



Model

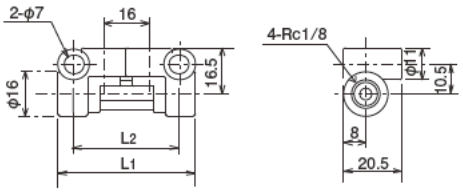
Model	Part Number
JV-2	206470

●Material: Zinc Die-casting (ZDC)



Model	Part Number	Specifications
JV-3	206471	Single type for 1port

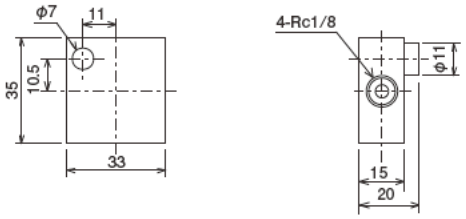
●Material: Zinc Die-casting (ZDC)



[JV-4S]

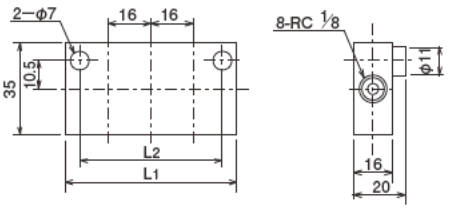
Model	Part Number	Specifications	L_1	L_2
JV- 4S	206472	Single type for 2 ports	49	38
JV- 5S	206473	Single type for 3 ports	65	54
JV- 6S	206474	Single type for 4 ports	81	70
JV- 7S	206475	Single type for 5 ports	97	86
JV- 8S	206476	Single type for 6 ports	113	102
JV- 9S	206479	Single type for 7 ports	129	118
JV-10S	206543	Single type for 8 ports	145	134

●Material: Zinc Die-casting (ZDC)



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

●Material: Brass (C3604)



[JV-8D]

Model	Part Number	Specifilcation	L_1	L_2
JV- 6D	206465	Double type for 4 ports	49	38
JV- 8D	206466	Double type for 6 ports	65	54
JV-10D	206467	Double type for 8 ports	81	70
JV-12D	206468	Double type for 10 ports	97	86
JV-14D	206469	Double type for 12 ports	113	102

●Material: Brass (C3604)

Series Progressive System for Small-Large Machines

GMNH-4-7C

EGH-4C

【Pump】

Series Progressive System motorized grease pump

GMNH (High pressure type)

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


[GMNH-4-4C]


[GMNH-1-4C・GMNH-2-4C]


[GMNH-4-7C]

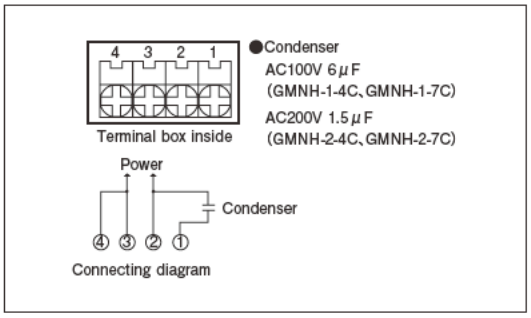

[GMNH-1-7C・GMNH-2-7C]

HOW to order

GMNH-□-□C

Cartridge type	C	Cartridge type
Cartridge	4	400mℓ
	7	700mℓ
Voltage	1	AC100V
	2	AC200V
	4	DC24V
High pressure type		

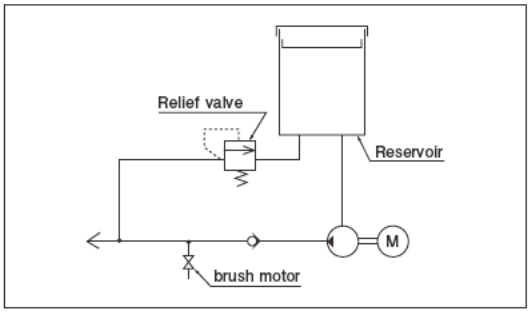
Wiring diagram



Specifications

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

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.

● Related parts


SP series progressive valve : P.71


AP series progressive valve : P.71

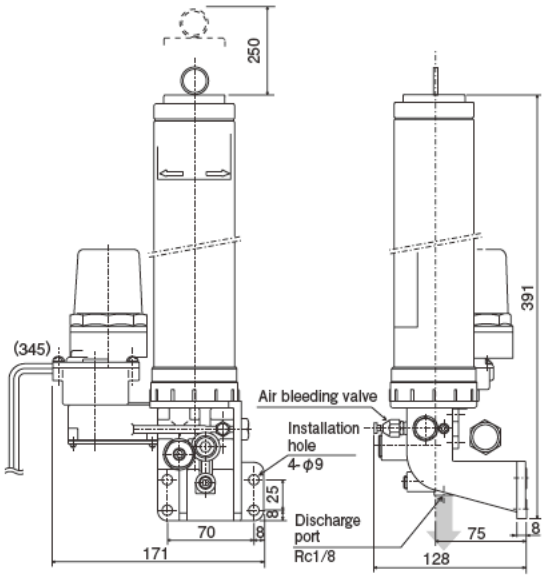

Pressure gauge : P.85


Main tubing : P.171

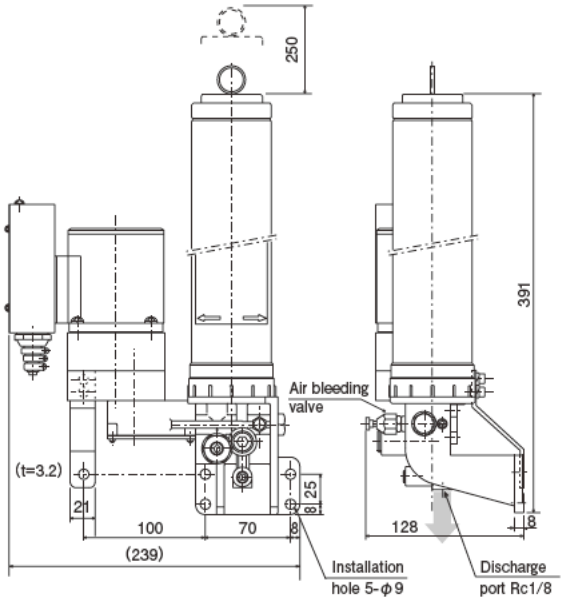

Adapter assemblies : P.185


LUBE original grease : P.81

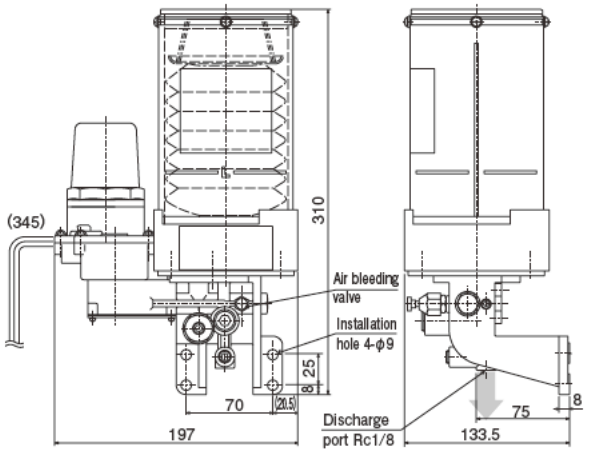
Dimensional drawing



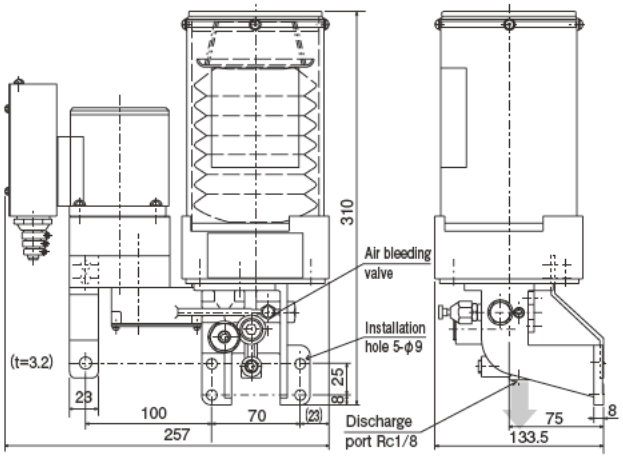
[GMNH-4-4C]



[GMNH-2-4C・GMNH-1-4C]



[GMNH-4-7C]



[GMNH-1-7C・GMNH-2-7C]

Series Progressive System manual grease pump

EGH

Compact, low-cost manually operated pump

Reservoir type EGH-3P | Cartridge type EGH-2C | Cartridge type EGH-4C

HOW to order

EGH-□□

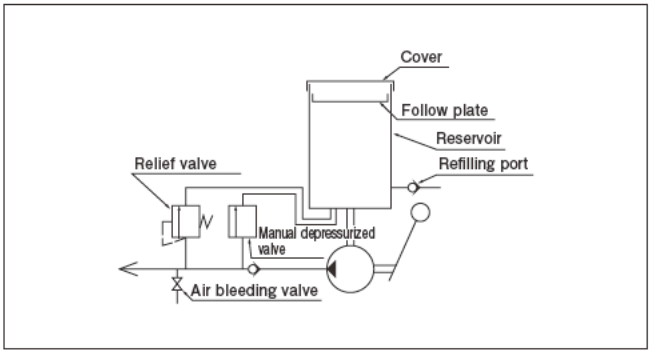
Type of reservoir (effective capacity)

3P	Reservoir type (260mℓ)
2C	Cartridge type (200mℓ)
4C	Cartridge type (400mℓ)

Specifications

EGH-3P		
Pump	Discharge volume	1mℓ/stroke
	Discharge pressure	10MPa (safety valve set pressure)
Working Viscosity		NLGI No.000、00、0、1 (lithium grease)
Recommended grease		MP0、FS2、MT1
Reservoir Capacity 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 viscosity		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

Hydraulic circuit drawing



Directions for use

- Use recommended cartridge greases
- Never use molybdenum disulfide-contained grease.
- Use lithium greases.
- Do not use any greases containing substances that attack brass and rubber.
- When refilling or replacing cartridge, take care not let foreign matter in the grease or pump.
- After refilling or replacing cartridge, always loosen the air bleed valve to purge the pump of air.
- Use the pressure relief lever correctly.

● Related parts


SP series progressive valve : P.71


AP series progressive valve : P.71


Pressure gauge : P.85


Main tubing : P.171

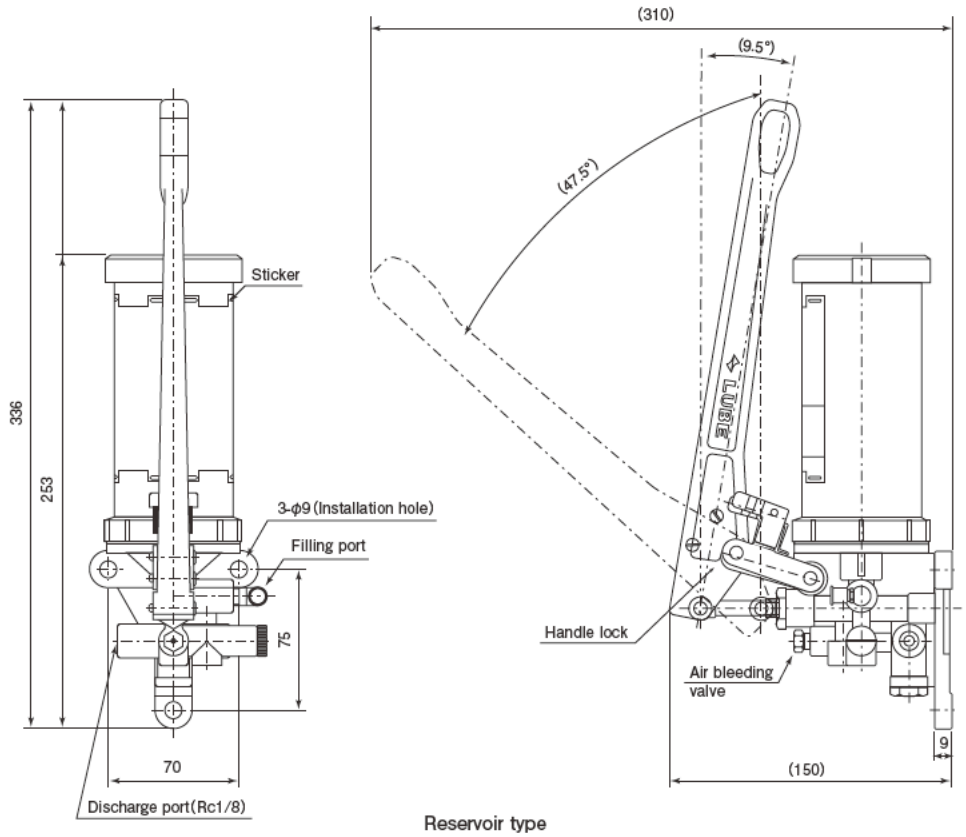

Adapter assemblies : P.185


Pneumatic pump for pail : P.86

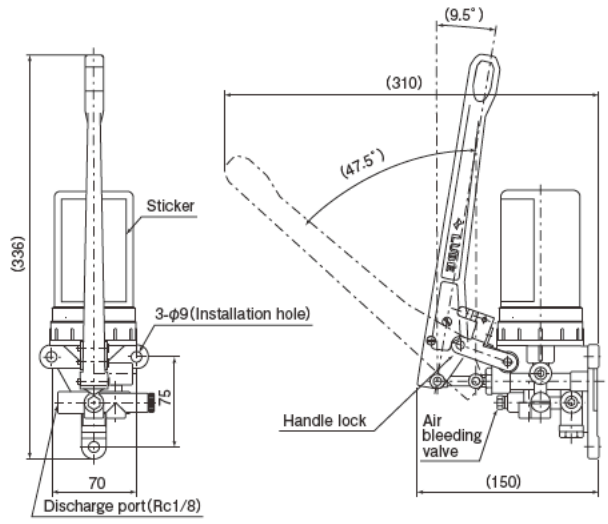

Hand grease gun : P.86


LUBE original grease : P.81

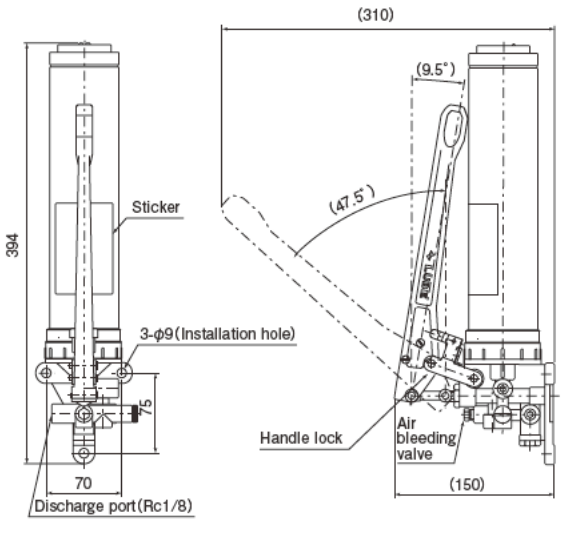
Dimensional drawing



Reservoir type
[EGH-3P]



Cartridge type
[EGH-2C]



Cartridge type
[EGH-4C]

Series Progressive System for Small-Large Machines

AP-6K

SP-8

【Valve】

Series Progressive Valve

AP・SP

AP & SP are mono style progressive metering blocks. They are a piston-type metering device which reliably dispenses lubricant to each point on the machine. Their mono style of fixed displacement, and the flexibility of combining outlets provides a large variety of metering possibilities. Monitoring can be done visually with a pin movement or electronically with a proximity sensor.

[AP-6]

[SP-8]

Specifications

Discharge volume	0.2mℓ/stroke
Discharge port	6mm or 4mm tube
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

Specialty Parts

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

Model

Model	Part Number	No. of discharge ports
AP-4K	205680	4
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
AP-10	205693	
AP-10S	205688	
AP-12K	205684	12
AP-12	205694	
AP-12S	205689	

Model	Part Number	No. of discharge ports
SP-4K	205530	4
SP-4	205540	
SP-6K	205531	6
SP-6	205541	
SP-6S	205536	
SP-8K	205532	8
SP-8	205542	
SP-8S	205537	
SP-10K	205533	10
SP-10	205543	
SP-10S	205538	
SP-12K	205534	12
SP-12	205544	
SP-12S	205539	

S: With proximity sensor adaptor
K: With indicator pin
※ L: See dimensional drawing.

● Related parts


GMNH-4-7C
: P.65


EGH-3P
: P.67


EGH-2C
: P.67


EGH-4C
: P.67


Pressure gauge
: P.85


Main tubing
: P.171

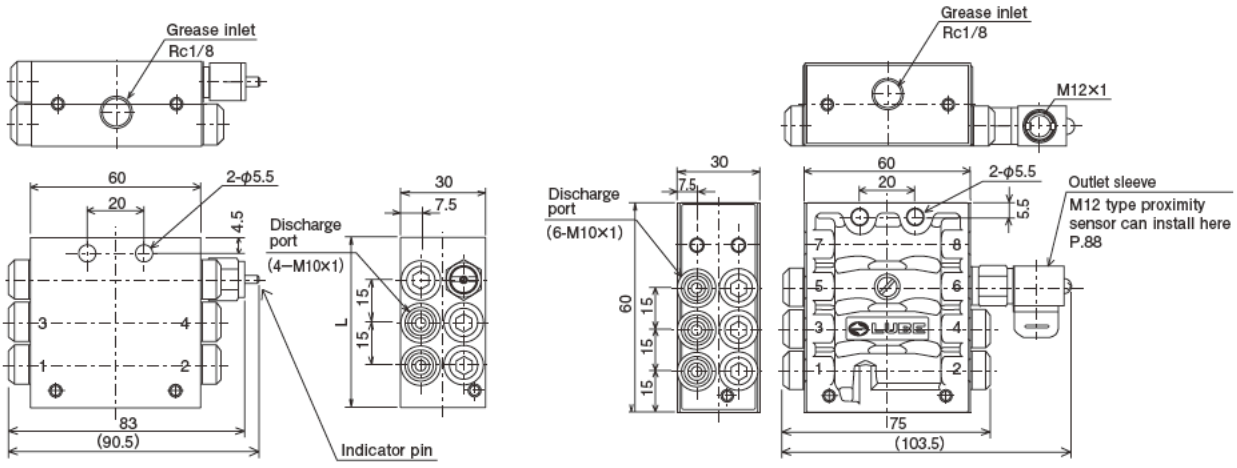

Branch tubing
: P.171


Adapter assemblies
: P.185

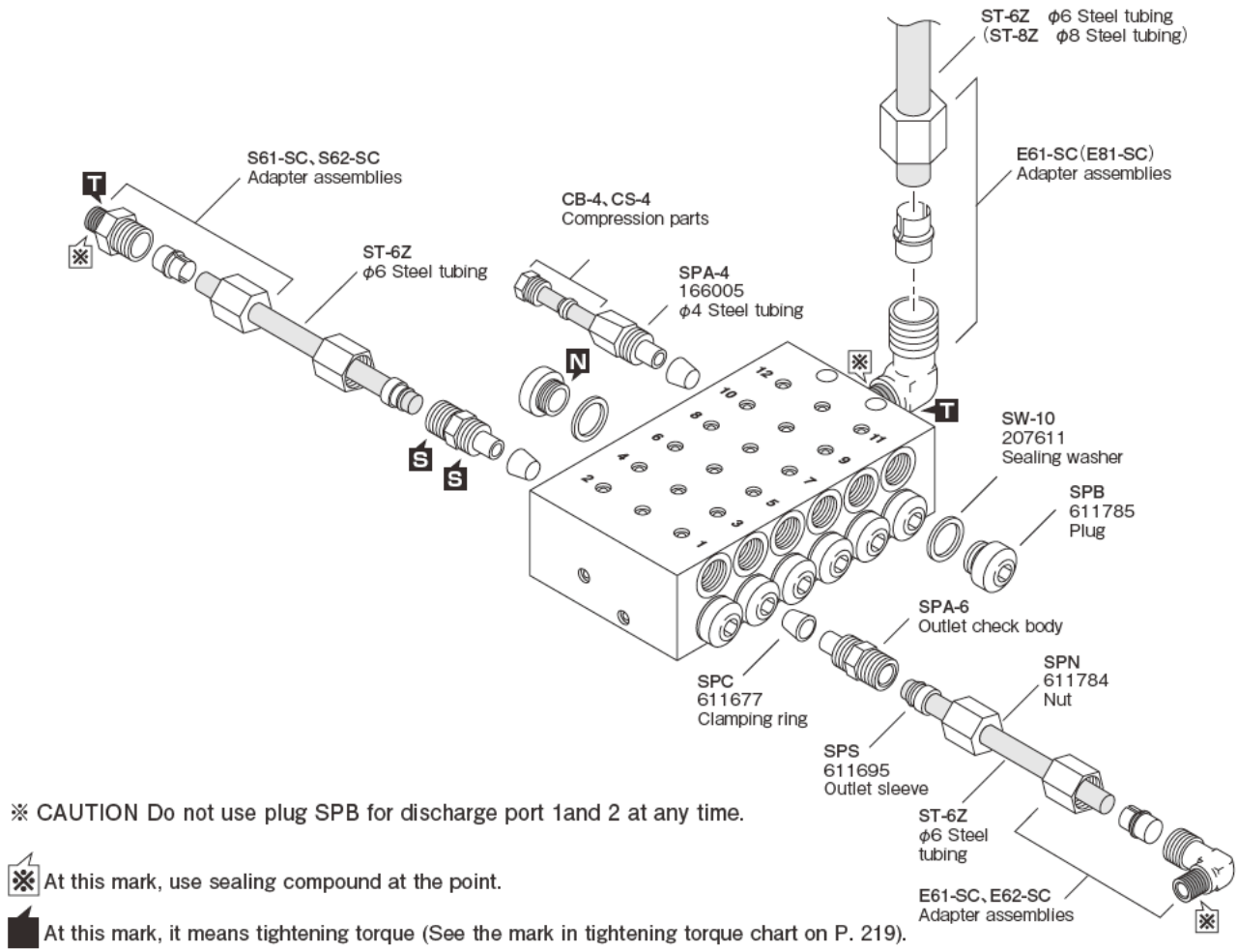

Compression parts
: P.169


Adapters
: P.175

Dimensional drawing



This is just an example



Operation chart

Step1

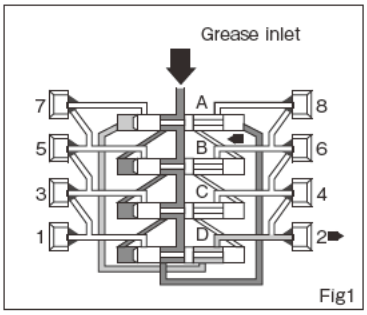


Fig1

The grease is sent by the pump or the grease gun enters from the inlet of the block upper part. The sent grease passes along the port shown in the dark gray color, reaches the right-hand side of a piston "A", and moves piston "A" leftward. At this time, the grease on the left-hand side of a piston "A" passes along the port shown in the light gray color, and is discharged from the outlet of No. 2.

Step2

If piston "A" carries out a full stroke leftward, as shown to Fig. 2 by the dark gray color, the port which results in surface of a piston "B" will be connected, and the grease from a pump will move a piston "B" leftward through this port. At this time, the grease on the left-hand side of a piston "B" is discharged from the outlet of No. 7 through the port shown in the light gray color.

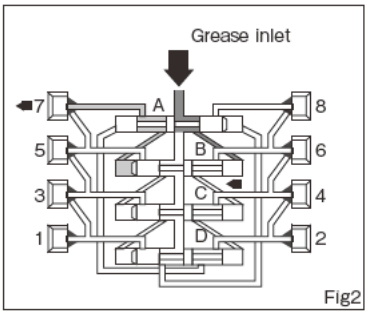


Fig2

Step3

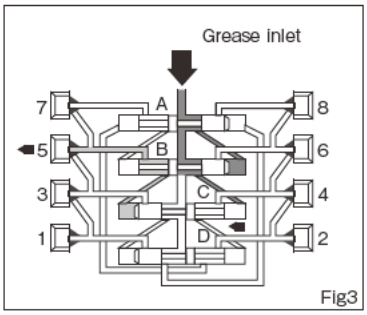


Fig3

Like last time, if piston "B" carries out a full stroke leftward, as shown to Fig. 3 by the dark gray color, the port which results in right-hand side edge of piston "C" will be connect, grease will pass along this port, and a piston "C" will be moved leftward. At this time, the grease on the left-hand side of piston "C" is discharged from a No. 5 outlet through the port shown in the light gray color.

Step4

If piston "C" carries out a full stroke, as shown by the dark gray color among the right figure, the port which results in right-hand side edge of a piston "D" will be connected, and a piston "D" will be moved leftward. At this time, the grease on the left-hand side of a piston "D" is discharged from No. 3 outlet through the port shown in the light gray color.

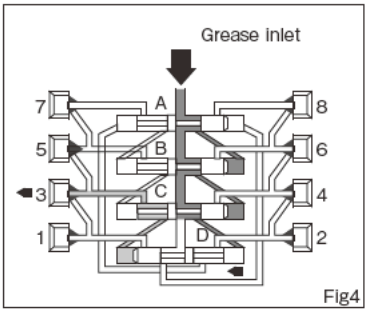


Fig4

Step5

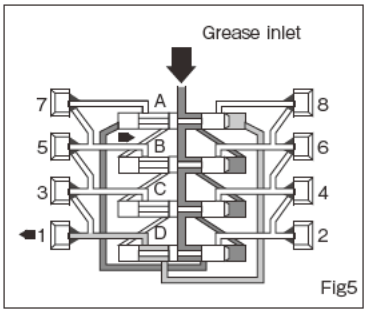
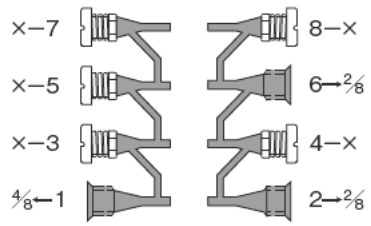


Fig5

This time, as a result of piston's "D'"' carrying out a full stroke, as shown by the dark gray color among the figure, the port which results in left-hand side edge of a piston "A" is connected, and a piston "A" is moved rightward. At this time, the grease on the right-hand side of piston "A" which worked as last operation grease is discharged from a No. 1 outlet through the port shown in the light gray color.
Grease will be discharged by the same repetition as henceforth in order of the outlet of 8, 6, 4, 2, 7, 5, 3, and 1.

Setting of discharge volume/ Suggestions

Example



×: Plugged port will not discharge.
1 : Discharge will be four (4) times the normal amount.
2, 6 : Discharge will be twice the normal amount.

● Setting of discharge volume

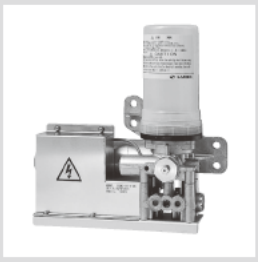
As for each discharge port, 0.2 ml/stroke grease is discharged at the time of a pump operation. If one discharge port is closed, the quantity from the closed port will be added to and discharged by the next discharge port below.

● Suggestions

1. Use only the specially designed SP fittings for discharge ports of the SP type valve.
2. When you attach the dischagre port Outlet Check Body please be sure to check whether the Clamping Ring is set correctly. Moreover, when you attach SPB plug into the grease dischagre port, please be sure to remove the Clamping Ring, if present. If a Port Plug is attached with the Clamping Ring. set, the whole valve stops operating.
3. Use proper torque when installing AP & SP Progressive Block specialty adapters.
4. Installation will become difficult if assembly of AP & SP Progressive Blocks is begun with the middle discharge ports. Begin assemble at one end and continue to the other on each side to insure proper and more efficient assembly.
5. Use the correct washer and proper torque when installing AP & SP Progressive Block port plugs.

Compatible with Both PDI and Series Progressive Metering Valve System for Small-Medium Machine

EGM-T



EGME-T

[Pump]

Motorized grease pump

Dual-function motorized pump

EGM-T

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

[EGM-10T-4-4C]

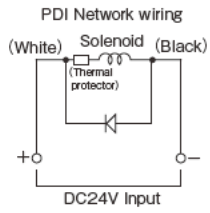
[EGM-10T-4-7C]

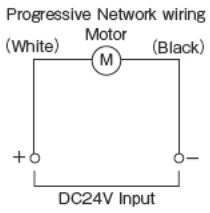
HOW to order

EGM−10T− 4 −□C

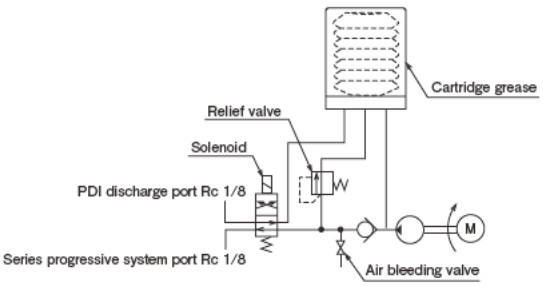
Cartridge	
2	200mℓ
4	400mℓ
7	700mℓ

Wiring diagram





Hydraulic circuit drawing



Specifications

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

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.
- Avoid continuous operation.
- Normal operation or when filling grease into the (PDI) main tubing, please remember to adhere to the 3 to 1 ratio for off time to running time not exceeding 7.5 minutes. Failure to follow this could result in permanent damage to the solenoid not allowing the pump to ever build pressure.
- When filling grease into the (PRO) main tubing there is no limitation of time which will damage the pump. Be cautious not to grossly over lubricate your bearing surfaces.

● Related parts


MG2 metering valve : P.57


MG2C metering valve : P.57


JVPA junctions : P.58


MGI metering valve with clogged line detection : P.59


MGLA metering valve with performance monitor : P.61


GPL Pressure switch for grease : P.62


Pressure gauge : P.85


Main tubing : P.171

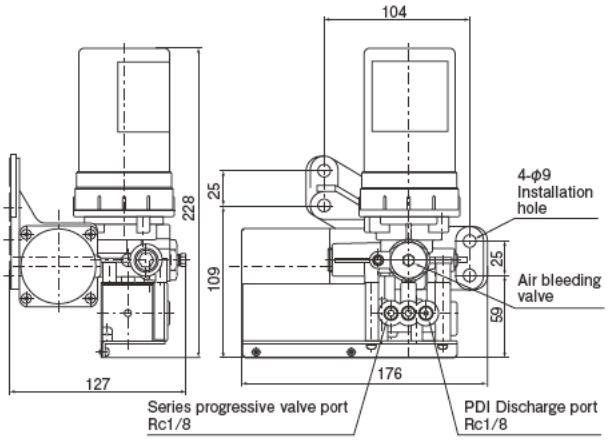

Adapter assemblies : P.185


LUBE original grease : P.81

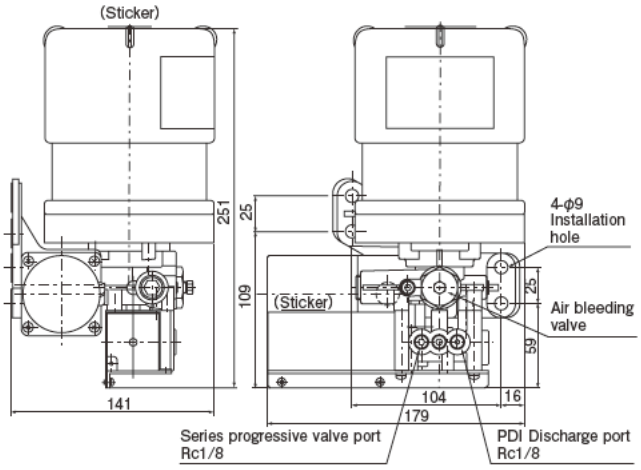

SP series progressive valve : P.71


AP series progressive valve : P.71

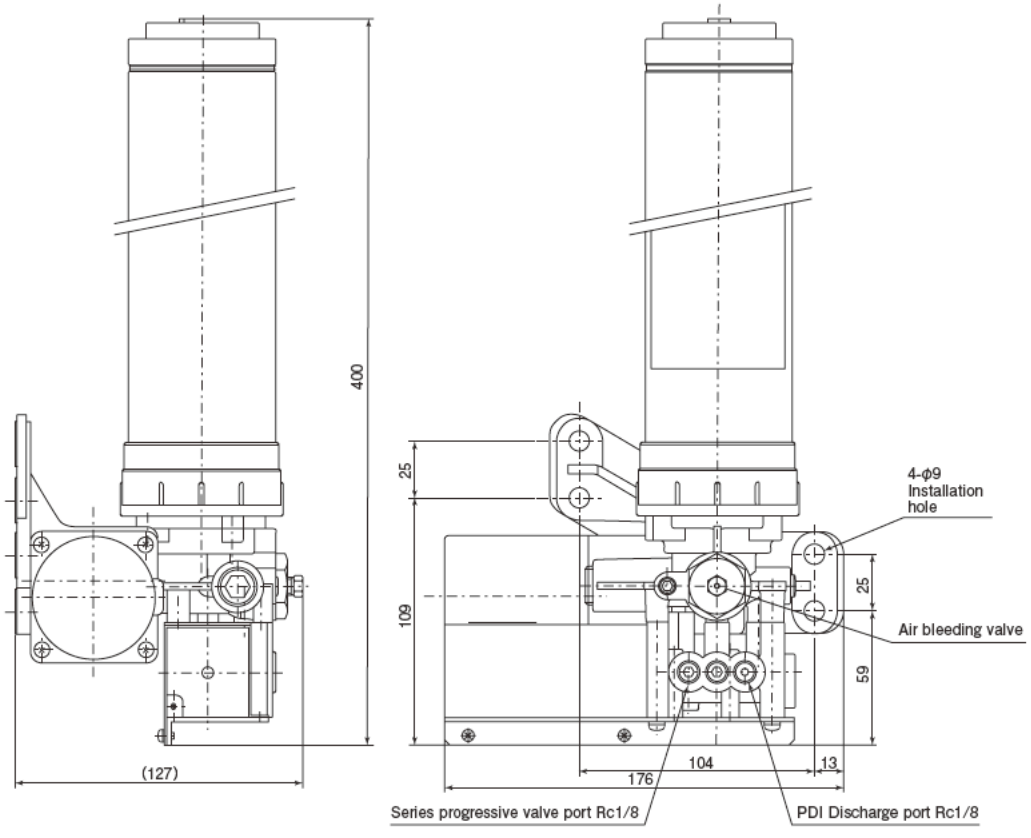
Dimensional drawing



[EGM-10T-4-2C]



[EGM-10T-4-7C]



[EGM-10T-4-4C]

Dual-function motorized pump

EGME-T

Can operate both PDI and PRO series progressive systems by switching built-in-solinoid valve. EGME pumps have a built in solenoid protection circuit which eliminate the 7.5 min maximum running time of other EGM pumps.

[EGME-10T-4-2C]

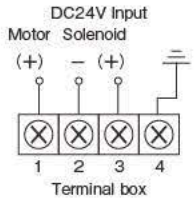
HOW to order

EGME-10T- 4 -□C

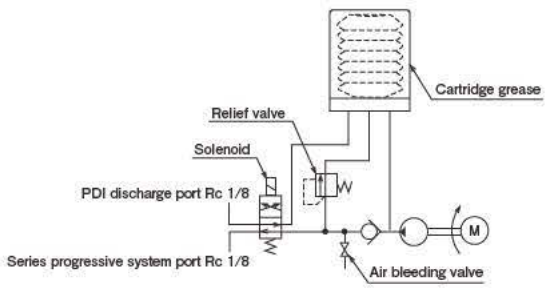
Cartridge

2	200mℓ
4	400mℓ
7	700mℓ

Wiring diagram



Hydraulic circuit drawing



Specifications

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

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.
- Avoid continuous operation.

● Related parts


MG2 metering valve : P.57


MG2C metering valve : P.57


JVPA junctions : P.58


MGI metering valve with clogged line detection : P.59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Pressure gauge : P.85


Main tubing : P.171

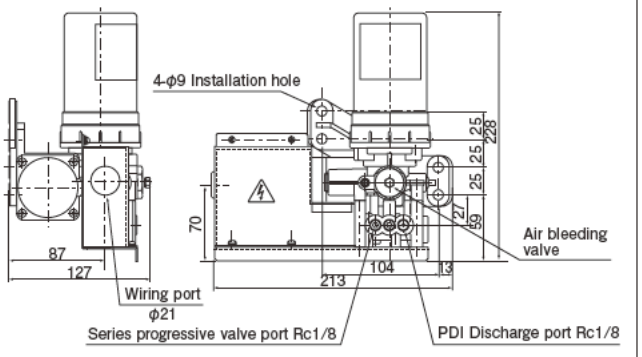

Adapter assemblies : P.185


LUBE original grease : P.81

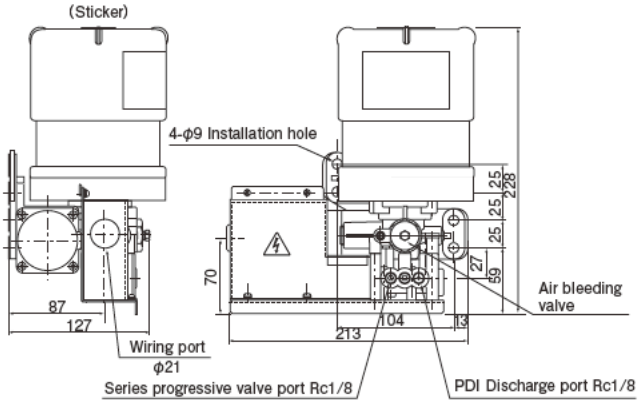

SP series progressive valve : P.71


AP series progressive valve : P.71

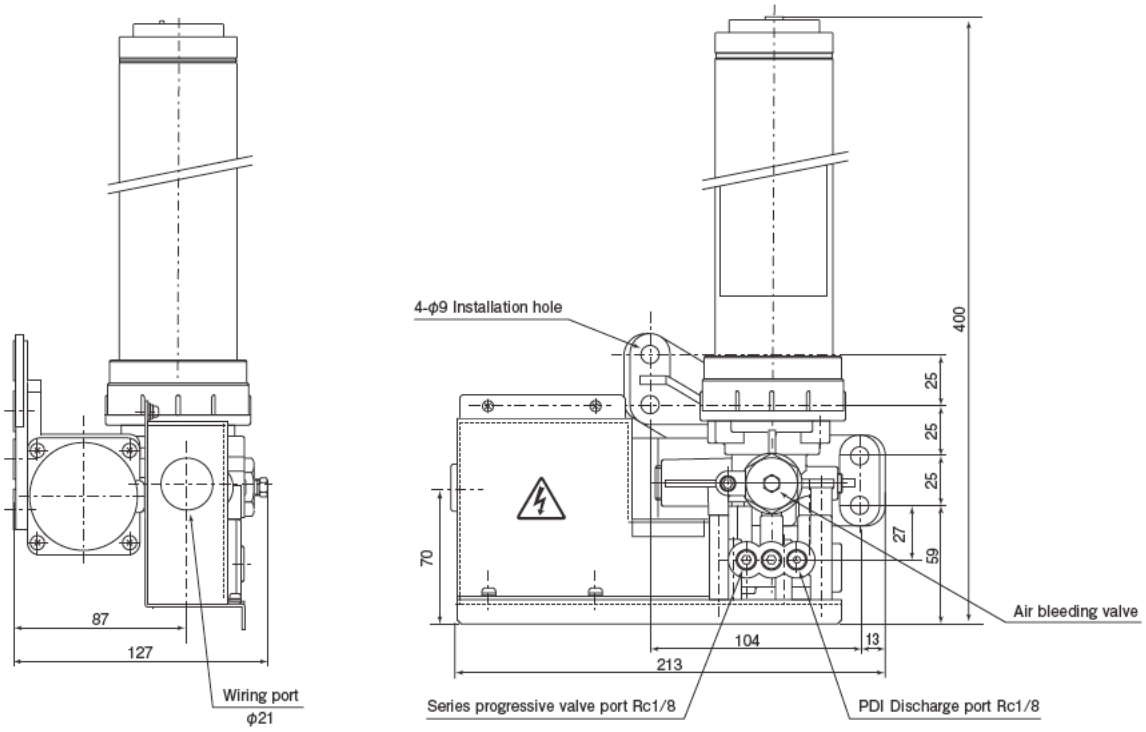
Dimensional drawing



[EGME-10T-4-2C]



[EGME-10T-4-7C]



[EGME-10T-4-4C]

LUBE Original Grease
LUBE Hybrid Lubricant

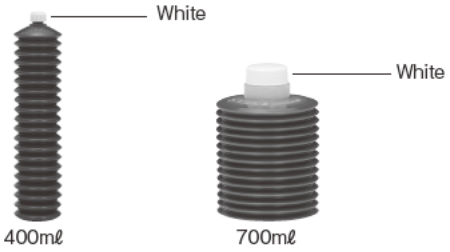
LUBE Original Grease

LUBE Hybrid Lubricant

LUBE Original Grease

MP [High performance Lithium All Purpose Grease]

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



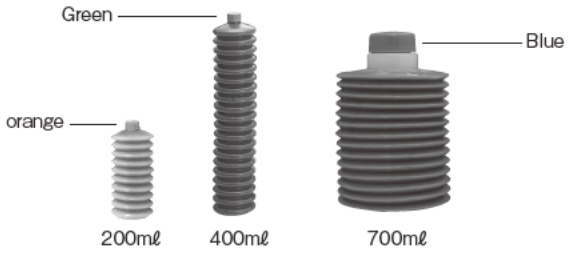
Model

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

Color of Grease : Brown

FS [High performance grease for heavy load carrying capacity]

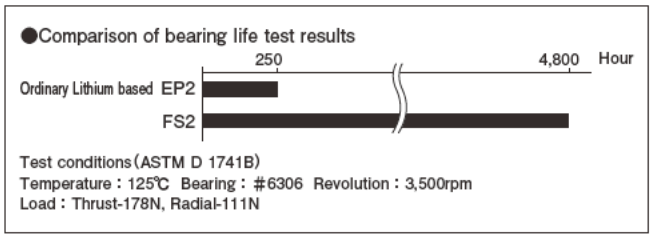
Excellent heavy load carrying capacity, wear resistance, shear stabitity, heat resistance, oxidation stability, water resistance and rust preventive property.



Model

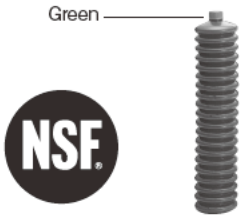
Model	Part Number	Capacity
FS2-2	249069	200mℓ
FS2-4	249053	400mℓ
FS2-7	249063	700mℓ

Color of Grease : Green



LFL-H1 [High-performance grease for food, medical and cosmetic machines]

LFL-H1 has acquired NSF H1 certification. It is a food grade grease suited for those machines which need to comply with the Food and Drug Administration's regulations. It has excellent pumpability and in order to improve safety and simplify its use, it is available in 400cc cartridges.



NSF registration number: 140284

Model

Model	Part Number	Capacity
LFL-H1-4	249301	400mℓ

Color of Grease : Beige

LUBE Hybrid Lubricant

LHL

High performance lubricant which Incorporates all the advantages of both oil & grease, at the same time eliminating the disadvantages of both.

■ Next generation lubricant which contributes to protecting the environment.

- Reducing lubricant consumption
- Preventing the deterioration and decomposition of the cutting fluids drastically reducing hazardous waste disposal.
- Reducing the abrasion of machine parts

Advantages of Oil: Liquidity excellent migration properties, transport properties and no solidification.
+
Advantages of Grease: High load carrying capacity, wear resistance, excellent oil film retention and adhesion properties
||
Incorporating the advantages of Oil and Grease

Model

Model	Part Number	Capacity	Color
LHL300-4S	249113	400mℓ	yellow
LHL300-7	249112	700mℓ	
LHL X100-2	249139	200mℓ	Brown
LHL X100-4	249136	400mℓ	
LHL X100-7	249137	700mℓ	

400mℓ 200mℓ 400mℓ 700mℓ
[LHL300-4S] [LHLX100-2] [LHLX100-4] [LHLX100-7]

LHL-X100 Performance Test Data

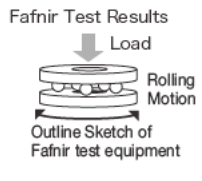
- Excellent load-carrying capacity and wear resistance
  The excellent load-carrying capacity and wear resistance prevent seizures and excessive wear.

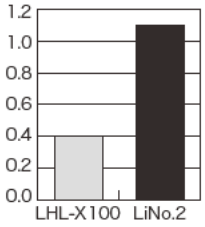
- Excellent water resistance and corrosion resistance
  LHL is versatile to emulsification and softening even when water is introduced. In addition, its excellent corrosion resistance prevents the development of rust and pitting.

- Excellent migration property
  Developed as lubricants for centralized lubrication systems, LHL has excellent transport property and supplying LHL in the right amount at the right time guarantees ideal lubrication effects.

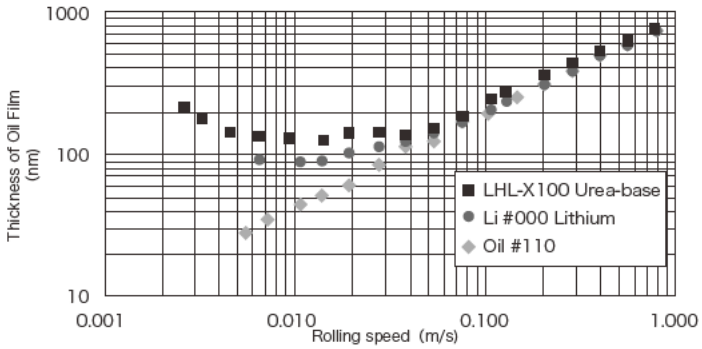
Fretting Resistance Test Utilizing the ASTM F4170 Fafnir Test

Testing Method
In conformity with ASTM D 4170 Fafnir Test
[Testing Conditions]
Shaft : ANDREWS W 5/8
Weight : 2450N (Ball 9pcs, Surface Pressure : 1.9GPa)
Rolling Angle : 12° (Rolling Width : Approx. 3.0mm)
Rolling Cycle : 3.4Hz (Approx. 200 cycles)
Time Duration : 10h
Temperature : Room temperature
Warm-up Operation : No
Amount of lubricant applied : 1.0 + 0.05g per bearing ? 0.2 + 0.01g
[Evaluation Method]
Amount of abrasion : Measuring the decrease in the mass of each race.





Thickness of Oil Film (LHL-X100·Lithium-based Grease·Oil)



LHL-X100 Special Urea Grease provides thicker oil films in slow rolling speed range.
Having tested the performance of lubricants by focusing on thickness of oil film provided by each lubricant, we found that the oil films become thinnest when rolling speeds become 0m/s (or all most 0m/s). Both greases provide thicker oil films than oil. LHL-X100, however, (a special urea grease)provides even thicker oil films than lithium grease. The test results prove that LHL-X100 prevents oil film deficiencies more effectively and efficiently which eliminates stick slip.

Accessories

Pressure gauge

Hand grease gun

Grease vacuum cleaner

Pressure gauge

Pressure gauges with reference pointer for visual mounting

[PB100]

[PB250]

[GV50-G]

Specifications

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

Model

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

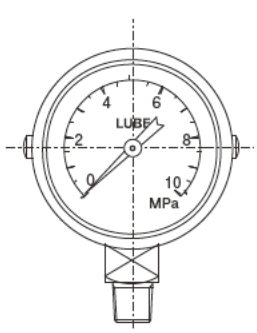
Pressure gauge fitting plate

Model	Part Number
PP	109102

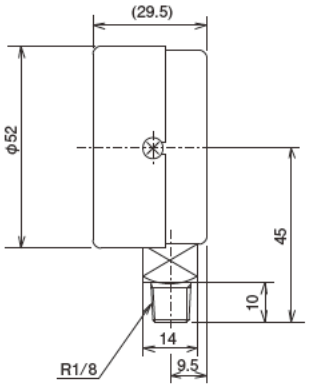
Directions for use

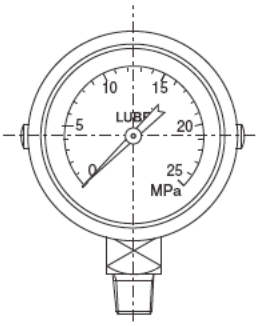
- Use care not to drop or exert other strong impact.
- Do not apply pressure beyond specified range.

Dimensional drawing

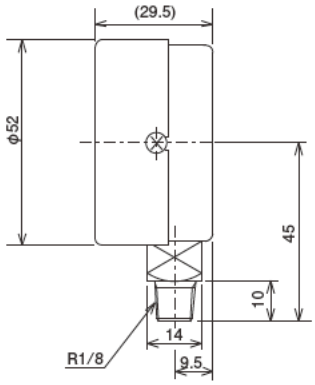


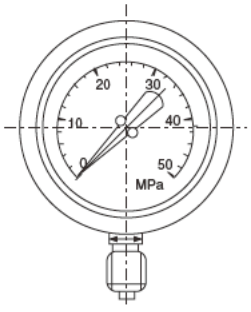
[PB100]



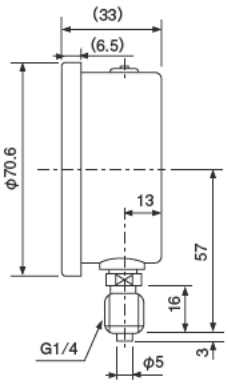


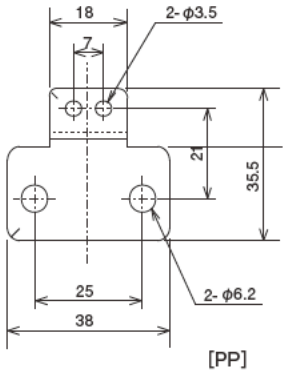
[PB250]



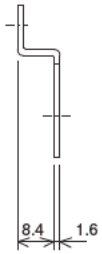


[GV50-G]





[PP]
Pressure gauge fitting plate

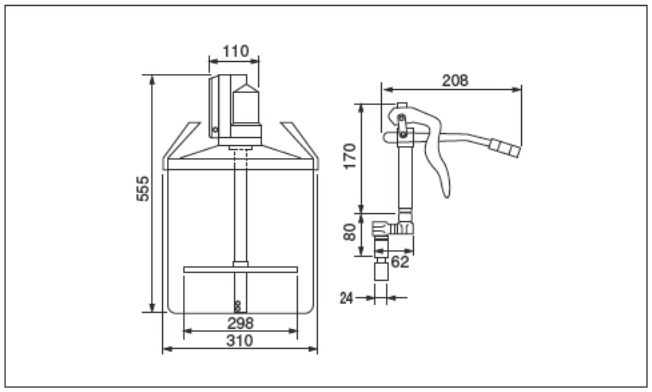


Grease filler pump

Pneumatic pump for pail

Grease can be filled in pneumatically.

Dimensional drawing



Specifications

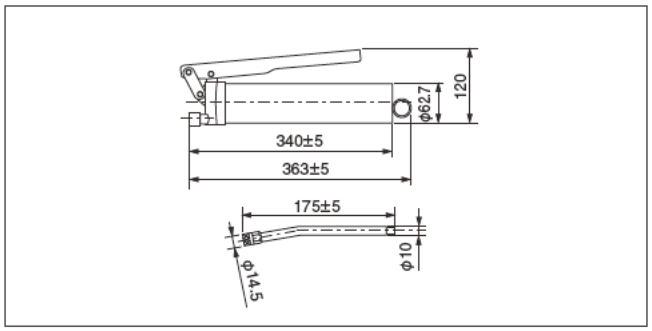
Discharge volume	540mℓ/min
Discharge pressure	34.3MPa
Working air pressure	0.4～0.7MPa
Air consumption	315ℓ/min (ANA)
Grease capacity	16kg
PumpWeight	6kg

Model

Model	Part Number
P3-C	JC0005

Hand Grease gun

Dimensional drawing



Specifications

Discharge volume	1.2mℓ/Stroke
Maximum pressure	40MPa
Grease capacity	400g
Weight	1.4kg

Model

Model	Part Number
LG-400	252422

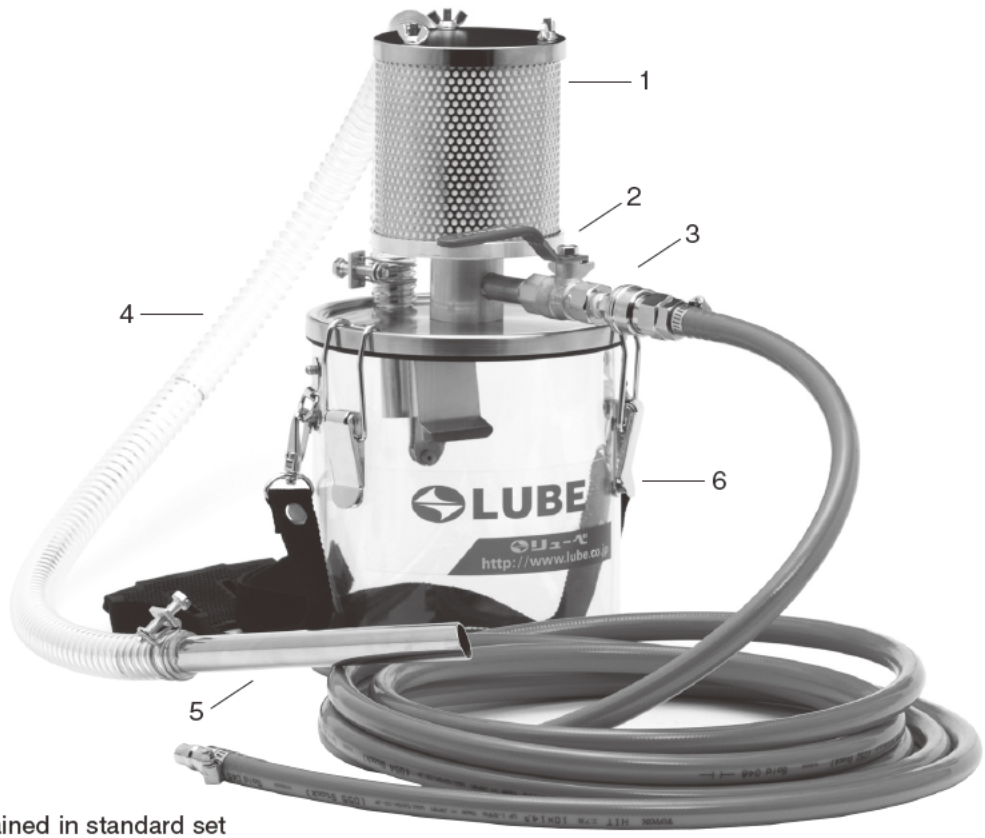
Grease vacuum cleaner

Vacuums excess grease, driven by air.
Compact portable model available.
Reduces consumption of workshop rags.

Model

Model	Part Number	Height * Width	Weight
GCP	GC5002	350×160mm	1.8kg

Standard set model: GCP



● Items contained in standard set
1. Silent filter
2. Air Valve (To turn the Vaccum ON/OFF)
3. Air Inlet Push-to-connect Coupler
4. Vacuum Hose
5. Nozzle
6. 3 liter Plastic Tank

Proximity sensor for Series Progressive valve

Electrically detects the movement of the indicator pin of progressive valve.
Proximity sensor monitors the movement of the indicator pin and detects a system or valve failure.

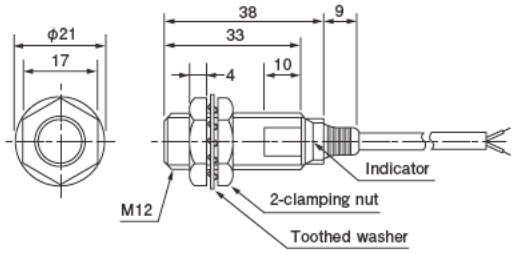
Specifications

	E2E-X2E1	E2F-X2E1	E2F-X2Y1
Power voltage	DC10~24V		AC24~240V
Working voltage range	DC10~40V	DC10~30V	AC20~264V
Output Form	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	

Model

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

Dimensional drawing



General Catalog
Centralized Lubrication Systems

Right time, Right amount, Right lubricant

Oil system

Positive Displacement Injector (PDI) System for Large Machines

•

(SLR) Single Line Resistance compact system for Small Machines with intermittent delivery

•

(SLR) Single Line Resistance compact system for Small to Large Machines with continuous (recirculation) delivery

Positive Displacement Injector (PDI) System for Large Machines

AMZ- Ⅲ [CE]

PM

AMO- Ⅲ DS

AMI-300S

【Pump】

Automatic intermittent gear pump / Pneumatic piston pump

Automatic intermittent gear pump

AMZ-Ⅲ [CE]

A lightweight and compact pump unit without controller. Conforming to European Safety Standard. Oil level and pressure switches are standard equipment.

[1.8ℓ]

[3ℓ]

How to order

AMZ-Ⅲ-□-□□

Voltage

1	AC100Vφ1
2	AC200Vφ1

Reservoir Mounting Poition

Blank	Resin
F	Foot Mount
B	Wall Mount

※Metalreservoir only

Reservoir capacity

Blank	1.8ℓResin reservoirs
3	3ℓResin reservoirs
30	3ℓMetal reservoirs
40	4ℓMetal reservoirs
80	8ℓMetal reservoirs

※Pump is installed on the right side, if a metal reservoir is selected.

Directions for use

- This pump unit requires a separate control circuit to operate.
- Do not remove the oil strainer to keep the pump clear of foreign matter.
- Oil viscosity varies with oil temperature. Be sure to use oil within the working viscosity range. Refer to the viscosity table.
- Do not use any special additive-contained oil, water soluble oil and solvent.
- Periodically check the oil in the reservoir for impurities. Replace it, if necessary, with fresh oil immediately. Be sure to clean the reservoir before oil change.
- Make sure that proper voltage is applied.
- Do not over tighten the discharge joint. Refer to the tightening torque table.
- Low-oil viscosity versions are available. Contact us for information.

Specifications

Pump	Discharge volume	90mℓ/min (50Hz), 110mℓ/min (60Hz)
	Discharge pressure	1.5MPa/217.5psi (safety valve set pressure)
Motor	Voltage / current	AC100Vφ1/1.5A, AC200Vφ1/0.8A (50Hz) AC100Vφ1/1.3A, AC200Vφ1/0.7A (60Hz)
	Output	19W (50Hz), 18W (60Hz) Shading motor
Emergency detection	Oil level switch	Contact type A contact (NO) ON at low level Contact capacity 0.5A, AC DC200V/30W smaller
	Prerssure switch	Contact type A contact (NO) Operating pressure: 1.3M ON Reset pressure: 0.9MPa OFF Contact capacity AC DC250V/2A
Operation	MAX. discharge time:1 min. Min.interval time:3 min.	
Working viscosity range	50~1300mm²/S (50Hz)	
Reservoir capacity	1.8ℓ,3ℓ (plastic) 3ℓ,4ℓ,8ℓ (sheet metal)	
Weight	1.8ℓ: 2.7kg 3ℓ: 3.6kg	
External fuse	100V/2.0A, 200V/1.0A	

※Should the pump malfunction, contact us for immediate response with substitution.

● Related parts

MO2(C) Metering valve : P.105

JVPA Junction : P.106

MO Metering valve : P.107

PV Junction : P.108

MOS Metering valve : P.109

PVS Junction : P.109

MIX・MIX-A Metering valve : P.113

F-3D Filter : P.159

Pressure gauge : P.162

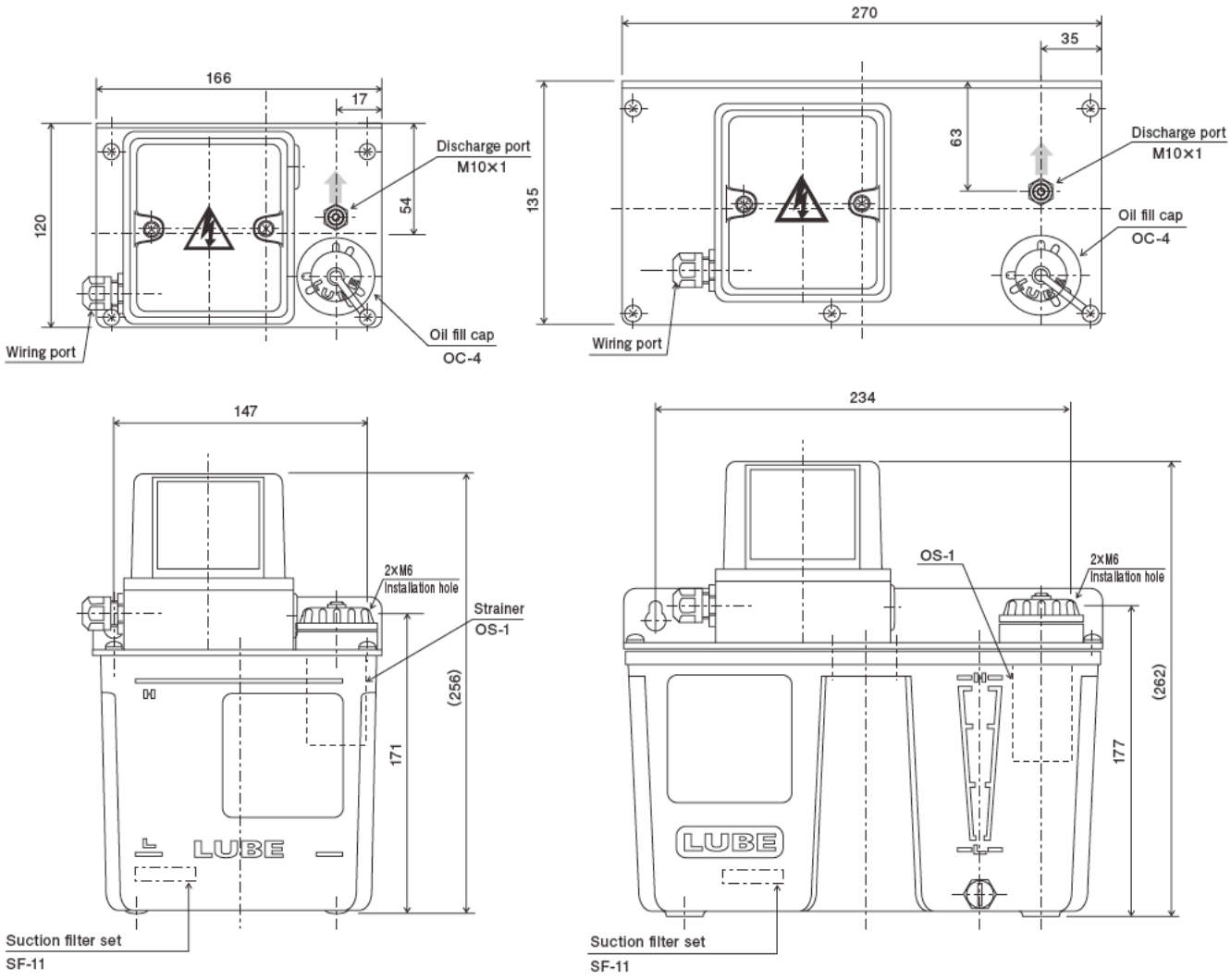
Tubing : P.171

Compression parts : P.169

Adapters : P.175

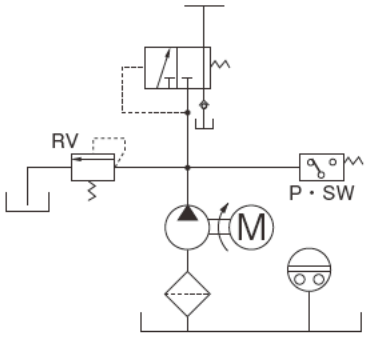
Reservoirs : P.148

Dimensional drawing

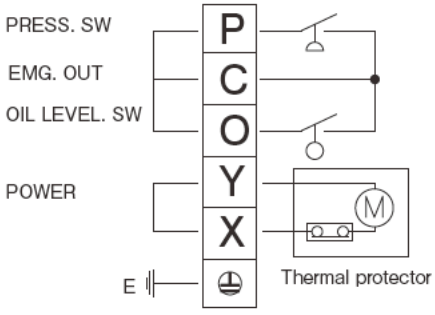


Improper handling can result in a death or serious injury Electrical shock may be received under certain conditions Be sure to ground.

Hydraulic circuit drawing



Wiring diagram



Pneumatic piston pump

PM-8S

Pneumatically actuated piston pump for use with positive displacement injectors.

[PM-8S]

HOW to order

PM-8S-□-□□

Oil level switch

Blank	Blank
L	With (A contact)

Reservoir capacity

Blank	1.8ℓResin reservoirs
※1 3	3ℓResin reservoirs
30	3ℓMetal reservoirs
40	4ℓMetal reservoirs
80	8ℓMetal reservoirs

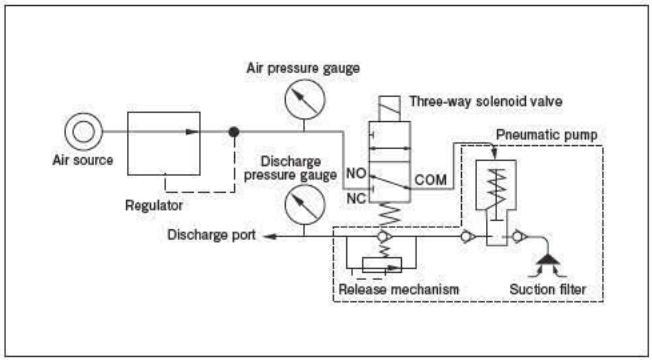
Reservoir Mounting Poition

Blank	1.8ℓResin
F	Foot Mount
B	Wall Mount

※Metalreservoir only

※Pump is installed on the right side, if a metal reservoir is selected.
※Specify the pump location (right or left) if 13L reservoir is.

Hydraulic circuit drawing



Specifications

Pump ratio	1:5 (under air pressure of 0.5MPa)	
Discharge volume	8mℓ/shot (6mℓ, 7mℓ: Available on order)	
Working viscosity	Spray method: Oil shot 10～100cSt Oil/air 10～1800cSt Contact us when a special lubricant is used.	
Air pressure vs. air consumption	0.4MPa - 0.27Nl/shot; 0.5MPa - 0.3Nl/shot Total valve discharge: Approx. 5mℓ	
Spray amount	When using 0.5mℓ valve, lubrication points can be up to 10 points.	
Reservoir capacity	1.8ℓ, 3ℓ resin reservoir (standard) 3ℓ resin reservoir, 3ℓ, 4ℓ, 8l metal reservoir (optional)	
Option	3-way solenoid valve	Voltage: AC100V, AC200V, DC24V
	Oil level swith	A contact (NO) ON at low level
	Contact capacity	AC, DC200V 30W or resistance load 0.5A, whichever smaller
Weight	1.8ℓ reservoir: 1.2 kg, 8ℓ reservoir: 11.0kg	

● Related parts


MO2(C) Metering valve : P.105

JVPA Junction : P.106


MO Metering valve : P.107

PV Junction : P.108


MOS Metering valve : P.109

PVS Junction : P.109


MIX・MIX-A Metering valve : P.113


F-3D Filter : P.159


Pressure gauge : P.162

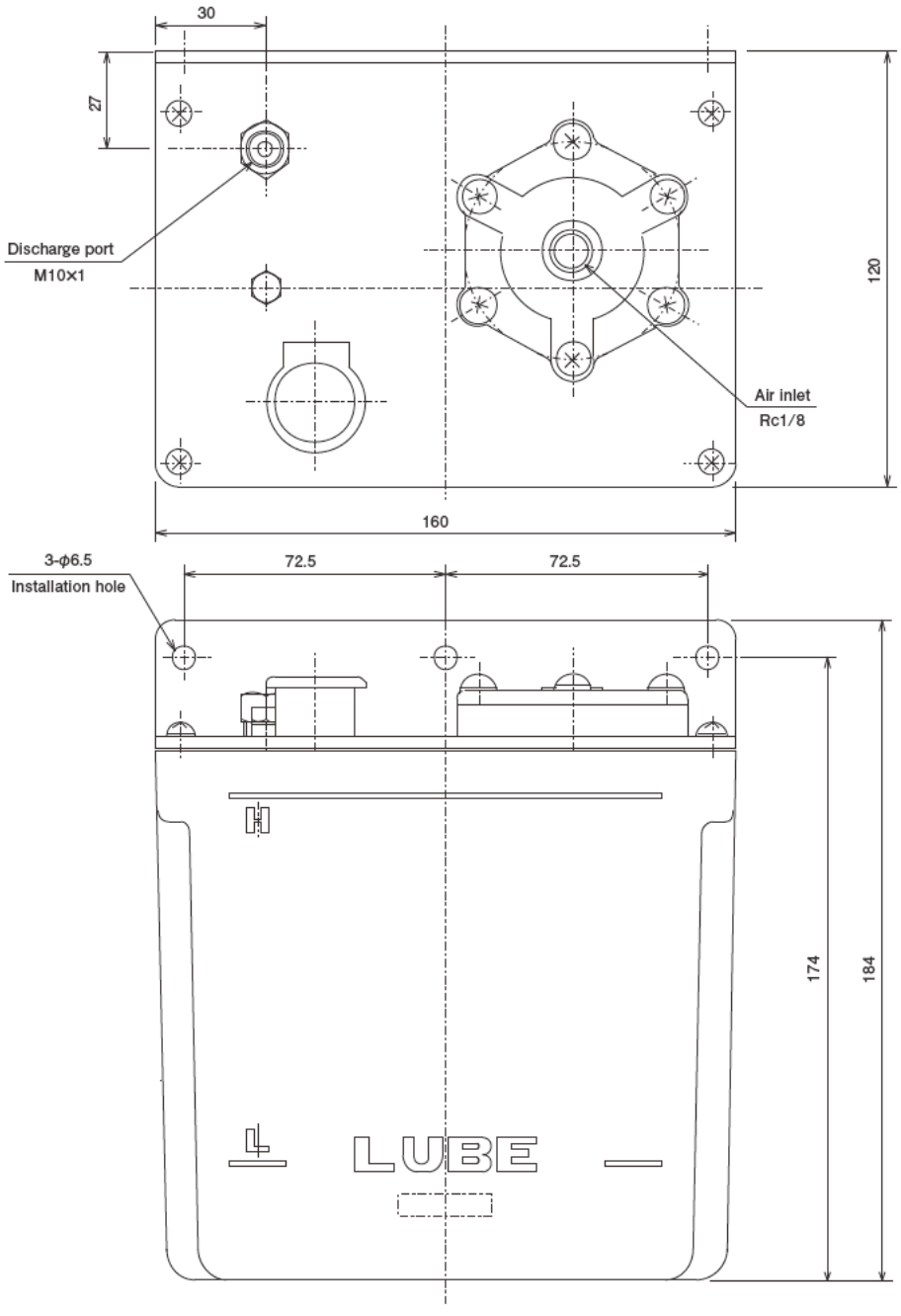

Tubing : P.171


Compression parts : P.169


Adapters : P.175


Reservoirs : P.148

Dimensional drawing



[PM-8S]

Directions for use

- When the pump is used for any special liquid compounds, contact us for consultation.
- See the instruction manual.

※ Should the pump malfunction, contact us for immediate response with substitution.

Automatic intermittent gear pump

AMO-ⅢDS

Capable of operating over a wide working viscosity range.
Digital display gives on sight visual indication.
Interval can be a function of time or count.

[1.8ℓ] [3ℓ]

HOW to order

AMO–ⅢDS–□–□□

Voltage

1	AC100Vφ1
2	AC200Vφ1

Reservoir Mounting Poition

Blank	Resin
F	Foot Mount
B	Wall Mount

※Metalreservoir only

Reservoir capacity

Blank	1.8ℓResin reservoirs
3	3ℓResin reservoirs
30	3ℓMetal reservoirs
40	4ℓMetal reservoirs
80	8ℓMetal reservoirs

※Pump is installed on the right side, if a metal reservoir is selected.

Directions for use

- Do not remove the oil strainer to keep the pump clear of foreign matter.
- Replace or clean the suction filter at least once a year.
- Oil viscosity varies with oil temperature. Be sure to use oil within specified working viscosity range.
- Do not use any special additive-contained oil, water soluble oil and solvent.
- Periodically check the oil in the reservoir for impurities. Replace it, if necessary, with fresh oil immediately. Be sure to clean the reservoir before oil change.
- Make sure that proper voltage is applied.
- Do not over tighten the discharge joint. Refer to the tightening torque table.
- Low-oil viscosity versions are available. Contact us for information.

Specifications

Pump	Discharge volume	150mℓ/min (50Hz), 180mℓ/min (60Hz)	
	Discharge pressure	2.0MPa/284psi (safety valve setting)	
Motor	Power	AC100Vφ1/0.83A, AC200Vφ10.41A (50Hz) AC100Vφ1/0.64A, AC200Vφ1/0.33A (60Hz)	
	Output	20W (50Hz/ 60Hz) Capacitor motor	
Controller	Timer Counter	Discharge time adjustable range: 1~99 seconds Interval time adjustable range: 1 to 9999 minutes 1 to 9999 counts	
	Emergency output	Contact type A contact (NO)	
		Contact capacity AC250V 1.5A	
	Emergency detection	Oil level switch	Contact type A contact (NO) ON at low level
		Prerssure switch	Contact type B contact (NC) Operating pressure: 1.7MPa OFF Reset pressure: 0.9MPa ON
	Liquid crystal display	INTERVAL	display 'INT'
		DISCHARGE	display 'DIS'
		ALARM	Low oil level display 'OILLEVEL ERR' Low pressure display 'PRESSURE ERR'
Working viscosity range	68~1800mm²/S (50Hz)		
Reservoir capacity	1.8ℓ, 3ℓ (plastic) 3ℓ, 4ℓ, 8ℓ (sheet metal)		
Weight	1.8ℓ Reservoirs: 3.2kg 3ℓ Reservoirs: 4kg		

※ Should the pump malfunction, contact us for immediate response with substitution.

● Related parts


MO2(C) Metering valve : P.105

JVPA Junction : P.106


MO Metering valve : P.107

PV Junction : P.108


MOS Metering valve : P.109

PVS Junction : P.109


MIX・MIX-A Metering valve : P.113


F-3D Filter : P.159


Pressure gauge : P.162

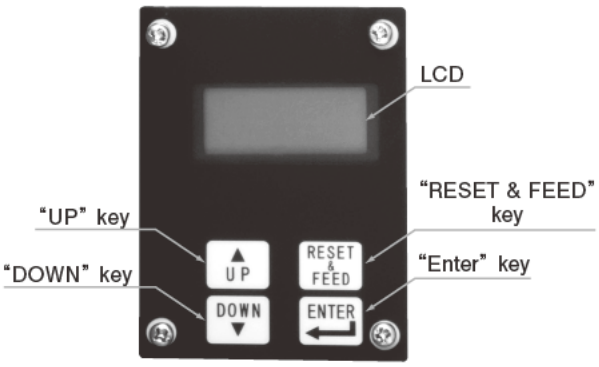

Tubing : P.171


Compression parts : P.169


Adapters : P.175


Reservoirs : P.148

Exterior features of the controller

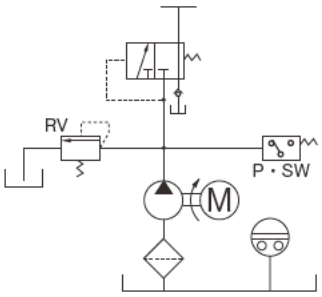


Operation panel of the controller

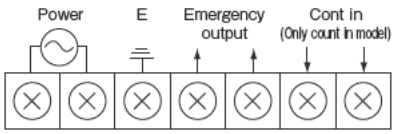
LCD shows the below:

INTERVAL → INT
DISCHARGE→ DIS
ALARM → Low oil level OILLEVEL ERR
Low pressure PRESSURE ERR

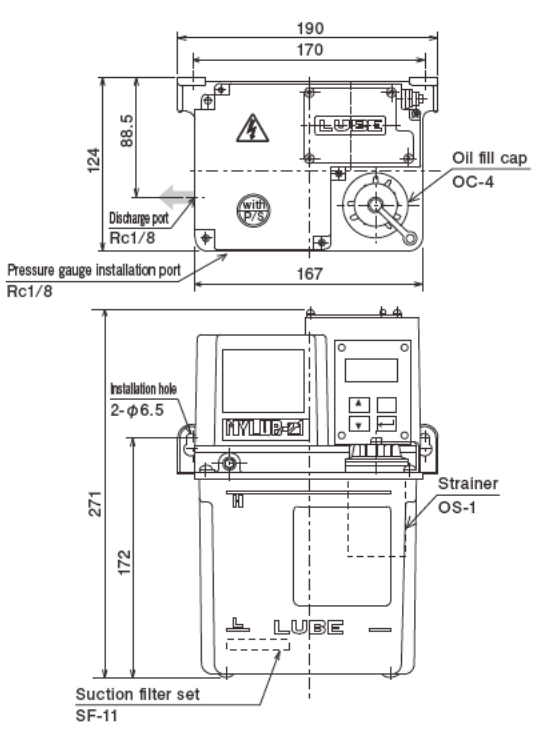
Hydraulic circuit drawing



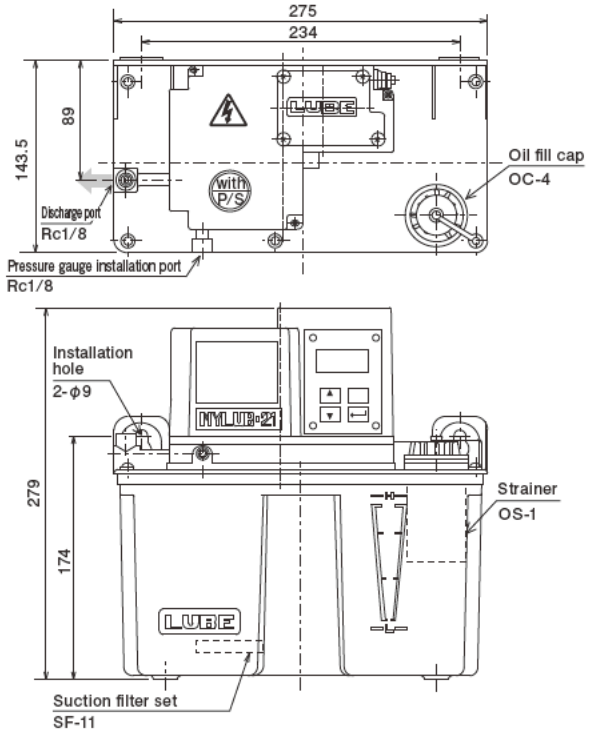
Wiring diagram



Dimensional drawing



[1.8ℓ]



[3ℓ]

Improper handling can result in a death or serious injury Electrical shock may be received under certain conditions Be sure to ground.

Automatic intermittent gear pump

AMO-Ⅱ-150S

Automatic intermittent gear pump without controller. Capable of working with a wide range of oil viscosities.

[1.8ℓ]

[3ℓ]

HOW to order

AMO-Ⅱ-150S-□-□-□□

Voltage

1	AC100Vφ1
2	AC200Vφ1

Pressure Switch

Blank	Blank (With Pressure Switch)
P	Blank (Without Pressure Switch)

Reservoir Mounting Poition

Blank	Resin
F	Foot Mount
B	Wall Mount

※Metalreservoir only

Reservoir capacity

Blank	1.8ℓResin reservoirs
3	3ℓResin reservoirs
30	3ℓMetal reservoirs
40	4ℓMetal reservoirs
80	8ℓMetal reservoirs

※Pump is installed on the right side, if a metal reservoir is selected.

Directions for use

- This pump unit requires a separate control circuit to operate.
- Do not remove the oil strainer to keep the pump clear of foreign matter.
- Replace or clean the suction filter at least once a year.
- Oil viscosity varies with oil temperature. Be sure to use oil within the working viscosity range.
- Do not use any special additive-contained oil, water soluble oil and solvent.
- Periodically check the oil in the reservoir for impurities. Replace it, if necessary, with fresh oil immediately. Be sure to clean the reservoir before oil change.
- Make sure that proper voltage is applied.
- Do not over tighten the discharge joint. Refer to the tightening torque table.
- Low-oil viscosity versions are available. Contact us for information.

Specifications

Pump	Discharge volume	150mℓ/ min (50Hz), 180mℓ/ min (60Hz)
	Discharge pressure	2.0Mpa(15kgf/cm2) 284psi
Motor	Voltage / current	AC100V φ1/0.83A, AC200V φ1/0.41A (50Hz) AC100V φ1/0.64A, AC200V φ1/0.33A (60Hz)
	Output	20W (50Hz/ 60Hz) Condenser Motor
Emergency detection	Oil level switch	Contact type A contact (NO) ON at low level
		Contact capacity 0.5A AC DC200V/30W smaller
	Prerssure switch	Contact type A contact (NC) Operating pressure: 1.7MPa OFF Reset pressure: 0.9MPa ON Contact capacity AC DC250V/3A
Discharge time	Max. Discharge time:99sec Min. Interval time:1min	
Working viscosity range	68~1800mm²/S (50Hz)	
Reservoir capacity	1.8ℓ, 3ℓ (plastic) 3ℓ, 4ℓ, 8ℓ (sheet metal)	
Weight	1.8ℓ Reservoirs: 3.2kg 3ℓ Reservoirs: 4kg(plastic)	

※Should the pump malfunction, contact us for immediate response with substitution.

● Related parts

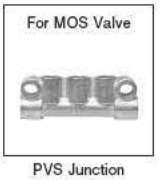
MO2(C) Metering valve : P.105

JVPA Junction : P.106

MO Metering valve : P.107

PV Junction : P.108

MOS Metering valve : P.109

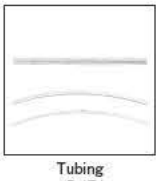


PVS Junction : P.109

MIX・MIX-A Metering valve : P.113

F-3D Filter : P.159

Pressure gauge : P.162



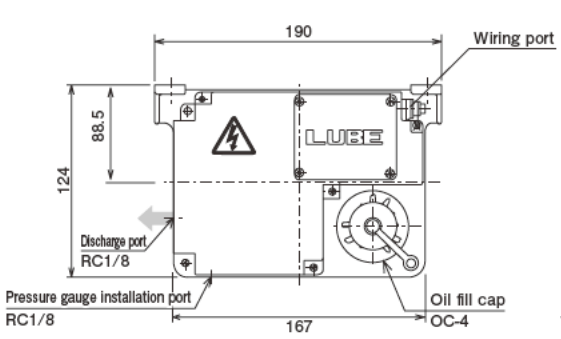
Tubing : P.171

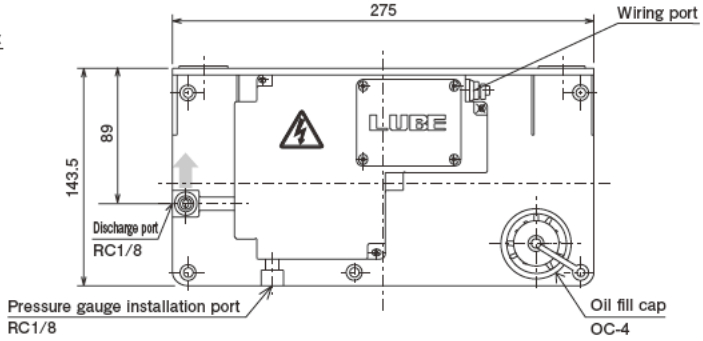
Compression parts : P.169

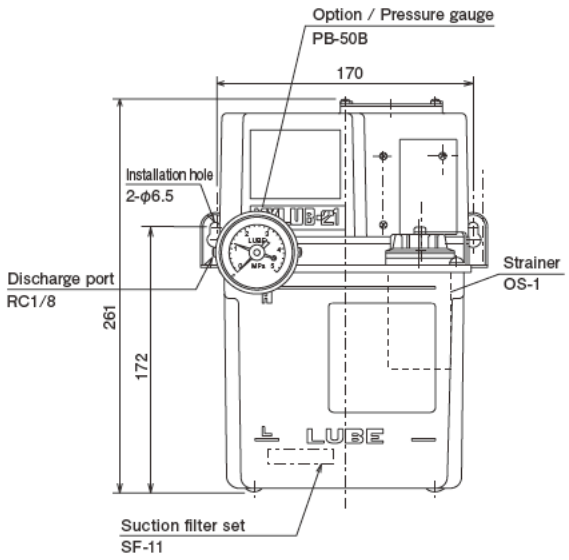
Adapters : P.175

Reservoirs : P.148

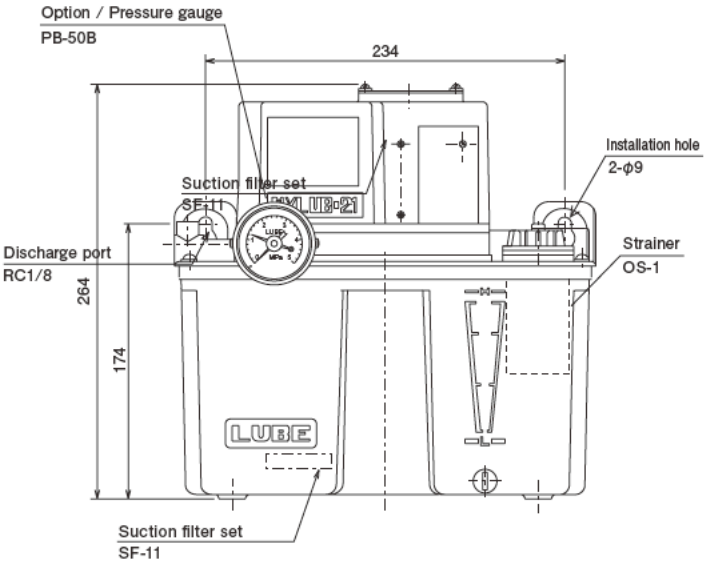
Dimensional drawing







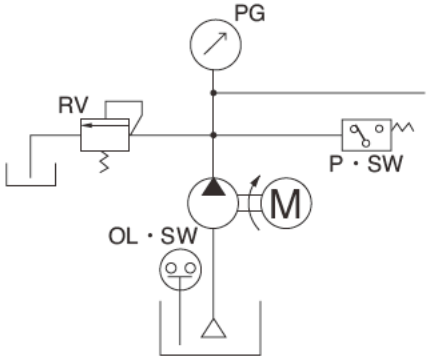
[1.8 ℓ]



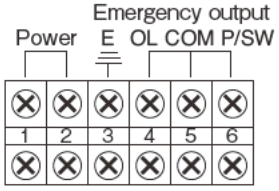
[3 ℓ]

Improper handling can result in a death or serious injury Electrical shock may be received under certain conditions Be sure to ground.

Hydraulic circuit drawing



Wiring diagram



Automatic intermittent gear pump

AMI-300S • AMI-1000S


[AMI-300S]


[AMI-1000S]

HOW to order

AMI-□S-□-□□□-□□

Discharge volume

300	300mℓ/min
1000	1000mℓ/min

Voltage

1	AC100Vφ1
2	AC200Vφ3

Reservoir capacity

2	2ℓMetal
3	3ℓResin reservoirs
30	3ℓMetal reservoirs
40	4ℓMetal reservoirs
80	8ℓMetal reservoirs

Reservoir Mounting Position

Blank	Resin reservoirs
F	Foot Mount
B	Wall Mount

Pump Position

L	Pump position-Left
R	Pump position-Right

※Except 2L reservoir.

Controller

Blank	Blank
C	With (Meca-tron)

Oil level switch

Blank	Blank
L	With

※If the controller is used, please select "With".

Specifications

		AMI-300S	AMI-1000S
Pump	Discharge volume	300mℓ/min (50Hz) 330mℓ/min (60Hz)	1000mℓ/min (50Hz) 1100mℓ/min (60Hz)
	Discharge pressure	2.5MPa (25kgf/cm2) 362.5 psi	
Motor	Power	AC100Vφ1/1.4A (condenser 14 μF)	AC100Vφ1/1.4A (50Hz) (condenser 20 μF)
		AC200Vφ3/0.35A	AC200Vφ3/0.56A (50Hz)
	Output	50W Induction motor	75W Induction motor
Operation rate		Max. Discharge time :3min Min. Interval time : 3min	
Working viscosity range		65~1300mm²/S (50Hz)	
Reservoir capacity		Standard reservoir up to 50 liters available.	
Weight		4.4kg	7.1kg
Others		With Pressure relief mechanism, Motor rotary direction: Clockwise	
		Meca-tron controller is available for controlling purpose.	
External fuse		100V/2A 200V/1A	100V/3A 200V/1A

Directions for use

- Replace or clean the suction filter at least once a year.
- Oil viscosity varies with oil temperature. Be sure to use oil within specified working viscosity range.
- Do not use any special additive-contained oil, water soluble oil and solvent.
- Periodically check the oil in the reservoir for impurities. Replace it, if necessary, with fresh oil immediately. Be sure to clean the reservoir before oil change.
- Make sure that proper voltage is applied.
- Do not over tighten the discharge joint. Refer to the tightening torque table.

※ Should the pump malfunction, contact us for immediate response with substitution.

● Related parts


MO2(C) Metering valve : P.105

JVPA Junction : P.106


MO Metering valve : P.107

PV Junction : P.108


MOS Metering valve : P.109

PVS Junction : P.109


MIX・MIX-A Metering valve : P.113


F-3D Filter : P.159


Pressure gauge : P.162

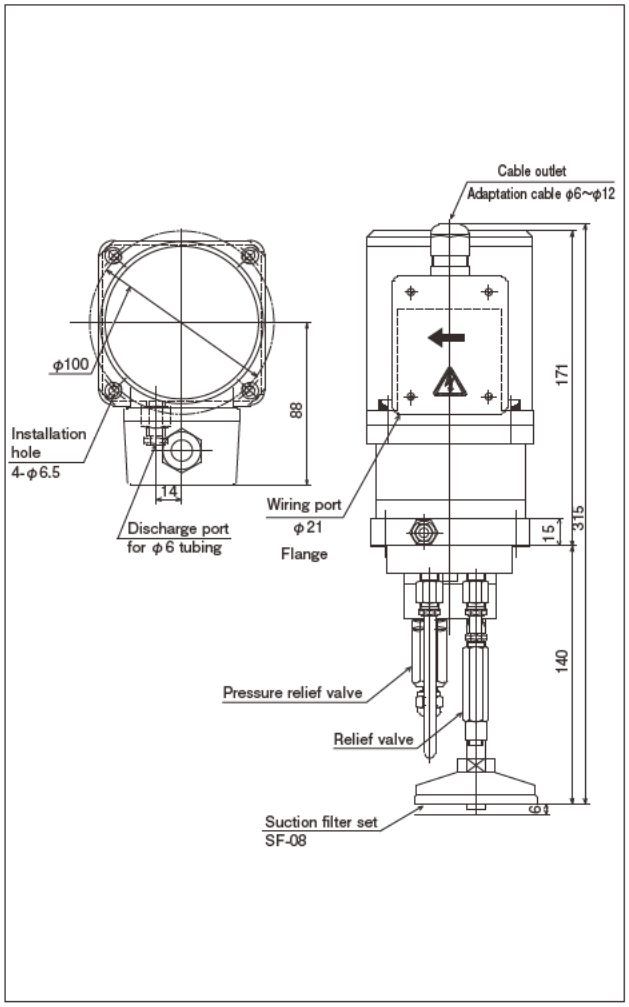

Tubing : P.171


Compression parts : P.169

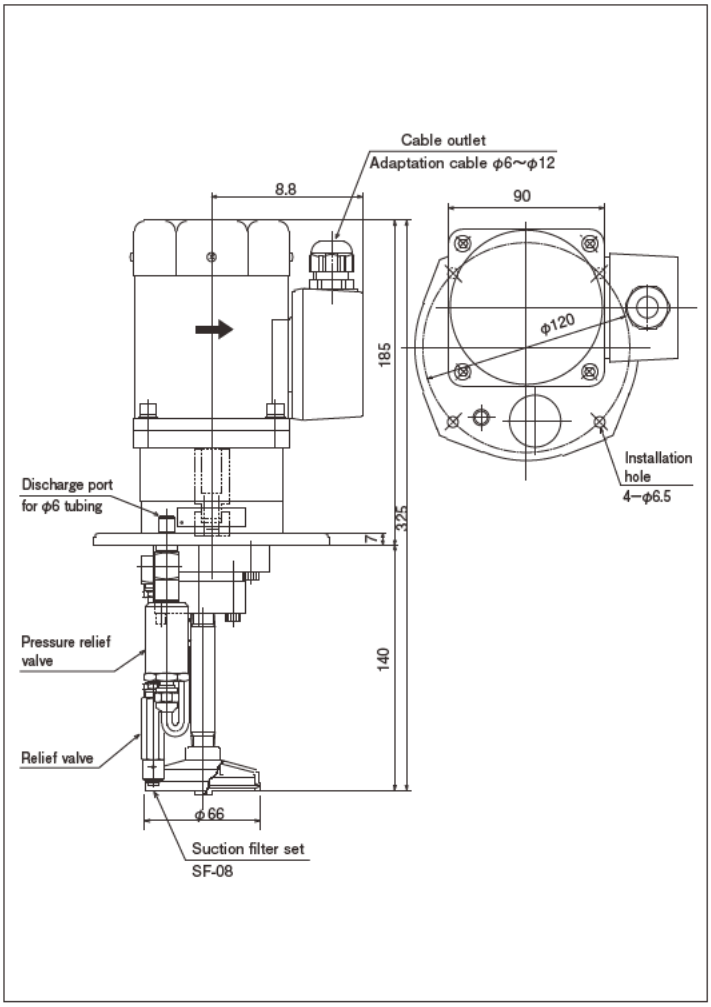

Adapters : P.175


Reservoirs : P.148

Dimensional drawing (AMI-300S)

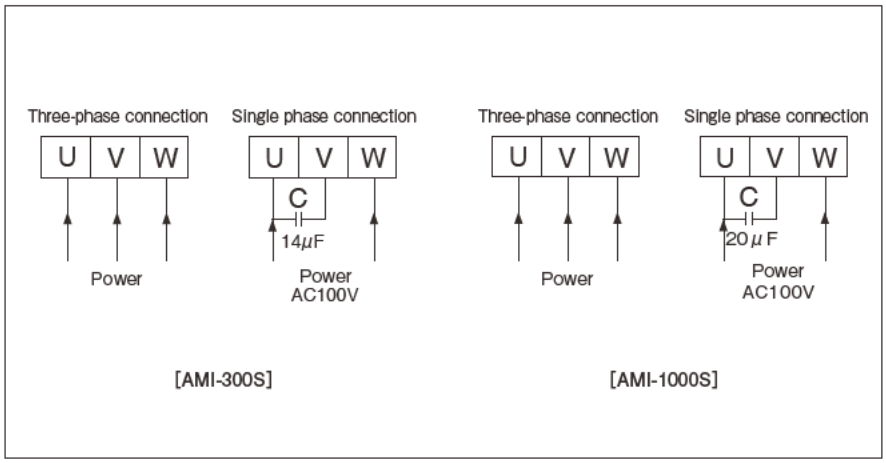


Dimensional drawing (AMI-1000S)

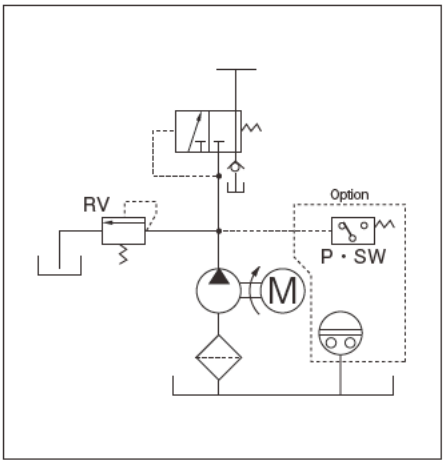


Improper handling can result in a death or serious injury Electrical shock may be received under certain conditions Be sure to ground.

Wiring diagram



Hydraulic circuit drawing



Positive Displacement Injector (PDI) System for Large Machines

MO2・MO2C

MO

MOS

MIX

MIX-A

【Valve】

Metering valve

MO2 · MO2C

Positive displacement injectors which are available with compression or push to connect tail tubing connections.


[MO2] [MO2C]

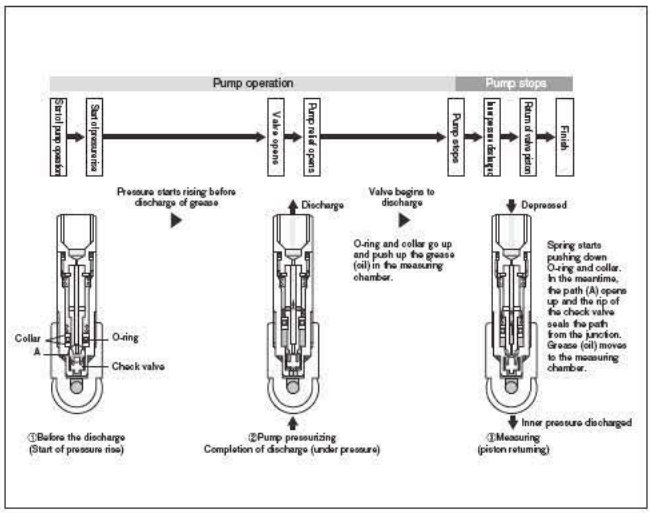
Specifications

Discharge volume	0.03, 0.05, 0.1, 0.2, 0.3, 0.5 mℓ/stroke
Operating pressure	1.0MPa
Reset pressure	0.3MPa

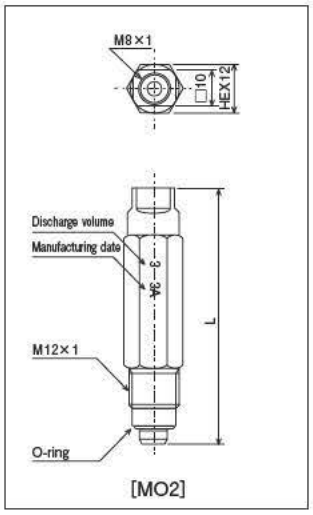
Model

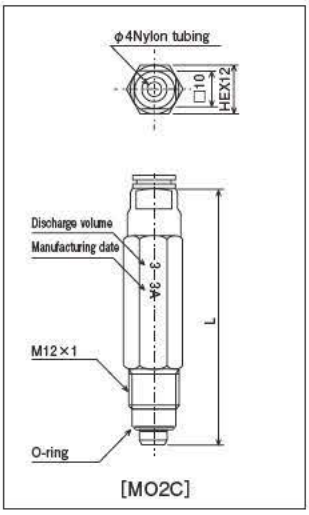
Model	Part Number	Discharge volume (mℓ)	L (mm)	Mark	
MO2-3	205761	0.03	48	3	HEX12
MO2-5	205762	0.05		5	
MO2-10	205763	0.1		10	
MO2-20	205764	0.2	64	20	
MO2-30	205765	0.3		30	
MO2-50	205766	0.5		50	
MO2C-3	205751	0.03	53.5	3	
MO2C-5	205752	0.05		5	
MO2C-10	205753	0.1		10	
MO2C-20	205754	0.2	69.5	20	
MO2C-30	205755	0.3		30	
MO2C-50	205756	0.5		50	

Operation Sequence



Dimensional drawing





● Related parts


AMZ- Ⅲ
: P.93


AMO- Ⅲ DS
: P.97


AMO- Ⅱ -150S
: P.99


AMI-300S · 1000S
: P.101


Tubing
: P.171


Adapters
: P.175


Compression parts
: P.169


Push-in Fitting
: P.182

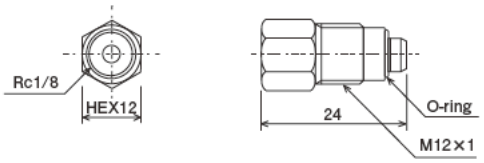

Pressure switch
: P.163


Ludo-sensor
: P.164

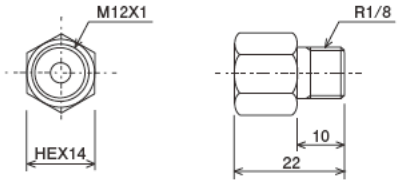
Junctions and special fittings for MO2 series valve installation

For MO2 valve installation

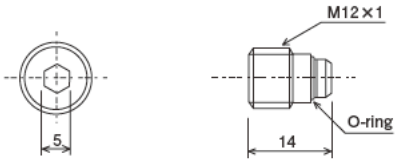
Dimensional drawing



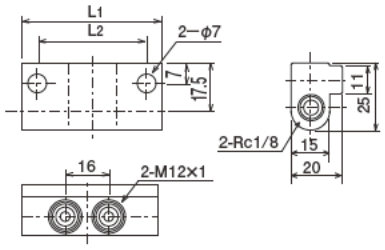
[Connector assembly]



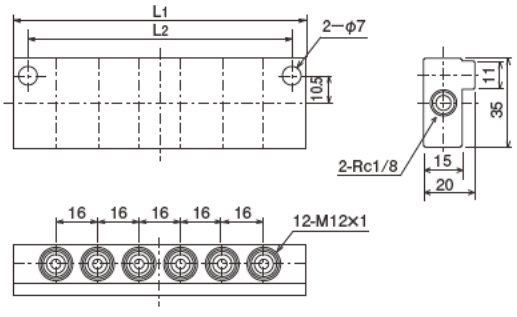
[Adapter]



[Plug assembly]



[Junction]



[Junction]

Model

Model	Part Number
SCP	619803

●Material: Brass (C3604)

Model	Part Number
Adapter for MG2or MO2	611825

●Material: Brass (C3604)

Model	Part Number
BPP	619802

●Material: Steel (SUM24)

Model	Part Number	Specifilcation	L_1	L_2
JVPA- 1S	216001	Single type for 1 port	33	22
JVPA- 2S	216002	Single type for 2 ports	49	38
JVPA- 3S	216003	Single type for 3 ports	65	54
JVPA- 4S	216004	Single type for 4 ports	81	70
JVPA- 5S	216005	Single type for 5 ports	97	86
JVPA- 6S	216006	Single type for 6 ports	113	102
JVPA- 7S	216007	Single type for 7 ports	129	118
JVPA- 8S	216008	Single type for 8 ports	145	134
JVPA- 9S	216009	Single type for 9 ports	161	150
JVPA-10S	216010	Single type for 10 ports	177	166
JVPA-11S	216011	Single type for 11 ports	193	182
JVPA-12S	216012	Single type for 12 ports	209	198

Model	Part Number	Specifilcation	L_1	L_2
JVPA- 2D	216021	Double type for 2 ports	33	11
JVPA- 4D	216022	Double type for 4 ports	49	38
JVPA- 6D	216023	Double type for 6 ports	65	54
JVPA- 8D	216024	Double type for 8 ports	81	70
JVPA-10D	216025	Double type for 10 ports	97	86
JVPA-12D	216026	Double type for 12 ports	113	102
JVPA-14D	216027	Double type for 14 ports	129	118
JVPA-16D	216028	Double type for 16 ports	145	134

●Material Aluminum A6063S-T5

Metering valve

MO

Positive displacement injectors (PDI) for oil. Up to nine different outputs per stroke are available. Can select proper discharge volume for all of your needs.

Available as service parts only. For new installations, please see MO-II valves.

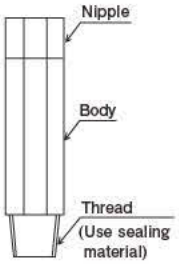
[MO]

Specifications

Discharge volume	0.01,0.03,0.05,0.1,0.2,0.3,0.5,1.0,1.5mℓ/stroke
Operating pressure	1.0MPa
Reset pressure	0.3MPa

Directions for use

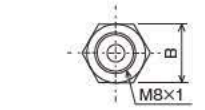
- When installing the valve on a junction side, screw it into place with a wrench applied to the valve body
- When connecting the valve to piping, turn bushing holding nipple with a wrench.

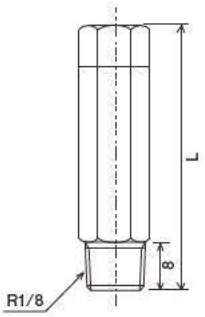


Model

Model	Part Number	Discharge volume (mℓ)	L (mm)	Mark	B
MO-1	205070	0.01	44.5	1	HEX12
MO-3	205071	0.03		3	
MO-5	205072	0.05		5	
MO-10	205073	0.1		10	
MO-20	205074	0.2	53.5	20	
MO-30	205075	0.3		30	
MO-50	205076	0.5	65	50	
MO-100	205077	1	74.5	100	HEX19
MO-150	205078	1.5		150	

Dimensional drawing





● Related parts


AMZ- Ⅲ
: P.93


AMO- Ⅲ DS
: P.97


AMO- Ⅱ -150S
: P.99


AMI-300S・1000S
: P.101


Tubing
: P.171


Adapters
: P.175


Compression parts
: P.169

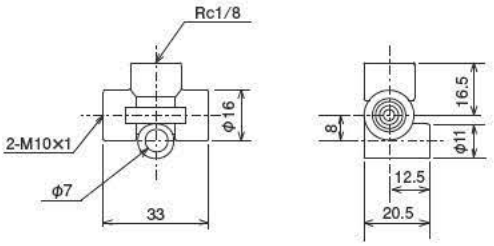

Push-in Fitting
: P.182


Pressure switch
: P.163


Ludo-sensor
: P.164

Junction for MO valve

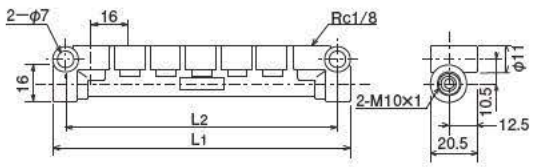
Dimensional drawing



Model

Model	Part Number	Specifications
PV-1	206481	Single type for 1 port

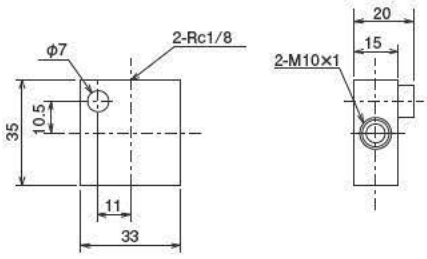
●Meterial: Zinc Die Casting (ZDC)



[PV-7]

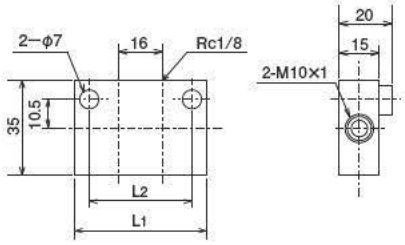
Model	Part Number	Specifications	L_1	L_2
PV-2	206482	Single type for 2 ports	49	38
PV-3	206483	Single type for 3 ports	65	54
PV-4	206484	Single type for 4 ports	81	70
PV-5	206485	Single type for 5 ports	97	86
PV-6	206486	Single type for 6 ports	113	102
PV-7	206487	Single type for 7 ports	129	118
PV-8	206489	Single type for 8 ports	145	134

●Material: Zinc Die Casting (ZDC)



Model	Part Number	Specifications
PV-2D	206491	Double type for 2 ports

●Material brass C3604



[PV-4D]

Model	Part Number	Specifications	L_1	L_2
PV-4D	206492	Double type for 4 ports	49	38
PV-6D	206493	Double type for 6 ports	65	54
PV-8D	206494	Double type for 8 ports	81	70
PV-10D	206495	Double type for 10 ports	97	86
PV-12D	206496	Double type for 12 ports	113	102

●Material brass C3604

Compact metering valve

MOS

MOS metering valve is the compact version of MO valve.
Up to four different outputs are available.

Available as service parts only.
For new installations, please see MO-II valves.

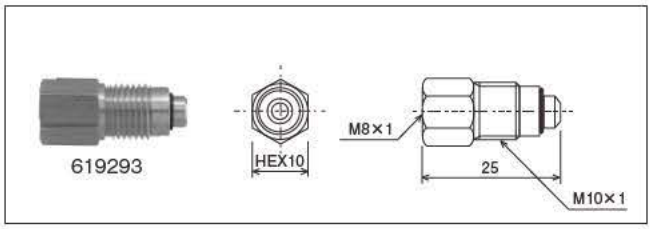
Specifications

Discharge volume	0.01、0.03、0.05、0.1mℓ/Stroke
Operating pressure	0.9MPa
Reset pressure	0.3MPa

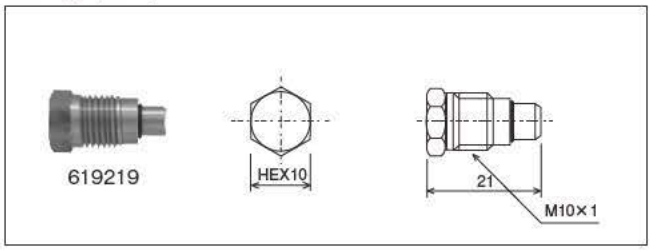
Model

Model	Part Number	Didcharge volume (ℓ)	Mark
MOS-1	205300	0.01	1
MOS-3	205301	0.03	3
MOS-5	205302	0.05	5
MOS-10	205303	0.1	10

■ Adapters (SAS)

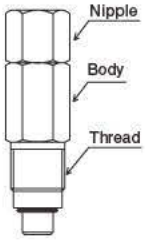


■ Plug (BPS)



Directions for use

- When installing the valve on a junction side, screw it into place with a wrench applied to the valve body (Tightening torque : 50kgf·cm)
- When connecting the valve to piping, turn bushing holding nipple with a wrench.



● Related parts


AMZ- Ⅲ
: P.93


AMO- Ⅲ DS
: P.97


AMO- Ⅱ -150S
: P.99


AMI-300S・1000S
: P.101


Tubing
: P.171


Adapters
: P.175

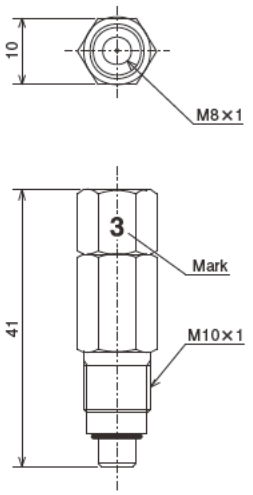

Compression parts
: P.169


Push-in Fitting
: P.182

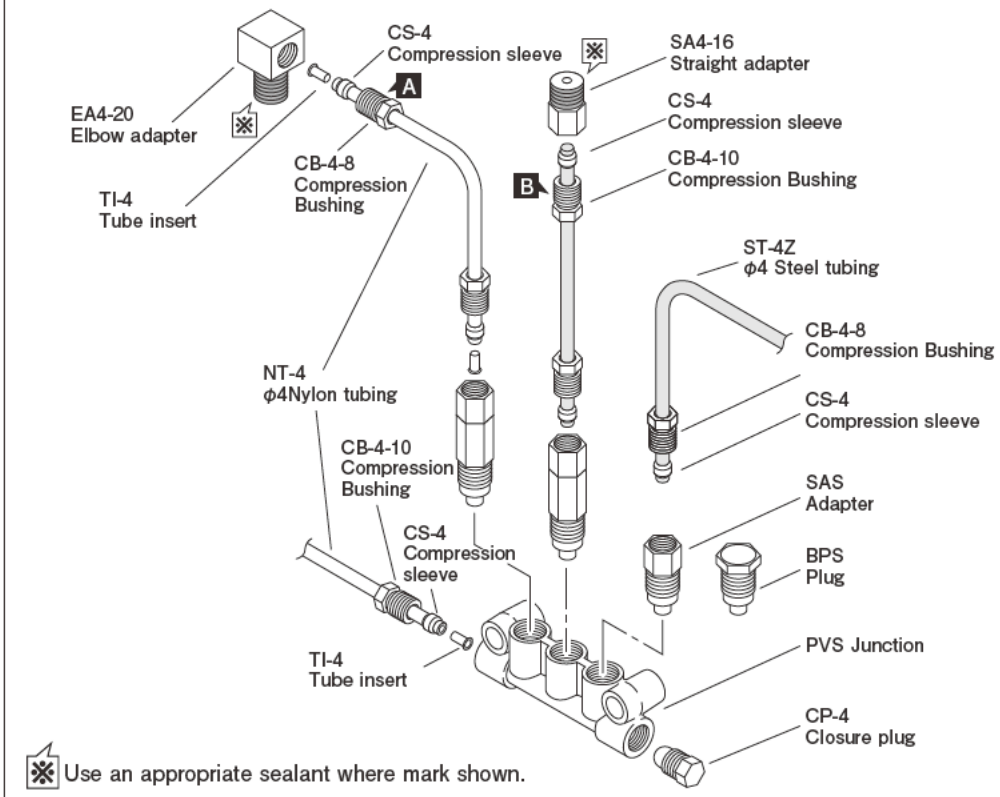

Pressure switch
: P.163


Ludo-sensor
: P.164

Dimensional drawing



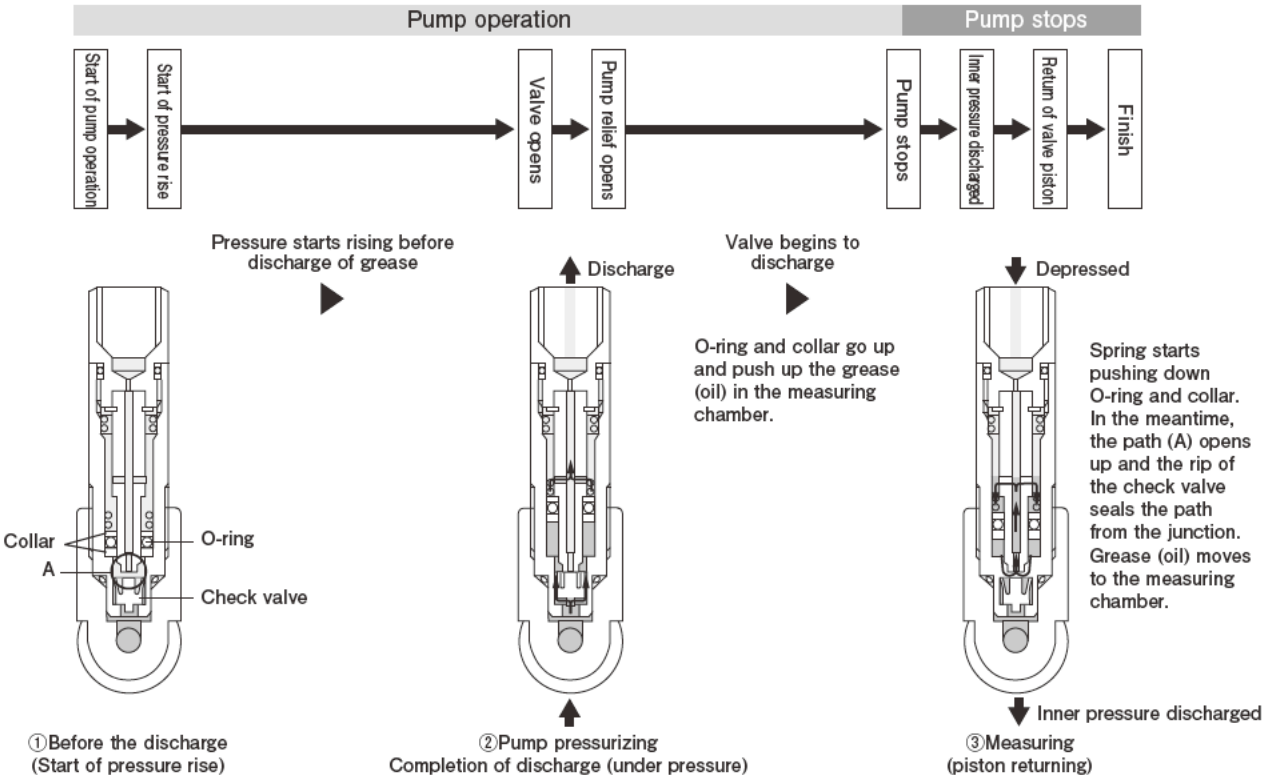
Sample tubing. (This is just an example.)



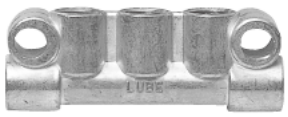
※ Use an appropriate sealant where mark shown.

■ Mark denote tightening torque. See the tightening torque list. P.219

Operation Sequence

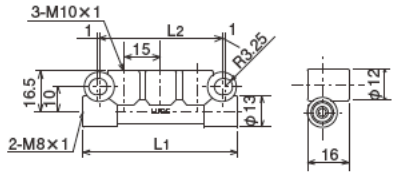


Junction for MOS compact metering valve



Valve installation ports are threaded in M10x1 specially for MOS valves.
Plug the installation ports not in use with Blanking Plug (BPS).
When connecting tubing, use the adapter (SAS).

Dimensional drawing

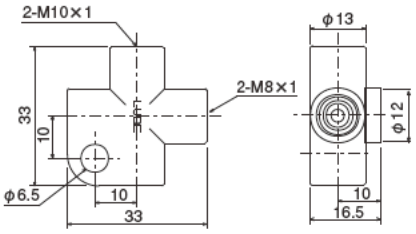


[PVS-3S]

Model

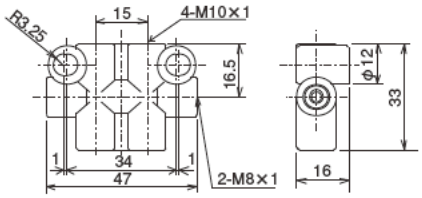
Model	Part Number	Specifications	L1	L2
PVS-2S	206572	Single type for 2 ports	47	34
PVS-3S	206573	Single type for 3 ports	63	50
PVS-4S	206574	Single type for 4 ports	78	65
PVS-5S	206575	Single type for 5 ports	93	80
PVS-6S	206576	Single type for 6 ports	108	95
PVS-7S	206577	Single type for 7 ports	123	110
PVS-8S	206578	Single type for 8 ports	138	125

●Material Zinc Die Casting (ZDC)



Model	Part Number	Specifications
PVS-2D	206554	Double type 2ports

●Material Zinc Die Casting (ZDC)



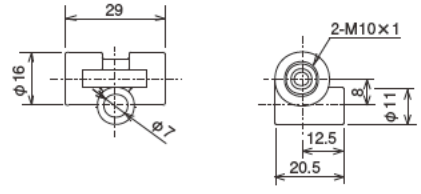
Model	Part Number	Specifications
PVS-4D	206557	Double type 4ports

●Material Zinc Die Casting (ZDC)

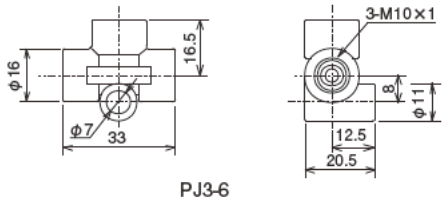
Junction for main tubing

For 6mm O.D tubing

Dimensional drawing



PJ2-6



PJ3-6

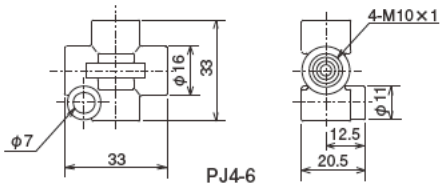
Model

External diameter

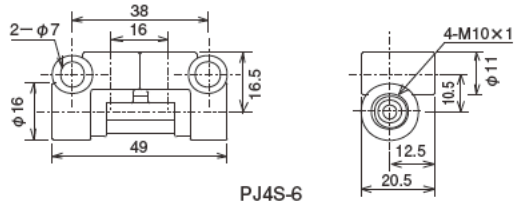
Model	Part Number	Specifications
PJ2-6	206452	Two-way
PJ3-6	206453	Three-way
PJ4-6	206454	Four-way
PJ4S-6	206461	

●Material Zinc Die Casting (ZDC)

Dimensional drawing

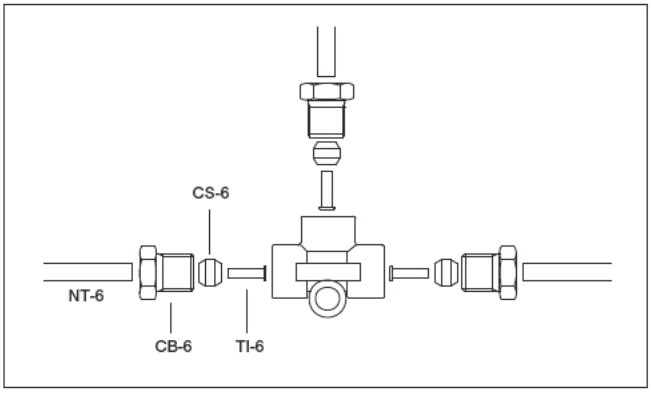


PJ4-6



PJ4S-6

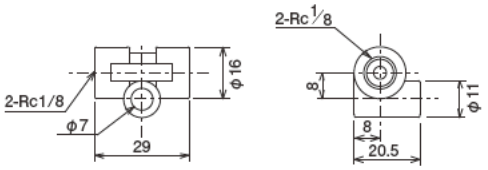
Example of connecting nylon tubing NT-6.

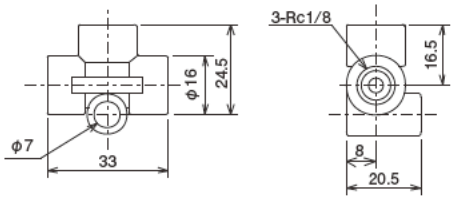


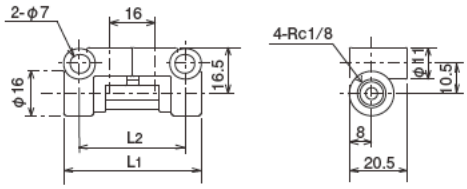
Junction

[JV-6S]

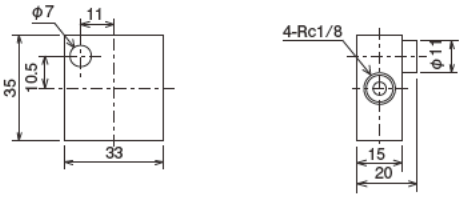
Dimensional drawing

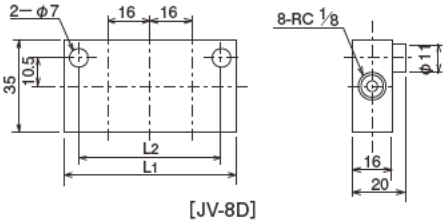






[JV-4S]





[JV-8D]

Model

Model	Part Number
JV-2	206470

●Material Zinc Die Casting (ZDC)

Model	Part Number	Specifications
JV-3	206471	Single type for 1 port

●Material Zinc Die Casting (ZDC)

Model	Part Number	Specifications	L_1	L_2
JV- 4S	206472	Single type for 2 ports	49	38
JV- 5S	206473	Single type for 3 ports	65	54
JV- 6S	206474	Single type for 4 ports	81	70
JV- 7S	206475	Single type for 5 ports	97	86
JV- 8S	206476	Single type for 6 ports	113	102
JV- 9S	206479	Single type for 7 ports	129	118
JV-10S	206543	Single type for 8 ports	145	134

●Material Zinc Die Casting (ZDC)

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

●Material brass (C3604)

Model	Part Number	Specifications	L_1	L_2
JV- 6D	206465	Double type for 4 ports	49	38
JV- 8D	206466	Double type for 6 ports	65	54
JV-10D	206467	Double type for 8 ports	81	70
JV-12D	206468	Double type for 10 ports	97	86
JV-14D	206469	Double type for 12 ports	113	102

●Material brass (C3604)

Air-oil metering valve

MIX・MIX-A

Air Oil Mixing Blocks have precision Positive Displacement Injectors built into them.

[MIX-A]

[MIX]

HOW to order

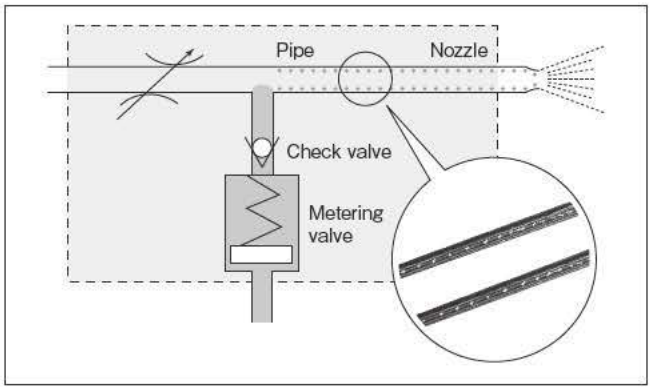
Fill the blanks with the valve marking from the left to right.
※Markings designate discharge volume. (Ex:5→0.05m ℓ / stroke)

Example)

Discharge port — Valve marking (From left to right)

MIX 3 3 5 10 ・・・

Air Oil system



Directions for use

• Please make sure to read Operation Manual before operation.

Model

		MIX	MIX-A
Discharge volume (mℓ)	Mark	Model	Model
0.005	05	—	MIX-A-05
0.01	1	MIX-1	MIX-A-1
0.015	15	—	MIX-A-1.5
0.03	3	MIX-3	MIX-A-3
0.05	5	MIX-5	MIX-A-5
0.1	10	MIX-10	—
0.2	20	MIX-20	—

Specifications

Discharge volume	MIX : 0.01、0.03、0.05、0.1、0.2 MIX-A : 0005、0.01、0.015、0.03、0.05mℓ/Stroke
Operating pressure	1.0MPa
Reset pressure	0.2MPa (0.15MPa : MIX-A)

Combination dimension list

MIX

Number of port	1 port	2 ports	3 ports	4 ports	5 ports	6 ports
L_1	—	50	70	90	110	130
L_2	—	40	60	40	60	80

● Material Aluminum

MIX-A

Number of port	1 port	2 ports	3 ports	4 ports	5 ports	6 ports
L_1	50	70	90	110	130	150
L_2	20	40	20	40	60	80

● Material Aluminum die casting

● Related parts


AMZ- Ⅲ
: P.93


AMO- Ⅲ DS
: P.97


AMO- Ⅱ -150S
: P.99


Tubing
: P.171


Adapters
: P.175


Compression parts
: P.169


Push-in Fitting
: P.182


Jet nozzle
: P.187


Pressure switch
: P.163


Ludo-sensor
: P.169

LUBE OIL / AIR MIXING Valve
STANDARD PRODUCT INQUIRY&ORDER SHEET

Date

L-MIX-A CODE NO.SL4010

Block assembly		Valve assembly					
Number of port	CODE No.	①	②	③	④	⑤	⑥
1	619821						
2	619822						
3	619823						
4	619824						
5	619825						
6	619826						

× ____PCS

▭ = Custom made

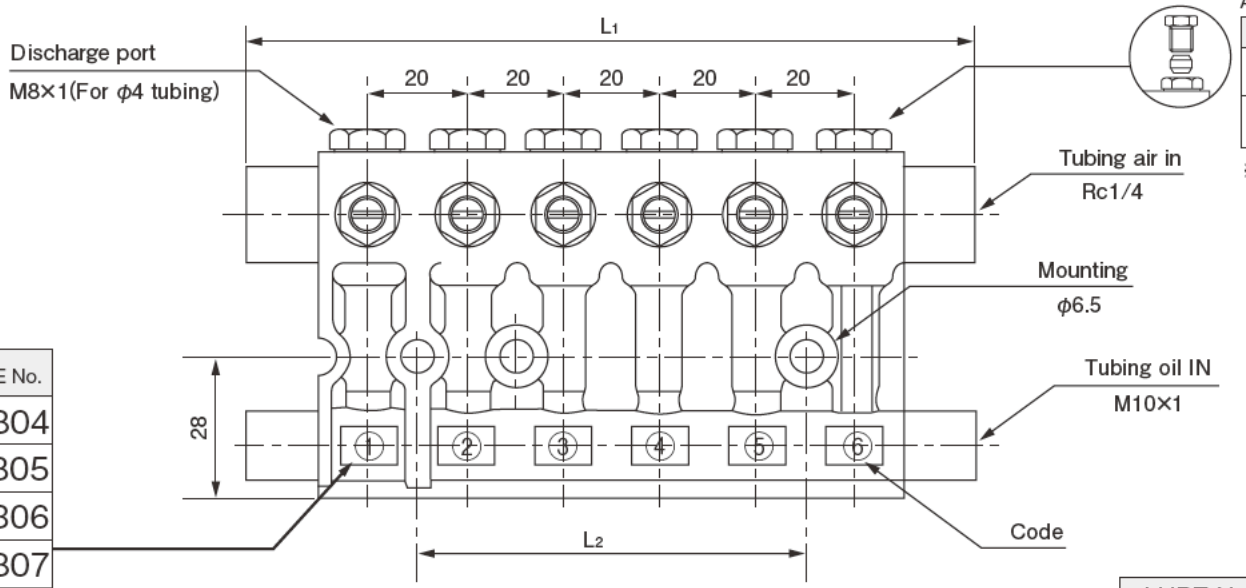
Customer order affirmation		sign
LUBE affirmation		sign

Mounting pitch

Number of port	1	2	3	4	5	6
mm	20	40	20	40	60	80

Size (mm)

Number of port	1	2	3	4	5	6
L_1	50	70	90	110	130	150
L_2	20	40	20	40	60	80



Accessory

	Model	CODE No.
	CB-4-8	106253
	CS-4	106254

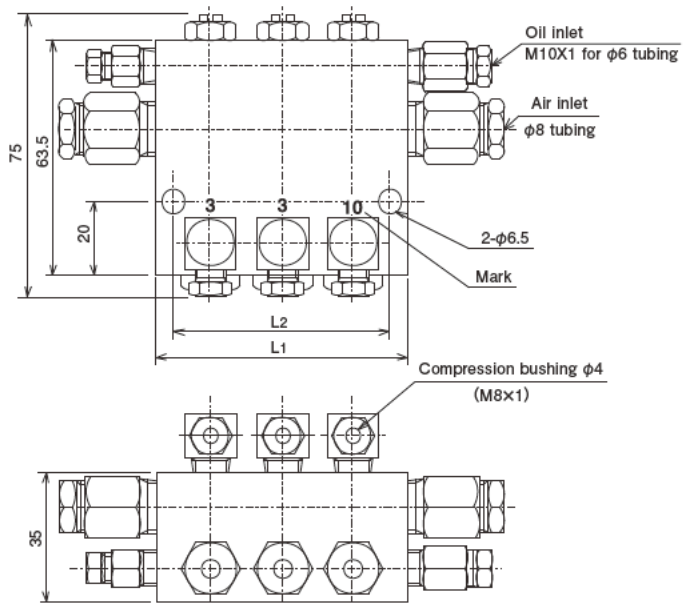
※Please use 106271 Tube Insert when using nylon tube

Valve block assembly

No.	Discharge volume (mℓ)	CODE No.
05	0.005	619804
1	0.01	619805
15	0.015	619806
3	0.03	619807
5	0.05	619808

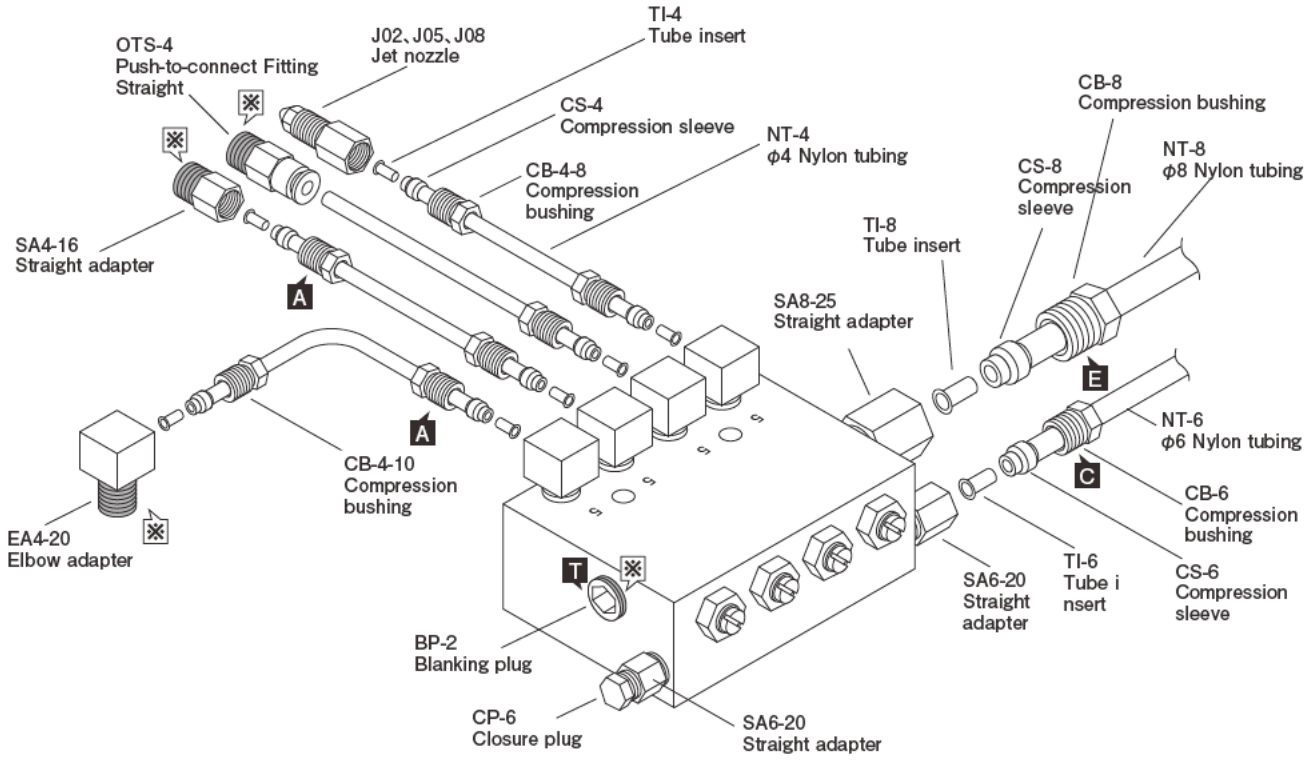
LUBE Notes (Article Check Number)	

Dimensional drawing



[MIX]

Example of connecting

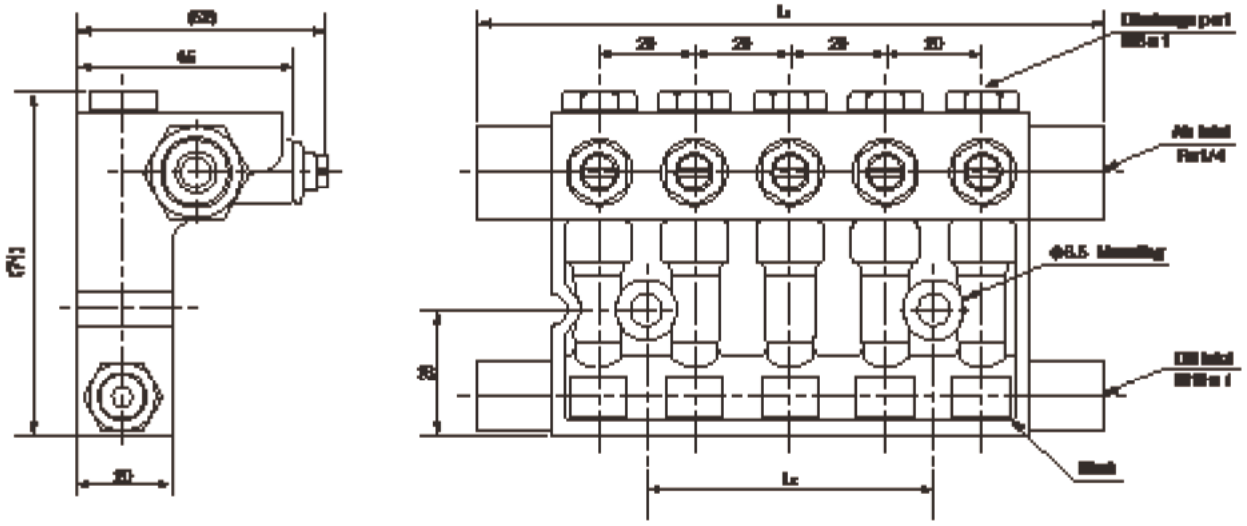


[MIX]

※ Use an appropriate sealant where mark shown.

■ Mark denote tightening torque. See the tightening torque list. P.219

Dimensional drawing



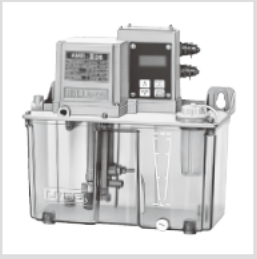
[MIX-A]

(SLR) Single Line Resistance compact system for small machines with intermittent delivery

MLZ

MMXL-Ⅲ


MMX-Ⅱ


AMR-ⅢDS

【Pump】

Automatic intermittent piston pump

MLZ

Compact version of MMXL-III. Ideal for small machines with limited installation space

[Standard] [CE]

HOW to order

MLZ-□-□-□□

Blank	Standerd
CE	CE type

Interval(50Hz)

A	6min
B	15min
C	30min
D	60min
E	120min

Oil level switch

Blank	Blank
L	With

Voltage

1	AC100V φ1
2	AC200V φ1

Directions for use

- Oil viscosity varies with oil temperature. Be sure to use oil within the working viscosity range. Refer to the viscosity table.
- Do not use any special additive-contained oil, water soluble oil and solvent.
- Periodically check the oil in the reservoir for impurities. Replace it, if necessary, with fresh oil immediately. Be sure to clean the reservoir before oil change.
- Make sure that proper voltage is applied.
- Do not over tighten the discharge joint. Refer to the tightening torque table.
- Do not press the discharge volume adjusting knob down by force.
- Adjust discharge volume only when the piston is fully relaxed (The knob is at the lowest position.).

※ Should the pump malfunction, contact us for immediate response with substitution.

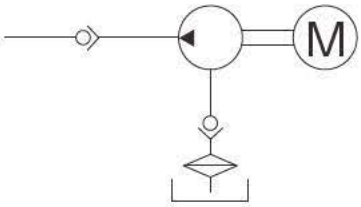
Specifications

Pump	Discharge volume	1.5~2.5mℓ/stroke
	Discharge pressure	0.3MPa
Motor	Voltage / current	AC100V φ1/50mA, AC200V φ1/25mA (50Hz) AC100V φ1/42mA, AC200V φ1/18mA(60Hz)
	Output	3W Synchronous
Emergency detection	Oil level switch	Contact type A contact (NO) ON at low level Contact capacity 0.5A, AC DC200V/30W smaller
Operation rating	Continuous	
Working viscosity range	30~1300mm²/S	
Reservoir capacity	0.8ℓ	
Weight	1.2kg	
Protection class	IP54 (CE Approved type)	

Replacement Motor Model

Interval		6min	15min	30min	60min	120min
Motor RPM (50Hz)		10	4	2	1	1/2
Replacement Motor Model	100V	M-B1	M-C1	M-D1	M-E1	M-F1
	200V	M-B2	M-C2	M-D2	M-E2	M-F2

Hydraulic circuit drawing



● Related parts


Flow unit
: P.129


PJ junction
: P.141


Tubing
: P.171


Pressure gauge
: P.162


Filter
FX-1 : P.159


Filter
FY-20 : P.159

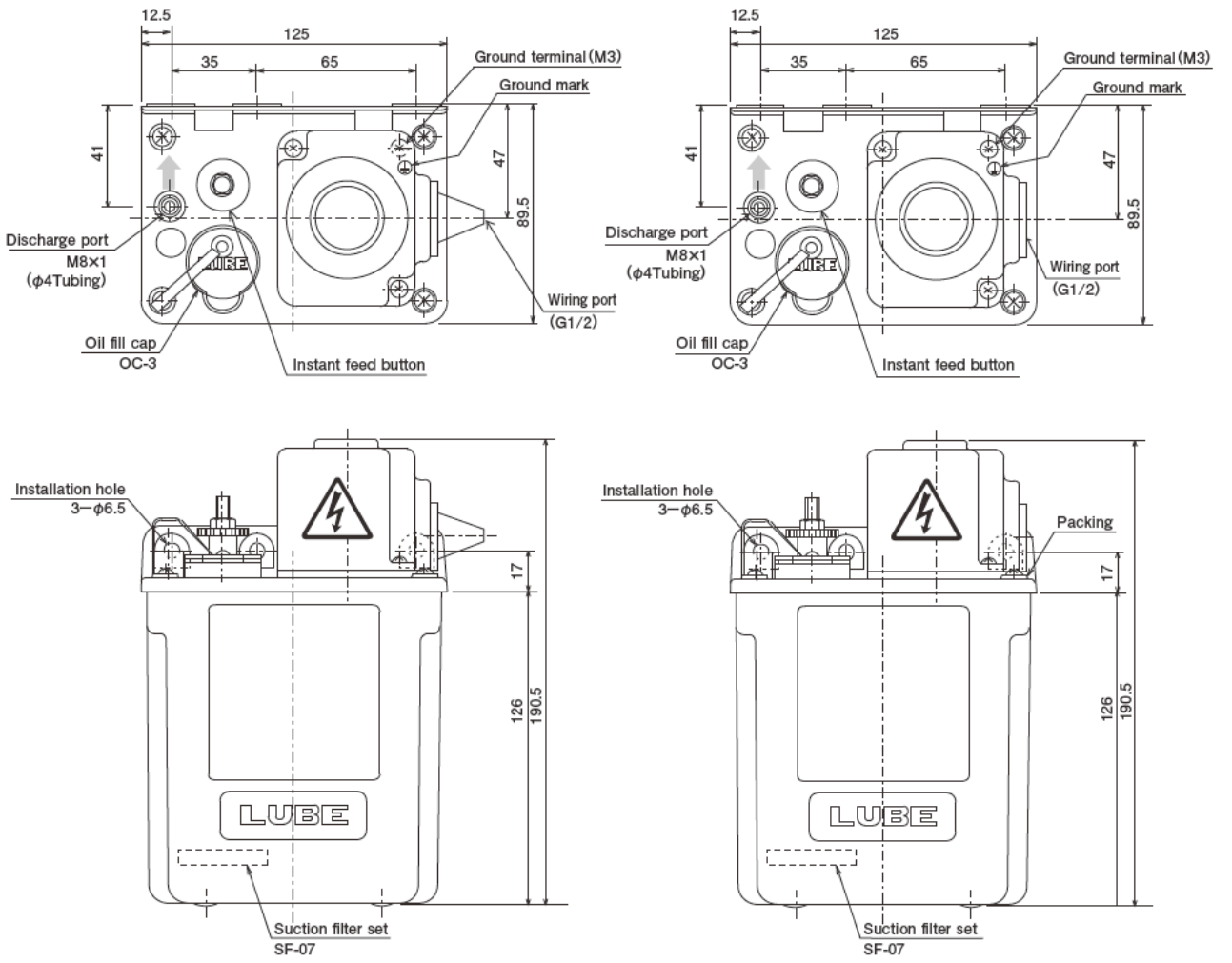

Pressure switch
: P.163


Compression parts
: P.169


Adapters
: P.175


Reservoir
: P.146

Dimensional drawing

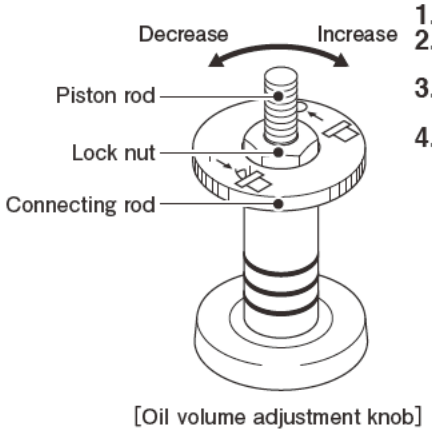


Improper handling can result in a death or serious injury

Electrical shock may be received under certain conditions

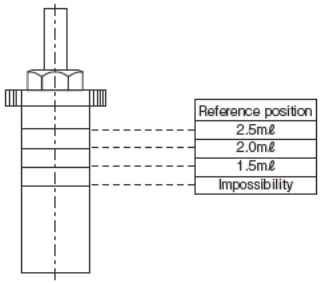
Be sure to ground.

Discharge Volume Adjustment

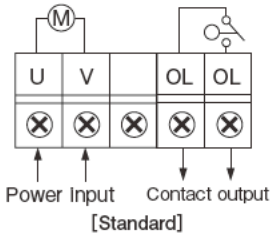


[Oil volume adjustment knob]

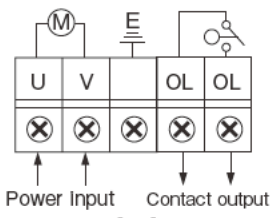
1. Loosen lock-nut by turning it counter-clockwise.
2. After loosening lock-nut, turn and adjust the connecting rod to the desired discharge volume and tighten lock-nut.
3. Turn clockwise to increase discharge and turn counter-clockwise to decrease discharge.
4. Adjusting scale is shown below.



Wiring diagram



[Standard]



[CE]

Automatic intermittent piston pump

MMXL-Ⅲ

Automatic intermittent pump incorporating a small energy-saving motor. Interval is controlled by the RPM of the motor so no external controllers or timers are needed. Widely used for small machines in many different industries.

[Standard]

[CE]

HOW to order

MMXL-Ⅲ-□-□□-□□-□□□

Blank	Standerd
CE	CE type

Discharge volume

1	1mℓ
2	2.5mℓ
5	5.5mℓ

Interval(50Hz)

A	3min
B	6min
C	15min
D	30min
E	60min
F	120min

Voltage

1	AC100V φ1
2	AC200V φ1

Oil level switch

Blank	Blank
L	With

Reservoir Mounting Poition

Blank	Resin
F	Foot Mount
B	Wall Mount

※Metal reservoir only

Pump Position

L	Pump position-Left
R	Pump position-Right

Reservoir capacity

Blank	1.8ℓResin reservoirs
3	3ℓResin reservoirs
30	3ℓMetal reservoirs
40	4ℓMetal reservoirs
80	8ℓMetal reservoirs

Directions for use

- Oil viscosity varies with oil temperature. Be sure to use oil within the working viscosity range. Refer to the viscosity table.
- Do not use any special additive-contained oil, water soluble oil and solvent.
- Periodically check the oil in the reservoir for impurities. Replace it, if necessary, with fresh oil immediately. Be sure to clean the reservoir before oil change.
- Make sure that proper voltage is applied.
- Do not over tighten the discharge joint. Refer to the tightening torque table.
- Do not press the discharge volume adjusting knob down by force.
- Adjust discharge volume only when the piston is fully relaxed (The knob is at the lowest position.).

※ Should the pump malfunction, contact us for immediate response with substitution.

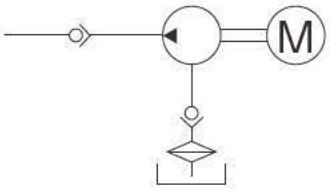
Specifications

Pump	Discharge volume	0.2~1.0mℓ/stroke 1.5~2.5mℓ/stroke 2.5~5.5mℓ/stroke
	Discharge pressure	0.3MPa
Motor (Other voltages available.)	Power	AC100V φ1/50mA, AC200V φ1/25mA (50Hz) AC100V φ1/42mA, AC200V φ1/18mA(60Hz)
	Output	3W Synchronous Motor
Emergency detection	Oil level switch	Contact type A contact (NO) ON at low level Contact capacity 0.5A, AC DC200V/30W smaller
Operation rating	Continuous	
Working viscosity range	30~1300mm²/S	
Reservoir capacity	0.8ℓ, 3ℓ (plastic) 3ℓ, 4ℓ, 8ℓ (sheet metal)	
Weight	1.8kg (With 1.8ℓ Reservoirs)	
Protection class	IP54 (CE Approved type)	

Replacement Motor Model

Interval		3min	6min	15min	30min	60min	120min
Motor RPM (50Hz)		20	10	4	2	1	1/2
Replacement Motor Model	100V	M-A1	M-B1	M-C1	M-D1	M-E1	M-F1
	200V	M-A2	M-B2	M-C2	M-D2	M-E2	M-F2

Hydraulic circuit drawing



● Related parts


Flow unit
: P.129


PJ junction
: P.141


Tubing
: P.171


Pressure gauge
: P.162


Filter
FX-1 : P.159


Filter
FY-20 : P.159

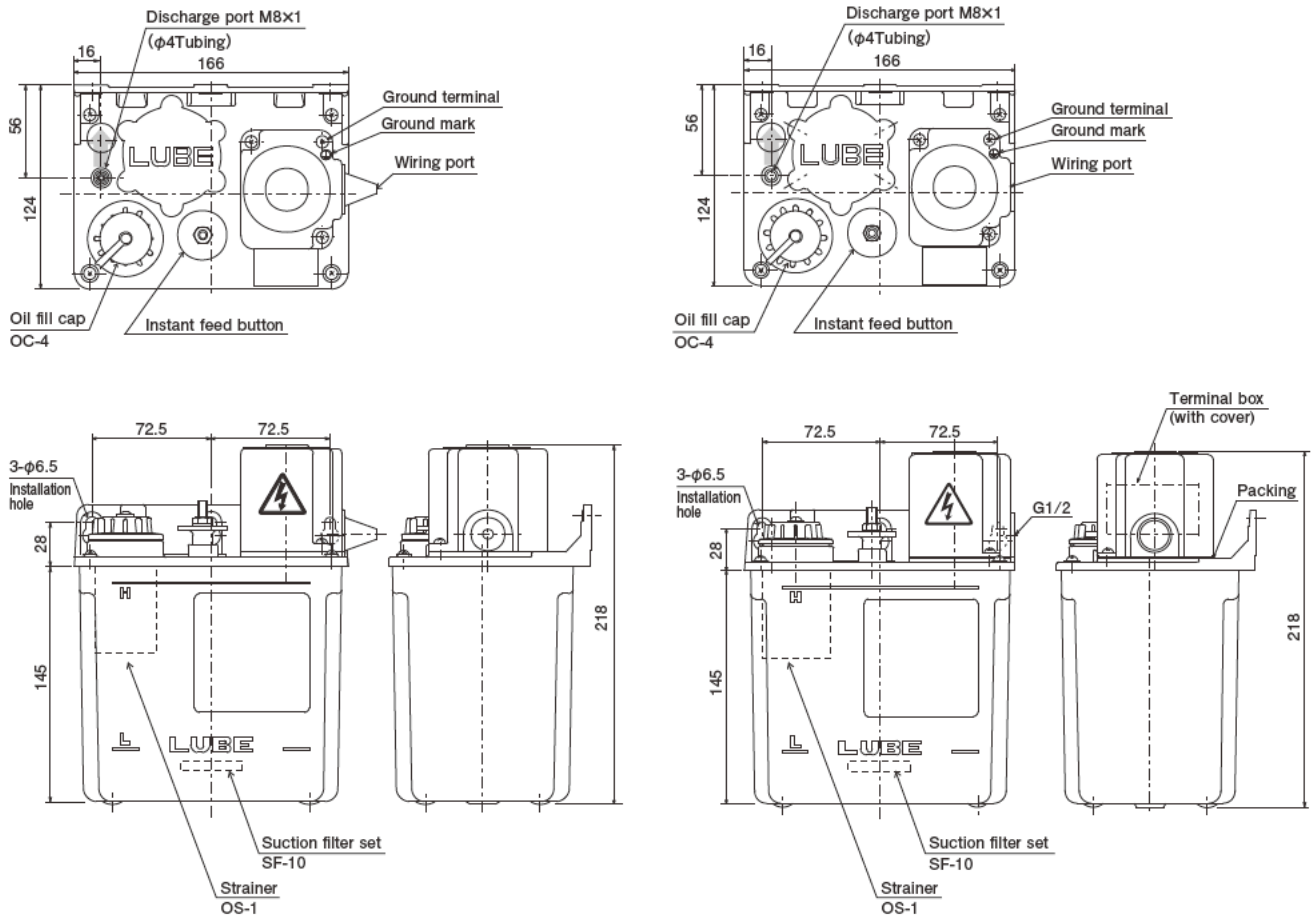

Pressure switch
: P.163


Compression parts
: P.169


Adapters
: P.175


Reservoir
: P.146

Dimensional drawing

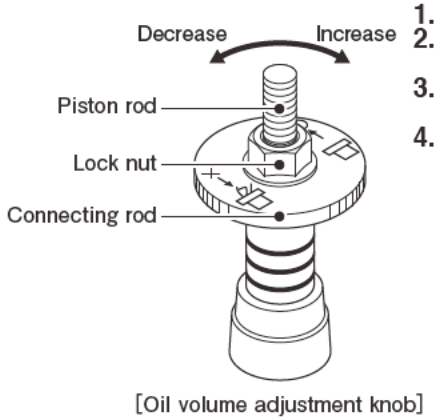


Improper handling can result in a death or serious injury

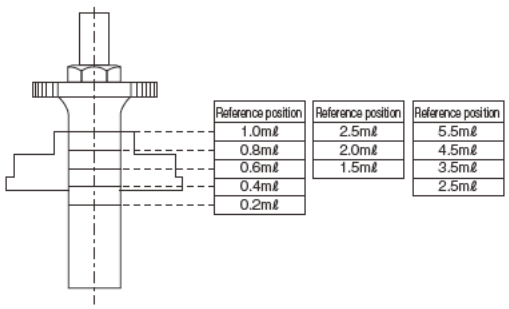
Electrical shock may be received under certain conditions

Be sure to ground.

Discharge Volume Adjustment

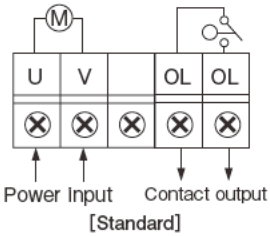


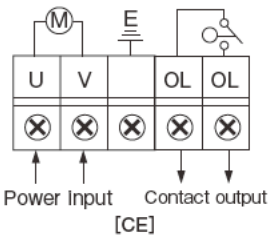
1. Loosen lock-nut by turning it counter-clockwise.
2. After loosening lock-nut, turn and adjust the connecting rod to the desired discharge volume and tighten lock-nut.
3. Turn clockwise to increase discharge and turn counter-clockwise to decrease discharge.
4. Adjusting scale is shown below.



Reference position	Reference position	Reference position
1.0mℓ	2.5mℓ	5.5mℓ
0.8mℓ	2.0mℓ	4.5mℓ
0.6mℓ	1.5mℓ	3.5mℓ
0.4mℓ		2.5mℓ
0.2mℓ		

Wiring diagram





Automatic intermittent piston pump

MMX-Ⅱ

HOW to order

MMX-Ⅱ-□□-□□-□□□

Discharge volume

2	2.5mℓ
5	5.5mℓ

Interval(50Hz)

A	1min. 25sec.
B	3min. 45sec.
C	7min. 30sec.
D	15min
E	30min
F	60min
G	120min

Voltage

1	AC100V φ1
2	AC200V φ3

Oil level switch

Blank	Blank
L	With

Reservoir capacity

Blank	1.8ℓResin reservoirs
3	3ℓResin reservoirs
30	3ℓMetal reservoirs
40	4ℓMetal reservoirs
80	8ℓMetal reservoirs

Reservoir Mounting Poition

Blank	Resin
F	Foot Mount
B	Wall Mount

※Metal reservoir only

Pump Position

L	Pump position-Left
R	Pump position-Right

Directions for use

- Do not remove the oil strainer to keep the pump clear of foreign matter.
- Oil viscosity varies with oil temperature. Be sure to use oil within the working viscosity range. Refer to the viscosity table.
- Do not use any special additive-contained oil, water soluble oil and solvent.
- Periodically check the oil in the reservoir for impurities. Replace it, if necessary, with fresh oil immediately. Be sure to clean the reservoir before oil change.
- Make sure that proper voltage is applied.
- Do not over tighten the discharge joint.
  Refer to the tightening torque table.
- Do not press the discharge volume adjusting knob down by force.
- Adjust discharge volume only when the piston is fully relaxed (The knob is at the lowest position.).
- Make sure motor Rotary direction.

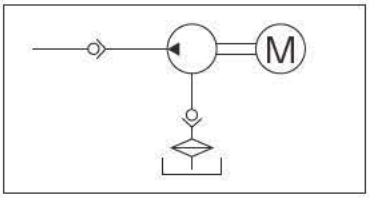
Specifications

Pump	Discharge volume	1.5~2.5mℓ/stroke 2.5~5.5mℓ/stroke
	Discharge pressure	0.4MPa
Motor (Other voltages available.)	Power	AC100Vφ1/0.23A, AC200Vφ3/0.11A (50Hz) AC100Vφ1/0.23A, AC200Vφ3/0.10A (60Hz)
	Output	5W Induction motor, E class
Oil level switch	Loading	0.5A, AC DC200V/30W
	Contact type	A contact (ON at low level)
Operation rating	Continuous	
Working viscosity range	30~1300mm²/S	
Reservoir capacity	0.8ℓ, 3ℓ (plastic) 3ℓ, 4ℓ, 8ℓ (sheet metal)	
Weight	3kg (1.8l plastic)	
Others	Rotary directions : Clockwise A 2μF condenser for the 100V motor is integrated into the terminal box.	

Replacement Motor ModelModel

Model	Part Number	Voltage
N-02	679320	AC100Vφ1/5W
N-10	679324	AC100Vφ3/5W
N-08	679323	AC200Vφ1/5W

Hydraulic circuit drawing

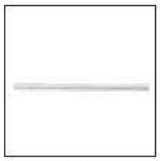


※Should the pump malfunction, contact us for immediate response with substitution.

● Related parts


Flow unit
: P.129


PJ junction
: P.141


Tubing
: P.171


Pressure gauge
: P.162


Filter
FX-1 : P.159


Filter
FY-20 : P.159

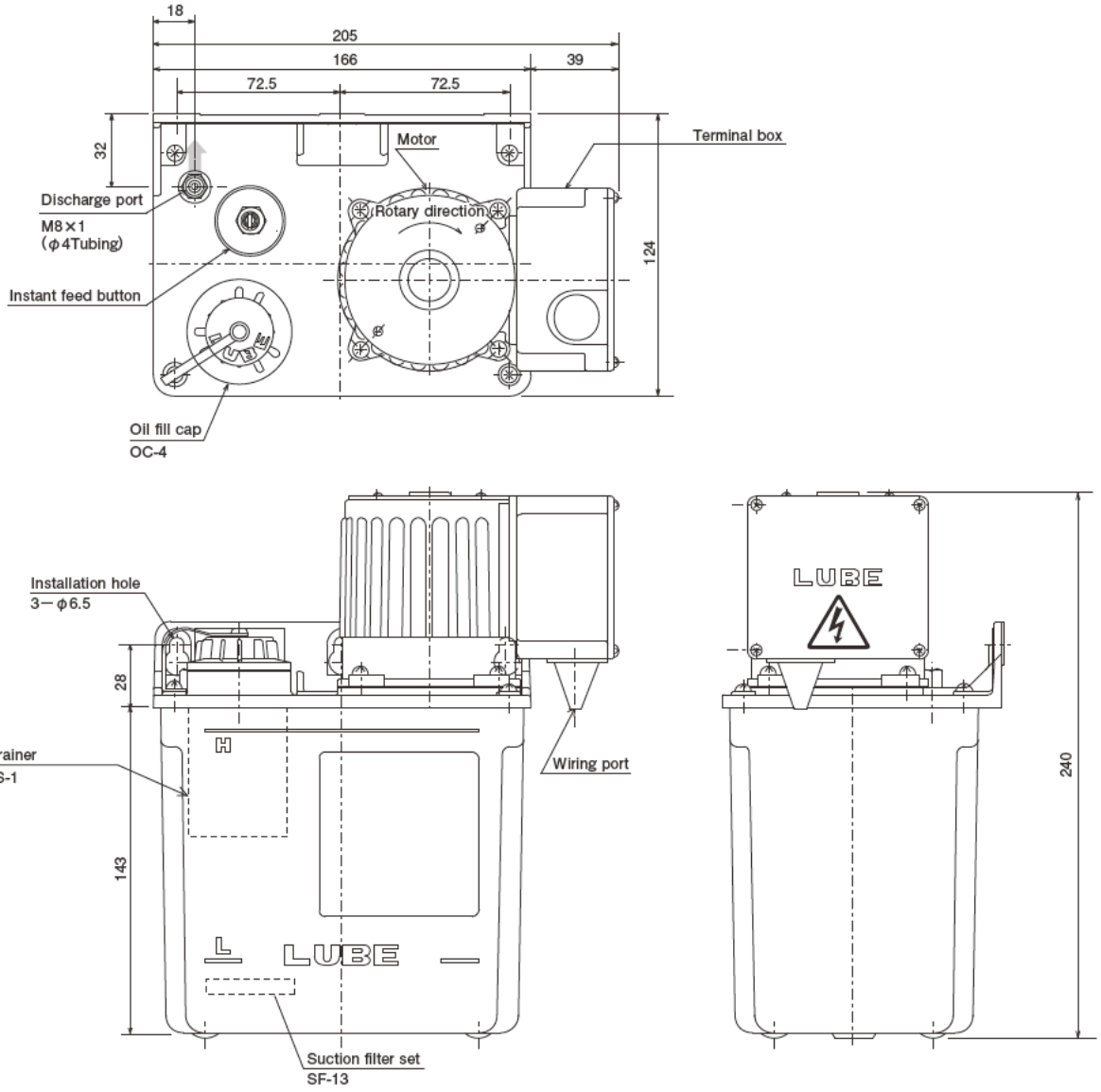

Pressure switch
: P.163


Compression parts
: P.169


Adapters
: P.175

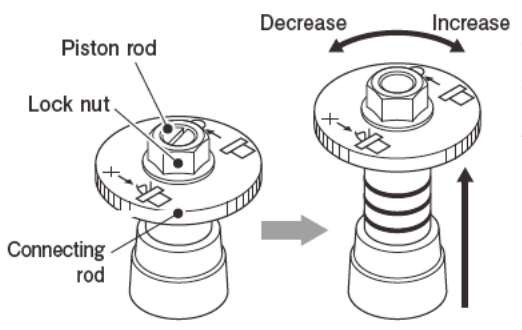

Reservoir
: P.146

Dimensional drawing

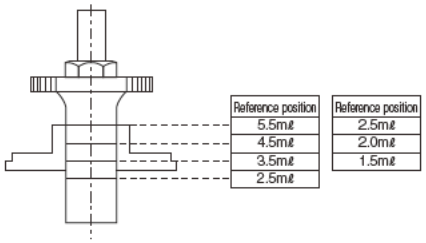


Improper handling can result in a death or serious injury Electrical shock may be received under certain conditions Be sure to ground.

Discharge Volume Adjustment

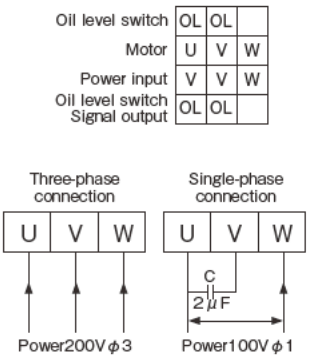


1. Loosen lock-nut by turning it counter-clockwise.
2. After loosening lock-nut, turn and adjust the connecting rod to the desired discharge volume
3. and tighten lock-nut.
   Turn clockwise to increase discharge and turn
4. counter-clockwise to decrease discharge.
   Adjusting scale is shown below.



Reference position	Reference position
5.5mℓ	2.5mℓ
4.5mℓ	2.0mℓ
3.5mℓ	1.5mℓ
2.5mℓ	1.5mℓ

Wiring diagram



Automatic intermittent gear pump

AMR-ⅢDS

Capable of operating over a wide range of working viscosity. Digital display gives on sight visual indication of operation. Interval can be a function of time or count.

[1.8ℓ Reservoir type]

[3ℓ Reservoir type]

HOW to order

AMR ⅢDS-□-□□

Voltage

1	AC100Vφ1
2	AC200Vφ1

Reservoir Mounting Poition

Blank	Resin
F	Foot Mount
B	Wall Mount

※Metalreservoir only

Reservoir capacity

Blank	1.8ℓResin reservoirs
3	3ℓResin reservoirs
30	3ℓMetal reservoirs
40	4ℓMetal reservoirs
80	8ℓMetal reservoirs

※Pump is installed on the right side, if a metal reservoir is selected.

Directions for use

- Do not remove the oil strainer to keep the pump clear of foreign matter.
- Replace or clean the suction filter at least once a year. Click here to view the service list.
- Oil viscosity varies with oil temperature. Be sure to use oil within specified working viscosity range.
- Do not use any special additive-contained oil, water soluble oil and solvent.
- Periodically check the oil in the reservoir for impurities. Replace it, if necessary, with fresh oil immediately. Be sure to clean the reservoir before oil change.
- Make sure that proper voltage and pressure are proper.
- Do not over tighten the discharge joint. Refer to the tightening torque table.

Specifications

Pump	Discharge volume	150mℓ/min (50Hz) 180mℓ/min (60Hz)	
	Discharge pressure	0.8MPa (safety valve set pressure)	
Motor	Power	AC100Vφ1/0.83A, AC200Vφ1/0.41A (50Hz) AC100Vφ1/0.64A, AC200Vφ1/0.33A (60Hz)	
	Output	20W (50Hz/60Hz) Capacitor motor	
Controller	Timer counter	Discharge time adjustable range: 1~99 seconds (2.5~247.5mℓ) 50Hz, (3~297mℓ) 60Hz Interval time adjustable range: 1 to 9999 minutes 1 to 9999 counts	
	Emergency output	Contact type A contact (NO)	
		Contact capacity AC250V 1.5A	
	Emergency detection	Oil level switch	Contact type A contact (NO) ON at low level
		Prerssure switch	Contact type A contact (NO) ON at low pressure
	Liquid crystal display	INTERVAL	display 'INT'
		DISCHARGE	display 'DIS'
		ALARM	When oil side decreases,display 'OILLEVEL ERR' When pressure is abnormal,display 'PRESSURE ERR'
Working viscosity range	68~1300mm²/S(50Hz)		
Reservoir capacity	1.8ℓ, 3ℓ (plastic) 3ℓ, 4ℓ, 8ℓ (sheet metal)		
Weight	1.8ℓ Reservoirs: 3.2kg, 3ℓ Reservoirs: 4kg		

※Should the pump malfunction, contact us for immediate response with substitution.

● Related parts

Flow unit
: P.129

PJ junction
: P.141

Tubing
: P.171

Pressure gauge
: P.162

Filter
FX-1 : P.159

Filter
FY-20 : P.159

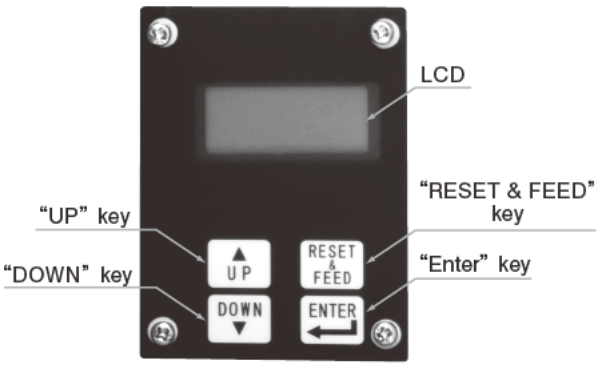
Pressure switch
: P.163

Compression parts
: P.169

Adapters
: P.175

Reservoir
: P.146

Exterior features of the controller

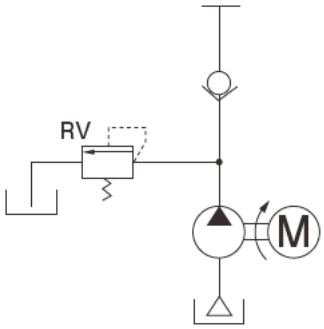


Operation panel of the controller

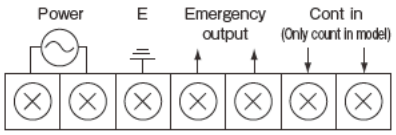
LCD shows the below:

INTERVAL → INT
DISCHARGE→ DIS
ALARM → Low oil level OILLEVEL ERR
Low pressure PRESSURE ERR

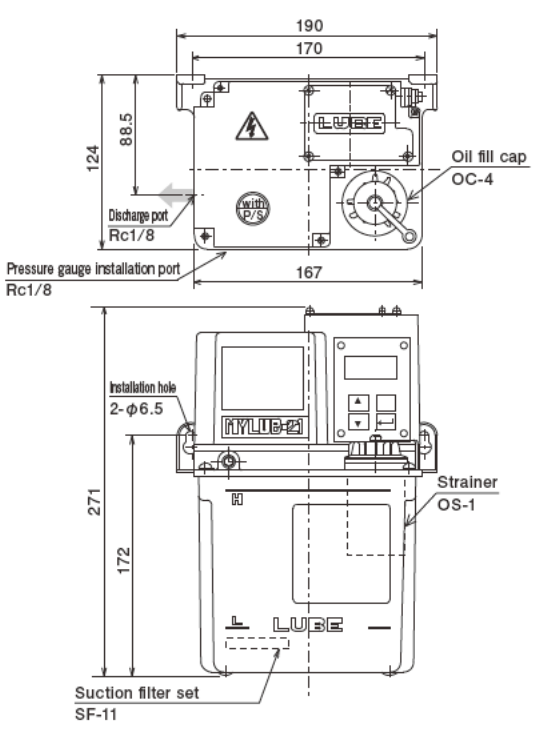
Hydraulic circuit drawing



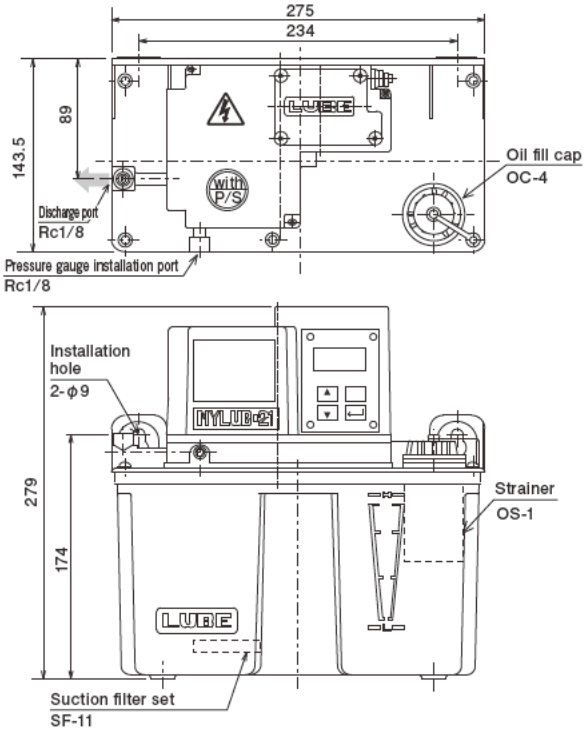
Wiring diagram



Dimensional drawing



[1.8ℓ reservoir type]



[3ℓ reservoir type]

Improper handling can result in a death or serious injury Electrical shock may be received under certain conditions Be sure to ground.

(SLR) Single Line Resistance compact system for small machines with intermittent delivery

HSA-1

HTU-02

HJB-1

【Valve】

Resistance type valve

Flow unit

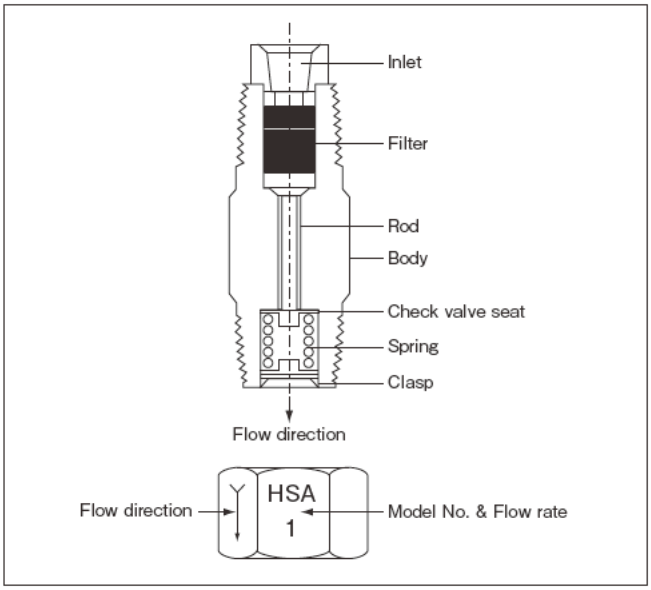
Flow Units are resistance valves used for an intermittent delivery type systems.

[HSA-1] [HTU-02] [HJB-1]

Specifications

Normal working pressure	Under 0.8 MPa

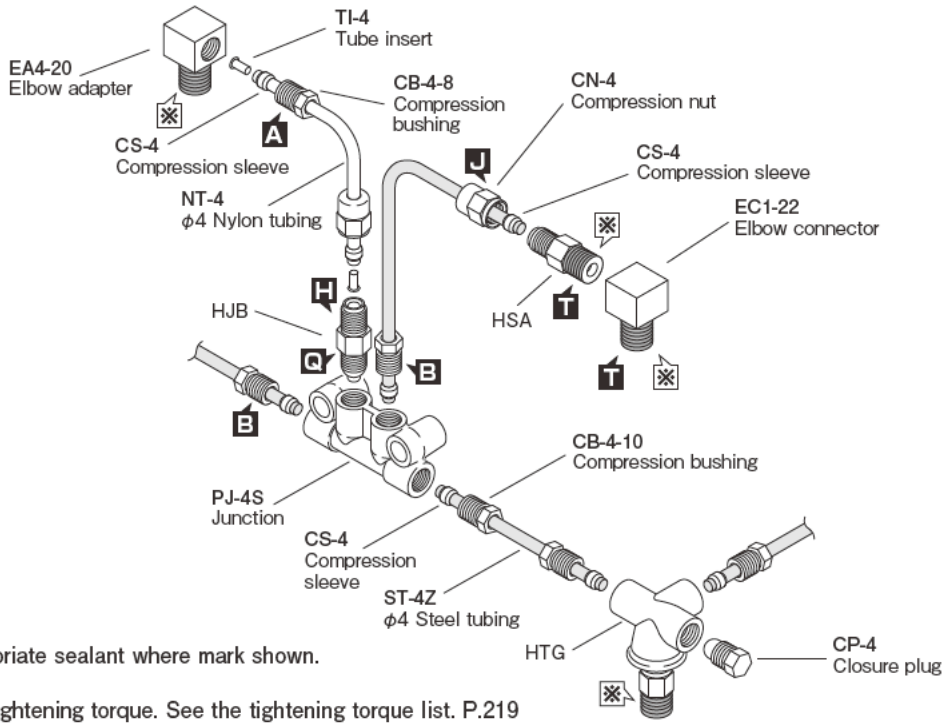
Internal construction



Directions for use

- Please conform the flow direction and thread size to connect to the junction.

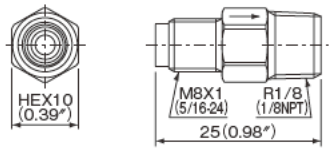
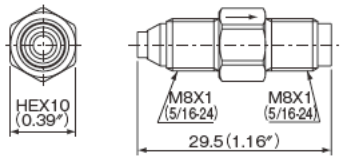
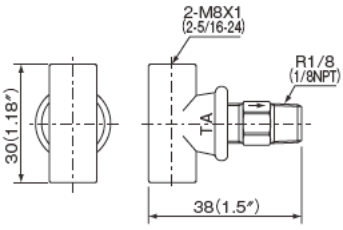
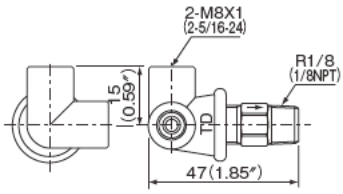
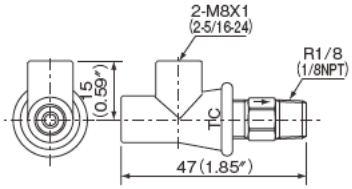
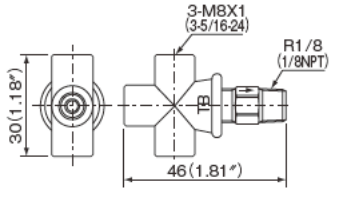
Tubing connection (This is just an example.)

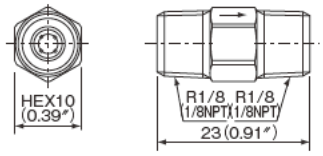
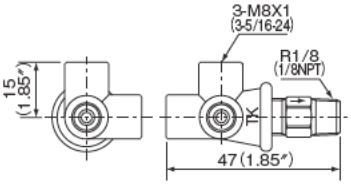


※ Use an appropriate sealant where mark shown.

■ Mark denote tightening torque. See the tightening torque list. P.219

RoHS compliant products are also available.
Please contact us for details.

Part Number		Model		Dimensional drawing
Metric	Inch			
105501	185501	HSA	03	
105001	185001		02	
105002	185002		0	
105003	185003		1	
105004	185004		2	
105005	185005		3	
105006	185006		4	
105007	185007		5	
105502	185502	HJB	03	
105008	185008		02	
105009	185009		0	
105001	185001		1	
105010	185010		2	
105011	185011		3	
105012	185012		4	
105013	185013		5	
105503	185503	HTA	03	
105015	185015		02	
105016	185016		0	
105017	185017		1	
105018	185018		2	
105019	185019		3	
105020	185020		4	
105021	185021		5	
105504	185504	HTD	03	
105022	185022		02	
105023	185023		0	
105024	185024		1	
105025	185025		2	
105026	185026		3	
105027	185027		4	
105028	185028		5	
105505	185505	HTC	03	
105029	185029		02	
105030	185030		0	
105031	185031		1	
105032	185032		2	
105033	185033		3	
105034	185034		4	
105035	185035		5	
105506	185506	HTB	03	
105036	185036		02	
105037	185037		0	
105038	185038		1	
105039	185039		2	
105040	185040		3	
105041	185041		4	
105042	185042		5	

Part Number		Model		Dimensional drawing
Metric	Inch			
105513	185513	HTU	03	
105072	185072		02	
105073	185073		0	
105074	185074		1	
105075	185075		2	
105076	185076		3	
105077	185077		4	
105078	185078		5	
105507	185507	HTK	03	
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105044	185044		0	
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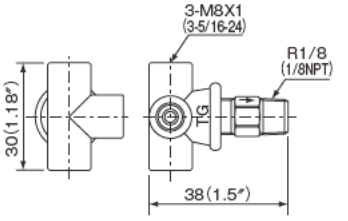
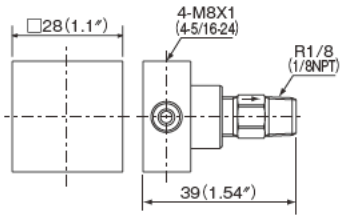
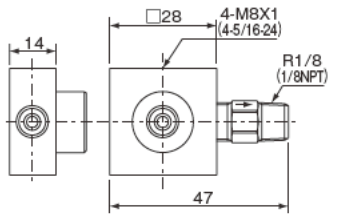
105046	185046		2	
105047	185047		3	
105048	185048		4	
105049	185049		5	
105508	185508	HTG	03	
105051	185051		02	
105052	185052		0	
105053	185053		1	
105054	185054		2	
105055	185055		3	
105056	185056		4	
105057	185057		5	
105509	185509	HTH	03	
105058	185058		02	
105059	185059		0	
105060	185060		1	
105061	185061		2	
105062	185062		3	
105063	185063		4	
105064	185064		5	
105510	185510	HTL	03	
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105066	185066		0	
105067	185067		1	
105068	185068		2	
105069	185069		3	
105070	185070		4	
105071	185071		5	

(SLR) Single Line Resistance compact system for small machines to lage machines with continuous (recirculation) delivery

AMS


AMI-300


AMI-1000

[Pump]

Automatic small discharge volume gear pump

AMS

Motor driven gear pump for continuous micro-volume lubrication used with a resistance type centralized lubrication equipment

HOW to order

AMS -□-□□-□□□

Discharge volume (50Hz / 60Hz)

1	1.25/1.5mℓ/min
3	2.5/3mℓ/min
15	15/18mℓ/min

Voltage

1	AC100V φ1
2	AC200V φ1

Oil level switch

Blank	Blank
L	With

Reservoir Mounting Position

Blank	Resin reservoirs
F	Foot Mount
B	Wall Mount

※Metal reservoir only

Pump Position

L	Pump position-Left
R	Pump Position-Right

※Except 1.8ℓ Resin reservoir

Reservoir capacity

Blank	1.8ℓ Resin reservoirs
3	3ℓ Resin reservoirs
30	3ℓ Metal reservoirs
40	4ℓ Metal reservoirs
80	8ℓ Metal reservoirs

Specifications

AMS-1, AMS-3		
Pump	Discharge volume	AMS-1: 1.25mℓ/min (50Hz) 1.5mℓ/min (60Hz) AMS-1: 1.25mℓ/min (50Hz) 1.5mℓ/min (60Hz)
	Discharge pressure	0.8MPa (safety valve setting)
Motor (Other voltages available.)	Power	AC100V φ1/50mA, AC200V φ1/25mA (50Hz) AC100V φ1/42mA, AC200V φ1/18mA (60Hz)
	Output	3W Synclonous Motor
Emergency detection	Oil level switch	Contact type A contact (NO) ON at low level Contact capacity 0.5A, AC DC200V/30W smaller
Operation rate	Continuous	
Working viscosity range	32~1300mm²/S	
Reservoir capacity	0.8ℓ, 3ℓ (plastic) 3ℓ, 4ℓ, 8ℓ (sheet metal)	
Weight	1.8kg	

Directions for use

- Oil viscosity varies with oil temperature. Be sure to use oil within the working viscosity range. Refer to the viscosity table.
- Do not use any special additive-contained oil, water soluble oil and solvent.
- Periodically check the oil in the reservoir for impurities. Replace it, if necessary, with fresh oil immediately. Be sure to clean the reservoir before oil change.
- Make sure that proper voltage is applied.
- Do not over tighten the discharge joint. Refer to the tightening torque table.

※ Should the pump malfunction, contact us for immediate response with substitution.

● Related parts


Control unit
: P.139


PJ junction
: P.141


Tubing
: P.171


Pressure gauge
: P.162


Filter
FX-1 : P.159


Filter
FY-20 : P.159


Pressure switch
: P.163


Compression parts
: P.169


Adapters
: P.175


Reservoir
: P.146

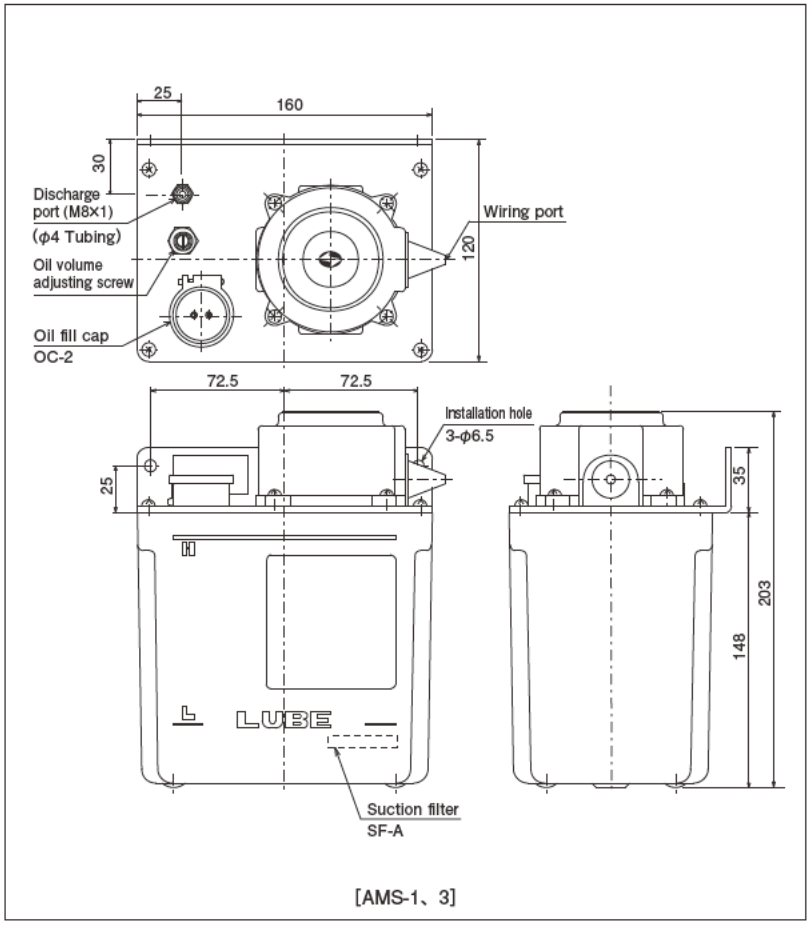
Specifications

AMS-15		
Pump	Discharge volume	15mℓ/min (60Hz)
	Discharge pressure	0.8MPa (safety valve setting)
Motor (Other voltages available.)	Power	AC100V ϕ10.25A (50/60Hz) 200V ϕ1
	Output	5.0W Accessory - Condesor 3,.0 F
Gear Head	Speed Reduction Ratio: 1/25	
Working viscosity range	32～1300mm²/S	
Reservoir capacity	0.8ℓ, 3ℓ (plastic) 3ℓ, 4ℓ, 8ℓ (sheet metal)	
Weight	2.3kg	

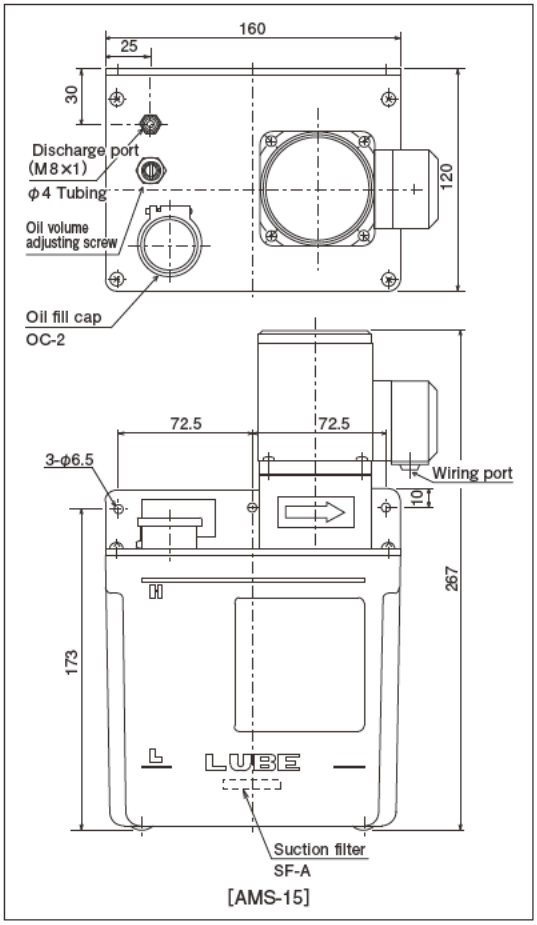
Replacement Motor Model

Pump	Voltage	Replacement Motor Model
AMS-1	100V	M-B1
	200V	M-B2
AMS-3	100V	M-A1
	200V	M-A2

Dimensional drawing



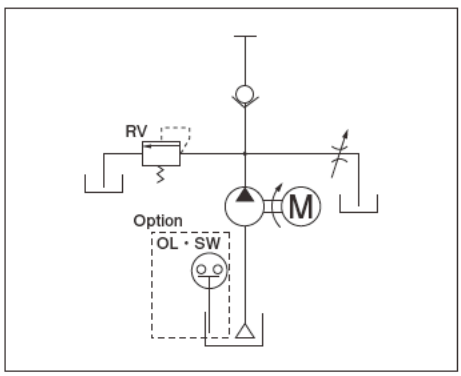
[AMS-1、3]



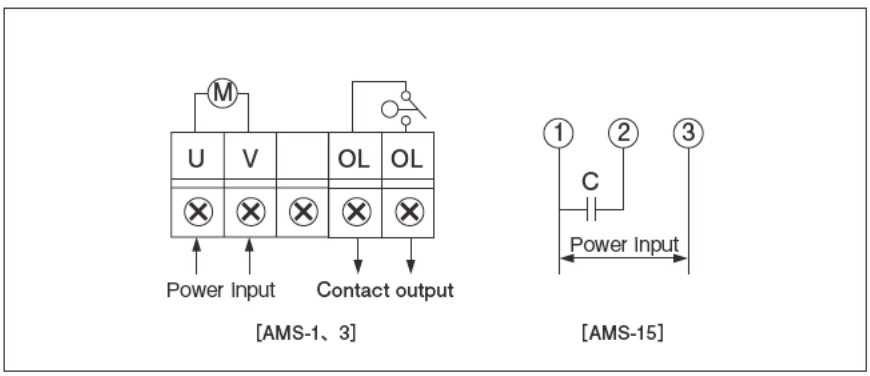
[AMS-15]

Improper handling can result in a death or serious injury Electrical shock may be received under certain conditions Be sure to ground.

Hydraulic circuit drawing



Wiring diagram



[AMS-1、3] [AMS-15]

Motor driven continuous gear pump

ACM-Ⅱ・AMI-300・AMI-1000

[ACM-Ⅱ] [AMI-300] [AMI-1000]

HOW to order

ACM-Ⅱ
AMI-300-□-□□□-□
AMI-1000

Voltage

1	AC100V φ1
2	AC200V φ3
3	AC200V φ3 With needle valve

※AC200V φ3 Needle valve available only with AMI-1000

Reservoir capacity

30	3ℓ Metal reservoirs
40	4ℓ Metal reservoirs
80	8ℓ Metal reservoirs

Oil level switch

Blank	Without
L	With

Reservoir Mounting Position

Blank	Resin reservoirs
F	Foot mount
B	Wall mount

Reservoir Mounting Position

L	Pump position-Left
R	Pump Position-Right

Directions for use

- Oil viscosity varies with oil temperature. Be sure to use oil within the working viscosity range. Refer to the viscosity table.
- Do not use any special additive-contained oil, water soluble oil and solvent.
- Periodically check the oil in the reservoir for impurities. Replace it, if necessary, with fresh oil immediately. Be sure to clean the reservoir before oil change.
- Make sure that proper voltage is applied.
- Do not over tighten the discharge joint. Refer to the tightening torque table.

※ Should the pump malfunction, contact us for immediate response with substitution.

Specifications

		ACM-II	AMI-300	AMI-1000
Pump	Discharge volume	60mℓ/min (50Hz) 70mℓ/min (60Hz)	300mℓ/min (50Hz) 330mℓ/min (60Hz)	1000mℓ/min (50Hz) 1100mℓ/min (60Hz)
	Discharge pressure	0.8MPa (safety valve setting)	0.8MPa (safety valve setting)	0.8MPa (safety valve setting)
Motor (Other voltages available.)	Voltage / Current	AC100V φ1/0.6A (Condenser: 5μF) AC200V φ3/0.3A	AC100V φ1/1.4A (Condenser: 8μF) AC200V φ3/0.35A	AC100V φ1/2.0A (Condenser 12μF) AC200V φ3/0.8A
	Output	30W Induction motor	50W Induction motor	75W Induction motor
Operation rate		Continuous		
Working viscosity range		32～1300mm²/S	65～1300mm²/S	
Reservoir capacity		2ℓ, 3ℓ, 4ℓ, 8ℓ (sheet metal)		
Weight		4.0kg	4.4kg	7.1kg
Other		Motor rotary direction: Counter- clockwise	Motor rotary direction: Clockwise	Motor rotary direction: Counter- clockwise
External fuse		100V/1A 200V/0.5A	100V/2A 200V/1A	100V/3A 200V/1A

● Related parts

Control unit
: P.139

PJ junction
: P.141

Tubing
: P.171

Pressure gauge
: P.162

Filter
FX-1 : P.159

Filter
FY-20 : P.159

Pressure switch
: P.163

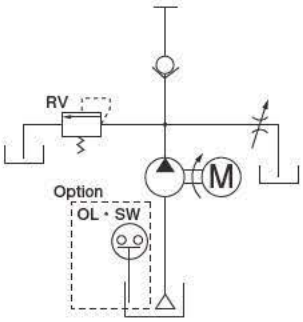
Compression parts
: P.169

Adapters
: P.175

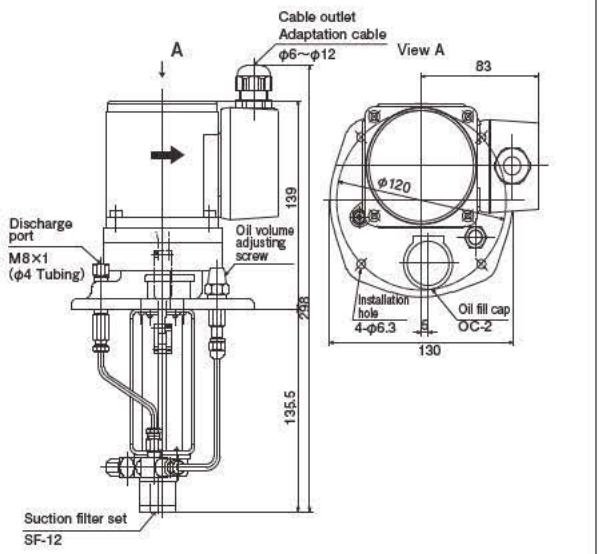
Reservoir
: P.146

AMI-300 with 3L reservoir and low level switch

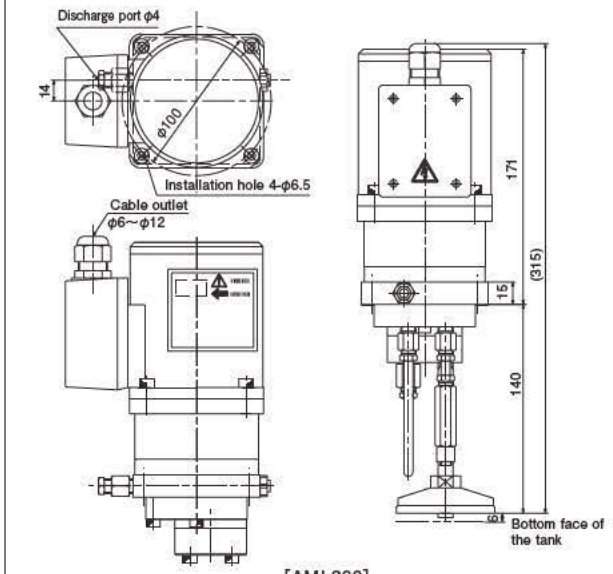
Hydraulic circuit drawing



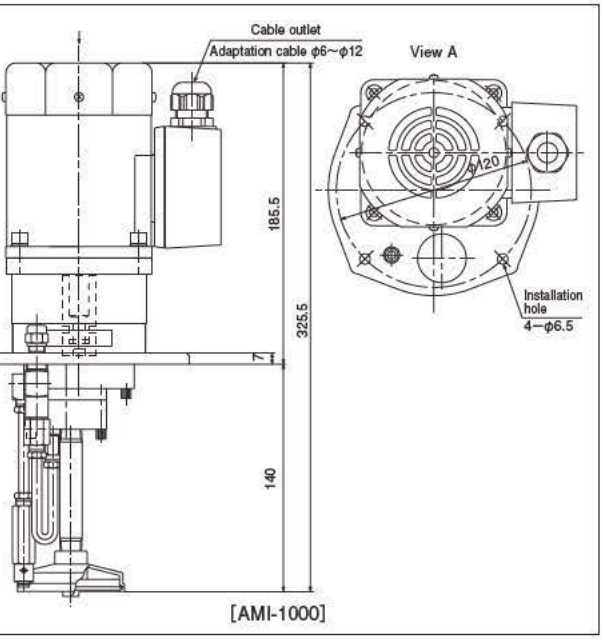
Dimensional drawing



[ACM- Ⅱ]

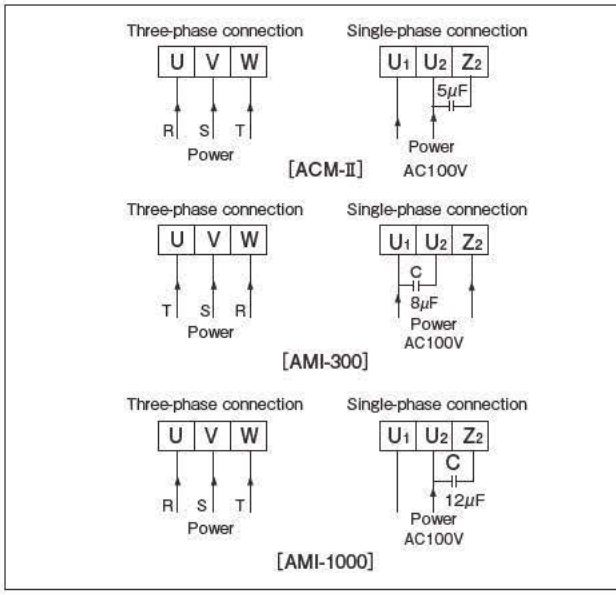


[AMI-300]



[AMI-1000]

Wiring diagram



Improper handling can result in a death or serious injury Electrical shock may be received under certain conditions Be sure to ground.

(SLR) Single Line Resistance compact system for small machines to lage machines with continuous (recirculation) delivery

CSA-04

CTU-2

CJB-04

[Valve]

(SLR) Single Line Resistance junctions for installing both Flow and control unit

PJ-2


TG

Single line resistance valve (continuous)

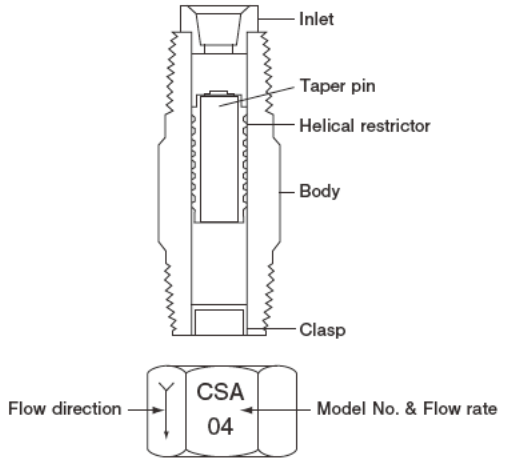
control unit

[CSA-04] [CTU-2] [CJB-04]

Specifications

Normal working pressure	Under 0.8 MPa

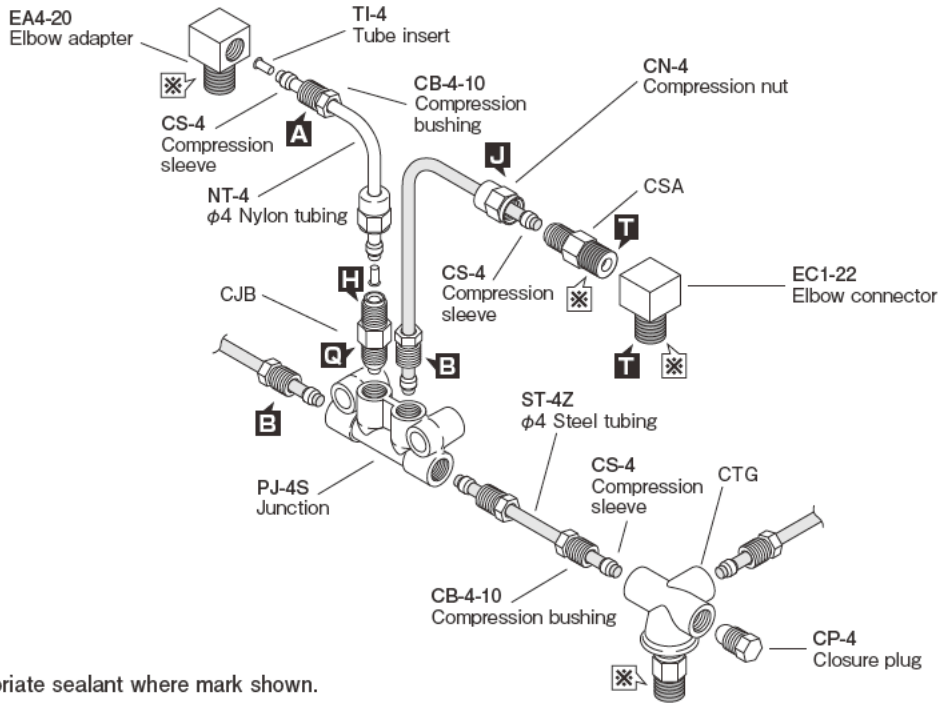
Internal construction



Directions for use

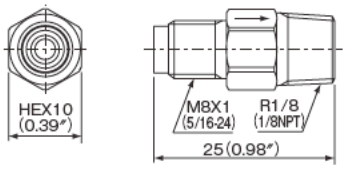
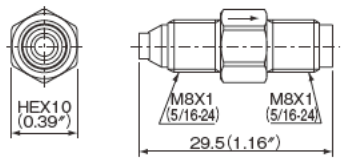
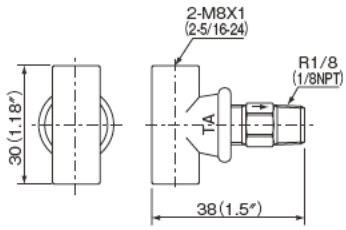
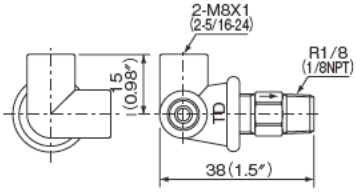
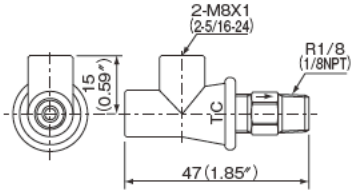
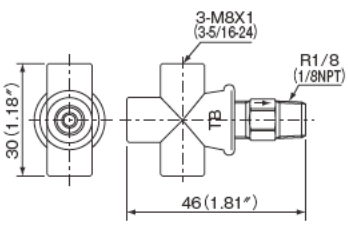
- Please confirm the flow direction and thread size to connect to the Junction.

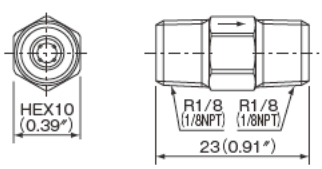
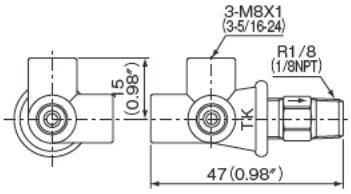
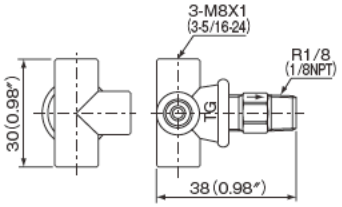
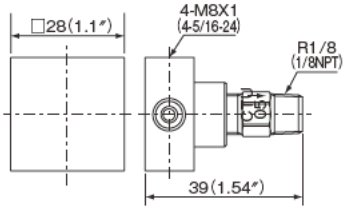
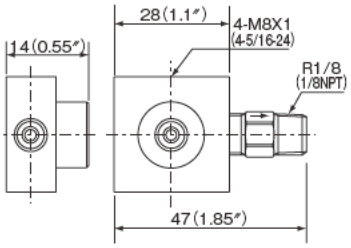
Tubing connection (This is just an example.)



※ Use an appropriate sealant where mark shown.

■ Mark denote tightening torque. See the tightening torque list. P.219

Part Number		Model		Dimensional drawing
Metric	Inch			
105201	185201	CSA	05	
105202	185202		04	
105203	185203		03	
105204	185204		02	
105205	185205		0	
105206	185206		1	
105207	185207		2	
105208	185208		3	
105209	185209		4	
105210	185210		5	
105211	185211	CJB	05	
105212	185212		04	
105213	185213		03	
105214	185214		02	
105215	185215		0	
105216	185216		1	
105217	185217		2	
105218	185218		3	
105219	185219		4	
105220	185220		5	
105221	185221	CTA	05	
105222	185222		04	
105223	185223		03	
105224	185224		02	
105225	185225		0	
105226	185226		1	
105227	185227		2	
105228	185228		3	
105229	185229		4	
105230	185230		5	
105231	185231	CTD	05	
105232	185232		04	
105233	185233		03	
105234	185234		02	
105235	185235		0	
105236	185236		1	
105237	185237		2	
105238	185238		3	
105239	185239		4	
105240	185240		5	
105241	185241	CTC	05	
105242	185242		04	
105243	185243		03	
105244	185244		02	
105245	185245		0	
105246	185246		1	
105247	185247		2	
105248	185248		3	
105249	185249		4	
105250	185250		5	
105251	185251	CTB	05	
105252	185252		04	
105253	185253		03	
105254	185254		02	
105255	185255		0	
105256	185256		1	
105257	185257		2	
105258	185258		3	
105259	185259		4	
105260	185260		5	

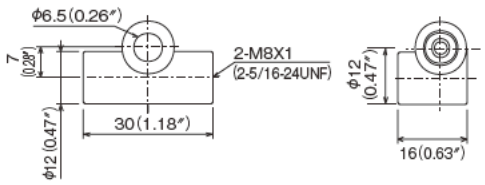
Part Number		Model		Dimensional drawing
Metric	Inch			
105321	185321	CTU	05	
105322	185322		04	
105323	185323		03	
105324	185324		02	
105325	185325		0	
105326	185326		1	
105327	185327		2	
105328	185328		3	
105329	185329		4	
105330	185330		5	
105261	185261	CTK	05	
105262	185262		04	
105263	185263		03	
105264	185264		02	
105265	185265		0	
105266	185266		1	
105267	185267		2	
105268	185268		3	
105269	185269		4	
105270	185270		5	
105271	185271	CTG	05	
105272	185272		04	
105273	185273		03	
105274	185274		02	
105275	185275		0	
105276	185276		1	
105277	185277		2	
105278	185278		3	
105279	185279		4	
105280	185280		5	
105281	185281	CTH	05	
105282	185282		04	
105283	185283		03	
105284	185284		02	
105285	185285		0	
105286	185286		1	
105287	185287		2	
105288	185288		3	
105289	185289		4	
105290	185290		5	
105291	185291	CTL	05	
105292	185292		04	
105293	185293		03	
105294	185294		02	
105295	185295		0	
105296	185296		1	
105297	185297		2	
105298	185298		3	
105299	185299		4	
105300	185300		5	

Junction

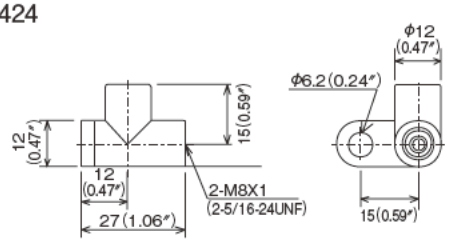
Junction for main tubing PJ

Dimensional drawing

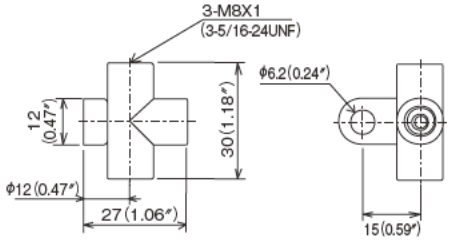
106421



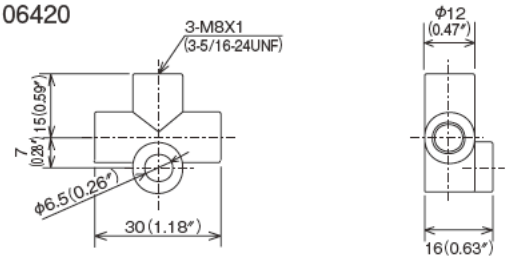
106424



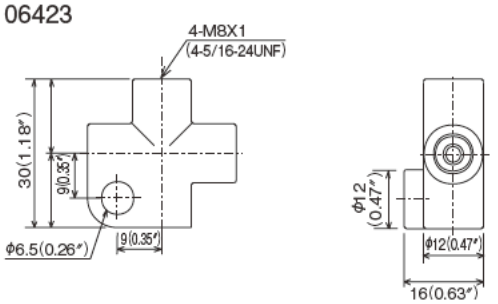
106425



106420



106423



Model

For 4mm (5/32) tubing

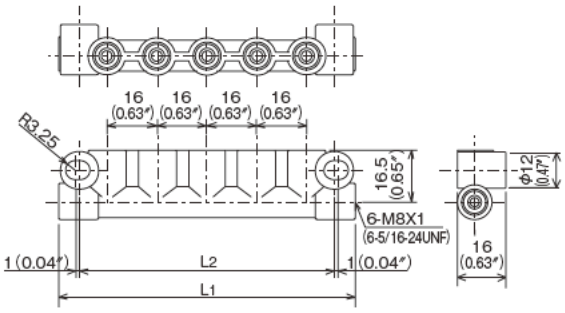
Model	Part Number		Specifications
	M8×1	5/16-24 UNF	
PJ-2	106421	186421	Two-way
PJ-2F	106424	186424	
PJ-3	106420	186420	Three-way
PJ-3F	106425	186425	
PJ-4	106423	186423	Four-way

●Material : ZDC

Junction

For Flow unit/ Control unit installation

Dimensional drawing

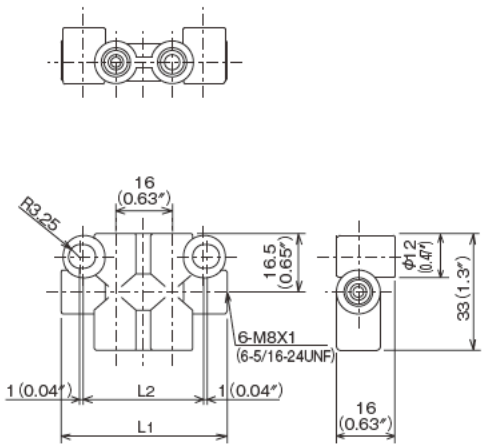


[PJ-7S]

Model

Model	Part Number		Specifications	Size	
	M8×1	5/16-24 UNF		L_1	L_2
PJ-4S	106401	186401	Single type for 2ports	47(1.85″)	34(1.34″)
PJ-5S	106402	186402	Single type for 3ports	63(2.48″)	50(1.97″)
PJ-6S	106403	186403	Single type for 4ports	79(3.11″)	66(2.60″)
PJ-7S	106404	186404	Single type for 5ports	95(3.74″)	82(3.23″)
PJ-8S	106405	186405	Single type for 6ports	111(4.37″)	98(3.86″)
PJ-9S	106406	186406	Single type for 7ports	127(5.00″)	114(4.49″)
PJ-10S	106407	186407	Single type for 8ports	143(5.63″)	130(5.12″)
PJ-12S	106408	186408	Single type for 10ports	175(6.89″)	162(6.38″)

●Material : ZDC



[PJ-6D]

Model	Part Number		Specifications	Size	
	M8×1	5/16-24 UNF		L_1	L_2
PJ-6D	106411	186411	Double type for 4ports	47(1.85″)	34(1.34″)
PJ-8D	106412	186412	Double type for 6ports	63(2.48″)	50(1.97″)
PJ-10D	106413	186413	Double type for 8ports	79(3.11″)	66(2.60″)

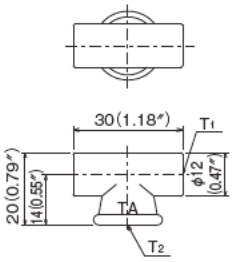
●Material : ZDC

Model	Part Number	Specifications	Size	
			L_1	L_2
PJ-12D	106414	Double type for 10ports	82(3.23″)	94(3.70″)
PJ-14D	106415	Double type for 12ports	98(3.86″)	110(4.33″)
PJ-16D	106416	Double type for 14ports	114(4.49″)	126(4.96″)

●Material : ZDC

Junction header

Dimensional drawing

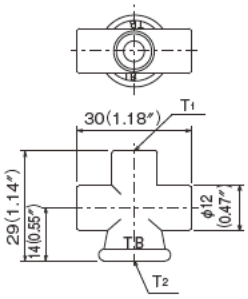


Model

Model	Part Number	T1	T2
TA	106431	2-M8×1	Rc 1/8
TA	186431	2-5/16-24 UNF	1/8 NPT

●Material : ZDC

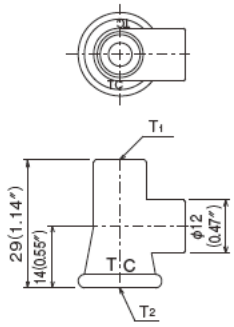
Dimensional drawing



Model

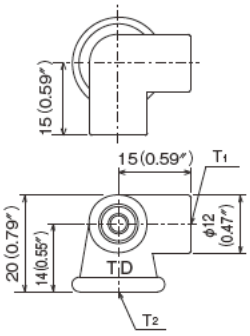
Model	Part Number	T1	T2
TB	106432	3-M8×1	Rc 1/8
TB	186432	3-5/16-24 UNF	1/8 NPT

●Material : ZDC



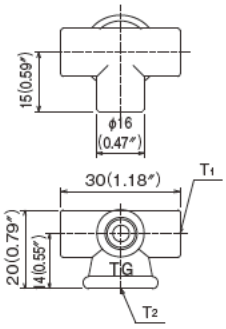
Model	Part Number	T1	T2
TC	106433	2-M8×1	Rc 1/8
TC	186433	2-5/16-24 UNF	1/8 NPT

●Material : ZDC



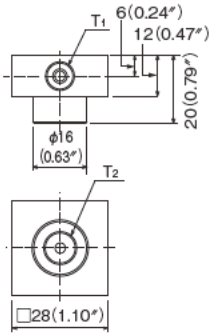
Model	Part Number	T1	T2
TD	106434	2-M8×1	Rc 1/8
TD	186434	2-5/16-24 UNF	1/8 NPT

●Material : ZDC



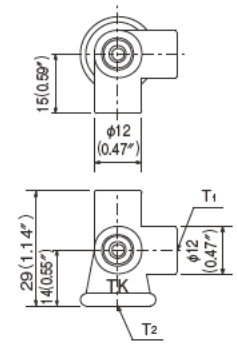
Model	Part Number	T1	T2
TG	106435	3-M8×1	Rc 1/8
TG	186435	3-5/16-24 UNF	1/8 NPT

●Material : ZDC



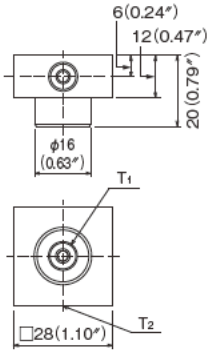
Model	Part Number	T1	T2
TH	106436	4-M8×1	Rc 1/8
TH	186436	4-5/16-24 UNF	1/8 NPT

●Material : C3604



Model	Part Number	T1	T2
TK	106437	3-M8×1	Rc 1/8
TK	186437	3-5/16-24 UNF	1/8 NPT

●Material : ZDC



Model	Part Number	T1	T2
TL	106438	4-M8×1	Rc 1/8
TL	186438	4-5/16-24 UNF	1/8 NPT

●Material : C3604

Reservoirs

Reservoir (Resin) 0.2 L

Reservoir (Resin) 3L


Reservoir (Metal) 2L


Reservoir (Metal) 4L


Reservoir (Metal) 8L

Resin reservoirs

Metal reservoirs

Resin reservoirs

0.2 • 0.4 ℓ


[T-2LP]


[T-4LP]

Model

Applicable pump	Model	Part Number	Useful capacity	Total capacity
L3	T-2LP	254104	0.2 ℓ	0.22 ℓ
EX-5 L5	T-4LP	254106	0.4 ℓ	0.5 ℓ

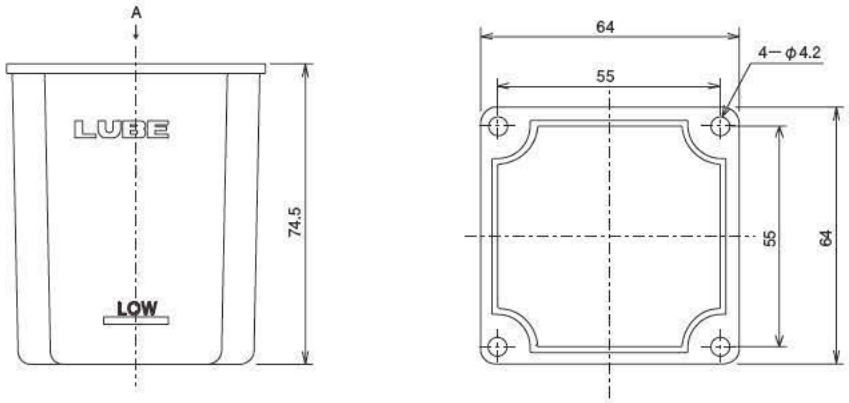
●Material : Cellulose Acetate

Directions for use

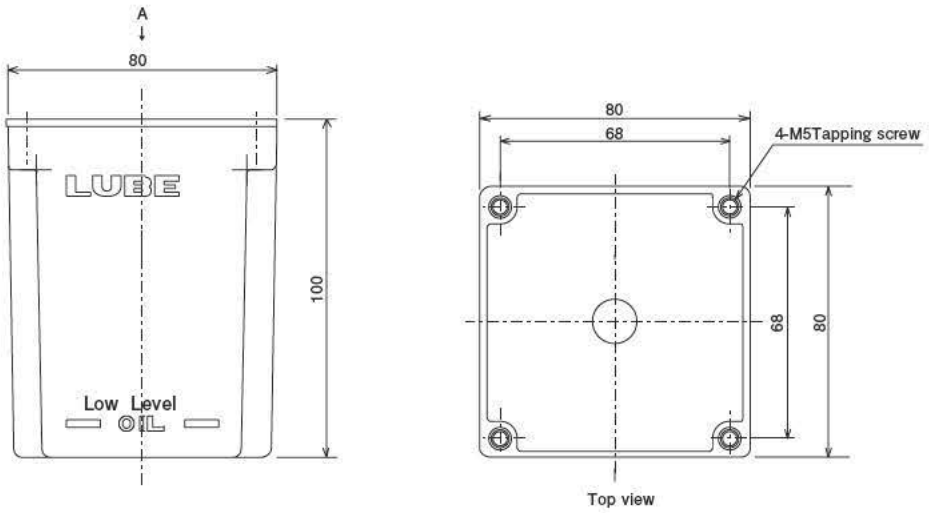
- Do not use solvents.
- Clean at least once a year.
- For details, see the instruction manual.

* Should the pump malfunction, contact us for immediate response with substitution.

Dimensional drawing



[T-2LP] 254104



[T-4LP] 254106

Resin reservoirs

0.8 · 1.8 ℓ


[T-8LP]

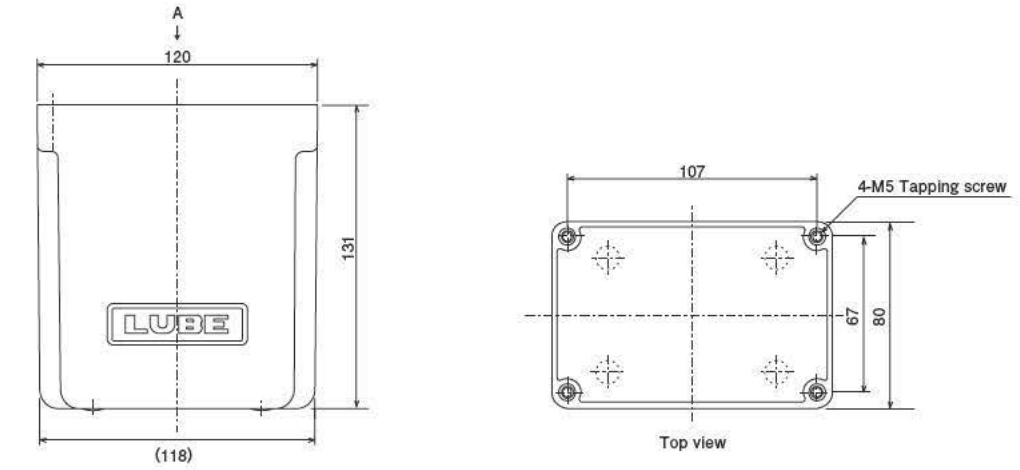

[T-18LP]

Model

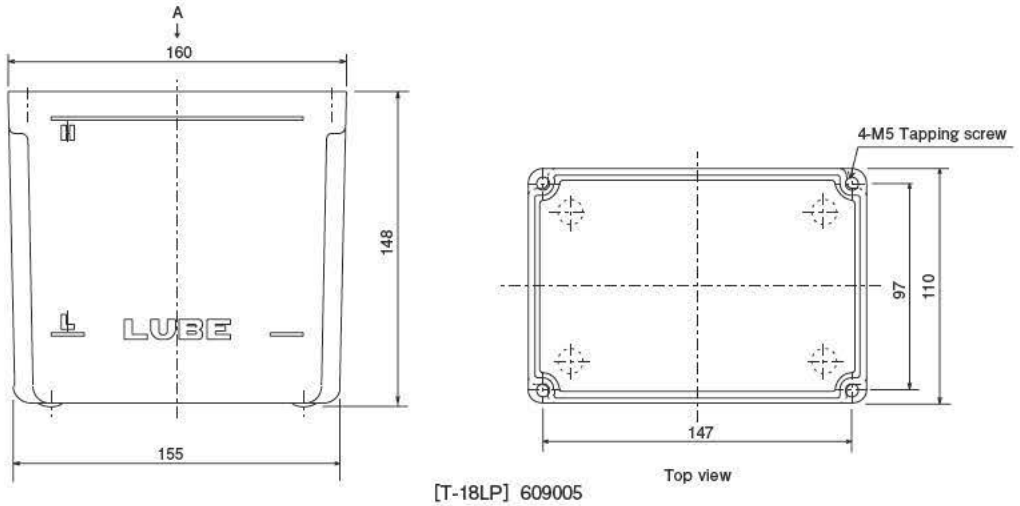
Applicable pump	Model	Part Number	Useful capacity	Total capacity
L8 MLZ	T-8LP	254102	0.8 ℓ	1.0 ℓ
AMZ-III, AMZ100S, AMO, MMXL-III, MMX-II, EX, AMR-III-150, L20, AMS	T-18LP	609005	1.8 ℓ	2.0 ℓ

●Material : Cellulose Acetate

Dimensional drawing



[T-8LP] 254102



[T-18LP] 609005

Resin reservoirs

3ℓ

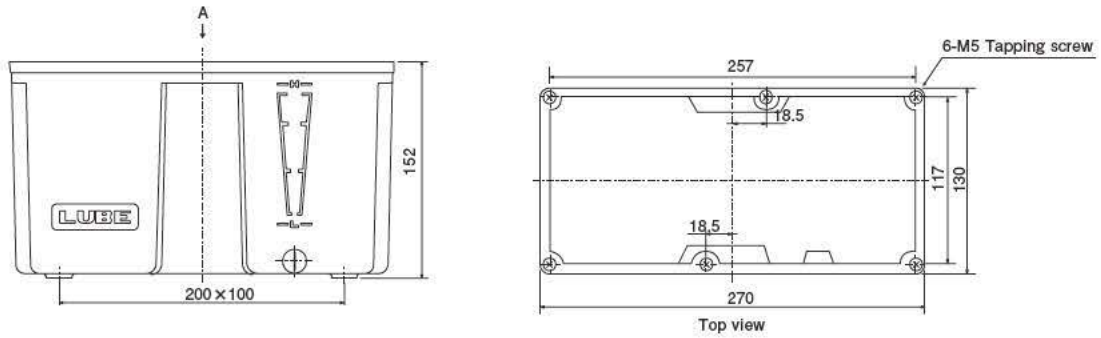
[T-30LP]

Model

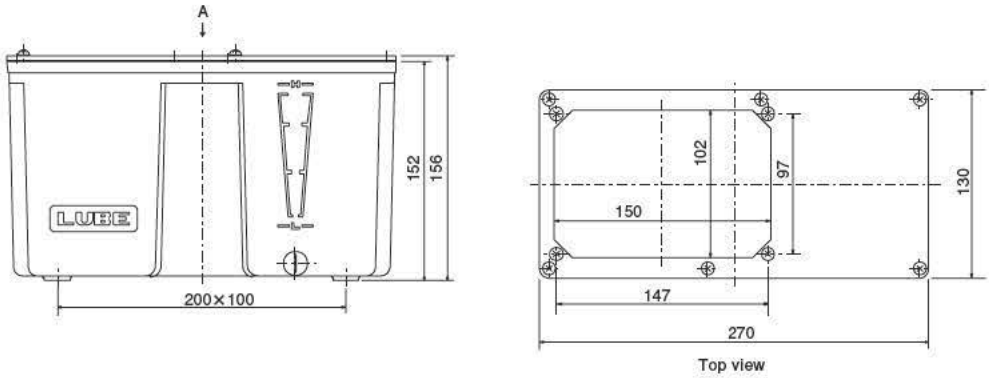
Applicable pump	Model	Part Number	Pump position
AMZ100S, AMO, MMXL-III, MMX-II, AMR-III-150	T-30LP	609006	—
	T-30LP-LX	104657	Left
	T-30LP-RX	104658	Right

●Material : Cellulose Acetate Useful capacity: 3L Total capacity: 4L

Dimensional drawing



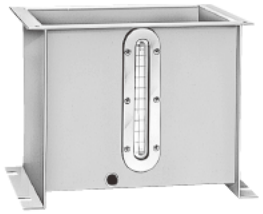
[T-30LP] 609006



[T-30LP-LX] 104657

Metal reservoirs

2 ℓ

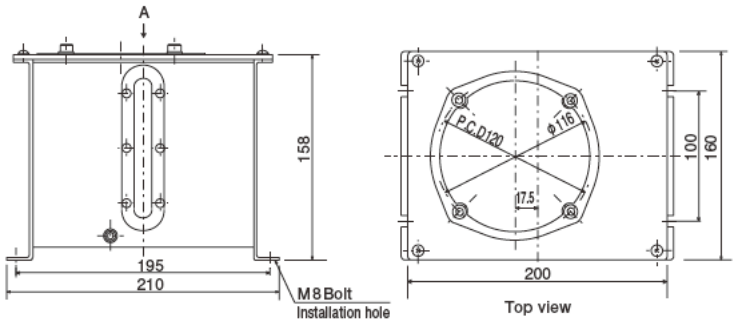


Model

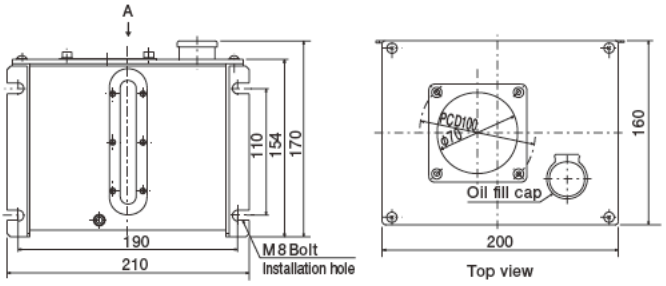
Applicable pump	Model	Part Number	Mounting
ACM-II, AM, ADM	T-20L-AF	104301	Foot
	T-20L-AB	104401	Back
AMI-300S, AMI-300	T-20L-HF	104303	Foot
	T-20L-HB	104301	Back
AMI-1000S, AMI-1000	T-20L-KF	104401	Foot
	T-20L-KB	104303	Back

● Material : SPCC Total capacity : 3.2L Useful capacity : 2.1L Coating color : Silver

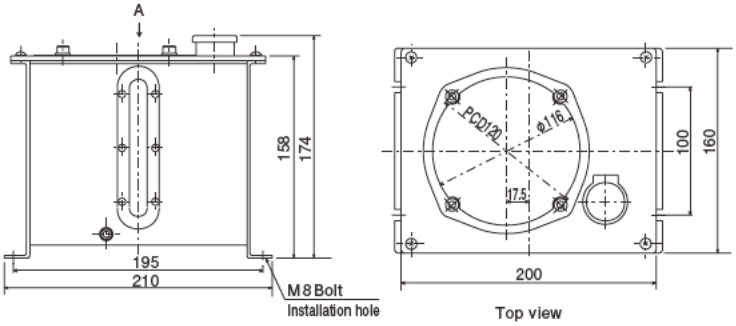
Dimensional drawing



[T-20L-AF] 104301



[T-20L-HB] 104403



[T-20L-KF] 104302

Metal reservoirs

3 ℓ

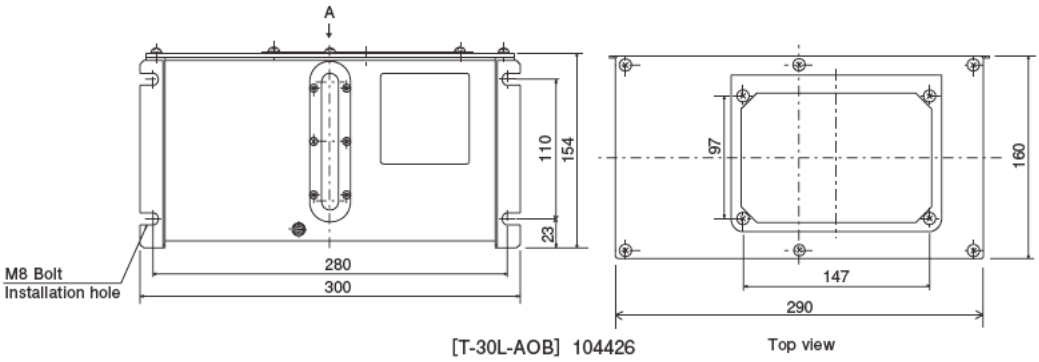
Model

Applicable pump	Model	Part Number	Pump position	Mounting	Oil level switch
AMZ100S, AMO AMR-III-150	T-30L-AOF	104326	Right	Foot	—
	T-30L-AOB	104426	Right	Back	—
MMXL-III MMX-II AMS	T-30L-LXF	104313	Left	Foot	—
	T-30L-LXB	104413	Left	Back	—
	T-30L-RXF	104314	Right	Foot	—
	T-30L-RXB	104414	Right	Back	—
AMI-300S AMI-300	T-30L-LHF	104318	Left	Foot	Without
	T-30L-LHB	104418	Left	Back	Without
	T-30L-RHF	104319	Right	Foot	Without
	T-30L-RHB	104419	Right	Back	Without
	T-30L-OLHF	104324	Left	Foot	With
	T-30L-OLHB	104424	Left	Back	With
	T-30L-ORHF	104325	Right	Foot	With
	T-30L-ORHB	104425	Right	Back	With
AMI-1000S AMI-1000	T-30L-LKF	104316	Left	Foot	Without
	T-30L-LKB	104416	Left	Back	Without
	T-30L-RKF	104317	Right	Foot	Without
	T-30L-RKB	104417	Right	Back	Without
	T-30L-OLKF	104322	Left	Foot	—
	T-30L-OLKB	104422	Left	Back	—
	T-30L-ORKF	104323	Right	Foot	With
	T-30L-ORKB	104423	Right	Back	With
ACM-II AM ADM	T-30L-LAF	104311	Left	Foot	Without
	T-30L-LAB	104411	Left	Back	Without
	T-30L-RAF	104312	Right	Foot	Without
	T-30L-RAB	104412	Right	Back	Without
	T-30L-OLAF	104320	Left	Foot	With
	T-30L-OLAB	104420	Left	Back	With
	T-30L-ORAF	104321	Right	Foot	With
	T-30L-ORAB	104421	Right	Back	With

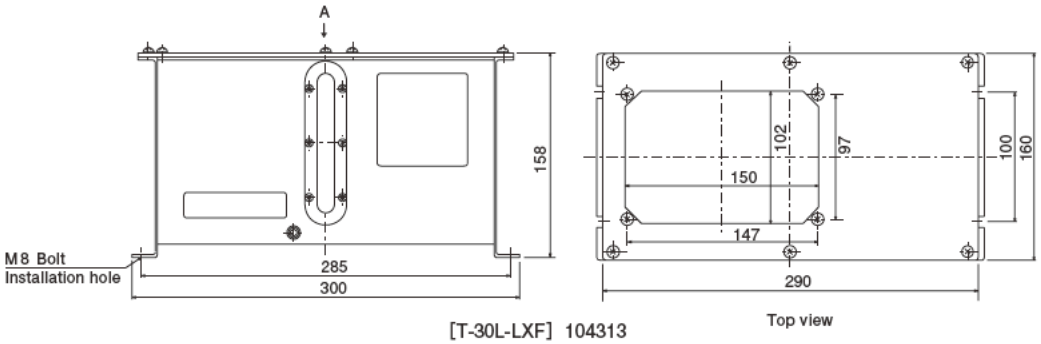
●Material : SPCC Total capacity : 3.2L Useful capacity : 2.1L Coating color : Silver

[T-30L-OLH]

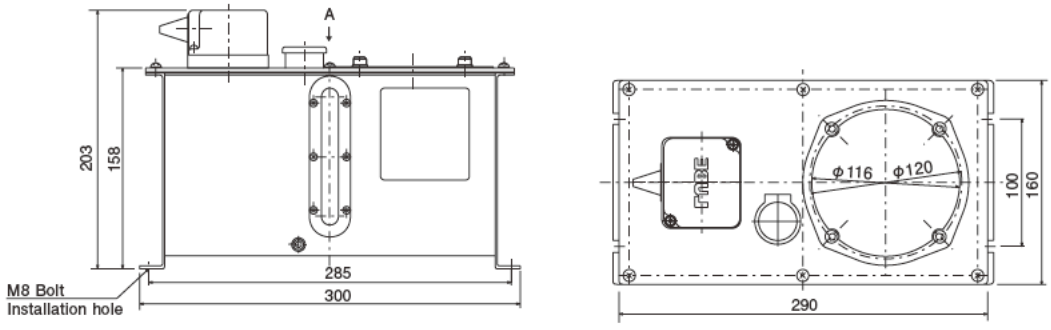
Dimensional drawing



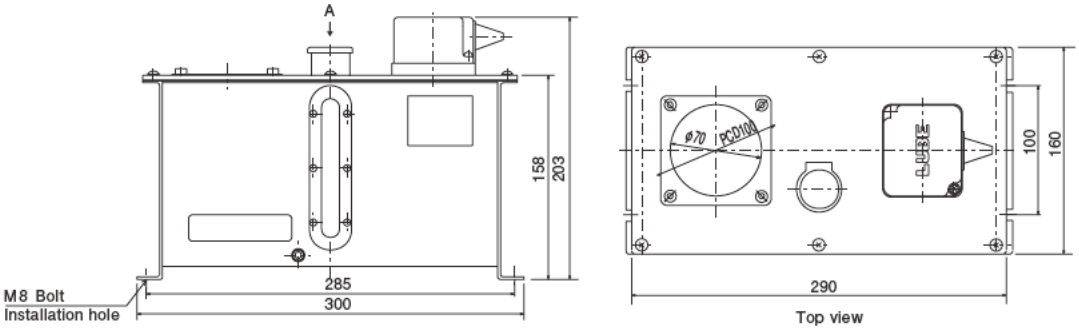
[T-30L-AOB] 104426



[T-30L-LXF] 104313



[T-30L-ORAF] 104321



[T-30L-OLHF] 104324

Metal reservoirs

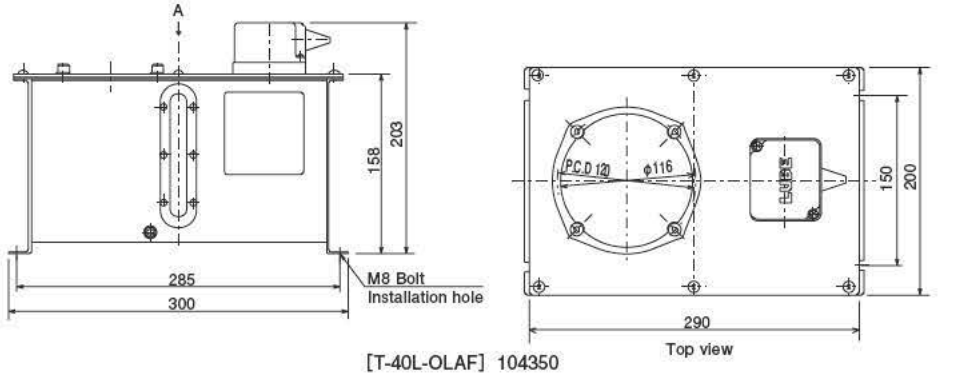
4 ℓ

Model

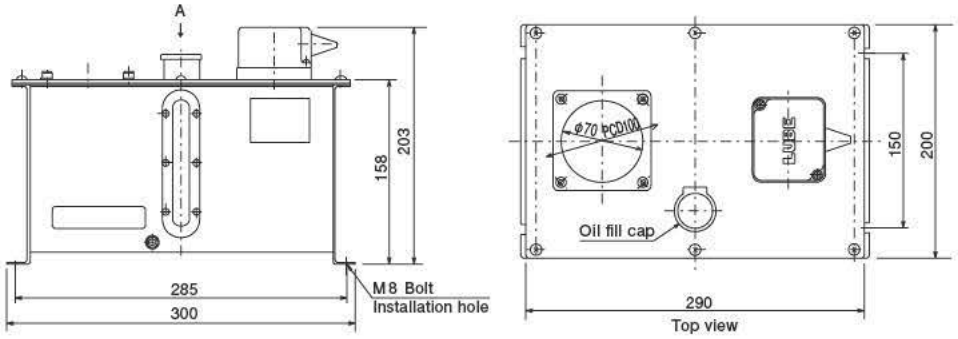
Applicable pump	Model	Part Number	Pump position	Mounting	Oil level switch
AMZ100S, AMO AMR-III-150	T-40L-AOF	104356	Right	Foot	—
	T-40L-AOB	104456	Right	Back	—
MMXL-III MMX-II AMS	T-40L-LXF	104343	Left	Foot	—
	T-40L-LXB	104443	Left	Back	—
	T-40L-RXF	104344	Right	Foot	—
	T-40L-RXB	104444	Right	Back	—
AMI-300S AMI-300	T-40L-LHF	104348	Left	Foot	Without
	T-40L-LHB	104448	Left	Back	Without
	T-40L-RHF	104349	Right	Foot	Without
	T-40L-RHB	104449	Right	Back	Without
	T-40L-OLHF	104354	Left	Foot	With
	T-40L-OLHB	104454	Left	Back	With
	T-40L-ORHF	104355	Right	Foot	With
	T-40L-ORHB	104455	Right	Back	With
AMI-1000S AMI-1000	T-40L-LKF	104346	Left	Foot	Without
	T-40L-LKB	104446	Left	Back	Without
	T-40L-RKF	104347	Right	Foot	Without
	T-40L-RKB	104447	Right	Back	Without
	T-40L-OLKF	104352	Left	Foot	With
	T-40L-OLKB	104452	Left	Back	With
	T-40L-ORKF	104353	Right	Foot	With
	T-40L-ORKB	104453	Right	Back	With
ACM-II AM ADM	T-40L-LAF	104341	Left	Foot	Without
	T-40L-LAB	104441	Left	Back	Without
	T-40L-RAF	104342	Right	Foot	Without
	T-40L-RAB	104442	Right	Back	Without
	T-40L-OLAF	104350	Left	Foot	With
	T-40L-OLAB	104450	Left	Back	With
	T-40L-ORAF	104351	Right	Foot	With
	T-40L-ORAB	104451	Right	Back	With

●Material : SPCC Total capacity : 6.3L Useful capacity : 4.2L Coating color : Silver

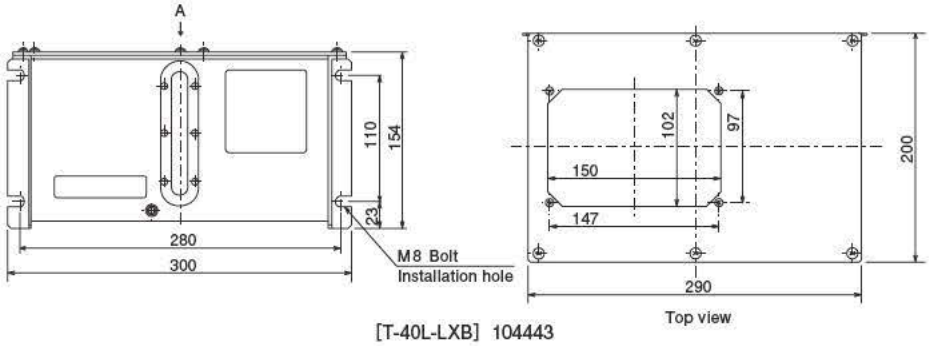
Dimensional drawing



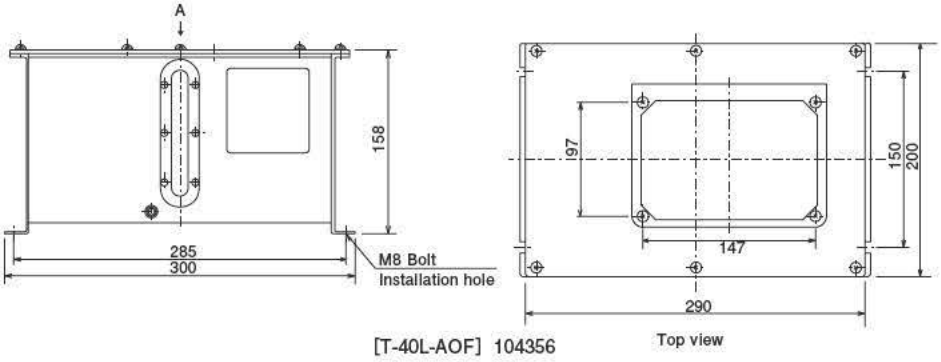
[T-40L-OLAF] 104350



[T-40L-OLHF] 104354



[T-40L-LXB] 104443



[T-40L-AOF] 104356

Metal reservoirs

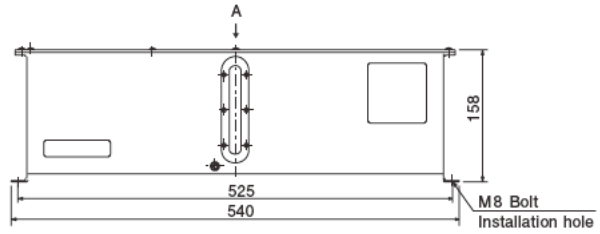
8 ℓ

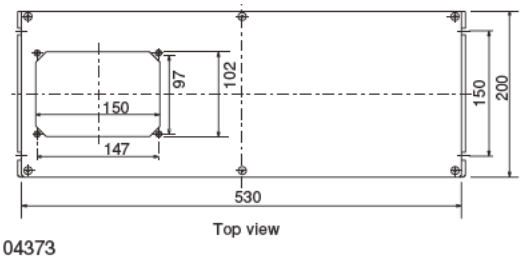
Model

Applicable pump	Model	Part Number	Pump position	Mounting	Oil level switch
AMZ100S, AMO AMR-III-150	T-80L-AOF	104386	Right	Foot	—
	T-80L-AOB	104486	Right	Back	—
MMXL-III MMX-II AMS	T-80L-LXF	104373	Left	Foot	—
	T-80L-LXB	104473	Left	Back	—
	T-80L-RXF	104374	Right	Foot	—
	T-80L-RXB	104474	Right	Back	—
AMI-300S AMI-300	T-80L-LHF	104378	Left	Foot	Without
	T-80L-LHB	104478	Left	Back	Without
	T-80L-RHF	104379	Right	Foot	Without
	T-80L-RHB	104479	Right	Back	Without
	T-80L-OLHF	104384	Left	Foot	With
	T-80L-OLHB	104484	Left	Back	With
	T-80L-ORHF	104385	Right	Foot	With
	T-80L-ORHB	104485	Right	Back	With
AMI-1000S AMI-1000	T-80L-LKF	104376	Left	Foot	Without
	T-80L-LKB	104476	Left	Back	Without
	T-80L-RKF	104377	Right	Foot	Without
	T-80L-RKB	104477	Right	Back	Without
	T-80L-OLKF	104382	Left	Foot	With
	T-80L-OLKB	104482	Left	Back	With
	T-80L-ORKF	104383	Right	Foot	With
	T-80L-ORKB	104483	Right	Back	With
ACM-II AM ADM	T-80L-LAF	104371	Left	Foot	Without
	T-80L-LAB	104471	Left	Back	Without
	T-80L-RAF	104372	Right	Foot	Without
	T-80L-RAB	104472	Right	Back	Without
	T-80L-OLAF	104380	Left	Foot	With
	T-80L-OLAB	104480	Left	Back	With
	T-80L-ORAF	104381	Right	Foot	With
	T-80L-ORAB	104481	Right	Back	With

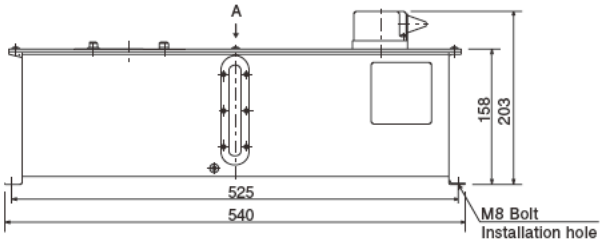
●Material : SPCC　Total capacity : 12.3L　Useful capacity : 80L　Coating color : Silver

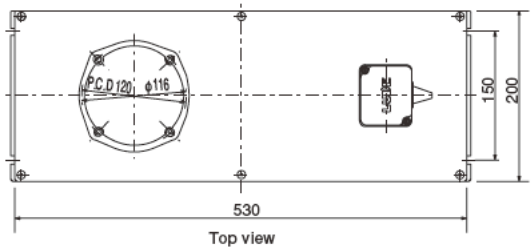
Dimensional drawing



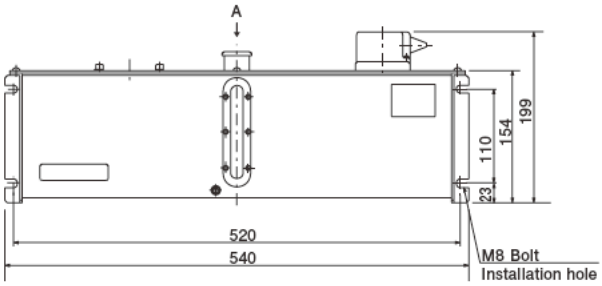


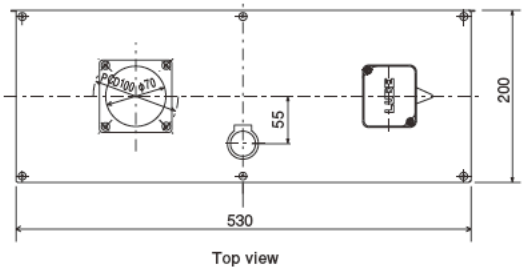
[T-80L-LXF] 104373



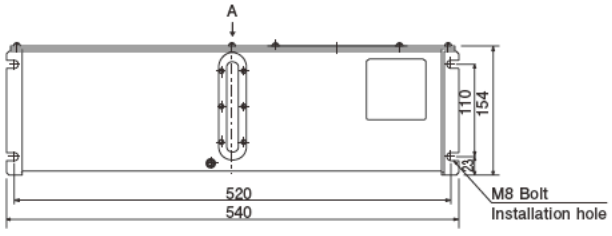


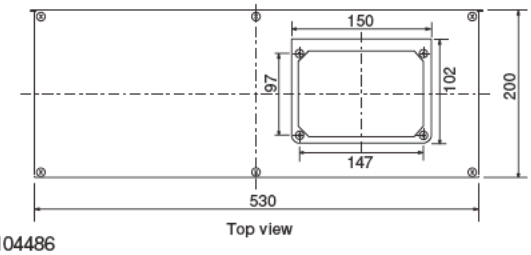
[T-80L-OLAF] 104380





[T-80L-OLHB] 104484





[T-80L-AOB] 104486

Accessories

Oil level switch

Filter/ Strainer

Pressure gauge

Pressure switch

Ludo-sensor

Oil level switch

Use for oil level detection.

[W-105-02]

[W-105B]

Specifications

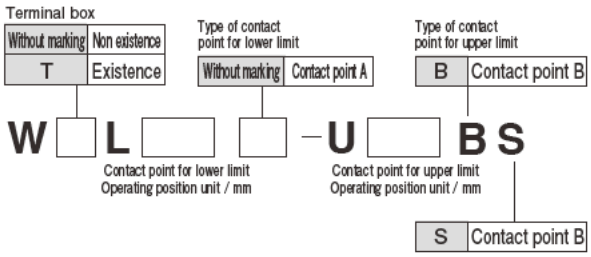
Contact type	A contact (NO) On at low level B contact (NC) Off at low level
Contact capacity	0.5A,AC DC200V/30W smaller
Working tempeature range	-10~80℃ (limited to liquid nonfreezing condition)
Working liguid specific gravity	over 0.7
Max. pressure	0.1MPa

Model

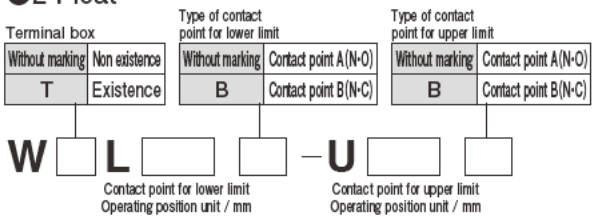
Model	Part Number	Contact type	Specification
W-105-02	109704	A contact	Without terminal box Cord length 20cm
W-105-02 (B)	109705	B contact	
W-105B	109706	A contact	With terminal box
W-105B (B)	109707	B contact	

Model	Part Number	terminal box
WL-100-U30BS	109221	—
WL-105-U32BS	109222	
WL-120-U50BS	109223	
WL-150-U35BS	109224	
WL-150-U50BS	109225	
WL-160-U80BS	109226	
WL-190-U80BS	109227	
WL-210-U50BS	109228	
WTL-100-U30BS	109271	○
WTL-105-U32BS	109272	
WTL-120-U50BS	109273	
WTL-150-U35BS	109274	
WTL-150-U50BS	109275	
WTL-160-U80BS	109276	
WTL-190-U80BS	109277	
WTL-210-U50BS	109278	

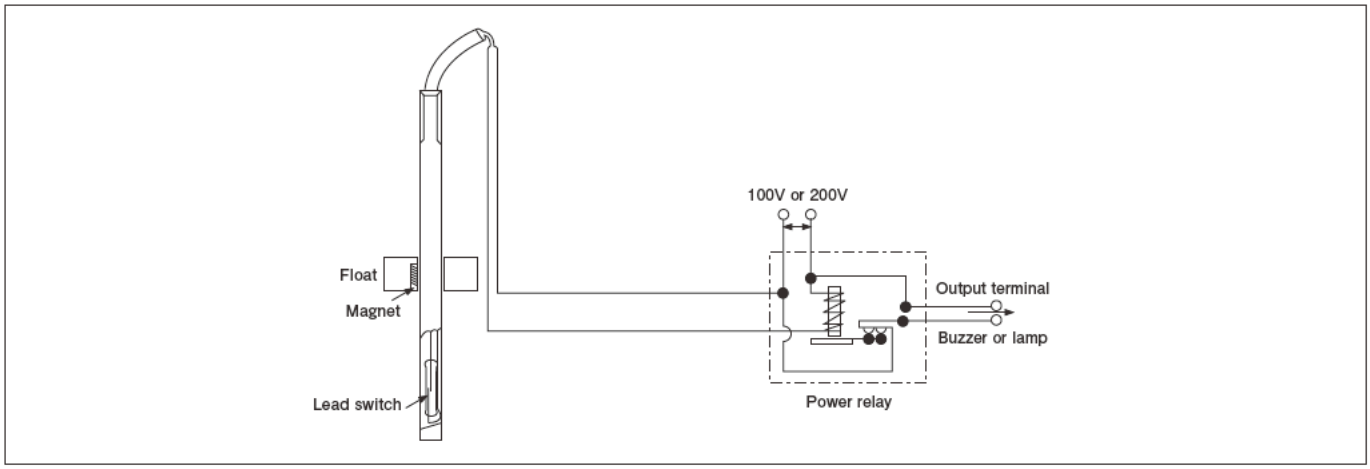
●1 Float



●2 Float

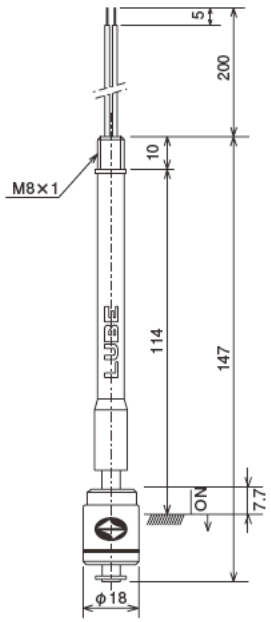


Examples for using oil level switch

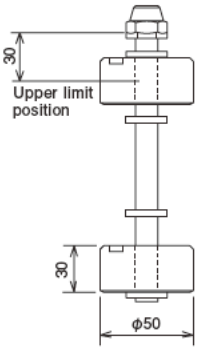


Dimensional drawing

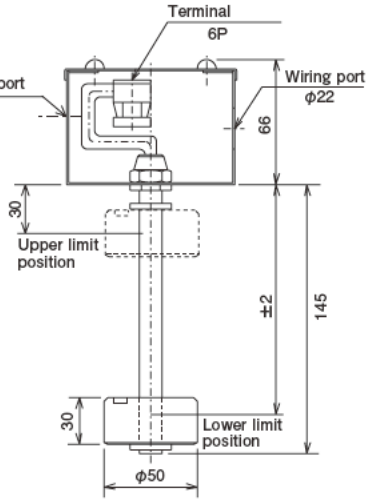
[W-105-02]



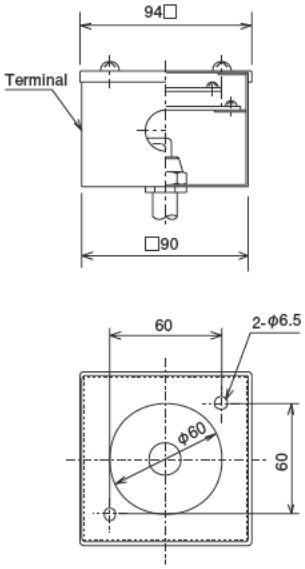
[WTL]



2 Float



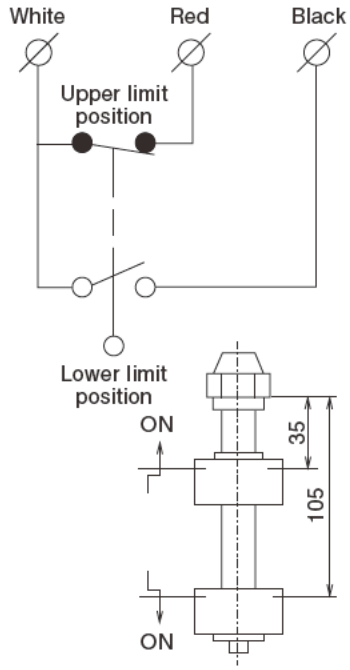
1 Float



Lower limit position

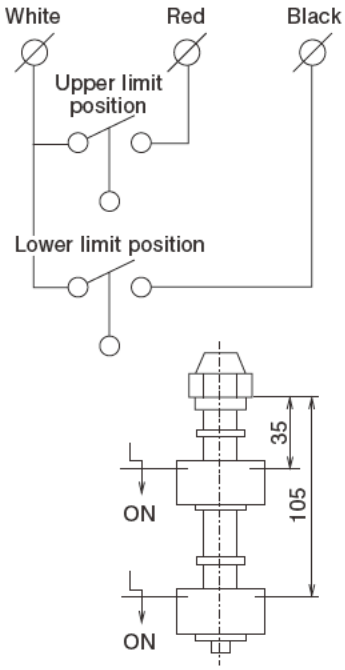
Example : 1 float

WL105-U35BS

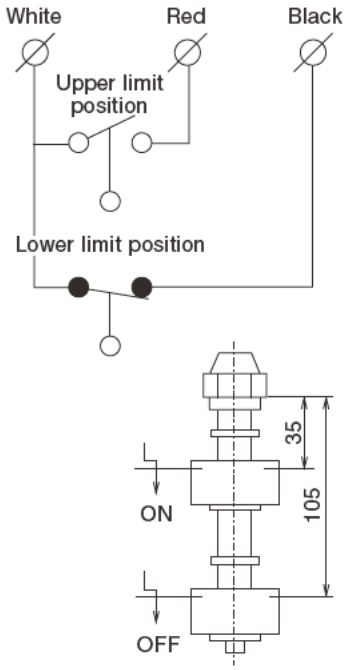


Example : 2 float

WL105-U35



WL105B-U35



Filter/ Strainer

In-Line oil filters help eliminate contamination from reaching the metering devices of the lubrication system.

[FX1-4]

[FY20]

[RF-250]

[F3-6-125]

Model

Line Filter

Model	Part Number	Connecting port	Normal working pressure (MPa)	Pressure Loss	Filtration rating
FX1-4	109311	M8×1	1.0	0.1	40μ
FX1-6	209311	M10×1			
F3-4-125	109308	M8×1	Max.2.9		125μ
F3-6-125	209308	M10×1			
F3-6-40	209310				40μ
F3-6-10	209309			0.15	10μ
FY20	109313	Rc1/8	2.5	0.1	20μ

Replacement Filter Element

Model	Part Number	Filtration rating
FXE	259304	40μ
F3E-125	259311	125μ
F3E-40	259312	40μ
F3E-10	259313	10μ

Sintered Strainer

Model	Part Number	Filtration rating	Material
FYE	650147	20μ	BC3

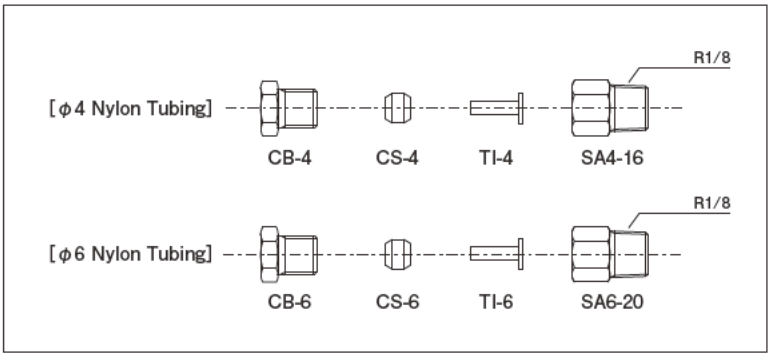
Recirculation Filte

Model	Part Number	Filtration rating
RF-250	109317	250μ

Strainer

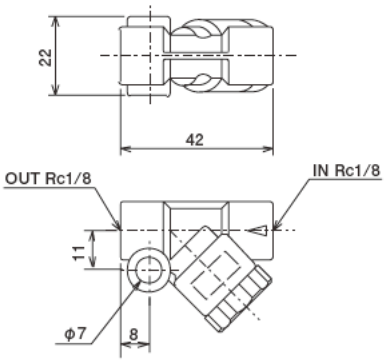
Model	Part Number	D	H	L	d	d1	P	Installation Screw
SAB-30	259353	56	33	44	30	35	48	4-M4
SAB-40	259354	65	34	69	40	45	57	
SAB-50	259355	80	34	135	50	56	75	4-M5
SAB-70	259358	108	70	120	70	80	100	6-M6

Connecting parts

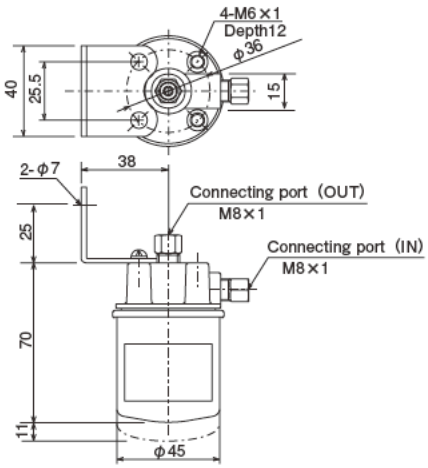


Dimensional drawing

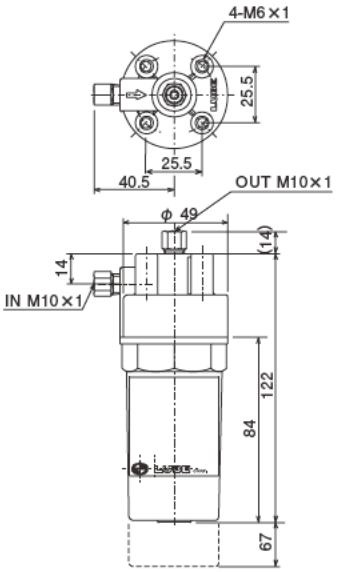
[Line filter]



[FY20]

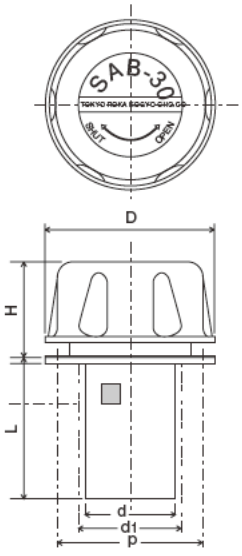


[FX1-4]



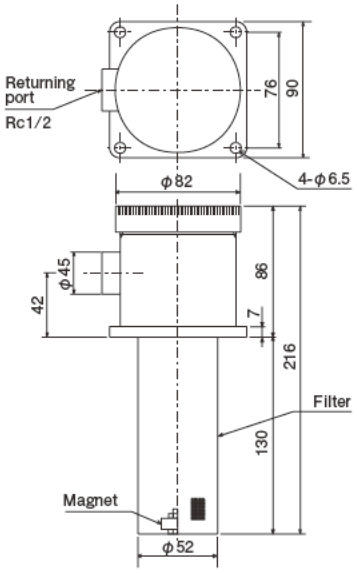
[F3-6-125]

[Strainer]



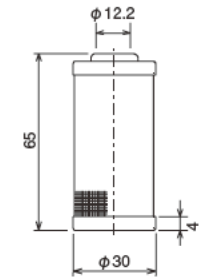
[SAB-30]

[Recirculation filter]

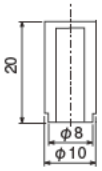


[RF-250]

[Element/ Strainer]



Replacement filter element
[F3E-125・F3E-40・
F3E-10]



Sintered strainer

[FY-20]

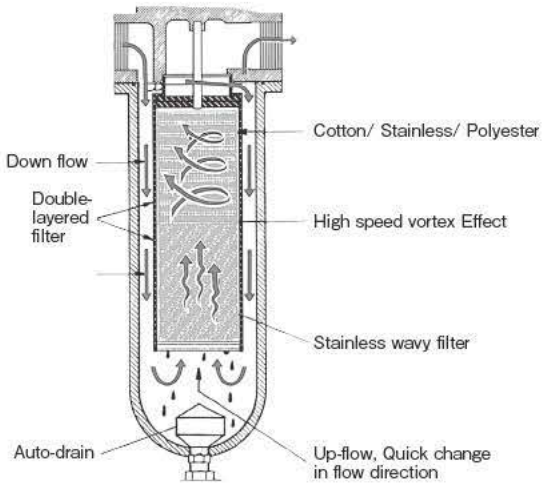
Eliminator

- Removes impurity particles down to 1 micron in size.
- Vaporizes water completely.
- Provided with auto drain as standard equipment to automatically drain removed impurities.
- Very easy to maintain.
  (Instantly removable bowl, quick-change cartridge).

Specifications

Filtration	Particles down to 1 micron in size
Max. working atmosphere	Plastic bowl=1.0MPa Metal bowl=1.7MPa
Max. working temperature	Plastic bowl=52℃ Metal bowl=80℃
Applicable flow rate	76ℓ/min.~19,800ℓ/min

Principle of operation and feature



1. Efficient separation

As air flows, forced to change its direction in the bowl, moisture, oil and dirt particles in it are coagulated and accumulated on the bottom of bowl and intermittently drained.

2. Coagulation

Air entering stainless steel filter is rubbed by stainless steel mesh screen and rid of foreign particles down to 2 microns in size.

3. 1-micron filtration

Submicron particles in the air are separated by cotton/polyester filter.

4. Vaporization

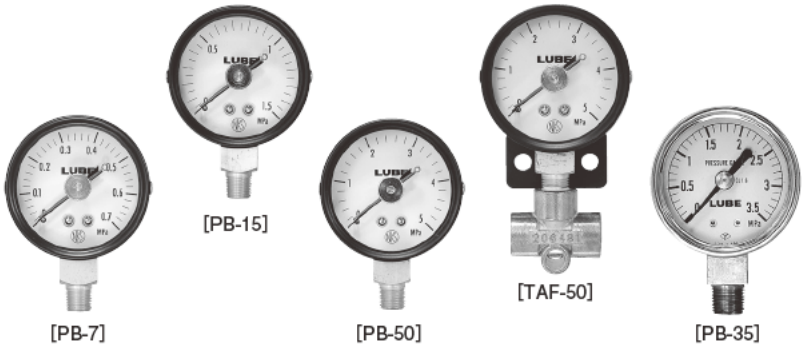
Air pressure is reduced to a minimal level at the final point of filter medium, where air temperature is slightly increased by friction between air and filter medium to heat and vaporize micro-drops of moisture left in the air.

Model. Specifications. Dimension.

	Model	Flow rate (l/min)		Bore (Rc)	Outside dimension (mm)			Weight (kg)	Material	
		Max.	Min.		Overall height	Overall width	Depth		Head	Bowl
Plastic bowl type	3P-020-PT2-Fi	560	170	1/4	190	76	76	1.5	Zinc diecast	Poly-carbonate
	3P-035-PT2-Fi	980	300		290	95	95	1.5		
	3P-060-PT4-Fi	1,750		1/2						
	3P-090-PT6-Fi	2,450	850	3/4	390	127	127	2.5		
	3P-150-PT8-Fi	4,250	1,275	1						
Metal bowl type	3P-020-PT2-Fi	560	170	1/4	190	75	66	1	Zinc diecast	Aluminum
	3P-035-MT2-Fi	980	300		290	95	95	1.5		
	3P-060-MT4-Fi	1.75	300	1/2						
	3P-090-MT6-Fi	2,450	850	3/4	490	127	127	2.5	Aluminum diecast	
	3P-150-MT8-Fi	4,250	1,275	1						
	3M-400-M12-Fi	11,300	3,400	1-1/2	770	217	217	217		
	3M-700-M16-Fi	19,600	5,950	2						

Pressure gauge

Recommended for visual inspection of the lubrication systems performance and future troubleshooting.



Specifications

Accuracy	±3%F.S
Temperature range	15℃～40℃
Material	Bourdon tube C6872T (Min.10MPa C5191T)
	Frame SPCC steel plate

Model

Pressure gauge

Model	Part Number	Pressure range (MPa)	Connection	Installation pin
PB-7	109166	0.7	R1/8	Available
PB-15	109167	1.5		
PB-50	109161	5		
PB-50B	109162			
TAF-7	109154	0.7	M8×1	—
TAF-15	109155	1.5		
TAF-50	209117	5	M10×1	Available
* PB-35	209136	3.5	R1/8	Not available
* PB-35B	209137			

Pressure gauge fitting plate

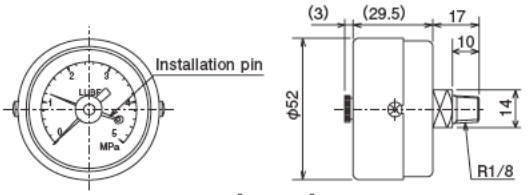
Model	Part Number
PP	109102

* Not usable for PB-35 and PB-35B

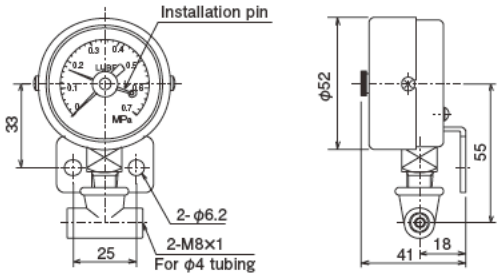
Directions for use

- Use care not to drop or exert other strong impact.
- Do not apply pressure beyond specified range.

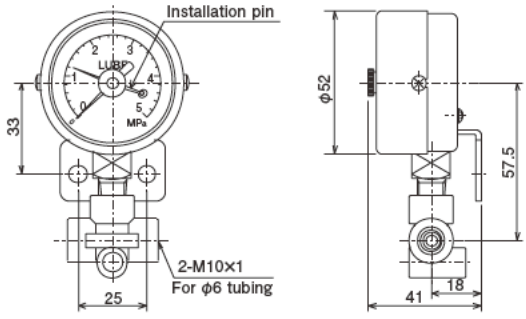
Dimensional drawing



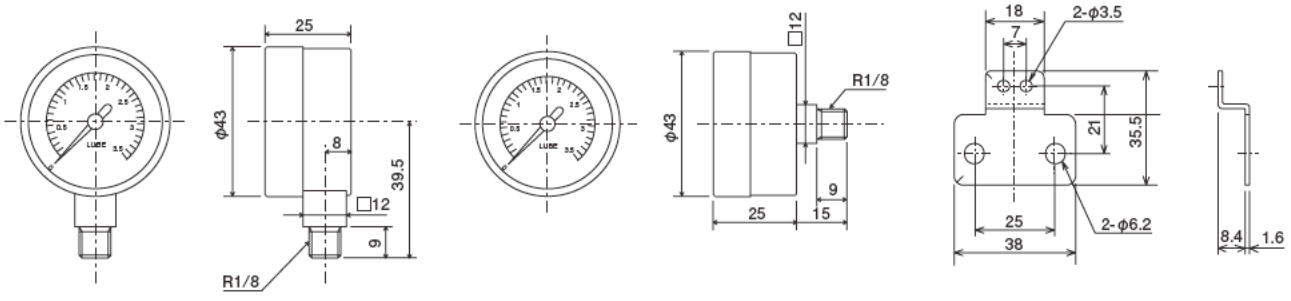
[PB-50B]



[TAF-7]



[TAF-50]



[PB-35] [PB-35B] Pressure gauge fitting plate [PP]

Pressure switch

Installed on main piping to detect any abnormal pressure in the lubrication system.

[SPS]

[PS]

SPS

Specifications

Rating	250V,5A 125V,10A
Contact type	Switch OFF on pressure rise in red-blue circuit Switch ON on pressure rise in red-black circuit

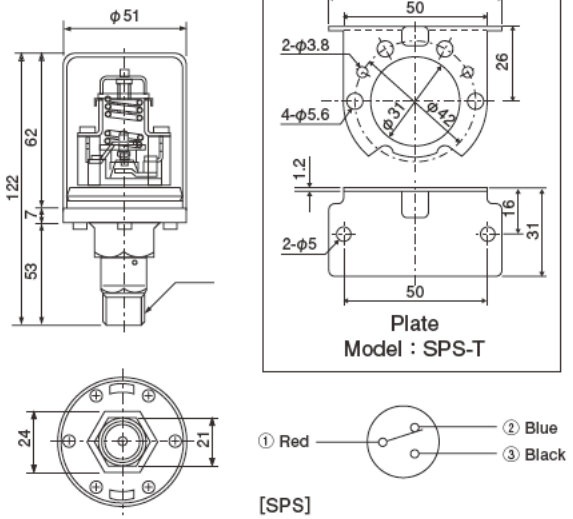
Model

Model	Part Number	Upper limit pressure(MPa)	Lower limit pressure(MPa)
SPS-8TP-17/14-3/8	209181	1.7	1.4
SPS-8T-1.0/0.5-1/4	109181	0.1	0.05
SPS-8T-2.5/2.0-1/4	109182	0.25	0.2
SPS-8T-4.0/3.5-1/4	109183	0.4	0.35
SPS-8T-12/9-1/4	109184	1.2	0.9

Directions for use

• Use care not to drop or exert other strong impact.

Dimensional drawing



[SPS]

PS

Specifications

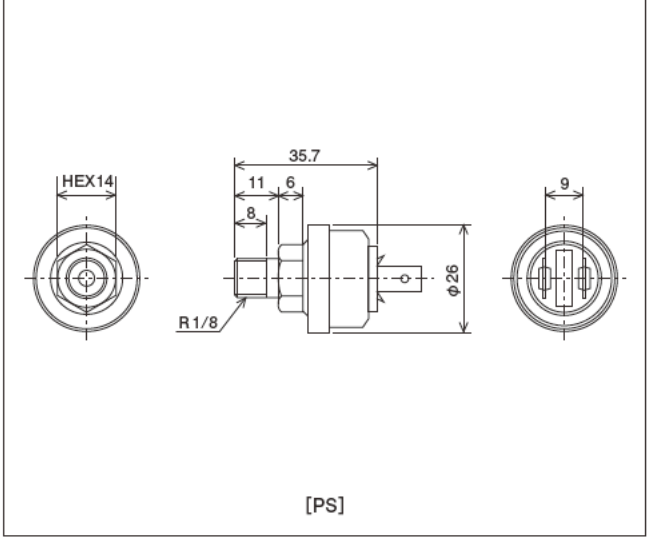
Electrical ratings	AC120/240V 135VA(AC250V for non-electrical appliance application) DC28V 2A
Operating pressure	See list below.
Proof pressure	4.4MPa
Burst Pressure	14.7MPa

Model

Model	Part Number	Contact type	Upper limit pressure(MPa)	Lower limit pressure(MPa)
PS-B170	209170	NC	1.667±0.049	0.883±0.147
PS-A170	209171	NO	1.667±0.049	0.882±0.147
PS-B014	209172	NC	0.137±0.029	0.069±0.029
PS-B150	209173		1.471±0.049	0.883±0.147
PS-B021	209174		0.206±0.029	0.147±0.029
PS-A015	209175		0.147±0.029	0.098±0.029
PS-A115	209176	NO	1.128±0.049	0.441±0.098
PS-A011	209177		0.108±0.029	0.049±0.029
PS-A150	209178		1.471±0.049	0.883±0.147
PS-A014	209203		0.137±0.029	0.069±0.029
PS-A180	209204		1.765±0.049	0.883±0.147
PS-A110	209205		1.079±0.049	0.558±0.147

* Use PS pressure switches in combination with junction PV-1.

Dimensional drawing



[PS]

LUDO-sensor

For monitoring oil flow to the lubrication points after the metering devices on the lubrication system.

Specifications

LUDO-sensor	
Detection capacity	0.1 m ℓ/cycle (working viscosity 65mm²/s)
Working viscosity range	65～1300mm²/s

Directions for use

• See the instruction manual.

HOW to order

■ LUDO-sensor

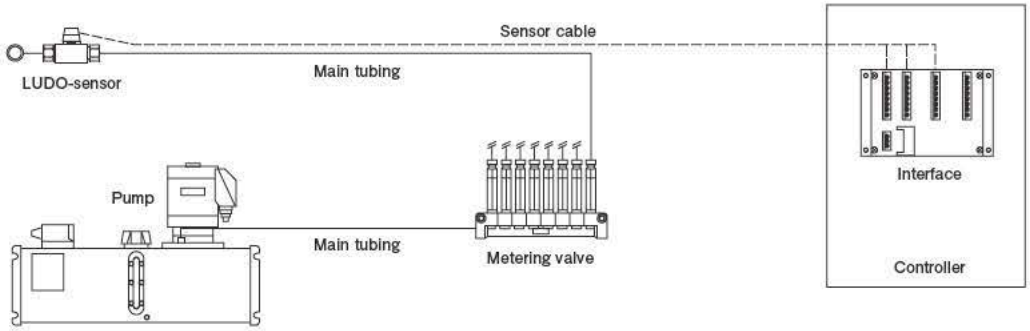
LS－□M

The length of cable (1m step)

■ Interface

IF－8CH

System Planning



● Related parts


AMZ- Ⅲ
: P.93


AMO- Ⅲ DS
: P.97


AMO- Ⅱ-150S
: P.99


AMI-300S・1000S
: P.101


MO2(C) Metering valve
: P.105

JVPA Junction
: P.106


MO
MO Metering valve: P.107

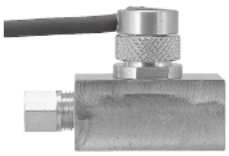
PV Junction
: P.108

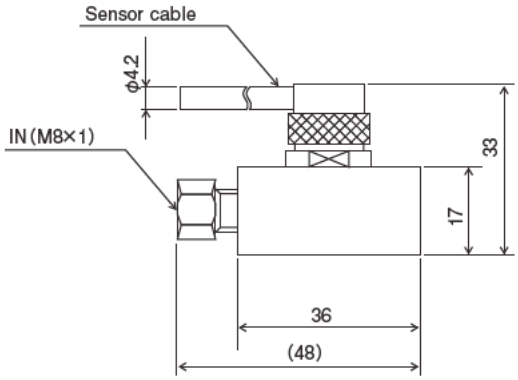

MOS Metering valve
: P.109

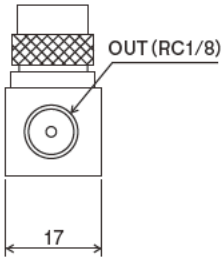
PVS
PVS Junction : P.111

Dimensional drawing

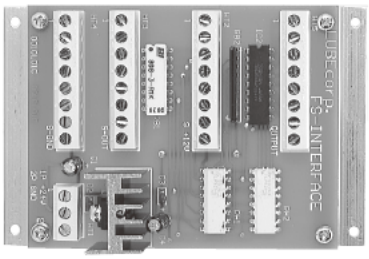
[LUDO-sensor]

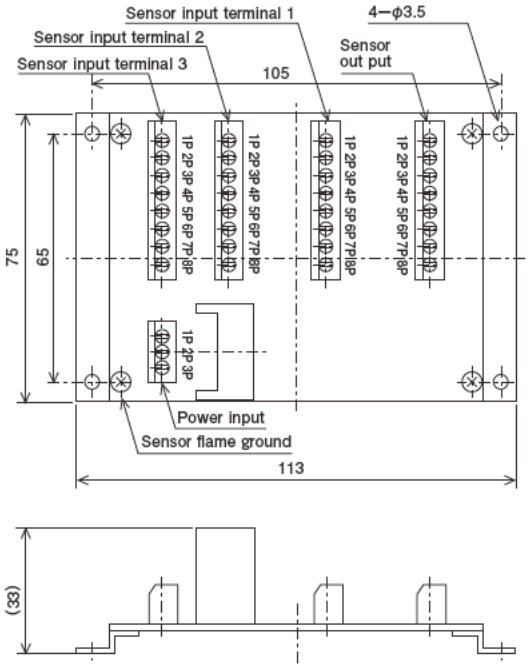






[Interface]





Air-Oil Sensor

OA- I

Integral element of oil/air lubrication system. (suitable for detection on oil tubing beyond mixing valve)

Specifications

Power/Voltage	DC24±10%
Abnormal output	Photo coupler (open collector)
Working tempeature range	0～+50℃ (no sweating)
Working ambient humidity	35～85%RH

OA-I- □ □

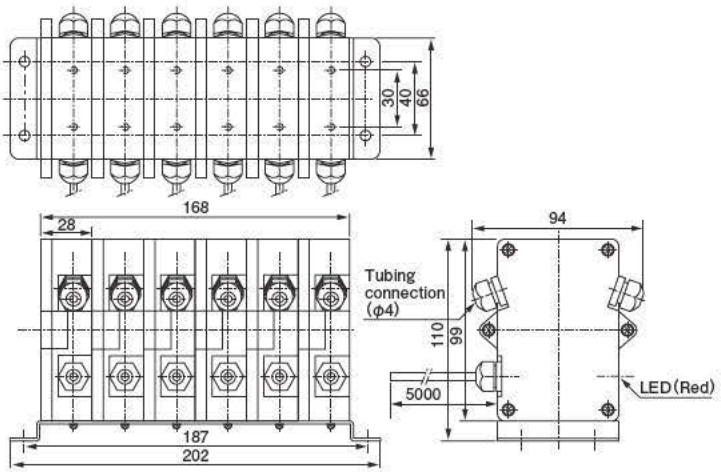
1	1 Port
2	2 Ports
3	3 Ports
4	4 Ports
5	5 Ports
6	6 Ports

4	φ4
6	φ6

Model

Part Number	Pipe O.D (φ)
420031	4
420032	6

Dimensional drawing

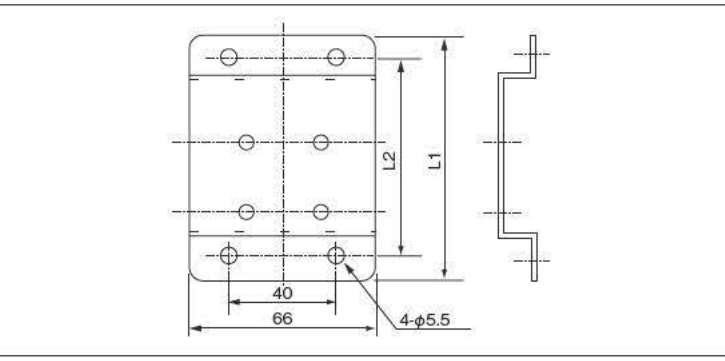


Air-Oil sensor mounting plate

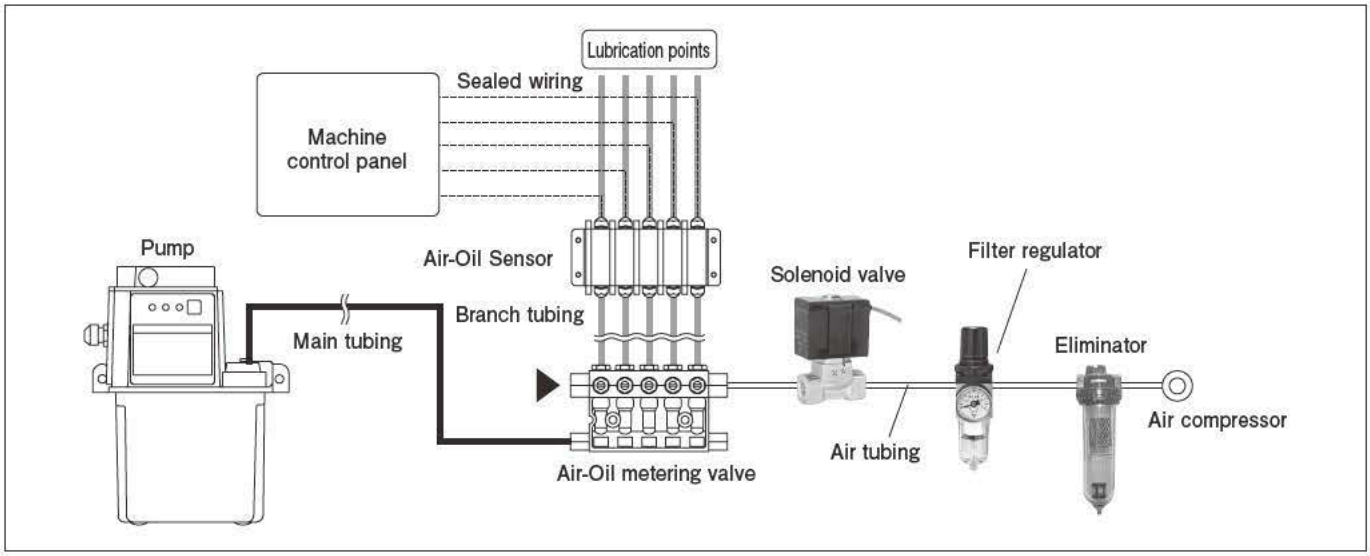
Model

Sequential number	L1	L2	Part Number
1	60	44	613011
2	88	72	613012
3	116	100	613013
4	144	128	613014
5	172	156	613015
6	200	184	613016

Model



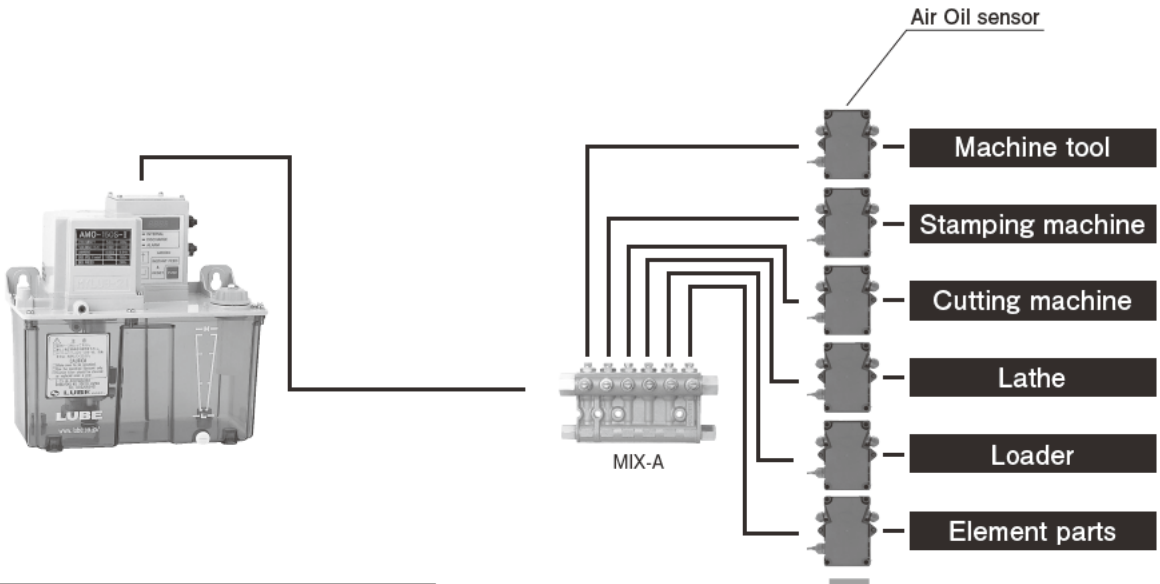
System planning

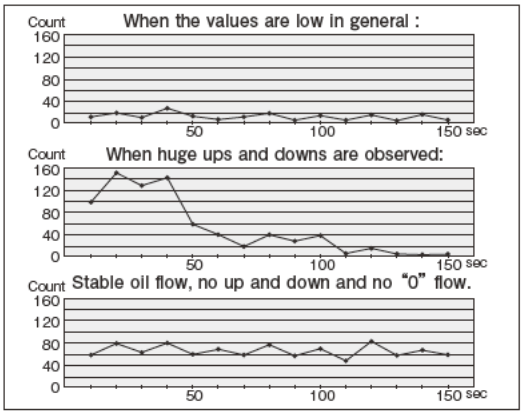


Air Oil sensing and logging system

Air Oil sensor / logger

As the air/oil particles move down the tail tubing to the lubrication points, the air/oil sensors detect this movement to monitor proper delivery. The air/oil loggers can count these signals generated from the Sensors so that proper adjustments can be made to air flow, air volume or system interval during setup to stabilize the air/oil delivery. The loggers can also be used during your PM cycles to ensure none of the adjustments have been changed and the system is operating properly.





Store the data obtained when the machine is operating in fine conditions and use it as the standard data for the comparison.

Tubing Parts

Compression parts

Flexible hose

Adapters

Connectors

Tubing Parts

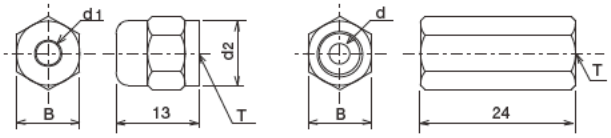
Compression parts

Used for connecting tubing to junctions, adapters and metering valves.

RoHS compliant products are also available.
Please contact us for details.

Some parts are available with standard threads.
Contact us for details.

Dimensional drawing



[CN-4-B]

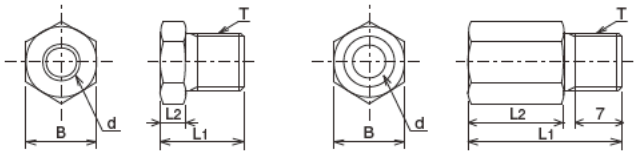
Model

Compression nut

Model	Part Number	Tubing O.D. (ϕ)	T	d1(ϕ)	d2(ϕ)	B
CN-4	106251	4	M8×1	4.2	10	10
CN4-B	166268				—	
CN-6	206251	6	M10×1	6.2	12	12

●Material : C3604

CN-4-B is special parts for braided tubing.



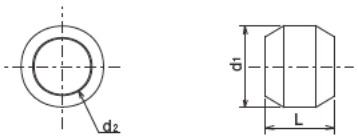
[CB-4-B、CB-6-B]

Compression bushing

Model	Part Number	Tubing O.D. (ϕ)	T	d1(ϕ)	L_1	L_2	B
CB-4-10	106252	4	M8×1	4.2	11.6	4	10
CB-4-8	106253						8
CB-4-B	166253				20	12	
CB-6	206252	6	M10×1	6.2	12.5	4	10
CB-6-B	166255	8			20	12	
CB-8	207252		M14×1.5	8.2	18.5	4.5	14

●Material : C3604

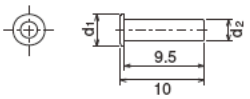
CB-4B and CB-6-B are special parts for Braided tubing.



Compression sleeve

Model	Part Number	Tubing O.D. (ϕ)	d1(ϕ)	d2 (ϕ)	L
CS-4	106254	4	6	4.1	5
CS-6	206254	6	8	6.1	6
CS-8	207254	8	10	8.1	6.5

●Material : C3604



Tube insert (For nylon tubing)

Model	Part Number	Tubing O.D. (ϕ)	d1(ϕ)	d2 (ϕ)
TI-4	106271	4	3.8	2.5
TI-6	206271	6	5.8	4
TI-8	207271	8	7.8	6

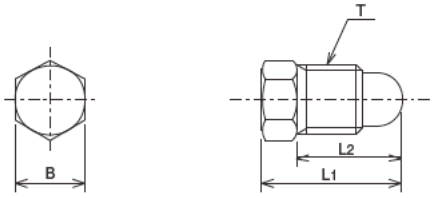
●Material : C3604

Closure plugs/ Sealing washers

Closure plugs, Blanking plugs

RoHS compliant products are also available.
Please contact us for details.

Dimensional drawing



Model

Closure plug

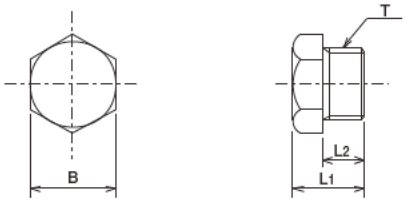
Model	Part Number	L1	L2	T	B
CP-4	106255	16	12	M8×1	8
CP-6	206255	20	15	M10×1	10
CP-8	207255	25	17	M14×1.5	17

●Material : C3604

Blanking plug

Model	Part Number	L	T	B
BP-1	540170	7	R1/8	5
BP-2	290038	9	R1/4	6

●Material : Steel

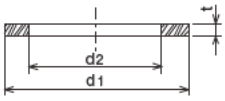


Blanking plug

Model	Part Number	L1	L2	T	B
BP-8	206274	10	6	M8×1	11
BP-10	206275	10	6	M10×1	12
BP-12	206276	10	6	M12×1	14
BP-14	207276	13	8	M14×1.5	17

●Material : C3604

Use with sealing washer.



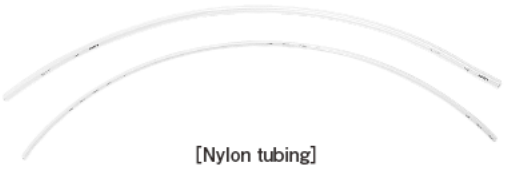
Sealing washer

Model	Part Number	d1(ϕ)	d2(ϕ)	T
SW-8	207610	12	8	1
SW-10	207611	14	10.1	1
SW-12	207612	16	12.1	1.5
SW-14	207613	18	14.1	1.5

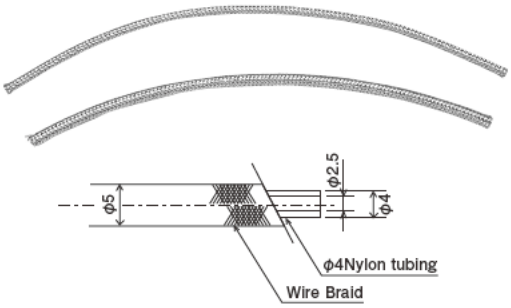
●Material : C2600

Tubing

RoHS compliant products are also available.
Please contact us for details.



[Nylon tubing]



[Braid tubing]

[Steel tubing]

Model

Nylon tubing

Model	Part Number	Outer dia-meter (ϕ)	Innner dia-meter (ϕ)	Standard length (m)	Working pressure (MPa)	Burst Pressure (MPa)	Working tempeature range	Minimum bending radius (R)mm	Color
NT-4	106801	4	2.5	100	2.5	9.8	−20℃ ～ +70℃	12	Milky White
NT-4H	106806				4.4	17.6		16	
NT-6	218005	6	4		2.2	8.6		24	
NT-6H	218006				3.7	15.2		27	
NT-8	218003	8	6		1.5	6.2		48	

●Material : Nylon PA20

Braided Nylon Tubing

Model	Part Number	Outer dia-meter (ϕ)	Standard length (m)	Working pressure (MPa)	Burst Pressure (MPa)	Working tempeature range	Minimum bending radius (R)mm	Surface treatment
BT-4	106803	5	100	2.5	9.8	−20℃～ +70℃	R16	EP-Fe/Zn
BT-6	218007	7		2.2	8.6		R17	

Aluminium tubing

Model	Part Number	Outer dia-meter (ϕ)	Innner dia-meter (ϕ)	Standard length (m)	Working pressure (MPa)	Tensile strength (MPa)	Extension
AT-4	106811	4	3	2	1.3	0.6～1	41%
AT-6	206811	6	4.4		2.0		

●Material : JIS H4080A1050Td-0

Copper tubing

Model	Part Number	Outer dia-meter (ϕ)	Innner dia-meter (ϕ)	Standard length (m)	Working pressure (MPa)	Tensile strength (MPa)	Extension
CT-4	106821	4	3	5	7	2	40%
CT-6	218015	6	4.4		8	2.1	
CT-8	206823	8	6		6	2.3	

●Material : JIS H3300C1220T-0L

Steel tubing

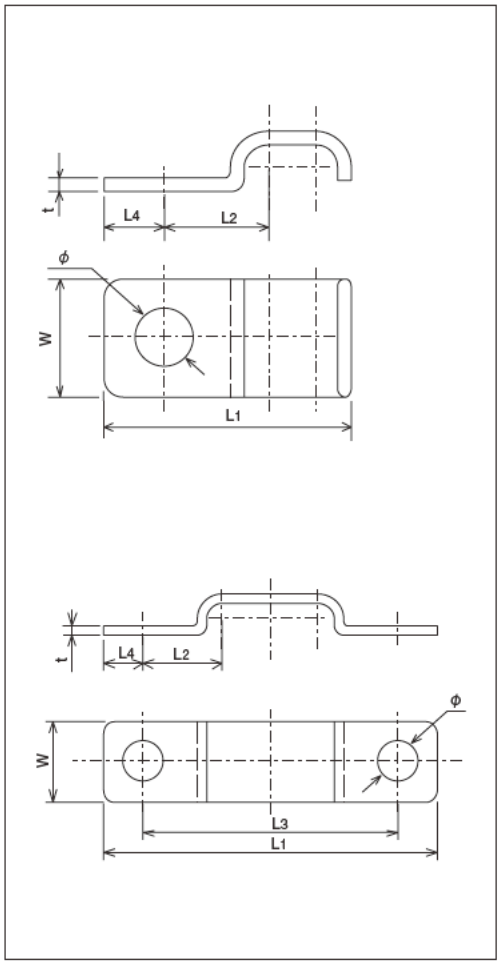
Model	Part Number	Outer dia-meter (ϕ)	Innner dia-meter (ϕ)	Standard length (m)	Working pressure (MPa)	Tensile strength (MPa)	Extension	Surface treatment
ST- 4Z	218011	4	2.6	2	25	Over 3	25%	Ep-Fe/ Zn 8/CM
ST- 6Z	218012	6	4.6					
ST- 8Z	206836	8	6.6		20			
ST-10Z	206837	10	8.6					

●Material : JIS G3141 (Equal to SPCC)

Tube clips

RoHS compliant products are also available.
Please contact us for details.

Dimensional drawing



Model

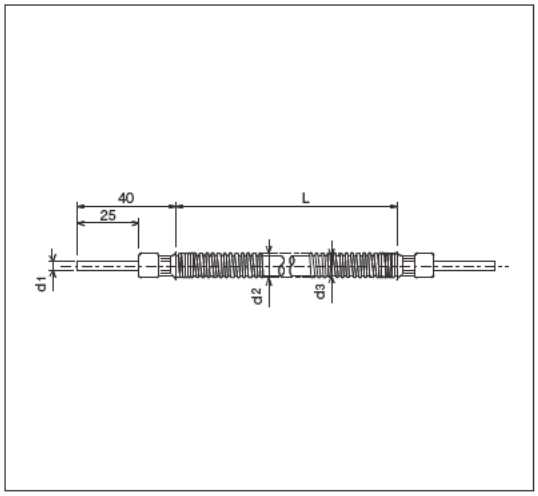
Model	Part Number	Number and O.D. of tubing		L_1	L_2	L_3	L_4	t	W	ϕ
PC-4-1	106301	4×1	One side fixed	17	9	—	5	1.2	10	5.2
PC-4-2	106302	4×2		21						
PC-4-3	106303	4×3		25						
PC-4-4	106304	4×4	Two side fixed	42	10	32				
PC-4-5	106305	4×5		46		36				
PC-4-6	106306	4×6		50		40				
PC-4-1L	106311	4×1	One side fixed	16	9	—				6.2
PC-4-2L	106312	4×2		20						
PC-4-3L	106313	4×3		25						
PC-4-4L	106314	4×4	Two side fixed	42	10	32				
PC-4-5L	106315	4×5		46		36				
PC-4-6L	106316	4×6		50		40				
PC-4-1LL	106321	4×1	One side fixed	22	11	—	8		15	8.5
PC-4-2LL	106322	4×2		26.2						
PC-4-3LL	106323	4×3		30.4	11.2					
PC-4-4LL	106324	4×4	Two side fixed	50	11	34				
PC-4-5LL	106325	4×5	One side fixed	38.4	11.2	—				

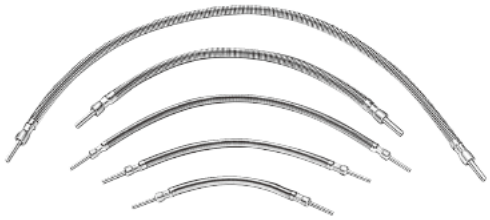
Model	Part Number	Number and O.D. of tubing		L_1	L_2	L_4	t	W	ϕ
PC-6-1	206301	6×1	One side fixed	20	10	5	1.2	10	5.2
PC-6-2	206302	6×2		25					
PC-6-3	206303	6×3		31					
PC-6-1L	206311	6×1		19					6.2
PC-6-2L	206312	6×2		24					
PC-6-3L	206313	6×3		30					
PC-6-1LL	206321	6×1		24.2	12	8		15	8.5
PC-6-2LL	206322	6×2		30.4					

Model	Part Number	Number and O.D. of tubing		L_1	L_2	L_4	t	W	ϕ
PC- 8-1	207301	8×1	One side fixed	23.7	12	6	1.6	11.5	6.4
PC- 8-2	207302	8×2		31.8					
PC-10-1	208301	10×1		29.2	14.4	8	1.2	15.4	6.2

Flexible hose (For low pressure)

Dimensional drawing





How to order

FH □-□□□□

Tubing diameter

4	ϕ4
6	ϕ6

Length L(mm)

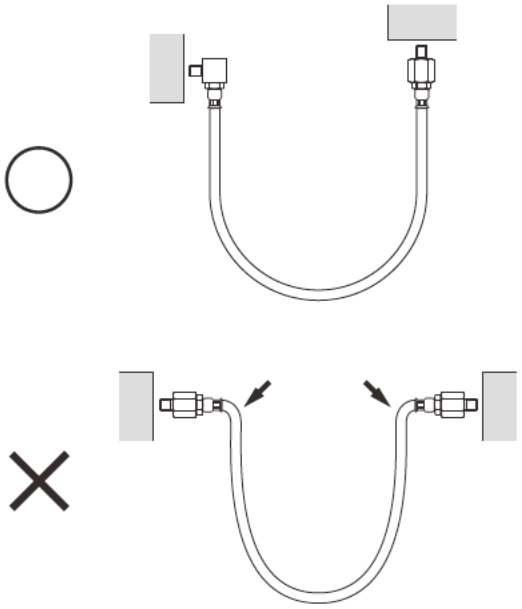
175～250	25mm Unit
250～1000	50mm Unit
1000～2000	100mm Unit
2000～5000	500mm Unit

Specifications

Outer diameter	4	6
Working pressure	3	4
Working temperature range	−20℃～+90℃	
Minimum bending radius	40	120
d1 (ϕ)	4	6
d2 (ϕ)	8	10
d3 (ϕ)	10	13.5

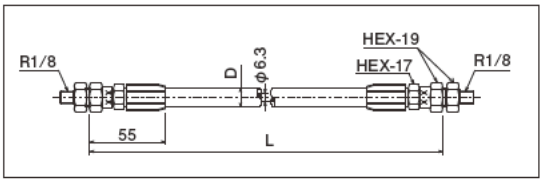
Directions for use

- Please make some allowance for length, bending radius and working pressure.
- Please make sure that tubing is not twisted.
- Please do not bend the tubing at close point to the connectors.



Flexible hose (For moderate and high pressure)

Dimensional drawing

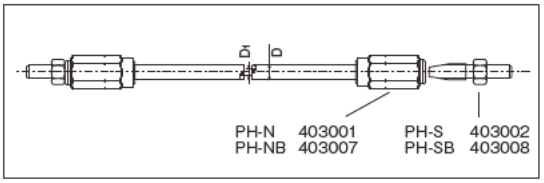


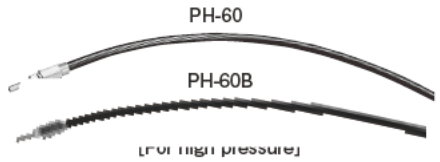
[For moderate and high pressure]

Model

For moderate pressure and high pressure (working temperature -40℃～+100℃)

Model	Part Number	Working pressure (MPa)	Minimum bending radius (R)	D (φ)	L (mm)
L1- 5	250151	10	85	13.5	500
L1- 7	250152				700
L1-10	250153				1000
L1-15	250154				1500
L3- 5	250161	35	105	15	500
L3- 7	250162				700
L3-10	250163				1000
L3-15	250164				1500





[For high pressure]

For high pressure (working temperature -30℃～+80℃)

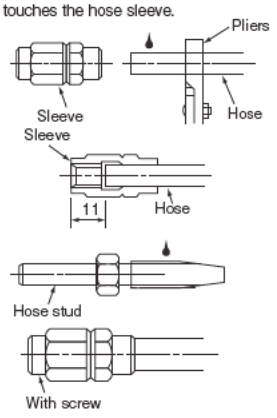
Model	Part Number	D (φ)	D_1 (φ)	Standard length	Working pressure (MPa)	Burst pressure (MPa)	Minimum bending radius (R)	Material	Color
PH-60	403010	8.3	3.6	100	20	72	15	Polyamide	Black
PH-60B	403020	12.37	6.35				40		

Directions for use

- Please make some allowance for length, bending radius and working pressure.

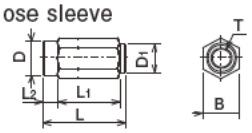
How to connections (PH-60)

Insert the hose into the hose sleeve. 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.

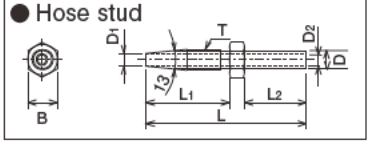


Dimensional drawing

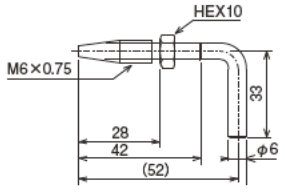
● Hose sleeve



● Hose stud



● Hose stud elbow



Model

Model	Part Number	T	L	L_1	L_2	D	D_1	B
PH-N	403001	M6×0.75	28	21	5	φ11.7	φ10	12
PH-NB	403007	M9×1.0	37	31	4	φ16.5	φ14	17

●Material : Steel

Model	Part Number	T	L	L_1	L_2	D	D_1	D2	B
PH-S	403002	M6×0.75	54	28	21	φ6	φ3.9	φ4	10
PH-SB	403008	M9×1.0	69	35.5	27	φ8	φ6.2	φ5	14

●Material : Steel

Model	Part Number
PH-SE	403003

●Material : Steel

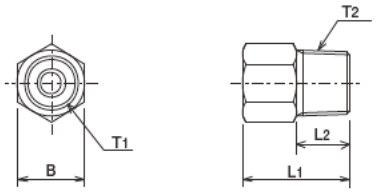
Adapter

SA - Straight Adapters

RoHS compliant products are also available.
Please contact us for details.

Some parts are available with standard threads.
Contact us for details.

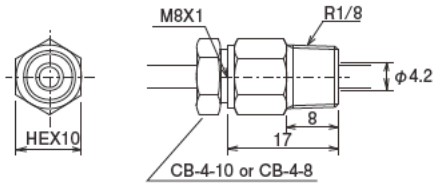
Dimensional drawing



Model

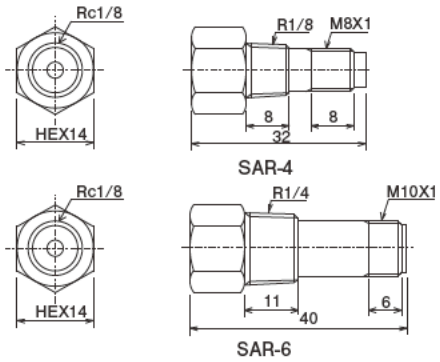
	Model	Part Number	Tubing O.D. (φ)	L_1	L_2	T_1	T_2	B
	SA4-16	106001	4	16	8	M8×1	R1/8	10
	SA4-20	106002		20	12			
✓	SA4-25	106003		25	17			
✓	SA4-30	106004		30	22			
✓	SA4-35	106005		35	27			
✓	SA6-20	206001	6	20	8	M10×1		12
✓	SA8-25	207001	8	25	10	M14×1.5	R1/4	17

●Material : C3604



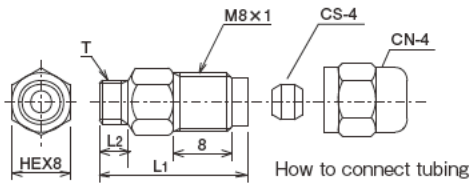
Model	Part Number	Tubing O.D. (φ)
SA-4K	106011	4

●Material : C3604



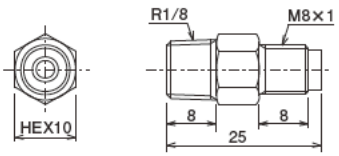
Model	Part Number	Tubing O.D. (φ)
SAR-4	106061	4
SAR-6	206223	6

●Material : C3604



	Model	Part Number	Tubing O.D. (φ)	L1s	L2	T
✓	SAT-6A	106062	4	20	4	M6×1
✓	SAT-6B	106065		23	7	M6×0.75

●Material : C3604

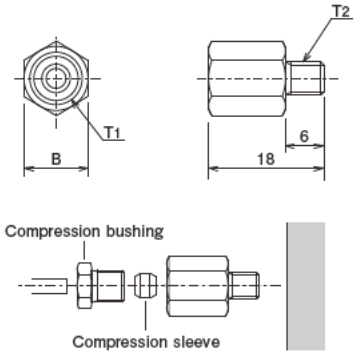


	Model	Part Number	Tubing O.D. (φ)
✓	SAT-1R	106081	4

●Material : C3604

RoHS compliant products are also available.
Please contact us for details.

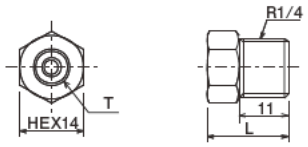
Dimensional drawing



Model

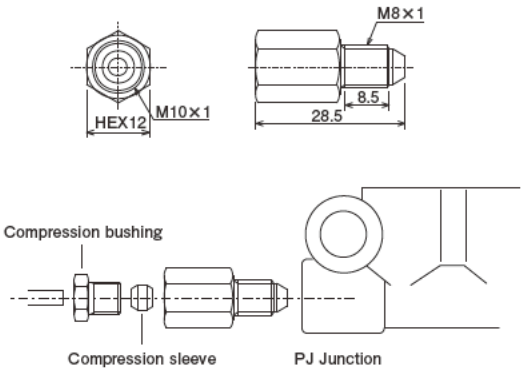
	Model	Part Number	Tubing O.D. (φ)	T_1	T_2	B
✆	SA4-5A	106082	4	M8×1	M 5×0.8	10
✆	SA4-6A	106084			M 6×1	
✆	SA4-6B	106085			M 6×0.75	
✆	SA4-7A	106087			M 7×1	
✆	SA4-8A	106088			M 8×1	
✆	SA4-10A	106089			M10×1	12
✆	SA6-6A	106094	6	M10×1	M 6×1	
✆	SA4-U	106099	4	M 8×1	1/4-28UNF	10
✆	SA6-U	106353	6	M10×1		12

●Material : C3604



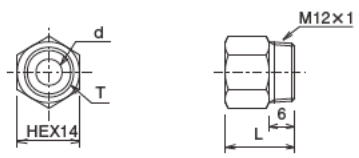
	Model	Part Number	Tubing O.D. (φ)	T	L
✆	SA4-2R	106091	4	M 8×1	18
✆	SA6-2R	206081	6	M10×1	20

●Material : C3604



	Model	Part Number	Tubing O.D. (φ)
✆	SA6-8T	106095	6

●Material : C3604



	Model	Part Number	Tubing O.D. (φ)	T	d (φ)	L
✆	SA4-12A	206012	4	M 8×1	3	14
✆	SA6-12A	206011	6	M10×1	4	16

●Material : C3604

※ Use with sealing washer.

Adapter

Elbow adapter/ T-adapter

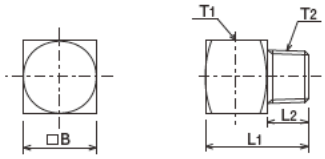
RoHS compliant products are also available.
Please contact us for details.

Some parts are available with standard threads.
Contact us for details.

Dimensional drawing

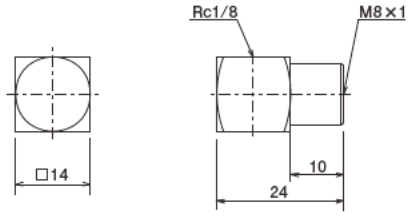
Model

EA



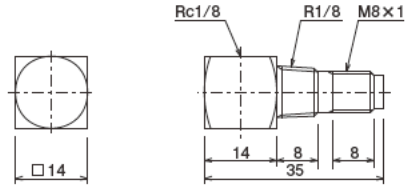
Model	Part Number	Tubing O.D. (φ)	L_1	L_2	T_1	T_2	B
EA4-20	106021	4	20	8	M8×1	R1/8	14
EA4-25	106022		25	13			
EA4-30	106023		30	18			
EA4-40	106024		40	28			
EA4-50	106025		50	38			
EA4-60	106026		60	48			
EA4-2R	206091		25	11		R1/4	
EA6-22	206092	6	22	8	M10×1	R1/8	16

●Material : C3604



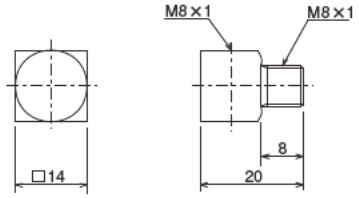
Model	Part Number	Tubing O.D. (φ)
EA4-1F	106031	4

●Material : C3604



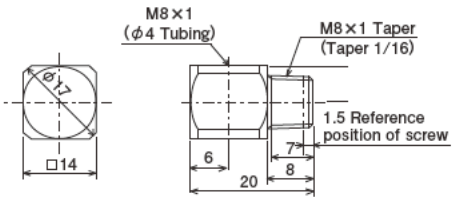
Model	Part Number	Tubing O.D. (φ)
EAR-4	106071	4

●Material : C3604



Model	Part Number	Tubing O.D. (φ)
EA4-8A	106029	4

●Material : C3604

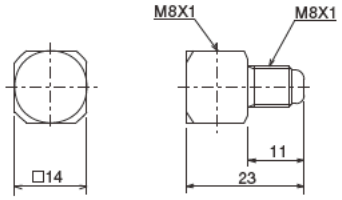


Model	Part Number	Tubing O.D. (φ)
EA4-8Taper	106037	4

●Material : C3604

RoHS compliant products are also available.
Please contact us for details.

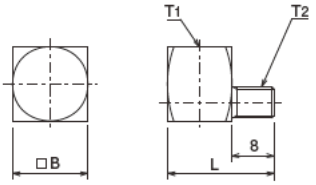
Dimensional drawing



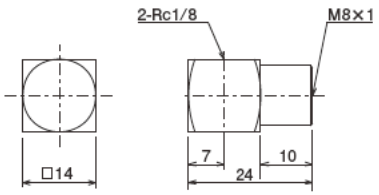
Model

Model	Part Number	Tubing O.D. (ϕ)
EA4-8T	106028	4

●Material : C3604

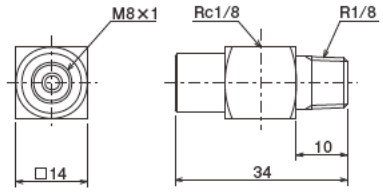


	Model	Part Number	Tubing O.D. (ϕ)	L	T_1	T_2	B	Material
	EA4-6A	106076	4	20	M8×1	M6×1	14	C3604
◐	EA4-6AS	106074						SS330B
	EA4-6B	106075				M6×0.75		C3604
◐	EA4-US	166036				1/4-28UNF		SUM-21
◐	EA4-8B	166054				M8×1.25Taper		C3604
◐	EA6-6AS	166048	6	22	M10×1	M6×1Taper	16	SUM-21
◐	EA6-U	166040				1/4-28UNF		



	Model	Part Number
◐	TA4-1F	106041

●Material : C3604



Model	Part Number
TAR-1F	106051

●Material : C3604

Connectors

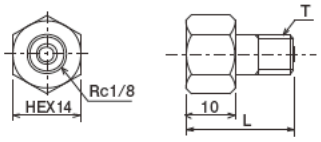
SC • EC • TC

RoHS compliant products are also available.
Please contact us for details.

Some parts are available with standard threads.
Contact us for details.

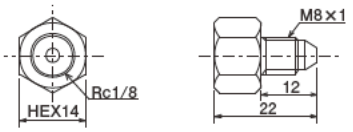
Dimensional drawing | **Model**

SC



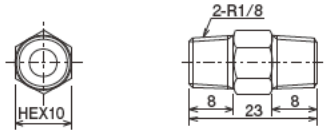
	Model	Part Number	L	T
	SC1-20	106141	20	R1/8
	SC1-25	106142	25	
☾	SC1-30	106143	30	
☾	SC1-40	106144	40	
☾	SC1-50	106145	50	
☾	SC1-60	106146	60	
☾	SC2	206141	20	R1/4

●Material : C3604



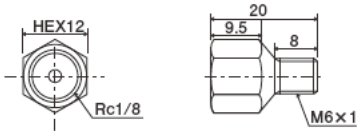
Model	Part Number
SC-8T	106147

●Material : C3604



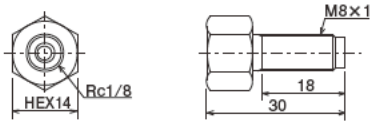
Model	Part Number
SCR	106151

●Material : C3604



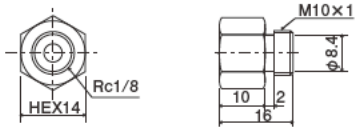
Model	Part Number
SC-6A	106154

●Material : C3604



Model	Part Number
SC-4	106174

●Material : C3604

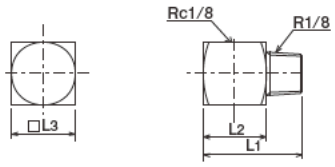


Model	Part Number
SC-10A	106177

●Material : C3604

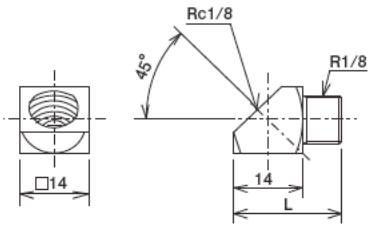
※ Use with sealing washer

EC



	Model	Part Number	L_1	L_2	L_3
	EC1-22	106101	22	14	14
	EC1-25	106102	25		
	EC1-30	106103	30		
	EC1-40	106104	40		
☾	EC1-50	106105	50		
☾	EC1-60	106106	60		
☾	EC1-20	106107	20	12	12

●Material : C3604

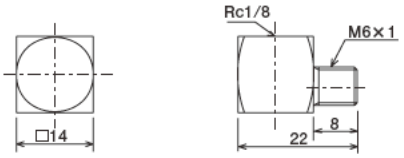


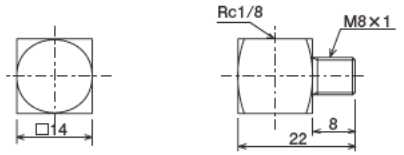
	Model	Part Number	L
☾	ECC-22	106121	22
☾	ECC-25	106122	25
☾	ECC-30	106123	30
☾	ECC-40	106124	40
☾	ECC-50	106125	50
☾	ECC-60	106126	60

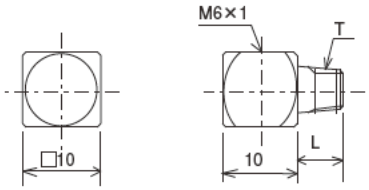
●Material : C3604

RoHS compliant products are also available.
Please contact us for details.

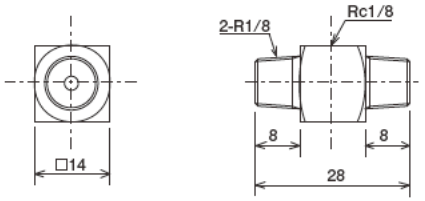
Dimensional drawing

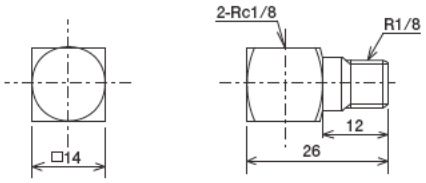


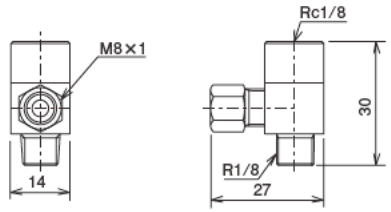


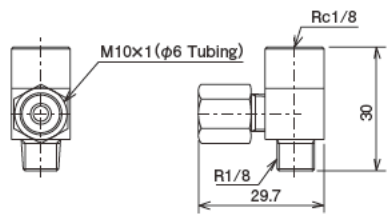


TC









Model

Model	Part Number
EC-6A	106181

●Material : C3604

Model	Part Number
EC-8A	106182

●Material : C3604

Model	Part Number	L	T
ECM-5A	106183	6	M5×0.8
ECM-6B	106184		M6×0.75
ECM-6A	106185		M6×1
ECM-6BL	106192	8	M6×0.75

●Material : C3604

Model	Part Number
TCR	106161

●Material : C3604

Model	Part Number
TCF	106171

●Material : C3604

Model	Part Number
PGC-4	619322

This is for pressure gauge.
●Material : C3604

Model	Part Number
PGC-6	619434

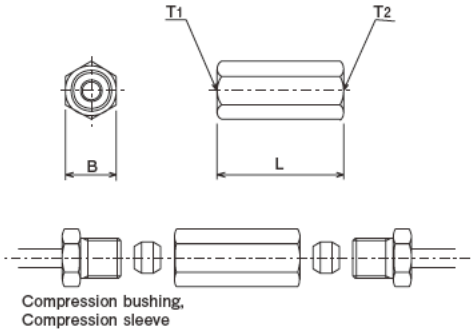
●Material : C3604

Couplers/ Unions

RoHS compliant products are also available.
Please contact us for details.

Some parts are available with standard threads.
Contact us for details.

Dimensional drawing



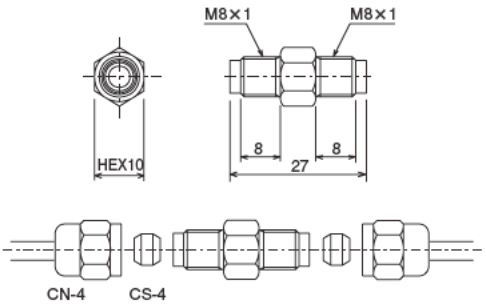
[How to connect]

Model

Model	Part Number	Tubing O.D. (φ)	T_1	T_2	L	B
KP-44	106201	4×4	M8×1.0	M8×1.0	25	10
KP-46	106202	4×6		M10×1.0	27	12
KP-4R	106291	4		Rc1/8	25	14
KP-66	106292	6×6	M10×1.0	M10×1.0	29	
KP-6R	106293	6		Rc1/8	25	
KP-RR	106294	—	Rc1/8			
KP-88	207201	8×8	M14×1.5	M14×1.5	40	17
PSC	207202	—	Rc3/8	Rc1/8	25	21

●Material : C3604

※ Use TI-4 for nylon tubing connection.

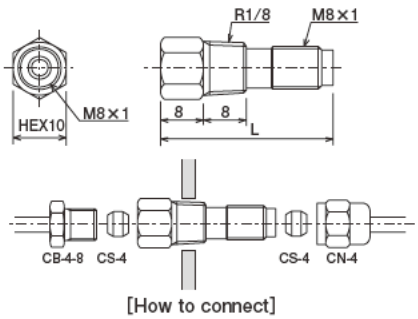


[How to connect]

Model	Part Number	Tubing O.D. (φ)
KPW-4	106211	4

●Material : C3604

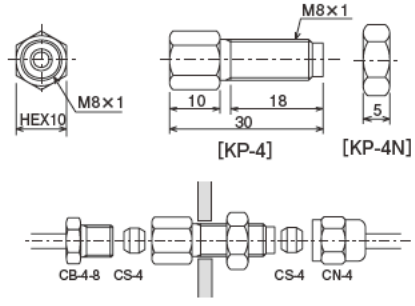
※ Use TI-4 for nylon tubing connection.



[How to connect]

Model	Part Number	Tubing O.D. (φ)	L
KPR-4	106221	4	32

●Material : C3604



[How to connect]

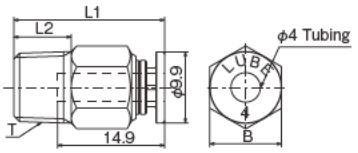
Model	Part Number	Tubing O.D. (φ)	Material
KP-4	106231	4	C3604
KP-4N	106232		SS400

Push-in fitting

Specifications

Applicable tubing diameter	4mm	6mm
Operating pressure	Oil: Under 3MPa Grease: Under 4MPa	Oil: Under 3MPa
Life	Oil: Under 1,000,000 times Grease: Under 100,000 times	Oil: 1,000,000 times
Working viscosity range	2	
Ambient temperature range	0～60℃	
Applicable material of tubing	4mm nylon tubing	6mm nylon tubing

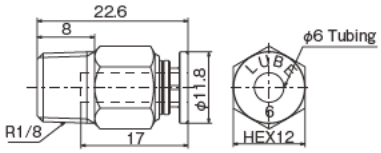
Dimensional drawing



Model

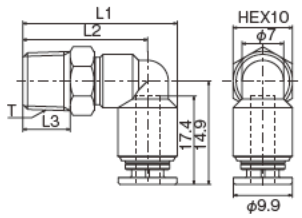
Model	Part Number	T	B	L_1	L_2
KBC4-01-F	209503	R1/8	HEX10	21	8
KBC4-02-F	209504	R1/4	HEX14		11
KBC4-M6-F	209501	M6×1.0	HEX10		4.5
KBC4-M6P0.75-F	209502	M6×0.75		20	3.5

●Material : C3604



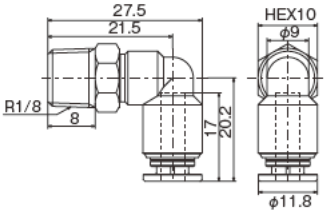
Model	Part Number
KBC6-01-F	209513

●Material : C3604



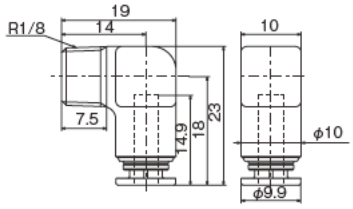
Model	Part Number	T	L_1	L_2	L_3
KBL4-01-FN	209508	R1/8	26	21	8
KBL4-M6-FN	209506	M6×1.0	22.5	17.5	4.5

●Material : C3604



Model	Part Number
KBL6-01-F	209518

●Material : C3604



Model	Part Number
KBE4-01-F	209523

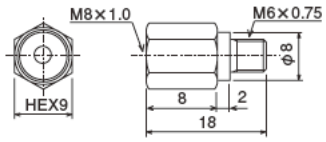
●Material : C3604

Fitting for limited space

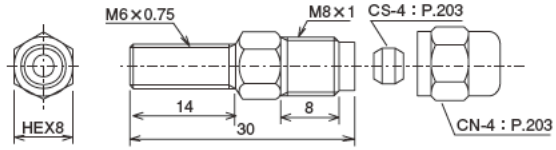
RoHS compliant products are also available.
Please contact us for details.

Handy for tubing connection in limited spaces such as at linear guide and ball screw.

Dimensional drawing



SAG4-6B



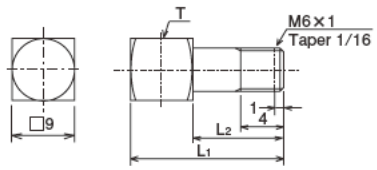
SATG-6B

[How to connect]

Model

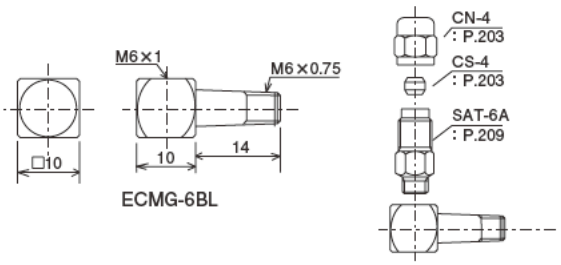
	Model	Part Number	Tubing O.D. (φ)
✆	SAG4-6B	106366	4
✆	SATG-6B	106064	

●Material : C3604



ECMG-6AL、ECMG-6ALL

	Model	Part Number	L_1	L_2	T
✆	ECMG-6ALL	106382	23	14	M6×1



ECMG-6BL

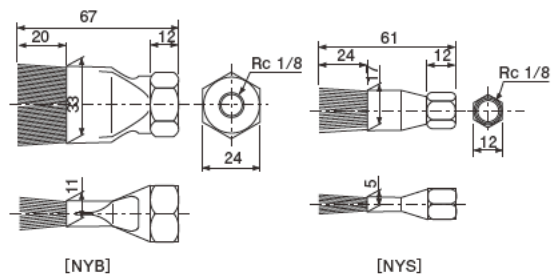
	Model	Part Number
✆	ECMG-6BL	166039

Brush

Intended for use when lubricant is applied to chains, etc.

Nylon Brush

Dimensional drawing



[NYB] [NYS]

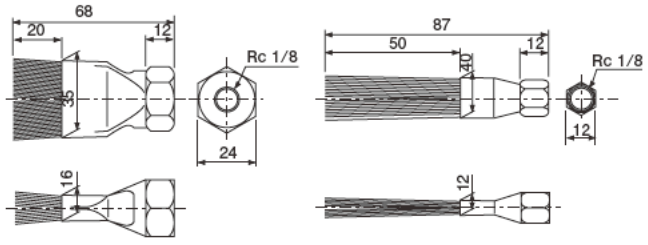
Model

Model	Part Number
NYB	109405
NYS	109406

RoHS compliant products are also available.
Please contact us for details.

Wire Brush

Dimensional drawing



[SYB] [SYS]

Model

Model	Part Number
SYB	109417
SYS	109418

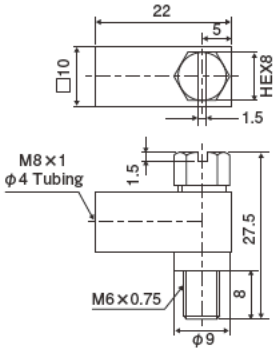
Banjo elbow

[ZE-6B]

[ZE-8A]

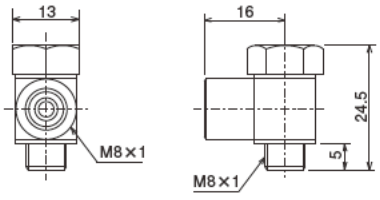
Use with sealing washer

Dimensional drawing



Model

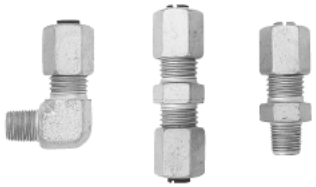
Model	Part Number	Tubing O.D. (ϕ)
ZE-6B	166045	4



Model	Part Number
ZE-8A	106027

Use with sealing washer.

Adapter assemblies [Fitting for Steel tubing]



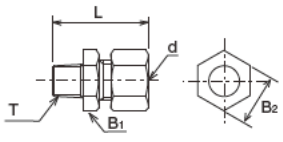
High pressure adapters for grease system to connect main tubing or to connect main tubing and Junction.

Dimensional drawing

Model

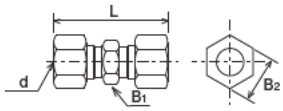
● Material : S25C

●Straight nipple



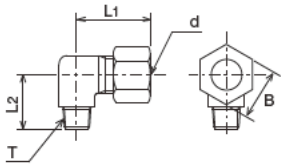
Model	Part Number	Outer diameter d	T	L	B_1	B_2
S61-SC	250111	φ6	R1/8	34.5	14.0	14.0
S62-SC	290191		R1/4	37.5	17.0	
S81-SC	250131	φ8	R1/8	35.5		17.0
S82-SC	290190		R1/4	37.5		

●Union



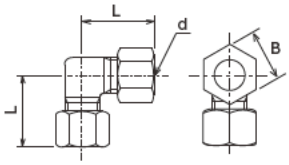
Model	Part Number	Outer diameter d	L	B_1	B_2
U6-SC	250112	φ6	43.0	14.0	14.0
U8-SC	250132	φ8	52.0	17.0	17.0

●Elbow nipple



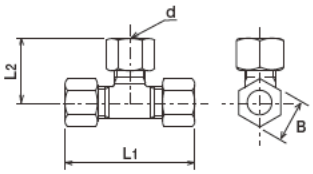
Model	Part Number	Outer diameter d	T	L_1	L_2	B
E61-SC	250113	φ6	R1/8	30.5	14.0	14.0
E62-SC	290184		R1/4	33.5	17.0	
E81-SC	250133	φ8	R1/8		16.0	17.0
E82-SC	290043		R1/4		18.0	

●Elbow union



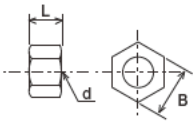
Model	Part Number	Outer diameter d	L	B
EU6-SC	250114	φ6	26.5	14.0
EU8-SC	250134	φ8	33.5	17.0

●Tee



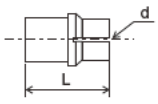
Model	Part Number	Outer diameter d	L_1	L_2	B
T6-SC	250115	φ6	53.0	26.5	14.0
T8-SC	250135	φ8	67.0	33.5	17.0

●Nut



Model	Part Number	Outer diameter d	L	B
N6-SC	250119	φ6	13.0	17.0
N8-SC	250139	φ8	15.0	14.0

●Sleeve



Model	Part Number	Outer diameter d	L
F6-SC	250118	φ6	14
F8-SC	250138	φ8	

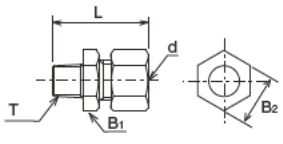
Adapter assemblies [Fitting for Copper tubing]

Dimensional drawing

Model

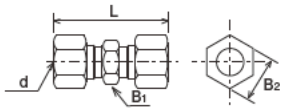
● Material : C3604BD

●Straight nipple



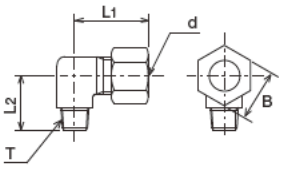
Model	Part Number	Outer diameter d	T	L	B_1	B_2
S61-BD	250101	ϕ6	R1/8	27.0	12.0	12.0
S62-BD	290219		R1/4	34.0	14.0	17.0
S81-BD	250121	ϕ8	R1/8	31.0		
S82-BD	290245		R1/4	35.0		

●Union



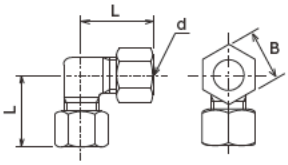
Model	Part Number	Outer diameter d	L	B_1	B_2
U6-BD	250102	ϕ6	32.0	12.0	12.0
U8-BD	250122	ϕ8	40.0	14.0	17.0

●Elbow nipple



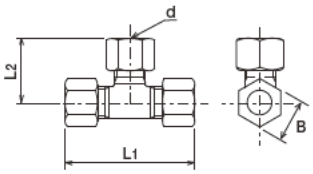
Model	Part Number	Outer diameter d	T	L_1	L_2	B
E61-BD	250103	ϕ6	R1/8	20.0	17.0	12.0
E62-BD	290277		R1/4	25.0	22.0	17.0
E81-BD	250123	ϕ8	R1/8	26.0	19.0	
E82-BD	290246		R1/4		22.0	

●Elbow union



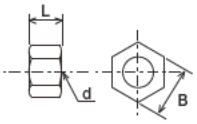
Model	Part Number	Outer diameter d	L	B
EU6-BD	250104	ϕ6	20.0	14.0
EU8-BD	250124	ϕ8	29.0	17.0

●Tee



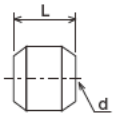
Model	Part Number	Outer diameter d	L_1	L_2	B
T6-BD	250105	ϕ6	40.0	20.0	14.0
T8-BD	250125	ϕ8	58.0	29.0	17.0

●Nut



Model	Part Number	Outer diameter d	L	B
N6-BD	250109	ϕ6	11.0	14.0
N8-BD	250129	ϕ8	13.0	17.0

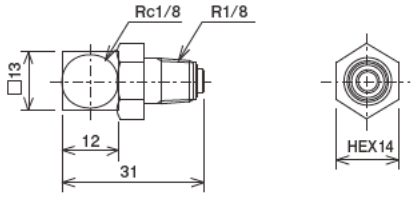
●Sleeve



Model	Part Number	Outer diameter d	L
F6-BD	250108	ϕ6	6.5
F8-BD	250128	ϕ8	8.0

Swivel elbow

Dimensional drawing



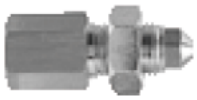
Model

Model	Part Number		Specifications
SVL	109412	0.8MPa	100rpm/MAX

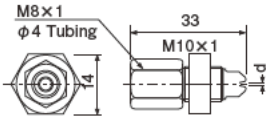
Directions for use

- Be sure to use at speeds below maximum RPM. Use as a joint for rotary or rocking part.

Jet nozzle



Dimensional drawing

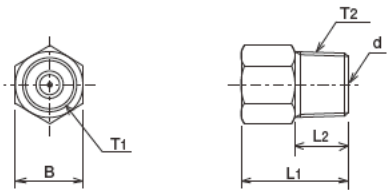


Model

Model	Part Number	d (φ)
J02	225008	0.2
J05	225007	0.5
J08	225006	0.8

Nozzle adapter

Dimensional drawing



Model

Model	Part Number	Tubing (φ)	L_2	L_2	T_1	T_2	B	d (φ)
NA-05	106974	4	16	8	M8×1	R1/8	10	0.5
NA-08	106975							0.8

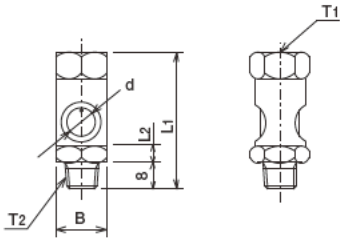
Sight feed

Visual performance indicators.

Directions for use

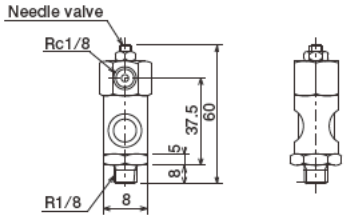
- Clogging and/or high back-pressure at the termination points could hinder the lubricant flow.
- Operational temperature range : 0～70℃.

Dimensional drawing

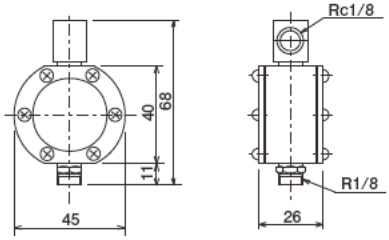


Model

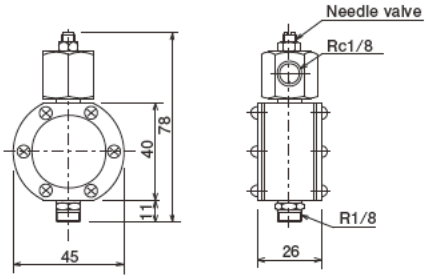
Model	Part Number	T_1	T_2	B	L_1	L_2	d	Specifications
SFB-4	106501	M8×1	Rc1/8	15	41	6	9	Gravity Feed
SFB-R	106502	Rc1/8						
SFB-RA	106503		M8×1					
SFB-RL	106504		Rc1/8	19	44	5	12	
SF-R	106505		Rc1/8	15	41	6	9	Pressure Feed
SF-RA	106506		M8×1					



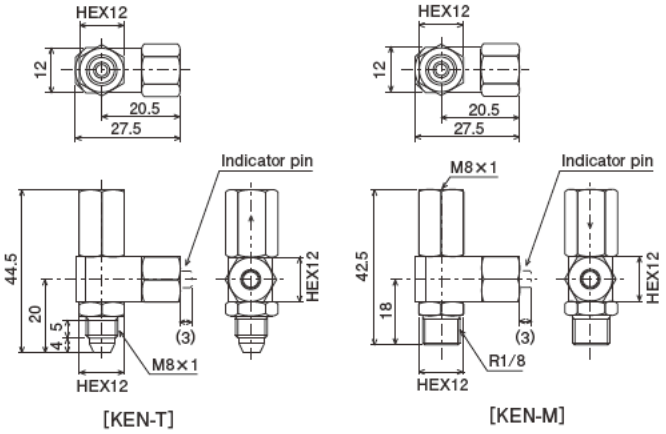
Model	Part Number	Specifications
SFB-N	106510	Gravity Feed with Needle
SF-N	106511	Pressure Feed with Needle



Model	Part Number	Specifications
SF-D	106520	Pressure Feed



Model	Part Number	Specifications
SFB-DN	106521	Gravity Feed with Needle



Indicator pin

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

Drive bushing/ Barb fitting

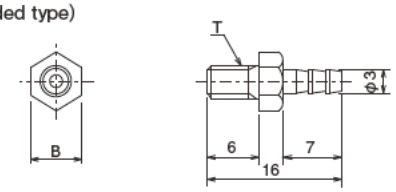
RoHS compliant products are also available.
Please contact us for details.

Used with nylon tubing with 4mm O.D. and 2.5mm I.D.

Dimensional drawing

● Drive bushing/ Barb fittings

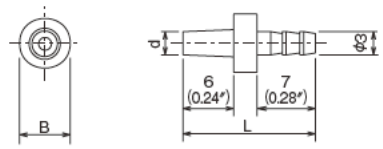
(Threaded type)



Model

	Model	Part Number	Specification	T	B
	STE-4A	106931	Threaded type	M4×0.7	6
	STE-5A	106933		M5×0.8	
☾	STE-6B	106935		M6×0.75	8
	STE-6A	106936		M6×1	
☾	STE-8B	106937		M8×1.25	9

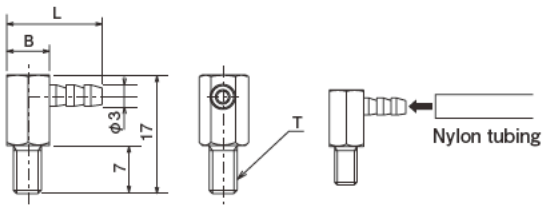
(Driving type)



	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		φ5.2	16 (0.63″)	8
	106927		φ6	16 (0.63″)	7

● Elbow drive bushing/ Barb fittings

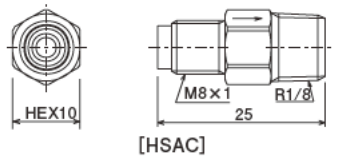
(Threaded type)



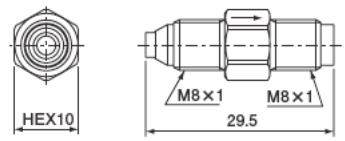
Model	Part Number	Specification	T	L	B
ETE-4A	106911	Threaded type	M4×0.7	13.5	6
ETE-5A	106913		M5×0.8	15	8
ETE-6B	106915		M6×0.75		
ETE-6A	106916		M6×1		
ETE-8B	106917		M8×1.25	16	9

Check valves

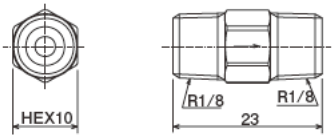
Dimensional drawing



[HSAC]



[HJBC]



[HTUC]

Model

Model	Part Number	作動圧力 (MPa)
HSAC	109407	0.034
HJBC	109415	0.034
HTUC	109416	0.016

Directions for use

• Check and confirm flow direction and thread size.

Replacement parts

(Oil fill cap, Strainer, Suction filter, Inlet check valve, Outlet check valve, Relief valve)

	Model	Part Number	Applicable pump
Oil fill cap	OC-4	529409	AMZ-Ⅲ、AMZ100S、AMO-150S-Ⅲ、AMO-Ⅱ-150S、MMXL-Ⅲ、MMX-Ⅱ、AMR-Ⅲ-150
	OC-3	529432	MLZ、L5
	OC-2	549005	EX、L20、ACM-Ⅱ、AM、ADM
	OC-1	549006	L3、L8
Strainer	OS-1	521037	AMZ-Ⅲ、AMZ100S、AMO-150S-Ⅲ、AMO-Ⅱ-150S、MMXL-Ⅲ、MMX-Ⅱ
Suction filter	SF-11	489011	AMZ-Ⅲ、AMZ100S、AMO-150S-Ⅲ、AMO-Ⅱ-150S、AMR-Ⅲ-150
	SF-08	489008	AMI-300S、AMI-1000S、AMI-300、AMI-1000
	SF-07	489007	MLZ
	SF-10	489010	MMXL-Ⅲ
	SF-A	500324	AMS
	SF-13	489013	MMX-Ⅱ、L8
	SF-12	489012	ACM-Ⅱ
	SF-01	489001	AM、ADM
	SF-05	489005	L20、EX
	SF-L3	540727	L3
	SF-L5	540562	L5
	SF-LK	540562	LK
Inlet check valve	IC-2.5	529008	MMX-Ⅱ（2.5mℓ）
	IC-5.5	529009	MMX-Ⅱ（5.5mℓ）、L-8、L-20
	IC-EX	539001	MLZ、LK
Outlet check valve	OC-1	509001	MMX-Ⅱ、EX、L-8、L-20
	OC-2	549070	MLZ、LK
Relief valve	RB-0.8	509002	AM、ACM、ADM、AMS 〈0.8MPa〉
	RB-2.5	519002	AMI-100S、200S、300S、1000S 〈2.5MPa〉
	RB-0.5	519003	AMI-300 〈0.5MPa〉

Services Provided by LUBE

Seminar information on basic lubrication systems understanding and preventive maintenance techniques

It is said that a sound introduction to lubrication techniques at worksites secures reliability and maintainability of machinery and equipment. This yields significant economic effects, including not only effective operation of equipment but also quality assurance of products. Through this seminar on preventive technology using lubrication, we would like to help you improve your lubrication and preventative maintenance techniques.

Contents of the seminar

① Importance of machine lubrication and maintenance **10 min.**

1. Abut the rates of lubrication trouble in machinery and equipment
2. About the importance of lubrication control in reference to failure rates.
3. About the difference between hand oiling and automatic lubrication
4. About the difference between oil and grease
5. Why should designated lubricants be used?

② Outline of LUBE's centralized grease systems **20 min.**

1. About the centralized grease systems
   - Types of centralized grease systems
   - Outline of LUBE's positive displacement injector system
   - Outline of LUBE's series progressive system
2. About the principle of operation
3. Comparison of centralized grease systems
4. How to select systems and cautions

③ About the maintenance of centralized lubrication systems **30 min.**

1. For safe use of systems
2. Precautions for maintenance
3. Why LUBE special greases is approved for use many machine manufacturers

Questions and answers **20 min.**

LRA Analysis (LUBE Real oil film Analysis)

What is LRA ?

What is LRA ?

LUBE offers a series of LRA to find the best suited lubrication film state for your machines. Then based on the analysis, we propose the minimal quantity lubrication (MQL) program specifically for your manufacturing environment.

Diagnosis of lubrication status with LRA analysis (Lube Real lubrication film Analysis)

(1) Reduces your runnning costs
(2) Maintains accuracy and performance of your machines and their essential parts
(3) Reduces Co2 Emissions

Example report of LRA Analysis

Quantities of particles

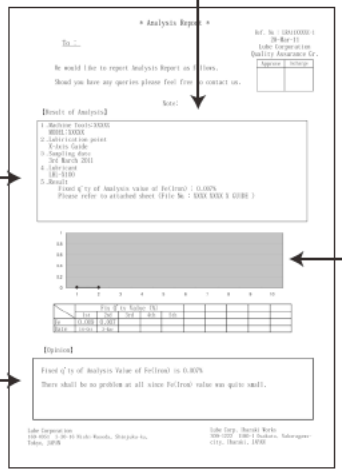
At the oil inlet point (large wear particle concentration), and 5 mm downstream of the inlet point (small wear particle concentration) on the particle concentration ferrogram of the oil trapped on the ferrogram.

History

Analysis No.
Our control No. is assigned from sample to sample.
Date of sampling
Customer sampling date

Outline of particles

Representative particles are shown.

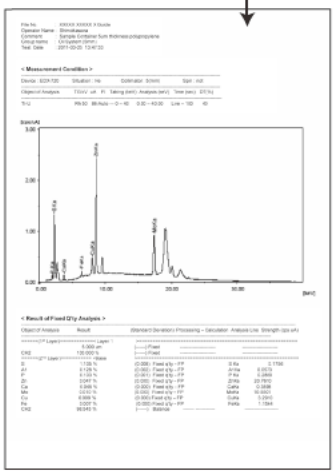


Remarks

In the remarks column, a description is given of the location of wear, cause of occurrence, whether or not overhaul is required, etc.

Configuration of particles

Types, forms, and quantities of wear particles trapped on the ferrogram are described.



SYSTEM PLANNING MANUAL

■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

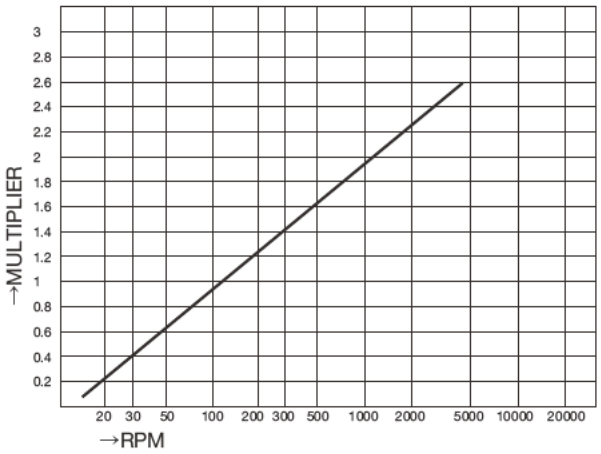
The amount of oil that is required for lubrication point is calculated by the following formulas and are based on experience and actual testing.

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×widt

● The relationship between rpm and multiplier



■Oil system

Positive Displacement Injector(PDI) - (AMO-System)

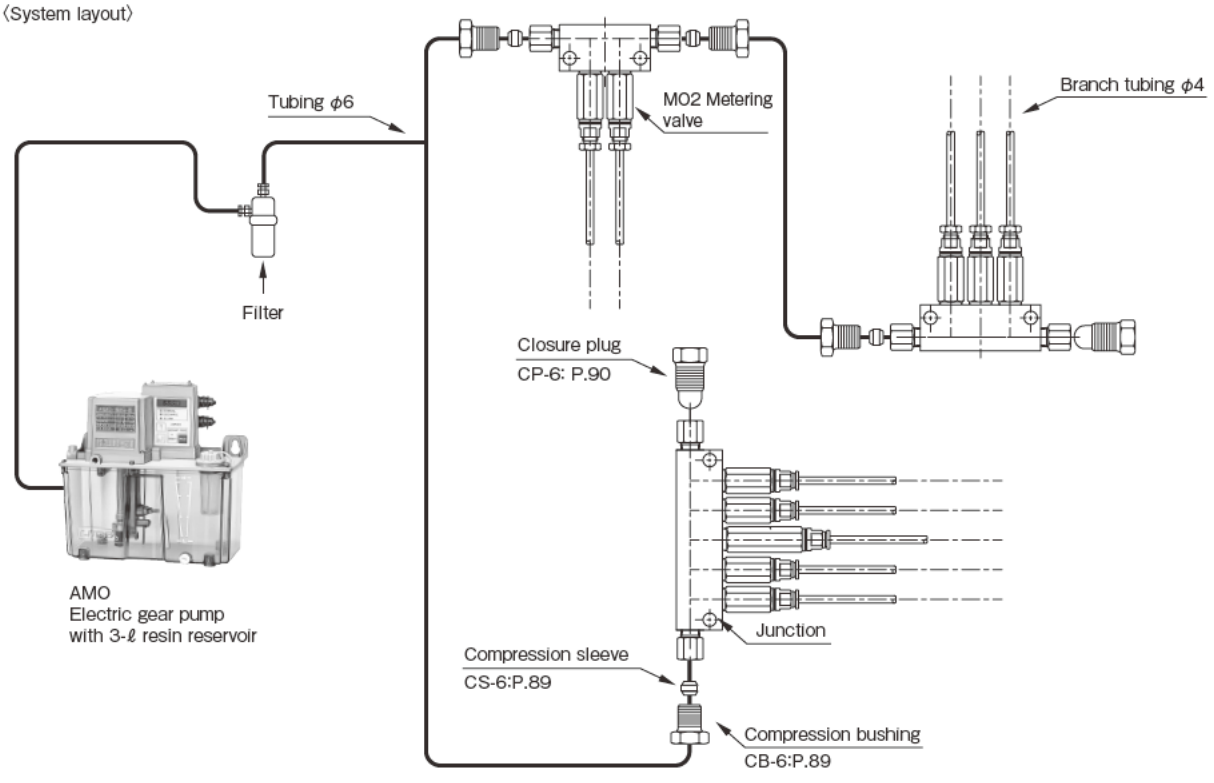
(1) System Overview

The AMO-series centralized lubrication system will deliver precise quantities of oil to all of your lubrication points, and have the flexibility to be adapted to just about any applications imaginable. The AMO-series pumps are electrically operated gear pumps, and offer many choices of controller options. The integrity of these system stems from the metering device the MO2(C)-Valve injector. The MO2(C)-Valve injector is a precisely calibrated piston distributor that will deliver an exact amount of oil upon main line pressure rise from the AMO-series pump. The MO2(C)-Valve re-set and re-load when main line pressure returns to zero. The AMO-series pumps come standard with an internal pressure relief valve and a low lubricant switch. Normally they also have an internal pressure switch that will monitor the main line for breakage. AMO-series pumps also have an option for a precision gear assembly that will allow the use of lubricants light as 22 Cst.

Lubrication system		Positive displacement injector system
Tubing		Single line (main tubing 6mm, tail tubing 4mm)
Lubricant		Oil (68~1800cSt)
Pump	Type	Motor driven gear pump AMO-Ⅱ-150S
	Discharge volume	150/180cc/min (50/60Hz)
Reservoir		1.8ℓ, 3ℓ : Resin / 3ℓ, 4ℓ, 8ℓ : Metal
Controller		Built-in (discharge time/interval timer), with indication lamps
Valve		MO valve

1. The AMO-series pumps can be with or without controller whitch allows the flexibility of just about any time or count interval required.
2. The AMO-series pumps are motor driven gear pumps that are preset to deliver 150 to 180 cc/min. and create 285 psi of main line pressure.
3. The AMO-series pumps have a 180 micron suction filter, but recommend an additional in line filter for added security against contamination.
4. The MO2(C)-Valve injectors are junction mounted distributors that can be arranged in just about any configurations imaginable.
5. The MO2(C)-Valves have 9 different discharge volumes to select from to meet the lubrication points actual cycle requirement.
6. Because the AMO-series systems have the flexibility of individual distributor junction assemblies, one main line feeding tube, an optional pressure switch, makes the engineering of the system layout, the installation of the system as easy as possible. As well as monitoring as much of the system for main line breakage as possible.

〈System layout〉



(2) System planning sequence

■To be considered

1. **Total length of main tubing (L) ... m**
   The total length of the steel tubing and flexible hose in the main tubing.
2. **The distance to the furtherest valve (l) ... m**
   The length of the main tubing to the furtherest valve from the pump.
3. **Total output of all valves (V) ...cc**
   The total oil output of all valves.
4. **Maximum operating viscosity (v)...cSt**
   The oil viscosity at the lowest temperature of the working environment. (Not to exceed 1800 cst.)

■ Designing the system
(How to complete Data Sheet)

1. Fill in the column 18～21.
2. Calculate required Oil Volume using the formula provided. Put the results in column 22.
3. Pick the smallest oil requirement from column 22, using it as the divider, calculate the relative ratios to all other oil requirements. Put the results in column 23.
4. Select valves with the least amount of output as possible and assign the valve to each point. Valve output should be in accordance with the ratios in column 23. Put the results in column 24. Calculate the total and put the result in section 7.
5. Using the valve output in column 24 as the divider, divide the oil requirements in column 22 and put the results in column 25.
6. Select the largest value from column 25, using the following formula, calculate the inteval time for 1 cycle. Put the result in column 26.

$$T=\frac{v\times 60}{Q}$$

T=1 interval time of cycle (min)
V=Discharge volume of valve (cc/shot)
Q=Oil requirement (cc/h)

7. Pick the largest value in column 25 and multiply by the values in column 24 to get the actual oil output per hour. Put the results in column 27.
8. Select System Specifications
   Put the customer information in column 1 - 8 in the System Specification Section.
9. Select Lubrication Pump
   Fill in specifications of the Lubrication Pump in section 17.
10. Based on the working viscosity in section 2 and the main line tubing length in section 6, use the table 1 to figure out pump discharge volume and put the result in section 9.
11. Use the following formula to calculate the valve operation time based on the data of total discharge volume of valve in section 7 and Pump Discharge Volume When the Valve in Operation in section 9 and put the result in section 10.

$$T'=\frac{v\times 78}{Q'}$$

T'=Operating time of valve (sec)
V =Total discharge volume of valve (cc)
Q'=Pump discharge volume when the valve in operation (cc/min)

12. Use table 2 to establish the time to reach the maximum pressure.
13. Use the Valve Operation Time in section 10 and the Pressure Rise Time in section 11 to get the Minimum Discharge Time of the pump and put the result in section 12.
14. Establish the pressure relief time by using the table 3 and put the result in section 13.
15. Set the Valve Reset time as 1.5 second according to the valve specification.
16. Calculate the pump minimum interval time from the Pressure Relief Time in section 13 and the Valve Reset Time in section 14. Put the result in section 15
17. Calculate the Minimum Lubrication Cycle from the Pump Minimum Discharge Time in section 12 and the Minimum Interval Time in section 15. Put the result in section 16.
18. If the Minimum Lubrication Cycle in section 16 is longer than the lubrication cycle, the system would lose its integrity. Then the number of lubrication points should be reduced or adjust the Total Oil Discharge Volume of Valves in section 7.

●Data sheet

LUBRICATION SYSTEM DATA SHEET

(AMO-Ⅲ DS-SYSTEM)

Name of Company
Add.
Section in charge
Person in charge

Machine names
Machine model

Name of sales office
Date
Quote No.

Item	System specifications		
1	Working oil		℃～ ℃
2	Maximum working viscosity ν		cSt
3	Total length of tubing L		m
4	Total length of steel(copper) tubing L′		m
5	Total length of flexible hose L″		m
6	Distance to the furthest ℓ		m
7	Total oil discharge volume of valves V		cc
8	Maximum discharge volume of valve V′		cc

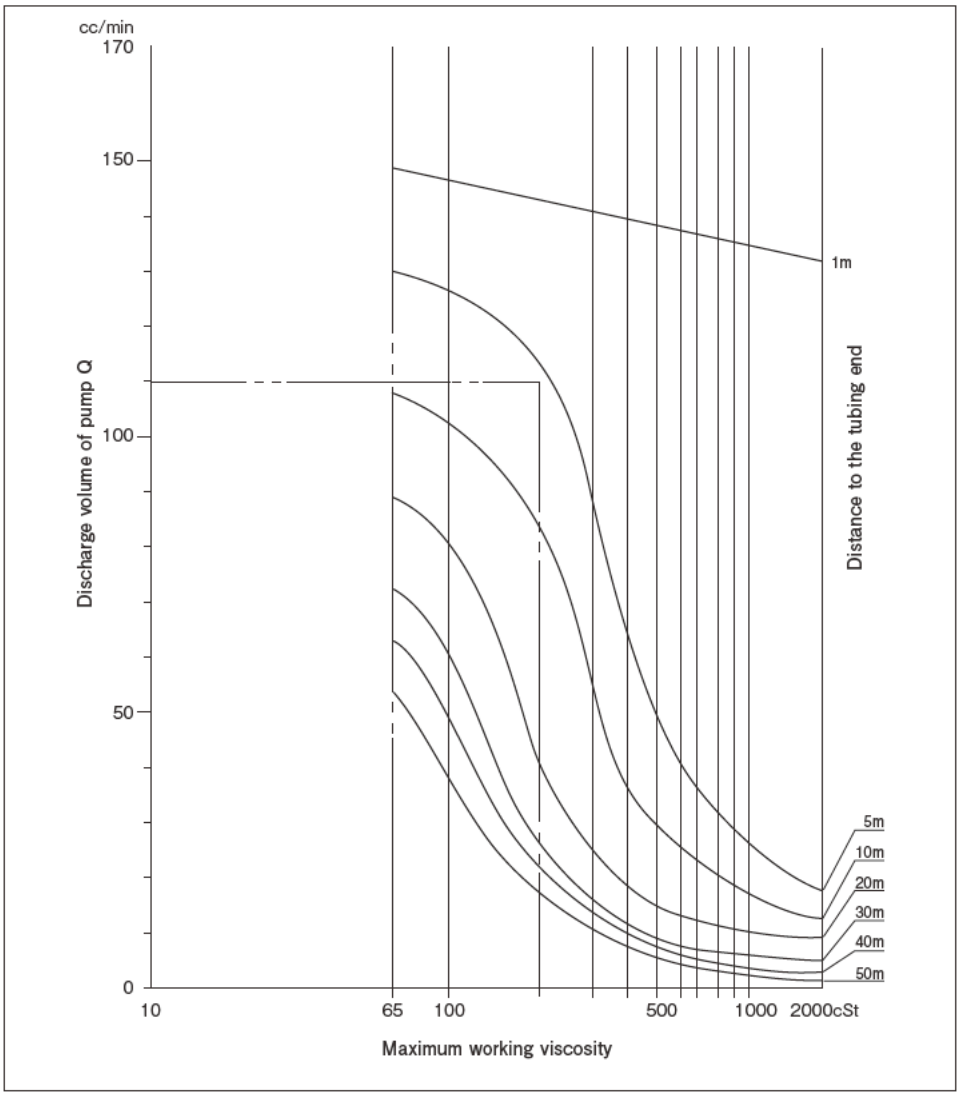
Item	System planning			
9	Pump discharge volume when valve operating		①	cc/min
10	Valve operating time		②	sec
11	Pressure rise time	Steel(copper) tubing	③	sec
		Flexible hose	④	sec
		System	⑤=③+④	sec
12	Minimum discharge time of pump		⑥=②+⑤	sec
13	Pressure relief time	Steel(copper) tubing	⑦	sec
		Flexible hose	⑧	sec
		System	⑨=⑦+⑧	sec
14	Reset time of valve		⑩ 1.5	sec
15	Minimum interval time of pump		⑪=⑨+⑩	sec
16	Minimum lubrication cycle time		⑫=⑥+⑪	sec
17	Lubricating pump		AMO-Ⅲ DS	
	Motor		ϕ VAC	Hz
	Condenser			μF
	Reservoir		: 1.8ℓ, 3ℓ	
			: 4ℓ, 6ℓ, 8ℓ	
	Controller		Yes/No	

Calculation of required oil volume

Lubrication points	Abbreviated name	Coefficient	Dimension		Width	Calculating value					
Antifriction(ball,roller,needle)bearing	A F	0.04	Bearing diameter	Row number	RPM or stroke(stroke/min)	Oil requirement(cc/h)	Ratio	Valve discharge volume (cc/shot)	Number of discharge	Lubricating cycle time(min)	Actual oil volume
Plain bearing(metal)	P	0.023	Diameter	Length							
Flat slide way	F W	0.0017 / 0.006	Width	Length							
Cylinder slide way	C W	0.023	Diameter	Length							
Ball roller bearing slide way	B W	0.012	Slide direction length	Row number							
Gear	G	0.046	Pitch diameter	Gear							
Cam	C A	0.013	Contacting circumference	Width							
Chain	C H	0.008	Length	Width							

Item	Name of lubricating parts	18	19	20	21	22	23	24	25	26	27
						Total		cc	Total		cc/h

●Pump discharge volume when valve in operation (Table 1)



●Pressure rise time (Table 2)
(0～relief pressure…sec)

Pump / Main tubing / Total length (m)	AMO-ⅢDS-150S	
	Steel tubing	Flexible hose
2	3.5	6
5	4.5	7.5
10	6	10.5
15	7.5	13.5
20	9	16.5
25	10.5	
30	12	
35	13.5	
40	15	
45	16.5	
50	18	

●Pressure rise time (Table 3)
(0～relief pressure…sec)

Each pump common		
Total length (m)	Steel tubing	Flexible hose
2	5.5	5.5
5	5.5	6
10	6	7
15	6.5	7.5
20	7	8.5
25	7.5	9
30	8	10
35	8.5	
40	9	
45	9.5	
50	10	

Single Line Resistance(SLR)

(1) System Overview

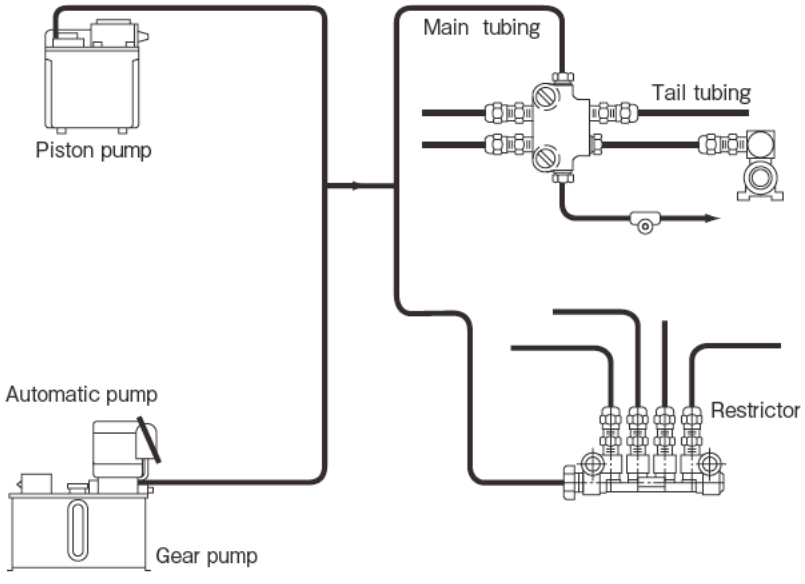
The basic principle of centralized lubrication systems is that oil will travel to the path of least resistance. These systems can be engineered to be either intermittent or continuous depending on the particular requirements. For intermittent systems the metering restrictors are called Flow Units and have 8 restriction sizes to choose from. For continuous systems the metering restrictors are called Control Units and have 10 restriction sizes to choose from. In either case for every size increase or decrease the amount of restriction will be either half or doubled from the previous size. Flow and Control units will deliver oil in a low pressure and small volume either intermittently or continuously depending on the chosen system, and have a wide range of working viscosities. LUBE SLR Systems can be used from small high precision machine to large casting machinery.

Characteristics:

1. Because it is a single main line system, the layout engineering and installation are simple, and visual inspection is easy.
2. There are numerous LUBE SLR electric piston pumps with various outputs, sizes and voltages to fit and lubricate just about any automatic intermittent application.
3. There are numerous LUBE SLR electric gear pumps with various outputs, sizes and voltages to fit and lubricate just about any automatic continuous application.
4. All pumps have a suction filter to help prevent blockage, but recommend an in line filter to help ensure proper oil delivery.
5. Be sure to choose the right size Flow or Control Unit to deliver the correct amount of oil to your lubrication surfaces.

Type of Lubrication system	Intermittant or continuous resistance	
Tubing	Single line (main tubing 4mm, tail tubing 4mm)	
Lubricant	Oil	
Pump	Automatic	
	Motor driven piston pump	Motor driven gear pump
Reservoir	0.8ℓ, 1.8ℓ, 3ℓ, 4ℓ, 8ℓ	2ℓ, 3ℓ, 4ℓ, 8ℓ
Metering restrictor	Flow unit~8 sizes (03,02,0,1,2,3,4,5) Control unit~10 sizes (05,04,03,02,0,1,2,3,4,5)	

〈System layout〉

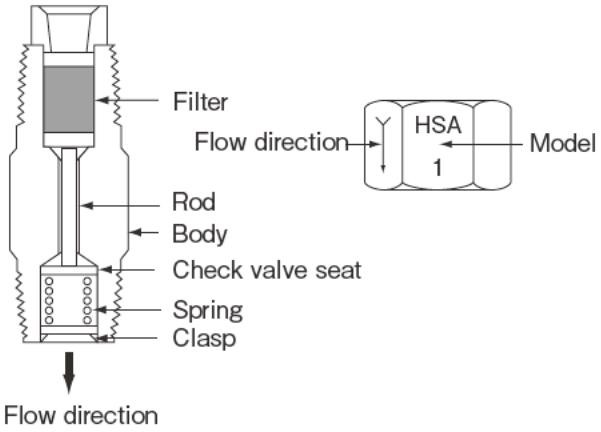


(2) System planning sequence

Designing an Intermittent System

Selection of Flow Unit

After calculation of required oil volume for each lubrication point, selection of Flow Unit determines whether or not the calculated oil volume will be discharged to each point. A random selection of Flow Unit will not produce any good results. In addition, it is not a perfect lubrication system if Flow Units with the same number provide different oil output depending on the places they are installed. (ie : being close v.s. far away from pump, or high v.s. low position) In LUBE-SLR centralized lubrication system, each Flow Unit is assigned the Flow Constant (φvalue) and, by selecting the pump to be used according to the total of φvalue of each Flow Unit in the system, the discharge volume from the Flow Units becomes perfectly balanced.



How to make Data Sheet (Table 5)

(1) Put lubrication data in Column 1-4.

(2) Calculate the required oil volume to each lubrication point using the previous calculation formulas and put the results in Column 5.

(3) Pick the smallest value in Column 5 as the divider and divide the other values in Column 5 to get relative oil volume ratio. Put the results in Column 6. Now the relative oil volume ratio for the smallest value is 1. Therefore let's decide its multiplier as 1 as well and put it in Column 8. As shown in Table 4, Flow Unit number for the multiplier 1 is 02. Put 02 in Column 7.

(4) Compare Table 4 and the relative oil volume ratios calculated in Column 6. Pick multipliers from Table 4 that are closest to each relative oil volume ratio in Column 6 and put them in Column 8. (ie : If a relative oil volume ratio in Column 6 is 7.5, put 8 in Column 8. If 13.2, put 16 in Column 8.)

(5) After completion of the above, select Flow Unit number and Flow Constant, using Table 4, that correspond to each multiplier in Column 8 and put them in Column 7 and 9 respectively

(6) Multiply the smallest value in Column 5 by the multipliers in Column 8 to obtain Actual Oil Volume (cc/h) and put them in Column 10.
(ie : If the smallest value in Column 5 is 0.5cc/h and the multipliers in Column 8 are 4, 16, 2 and 1, put the products 2, 8, 1 and 0.5 in Column 10.)

(7) Calculate the total of each Column 9 and 10 and put them in the total sections in Table 5. (φT and FT)

●Flow constant of Flow Unit (φvalue) and multiplier (Table 4)

Flow unit number	Flow constant	Multiplier
03	1.2	0.5
02	2.5	1
0	5	2
1	10	4
2	20	8
3	40	16
4	80	32
5	160	64

Note：The oil viscosity should be 32～1300 cSt under operation temperature.

●Data sheet (Table 5)

LUBRICATION SYSTEM DATA SHEET

Name of Company
Add.
Section in charge
Person in charge

Mechanical name
Name of machine model

Name of sales office
Date
Quote No.

System specifications			Pump unit specification				
Type of system	☐ Cyclic ☐ Continuous	Model			Discharge volume		cc/h
		Part Number					cc/shot
	☐ Manual ☐ Automatic	Motor	Voltage	V	Discharge pressure		kgf/cm²
			Output	W			kgf/cm²
Oil: Oil name			Phase	φ	Interval		Min (Cam setting No.)
Oil: Working viscosity	cSt(40℃/104°F)		Frequency	Hz			
	cSt(100℃/212°F)		Condenser	μF	Resrvoir capacity		ℓ
					Oil level switch		With/without
						Model	

Calculation of required oil volume											
Lubrication points	Abbreviated name	Dimension	Width		Condition	Calculating value		Flow unit/Control unit			
			Bearing diameter	Row number	RPM or stroke(stroke/min)	Required oil volume(cc/h)	Oil volume ratio	Flow unit or Control unit Number	Multiplier	Capacity constant (φvalue)	Actual oil volume (cc/h)
Antifriction (ball,roller,needle) bearing	A F	0.04									
Plain bearing(metal)	P	0.023	Diameter	Length							
Flat slide way	F W	0.0017 / 0.006	Width	Length							
Cylinder slide way	C W	0.023	Diameter	Length							
Ball roller bearing slide way	B W	0.012	Length	Row number							
Gear	G	0.046	Pitch diameter	Gear							
Cam	C A	0.013	Contacting circumference	Width							
Chain	C H	0.008	Length	Width							
Item	Name of lubricating parts	1	2	3	4	5	6	7	8	9	10
									Total	φT	FT

Selection of Lubrication Pump

(1) The total required oil volume has been calculated in Table 5. Now, let's select a pump with the most appropriate output.

(2) Count the actual total number of Flow Unit in the system and pick the closet number of the Flow Unit from the first column in Table 6. Then choose the φT value, for the number of Flow Unit selected above, from Table 6 that is closest to the φT value calculated in Table 5. φT calculated needs to be smaller than φT selected from Table 6.

(3) The selected φT value indicates the minimum required output of the pump (cc/shot)- See the top row of Table 6. It is recommended to choose the pump with the output that is a little larger than the minimum required output.

Designing Continuous System

Select Control Unit for continuous system by completing the Data Sheet as is done for selection of Flow Unit for intermittent system. Refer to Table 9 for the relation between Control Unit selected, pump output and pump output pressure.

(1) Mark the viscosity (cSt) of the given oil on V-axis.

(2) Divide the total of Column 10 (FT) on the Data Sheet by 60 and mark the result on f-axis.

(3) Join the above two (2) marks with a straight line and extend the line until it intersects with X-axis.

(4) Mark the maximum and minimum pump discharge pressure on P-axis, (Generally, a well-balanced relation between pump pressure and discharge volume is attained when the pump is used at the pressure 2-6kgf/cm2.)

(5) Join the point on X-axis and two (2) points on P-axis above (Max. & Min. discharge pressure) with straight lines and extend them until they intersect with φT-axis. These two (2) points on φT-axis indicate the maximum and minimum value for the φ T value for the system being designed now. Therefore, the calculated φT value needs to fall in this range.

(6) To increase φT value, increase the size of Control Unit selected by one size and calculate new φT value. Repeat the same procedure until φT value falls into the range.

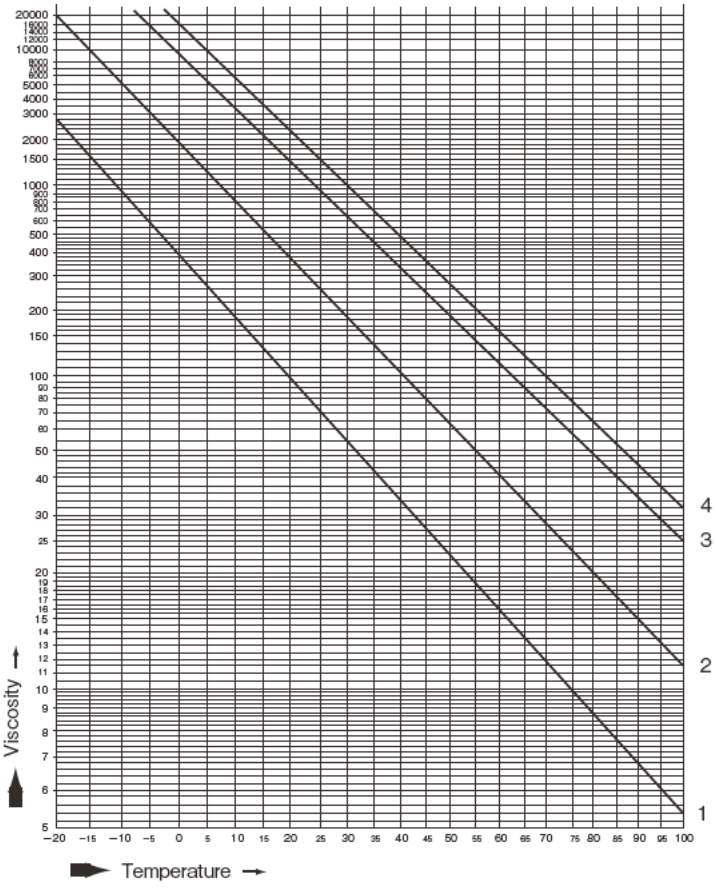
(7) To decrease φT value, decrease the size of Control Unit selected by one size and calculate new φT value. Repeat the same procedure until φT value falls into the range.

(8) Mark the final φT value on φT-axis and join it with the point on X-axis. The point on P-axis, where the line from φT-axis to X-axis crosses, indicates the pump discharge pressure.

●The maximum φT value for intermittent system (Table 6)

Pump / Number of flow unit	Discharge volume of pump cc/shot					
	0.5	1	2	3	4	5
5	150	250	450	700	800	
10	115	180	320	560	680	750
15	96	150	255	450	570	640
20	82	128	225	360	480	550
25	68	108	180	320	400	470
30	58	90	155	280	330	400
40	48	65	120	215	250	290
50		60	94	155	185	215
60			72	115	135	160
70				84	84	125
80						96
90						

●Viscosity Temperature graph (Table 7)

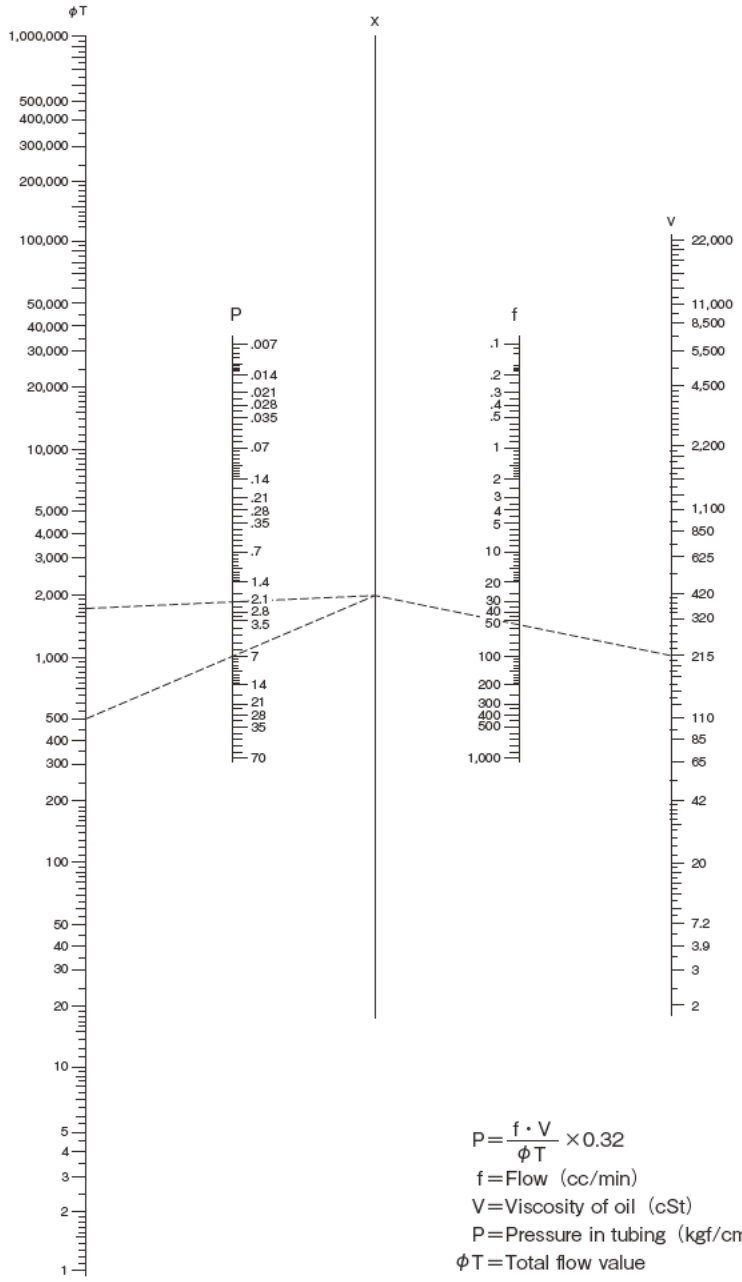


	40℃/104°F	100℃/212°F
1 : Oil #32	32.7cSt	5.6cSt
2 : Oil #100	101.0cSt	11.9cSt
3 : Oil #320	319.0cSt	26.0cSt
4 : Oil #460	454.3cSt	32.3cSt

●Flow constant of flow unit (φvalue) and multiplier (Table 8)

Control unit Number	Flow constant	Multiplier
5	0.3	0.13
4	0.6	0.25
3	1.2	0.5
2	2.5	1
0	5	2
1	10	4
2	20	8
3	40	16
4	80	32
5	160	64

●Relation between oil discharge pressure and oil discharge volume of pump (Table 9)



$$P=\frac{f\cdot V}{\phi T}\times 0.32$$

f＝Flow（cc/min）

V＝Viscosity of oil（cSt）

P＝Pressure in tubing（kgf/cm²）

φT＝Total flow value

■Grease system

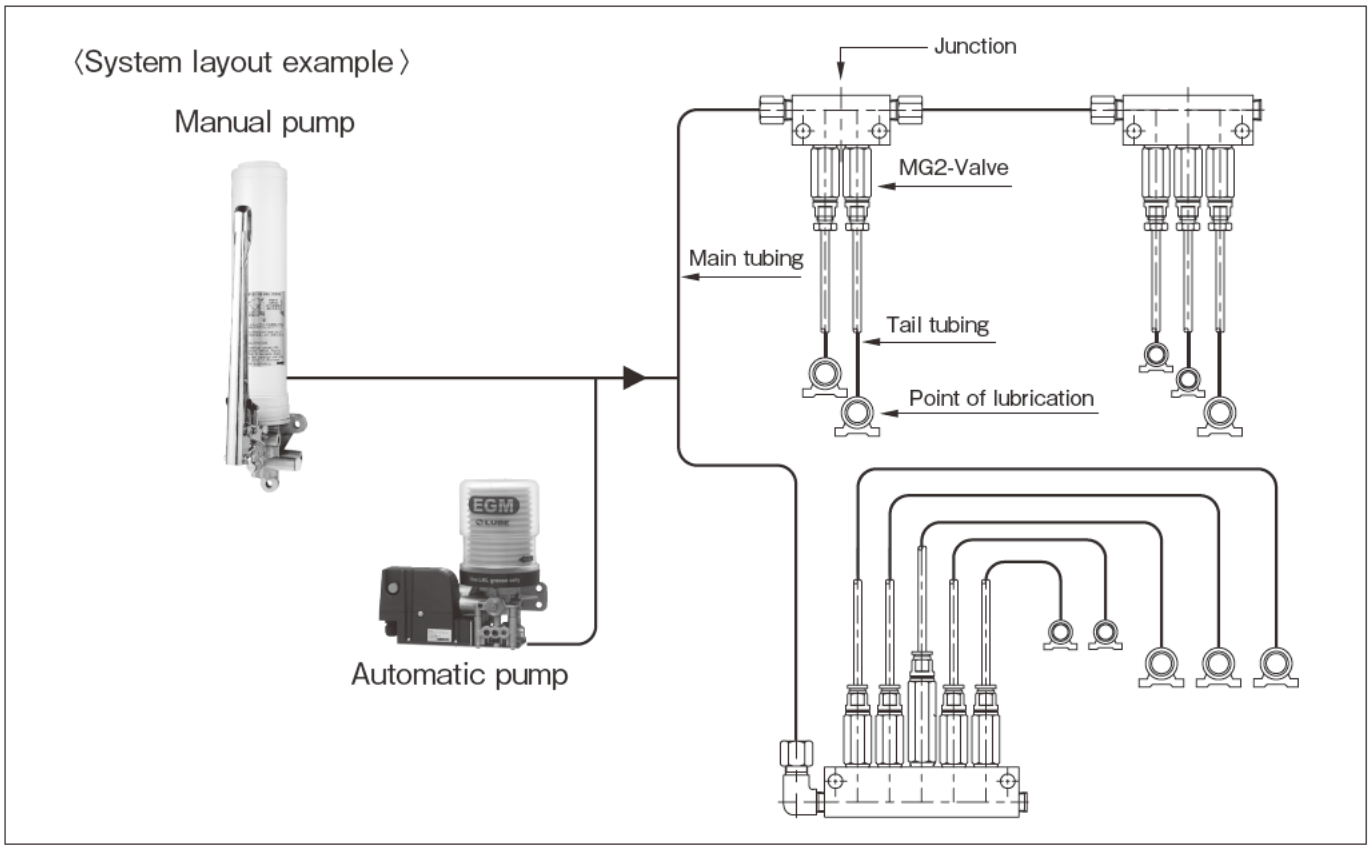
Positive Displacement Injector(PDI)

(1)System Overview

The Grease 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 Grease systems have a wide assortment of manual, pneumatic and electric pumps to satisfy any lubrication requirement. The integrity of these systems stems from its metering device the MG2(C)-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. MG2(C)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

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	Motor driven
Model		EGH-4C	EGM-10S-4-7C
Discharge volume		1cc/stroke	10cc/min
Discharge pressure		10MPa (100kgf/cm²)	10MPa (100kgf/cm²)
Reservoir		0.4 ℓ	0.4, 0.7 ℓ
Controller		—	—
Distributor MG2 valve	Model	Positive displacement injector	
	Operating pressure	2.5Mpa (25kgf/cm²)	
	Operating pressure	1.4Mpa (14kgf/cm²)	
	Discharge volume	0.03, 0.05, 0.1, 0.2, 0.3, 0.5, 1.0, 1.5cc stroke	
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	



MG2(C) and MGI-Valve injectors will re-set and re-load when main line pressure returns to zero. These 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. MG2(C)-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 MG2(C) and MGI-Valves are junction mounted distributors that can be arranged in just about any configuration imaginable.
5. Because the Grease Systems have the flexibility of individual distributor junction assemblies using one main line tube, makes the engineering of the system layout and installation of the system as easy as possible.

Initial Grease Volume Required

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……(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 (1.4MPa(14kgf/cm²) 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 5MPa(50kgf/cm²).
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.

Designing EGH-4C 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 main line tubing needs to be considered along with the viscosity of the grease for pressure relief time required.

Interval lubrication time

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

●Pressure Relief 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″

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

Disigning EGME II-8S Pump System

Selection of valve

1. Select the valves based on the grease volume required to each lubrication point.
2. The total length of main line tubing needs to be considered to determine the running time required to build pressure to cycle the MG2 valves.

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 (φ8) (Table 19)

Total length of tubing	Pressure rising time
10m(32.8 feet)	15sec

※ 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.

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)

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
10m/32.8F	15″	15′	30′	60′

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′

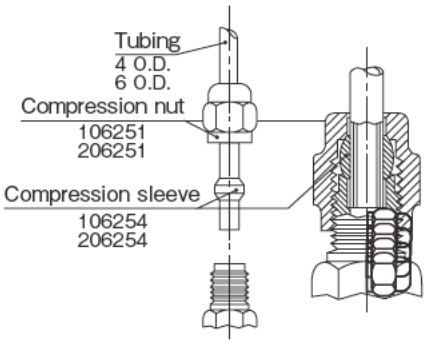
Note : [◦] = Hours, [′] = Minutes, [″] = Seconds

■Tubing connection method

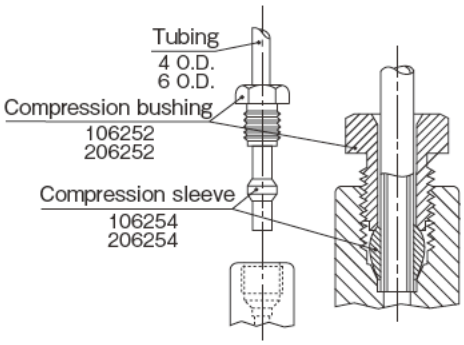
1. In general, the main size tubing used is, 4mmO.D., 6mmO.D, or 8mmO.D. In most cases the secondary tubing is 4mm.
2. The tubing is made of copper, steel, or nylon.
3. When cutting the tubing always use a tubing cutter and cut at a 90 degree angle. After cutting, remove all burs. Be sure not to flatten or damage the tubing.
4. When installing the tubing, always use compression fittings as described in the drawings below.
5. For type HSA/CSA, type HJB/CJB see the illustrations on the right for making tubing connections.
6. For making junction connections, see the illustrations.

Standard compression connections

■Compression nut used example

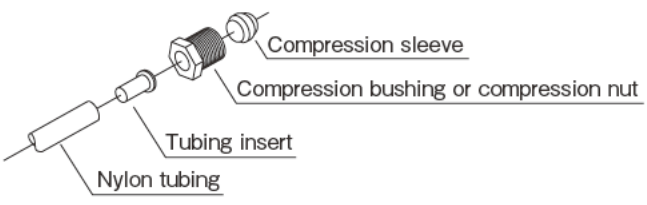


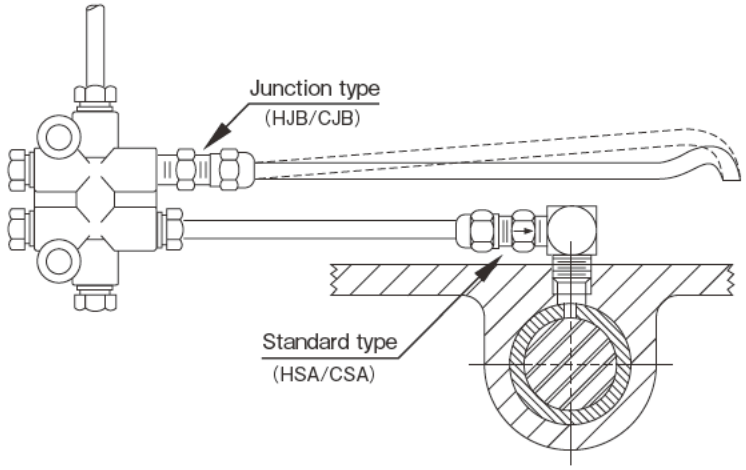
■Compression bushing used example



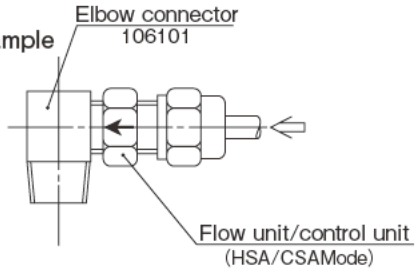
■Nylon tube used example

Install the tube insert into the end of the nylon tube. Install the compression bushing or nut, followed by the compression sleeve and insert assembly into or onto the the appropriate compression connection. Tighten the compression bushing or nut so that the compression sleeve tightens onto the tubing wall.

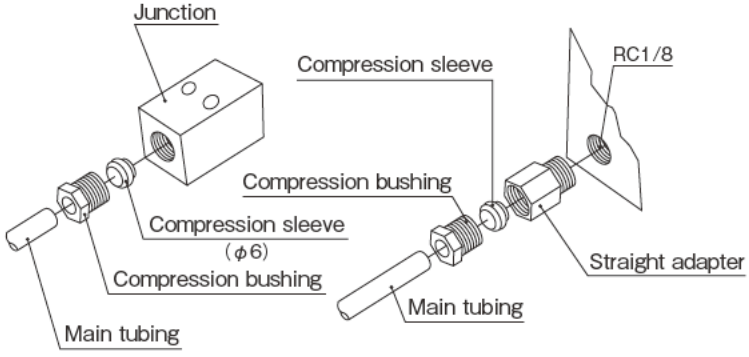




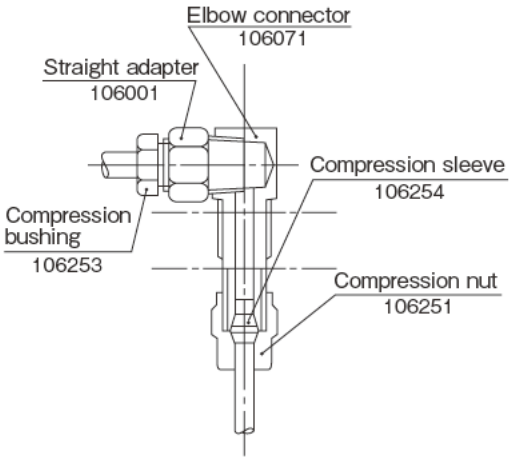
■Connector used example



■Main piping connecting example



■Adapter used example



■Reference for lubricant

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

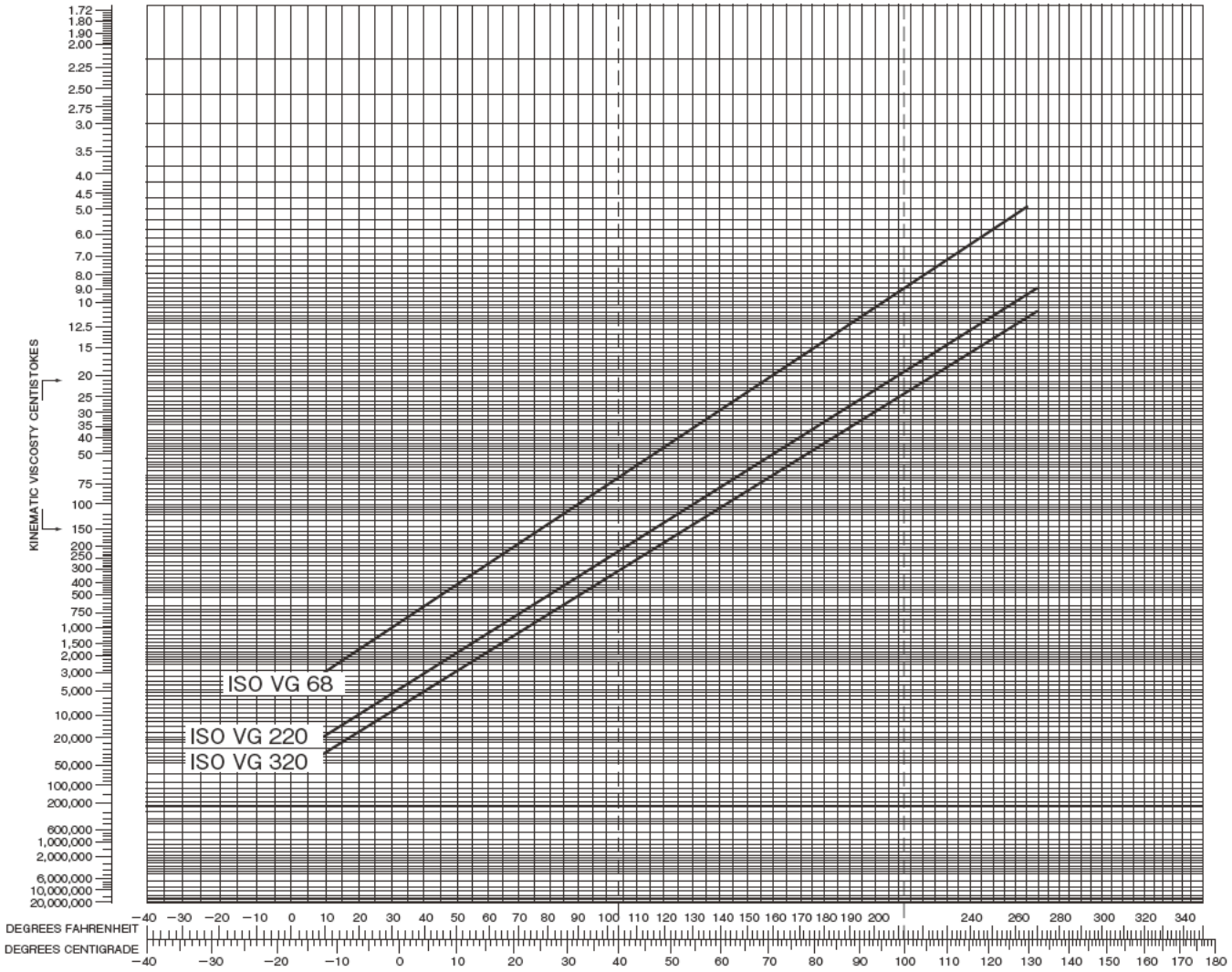
ISO=International Organization for Standardization

●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

●Viscosity-temperature Chart



SAFETY AND TROUBLE SHOOTING

Safety and trouble shooting

● For oil

Pump not discharging oil

○Low oil level in reservoir — add currently used oil
○Clogged suction filter — clean or change oil filter and clean reservoir
○Check for incorrect oil — if not correct, purge complete system, clean reservoir and fill with correct oil
○Motor turns in wrong direction — check motor wiring
○Damaged tubing within the pump — fix or replace
○By-pass valve out of adjustment — adjust by-pass valve
○Check inlet and outlet check valve — disassemble and clean
Note: Never add a check valve to a pump that was not originally intended.

No pressure increase in the main line

○Check for broken Tubing or leaking fittings — Replace as needed.
○Ball seat of relief valve is clogged — clean relief valve
○Air in tubing — check for leaks, open system at furthest point and run pump to remove air
○Improper selection of control unit or flow unit — check manufacturers recommendation and replace with correct unit
○Improper pressure setting (gear pump) — ajust by-pass setting
○Damaged "O" ring on the piston (piston pump) — replace
○Oil leaking from junction — tighten fitting properly or replace tube fitting

Air in system

○Oil level in the reservoir is too low — fill with correct oil and follow above procedure for removing air
○Damaged tubing — replace damaged tubing

No oil passing thru flow or control unit

○Check flow direction on hex of flow or control unit — if incorrect, replace with correct unit
○Check for clogged unit — replace unit

The pump is not running, but light is on (if equipped)

○Motor is wired wrong — check motor wiring
○Circuit protector is in off position — press reset button

Trouble indication light is on (if equipped)

○Discharge time is set too short, pump is not reaching proper pressure — check time setting
○The oil level switched because of low oil level — fill reservoir with correct oil

Reservoir has proper oil level, but oil level warning is on

○Mistake on A, B contacts of oil level switch — consult with us

Cannot turn off trouble light (if equipped)

○Reset button has not been pressed — press the reset button
○Oil has not been added to reservoir — fill reservoir with correct oil
○Pump did not reach the specified pressure — consult with us

● For grease

No grease coming out of the pump

○Low grease level — change grease cartridge
○Change in grease consistency, too thick to pump — check grease grade and temperature
○Only sucks air — Crack air bleeding plug to purge air from pump
○Motor turns in wrong direction — check motor wiring connections
○Solenoid (if equipped) not actuating — Replace solenoid and confirm wiring polarity is correct.

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 EGH 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 is too low — change cartridge 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

Tightening torque table

	Mark	Products of application and combination	Number of rotations after binding tight in a sheet side by the hand	Tourque N·m	Number of rotations after again newly hitting a sheet side in bolting
4mm Compression Bushing for piping	A	Nylon tubing (Tube Insert is entered.) Aluminum-tubing	2/3	3.4	1/6 ~ 1/4
	B	Copper tubing, Steel Tubing	2/3	3.9	1/6 ~ 1/4
6mm Compression Bushing for piping	C	Nylon tubing (Tube Insert is entered.)	2/3	3.4	1/6 ~ 1/4
	D	Copper tubing, Steel Tubing	2/3	3.9	1/6 ~ 1/4
8mm Compression Bushing for piping	E	Nylon tubing (Tube Insert is entered.)	2/3	6.9	1/6 ~ 1/4
	F	Copper tubing	2/3	11.8	1/6 ~ 1/4
	G	Steel Tubing	2/3	13.7	1/6 ~ 1/4
4mm Compression Nut for piping	H	Nylon tubing (Tube Insert is entered.)	2/3	2.5	1/6 ~ 1/4
	I	Copper tubing	2/3	2.9	1/6 ~ 1/4
	J	Steel Tubing	2/3	3.9	1/6 ~ 1/4
6mm Compression Nut for piping	K	Nylon tubing (Tube Insert is entered.)	2/3	4.9	1/6 ~ 1/4
	L	Copper tubing, Steel Tubing	2/3	5.9	1/6 ~ 1/4
Sealing washer	M	SW-10; brass and brass	1/12	6.4	—
	N	SW-10; brass and iron	1/12	11.8	—
	O	SW-10; brass and brass	1/5	19.6	—
	P	SW-10; brass and iron	1/5	19.6	—
Flow unit	Q	Junctions	1/2	5.9 ~ 7.8	1/6 ~ 1/4
SP valve	R	Sealing washer SW iron and aluminium (Plug)	1/6	9.8	—
	S	Outlet Check, Straight Adapter (Dischagre Port); With compression sleeves	2/3	9.8	—
Other	T	Tubing parts (Rc1/8); zinc, aluminium, brass and iron, brass	2.5 ~ 3	6.9	—
	U	Tubing parts (Rc1/8); iron and iron	1	8.8	—
	V	ϕ6 high pressure Fitting, Fitting body and Nut sleeve, Steel Tubing	1·1/4	19.6	—
	W	ϕ 8 high pressure Fitting, Fitting body and Nut sleeve, Steel Tubing	1·1/4	29.4	—

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MMXL-Ⅲ-1B-1	301052	121
MMXL-Ⅲ-1B-1L	301064	121
MMXL-Ⅲ-1B-2	301058	121
MMXL-Ⅲ-1B-2L	301070	121
MMXL-Ⅲ-1C-1	301053	121
MMXL-Ⅲ-1C-1L	301065	121
MMXL-Ⅲ-1C-2	301059	121
MMXL-Ⅲ-1C-2L	301071	121
MMXL-Ⅲ-1D-1	301054	121
MMXL-Ⅲ-1D-1L	301066	121
MMXL-Ⅲ-1D-2	301060	121
MMXL-Ⅲ-1D-2L	301072	121
MMXL-Ⅲ-1E-1	301055	121
MMXL-Ⅲ-1E-1L	301067	121
MMXL-Ⅲ-1E-2	301061	121
MMXL-Ⅲ-1E-2L	301073	121
MMXL-Ⅲ-1F-1	301056	121
MMXL-Ⅲ-1F-1L	301068	121
MMXL-Ⅲ-1F-2	301062	121
MMXL-Ⅲ-1F-2L	301074	121
MMXL-Ⅲ-2A-1	301013	121
MMXL-Ⅲ-2A-1L	301019	121
MMXL-Ⅲ-2A-2	301001	121
MMXL-Ⅲ-2A-2L	301007	121
MMXL-Ⅲ-2B-1	301014	121
MMXL-Ⅲ-2B-1L	301020	121
MMXL-Ⅲ-2B-2	301002	121
MMXL-Ⅲ-2B-2L	301008	121
MMXL-Ⅲ-2C-1	301015	121
MMXL-Ⅲ-2C-1L	301021	121
MMXL-Ⅲ-2C-2	301003	121
MMXL-Ⅲ-2C-2L	301009	121
MMXL-Ⅲ-2D-1	301016	121
MMXL-Ⅲ-2D-1L	301022	121
MMXL-Ⅲ-2D-2	301004	121
MMXL-Ⅲ-2D-2L	301010	121
MMXL-Ⅲ-2E-1	301017	121
MMXL-Ⅲ-2E-1L	301023	121
MMXL-Ⅲ-2E-2	301005	121
MMXL-Ⅲ-2E-2L	301011	121
MMXL-Ⅲ-2F-1	301018	121
MMXL-Ⅲ-2F-1L	301024	121
MMXL-Ⅲ-2F-2	301006	121
MMXL-Ⅲ-2F-2L	301012	121
MMXL-Ⅲ-5A-1	301037	121
MMXL-Ⅲ-5A-1L	301043	121
MMXL-Ⅲ-5A-2	301025	121
MMXL-Ⅲ-5A-2L	301031	121
MMXL-Ⅲ-5B-1	301038	121
MMXL-Ⅲ-5B-1L	301044	121
MMXL-Ⅲ-5B-2	301026	121
MMXL-Ⅲ-5B-2L	301032	121
MMXL-Ⅲ-5C-1	301039	121
MMXL-Ⅲ-5C-1L	301045	121
MMXL-Ⅲ-5C-2	301027	121
MMXL-Ⅲ-5C-2L	301033	121
MMXL-Ⅲ-5D-1	301040	121
MMXL-Ⅲ-5D-1L	301046	121
MMXL-Ⅲ-5D-2	301028	121
MMXL-Ⅲ-5D-2L	301034	121
MMXL-Ⅲ-5E-1	301041	121
MMXL-Ⅲ-5E-1L	301047	121
MMXL-Ⅲ-5E-2	301029	121
MMXL-Ⅲ-5E-2L	301035	121
MMXL-Ⅲ-5F-1	301042	121
MMXL-Ⅲ-5F-1L	301048	121
MMXL-Ⅲ-5F-2	301030	121
MMXL-Ⅲ-5F-2L	301036	121
MMXL-Ⅲ CE-1A-1	367001	121
MMXL-Ⅲ CE-1A-1L	367055	121
MMXL-Ⅲ CE-1A-2	367007	121
MMXL-Ⅲ CE-1A-2L	367061	121
MMXL-Ⅲ CE-1B-1	367002	121
MMXL-Ⅲ CE-1B-1L	367056	121
MMXL-Ⅲ CE-1B-2	367008	121
MMXL-Ⅲ CE-1B-2L	367062	121
MMXL-Ⅲ CE-1C-1	367003	121
MMXL-Ⅲ CE-1C-1L	367057	121
MMXL-Ⅲ CE-1C-2	367009	121
MMXL-Ⅲ CE-1C-2L	367063	121
MMXL-Ⅲ CE-1D-1	367004	121