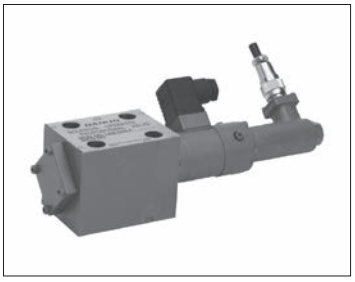
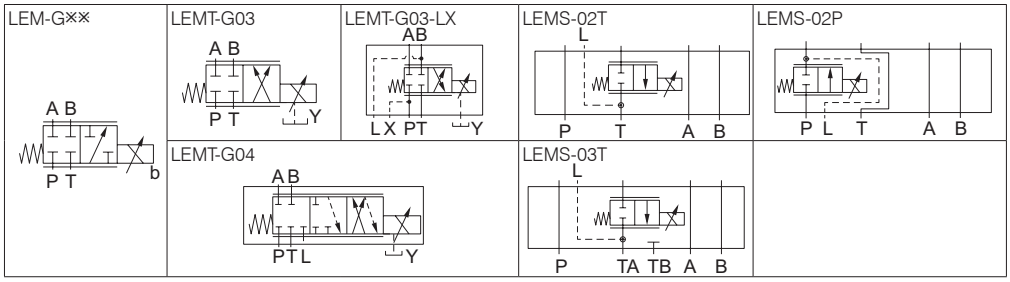
Direct Operated Type Solenoid Operated Proportional Throttle Valve





Features

- These proportional throttle directional control valves perform spool position feedback control by directly driving the spool with the proportional solenoid and detecting the displacement with the differential transformer.
- Combining the valve with a pressure compensation valve and the dedicated driver achieves highly accurate proportional flow rate control.
- Highly accurate proportional flow rate control with meter-in control at port P or meter-out control at port T can be realized by stacking the LEMS valves in combination with the dedicated reduction type pressure compensation valve (MGS) under the solenoid valve.

Nomenclature

- **Gasket mount type**

LEM	–	G	※※	–	F	–	20	–	※
1		2	3		4		5		6

LEMT	–	G	※※	–	F	–	20	–	※※
1		2	3		4		5		7

1 Model No.
(Applicable fluids: petroleum-based hydraulic oil)
LEM: Solenoid operated proportional throttle valve
LEMT: Back pressure type solenoid operated proportional throttle valve

2 Connections
G: Gasket mount type

3 Nominal diameter
02: ¼ <Applicable only to the model designation LEM>
03: ⅜
04: ½ <Applicable only to the model designation LEMT>

Note: *1 Specifications with SOL.a apply only to nominal diameter 02 (¼).
*2 DIN connector mounting at the left side applies only to nominal diameter 03 (⅜).
*3 The option code II applies only to LEMT-G03.

4 Spool type
F: Spring offset type
All ports blocked when neutral

5 Design No.
(The design No. is subject to change)

6 Option code I
No designation: With SOL.b (flow P → B)
G: With SOL.a (flow P → A) *1
L: DIN connector mounting position, left side *2

7 Option code II *3
No designation: Without ports L and X
LX: With ports L and X

- **Stacking type**

LEMS	–	※※	※	–	※※	–	※	※
1		2	3		4		5	6

1 Model No.
LEMS: Stacking type solenoid operated proportional throttle valve

2 Nominal diameter
02: ¼
03: ⅜

3 Control port
P: Port P *4
T: Port T

Note: *4 Applicable only to nominal diameter 02 (¼)

4 Design No. (The design No. is subject to change)
20: Nominal diameter 03 (⅜)
30: Nominal diameter 02 (¼)

5 DIN connector mounting position *4
No designation: Bottom
A: Right
B: Top
C: Left

6 Differential transformer connector mounting position *4
No designation: Bottom
Q: Right
R: Top
S: Left

Specifications

Model code	Nominal diameter	Maximum operating pressure MPa {kgf/cm²}	Rated flow rate *5 L/min	T port permissible back pressure MPa {kgf/cm²}	Hysteresis, resolution, repeatability	Coil resistance (20°C) Ω	Current at start of flow (Nominal) mA	Current at rated flow (Nominal) mA
LEM -G02-F-20	¼	21 {210}	25	2.5 { 25}	No greater than 1% of rated input voltage	26	300	700
LEM -G03-F-20	⅜		50					
LEMT-G03-F-20	⅜			21 {210}				
LEMT-G04-F-20	½		130			13	500	1540
LEMS-02※ -30	¼		25	2.5 { 25}		26	300	700
LEMS-03T -20	⅜	16 {160}	50					

Note: *5 The rated flow rate indicates the values when the valve is used in combination with a pressure compensation valve (differential pressure: 0.6 MPa {6 kgf/cm²})

Applicable driver model code

Valve model code	Applicable driver	
	Model code	Power supply voltage
LEM-G※※, LEMT-G03, LEMS-※※	KF-5-10	AC 100, 200, 220 V (Common for 50 and 60 Hz)
LEMT-G04	KFH-5-10	

Sub-plate model code

- The sub-plate is not provided with the valve. Order it separately as required by specifying the model code given in the table below.

Model code	Nominal diameter	Connection port diameter	Mass kg
JS-01M02	¼	Rc¼	0.64
JS-02M03		Rc⅜	2.3
JS-03M	⅜	Rc⅜	2.5
JS-03M04		Rc½	2.2

Refer to Page S-9 for the dimensions of the sub-plate.

Accessories

Model No.	Hexagon socket head cap bolt	Number	Tightening torque N·m {kgf·cm}
LEM-G02	M5 × 45	4	5 to 8 { 50 to 80}
LEM(T)-G03	M6 × 35	4	10 to 13 {100 to 130}
LEMT-G04	M6 × 50	2	10 to 13 {100 to 130}
	M10 × 55	4	59 to 62 {590 to 620}

Handling

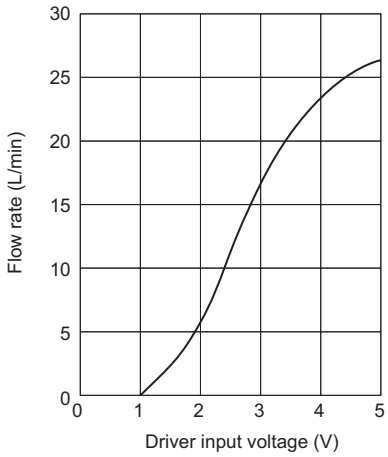
- Directly connect the tank and drain piping to the tank without merging it with other tank piping.
- Do not touch the zero adjusting screw of the differential transformer since it is factory adjusted.
- Use this valve in combination with a pressure compensation valve. Order a pressure compensation valve separately by referring to the table below as necessary.

Model No.	Bypass type pressure compensation valve	Reduction type pressure compensation valve
LEM-G※※	MUV12AL6S MUL12AL6N-358	MDM12AL6N
LEMT-G03		
LEMT-G04	MUV16AL6S MUL16AL6N-347 MUL12AL※N-561	MDM16AL6N
LEMS-02P	–	MGS-02P-20-※※ (Stacking type)
LEMS-02T	–	MGS-02T-20-※※ (Stacking type)
LEMS-03T	–	MGS-03T-10-※ (Stacking type)

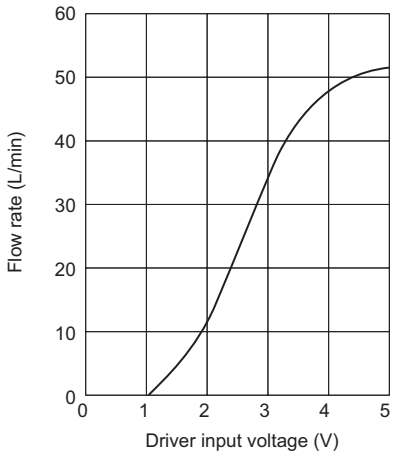
Performance curves (viscosity: 32 mm^2/s {cSt})

Input voltage - Flow rate characteristics

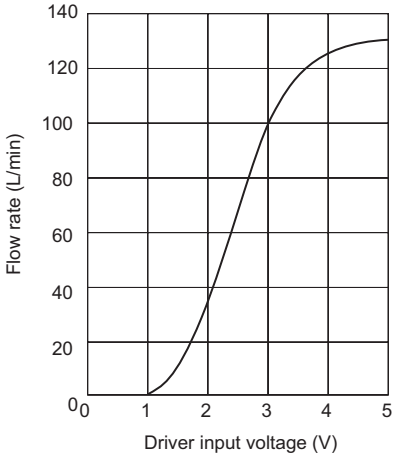
LEM-G02



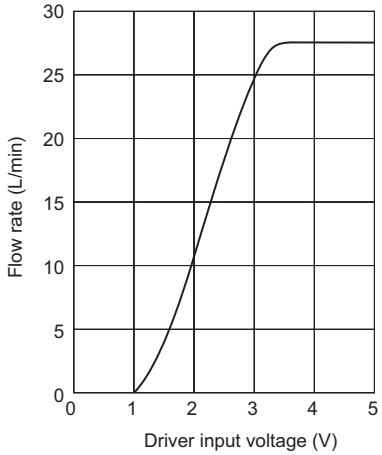
LEM(T)-G03



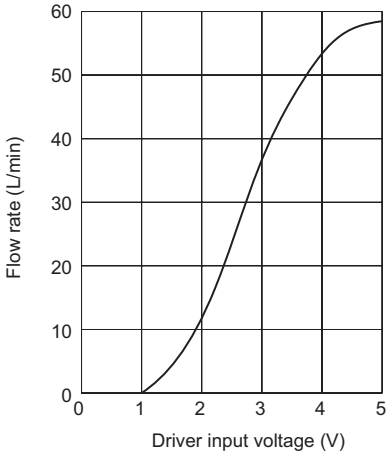
LEMT-G04



LEMS-02P(T)



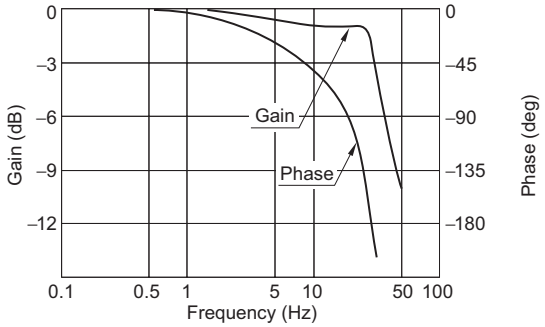
LEMS-03T



Frequency response characteristics

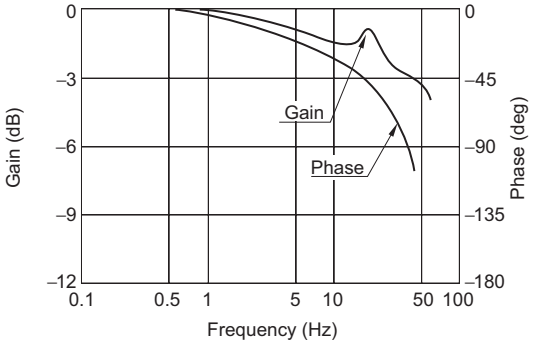
LEM※-(G)02

Flow rate fluctuation: 12 ± 1.25 L/min



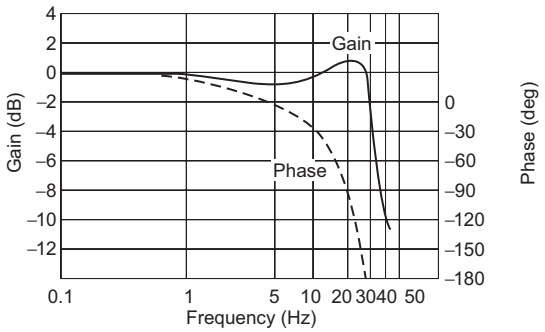
LEM※-(G)03

Flow rate fluctuation: 25 ± 2.5 L/min



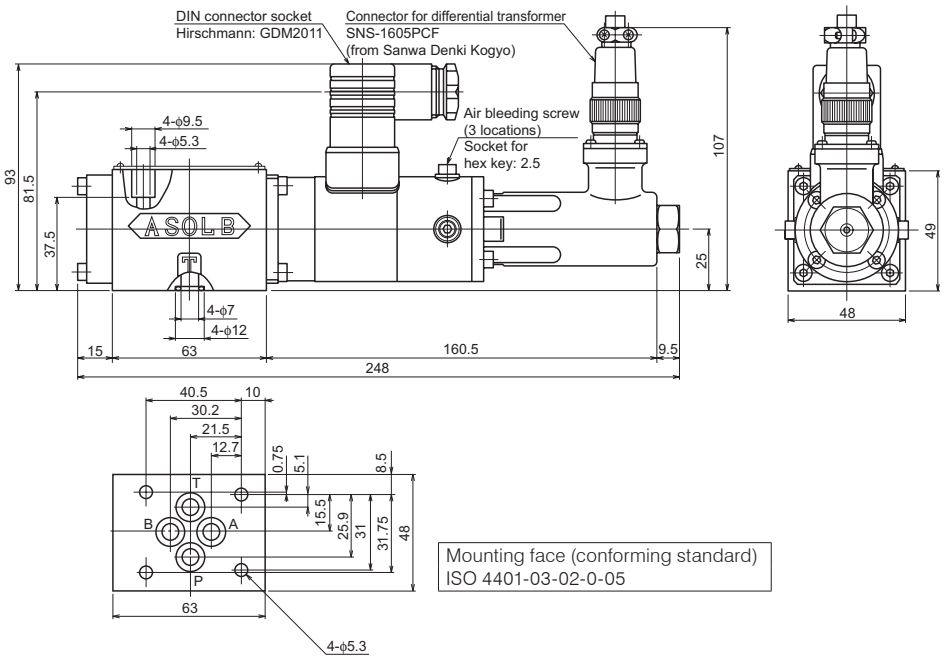
LEMT-G04

Flow rate fluctuation: 65 ± 5 L/min



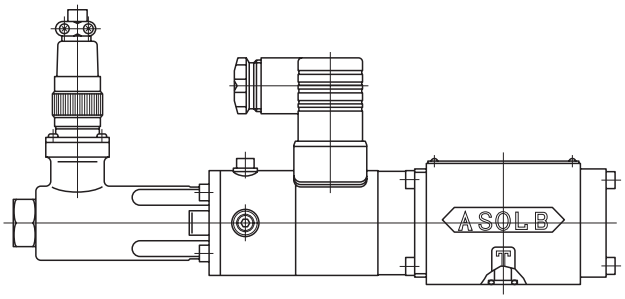
External dimension diagram

LEM-G02

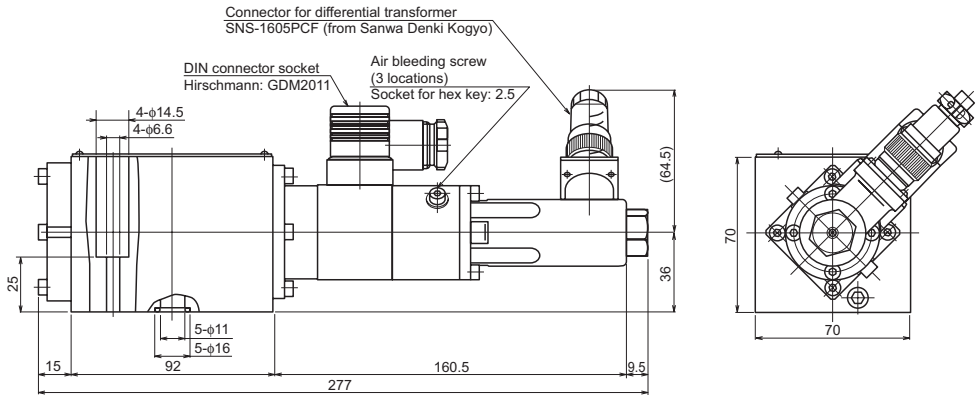


Mounting face (conforming standard)
ISO 4401-03-02-0-05

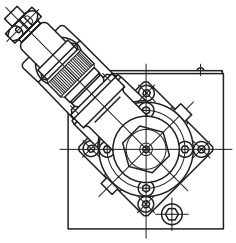
●Option code I: G

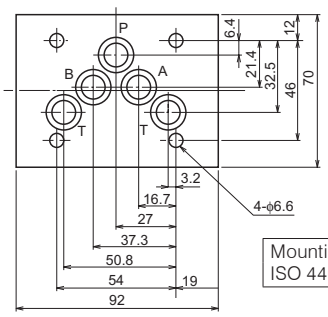


LEM-G03



●Option code I: L

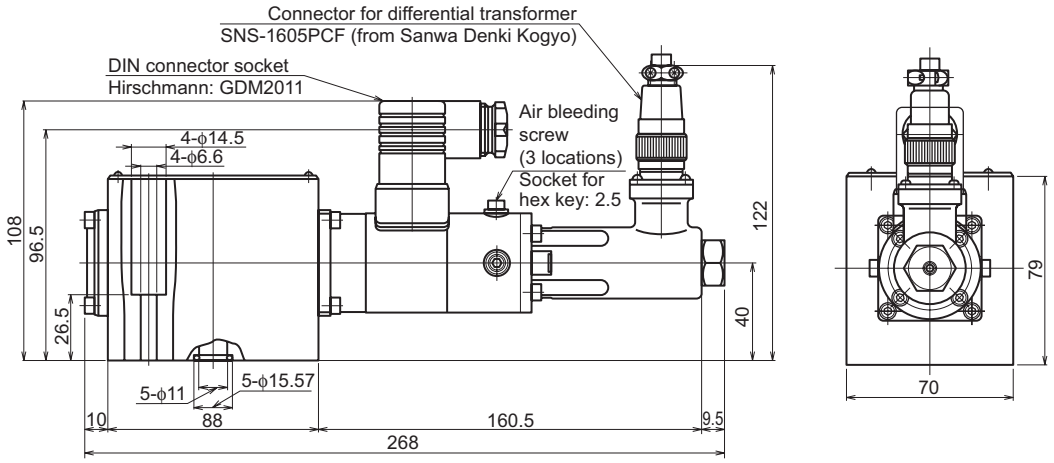




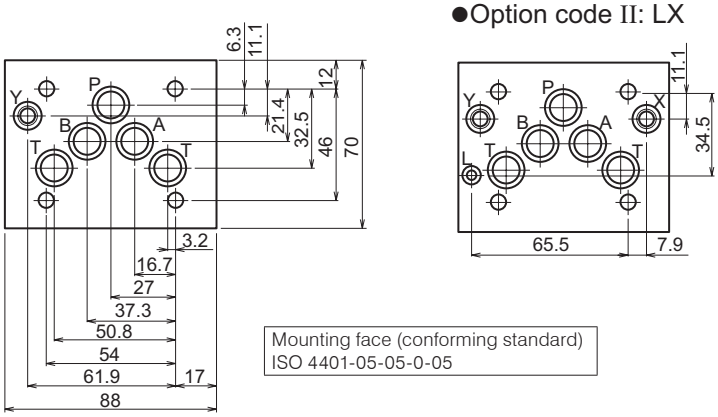
Mounting face (conforming standard)
ISO 4401-05-04-0-05

External dimension diagram

LEMT-G03

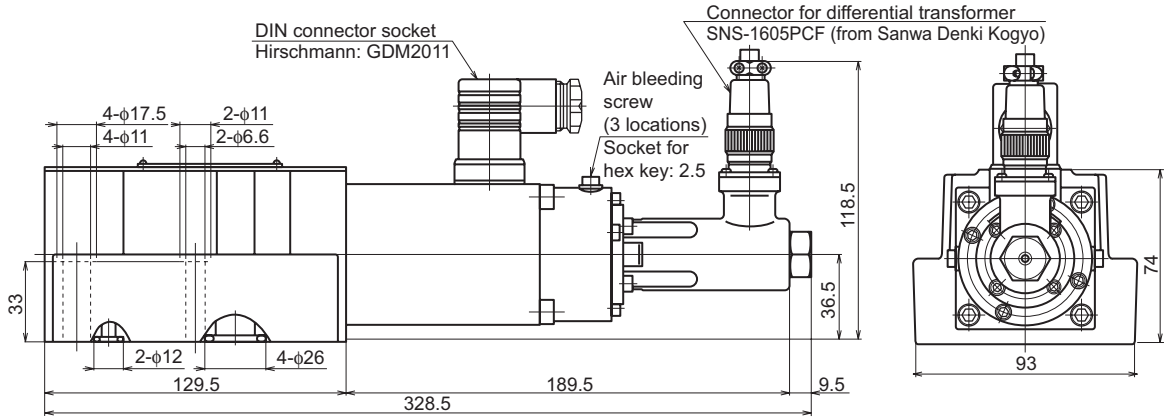


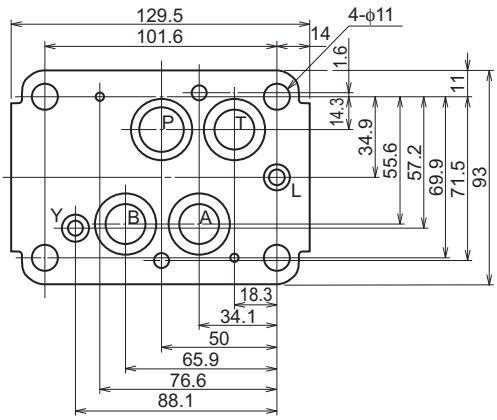
●Option code II: LX



Mounting face (conforming standard)
ISO 4401-05-05-0-05

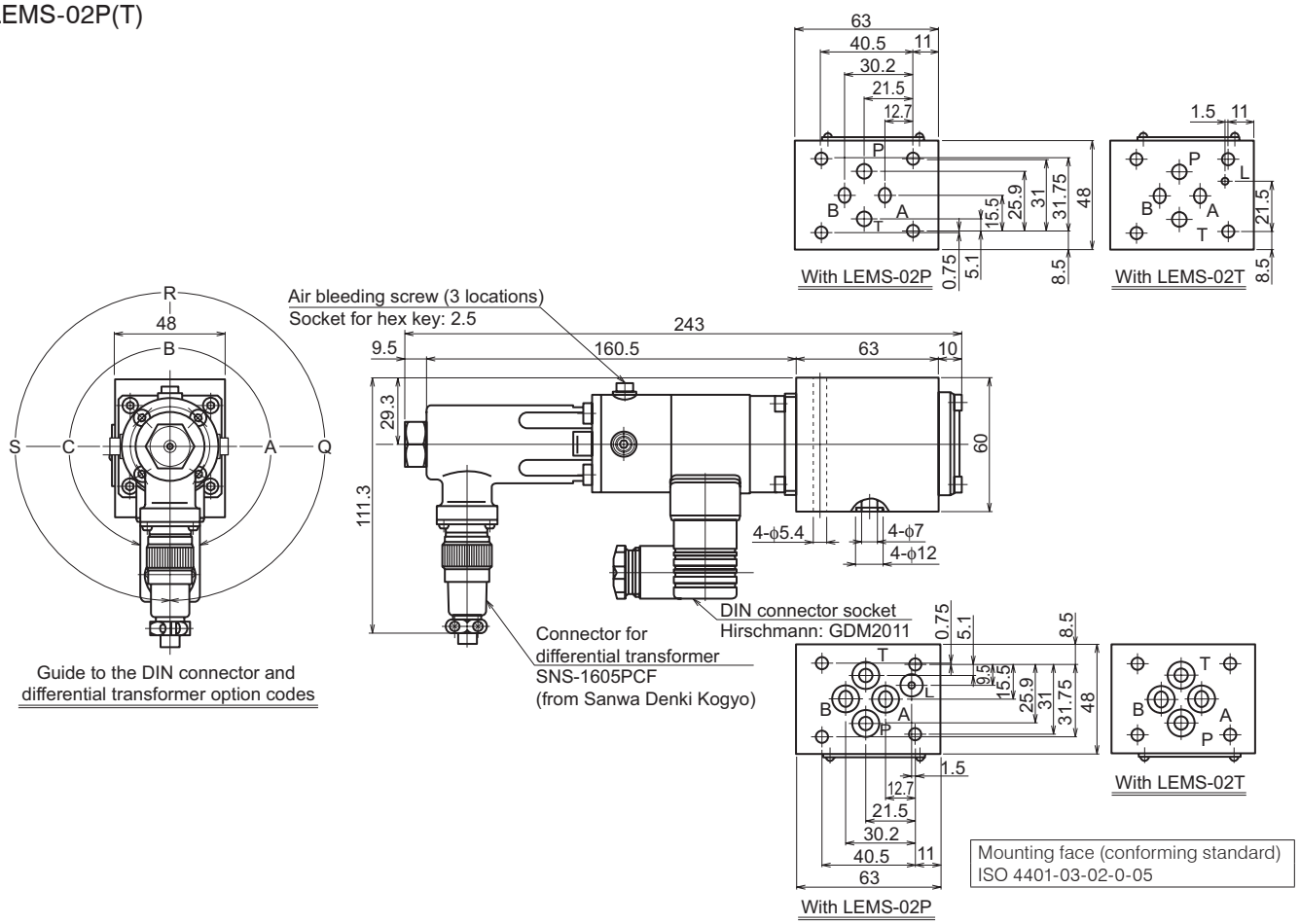
LEMT-G04



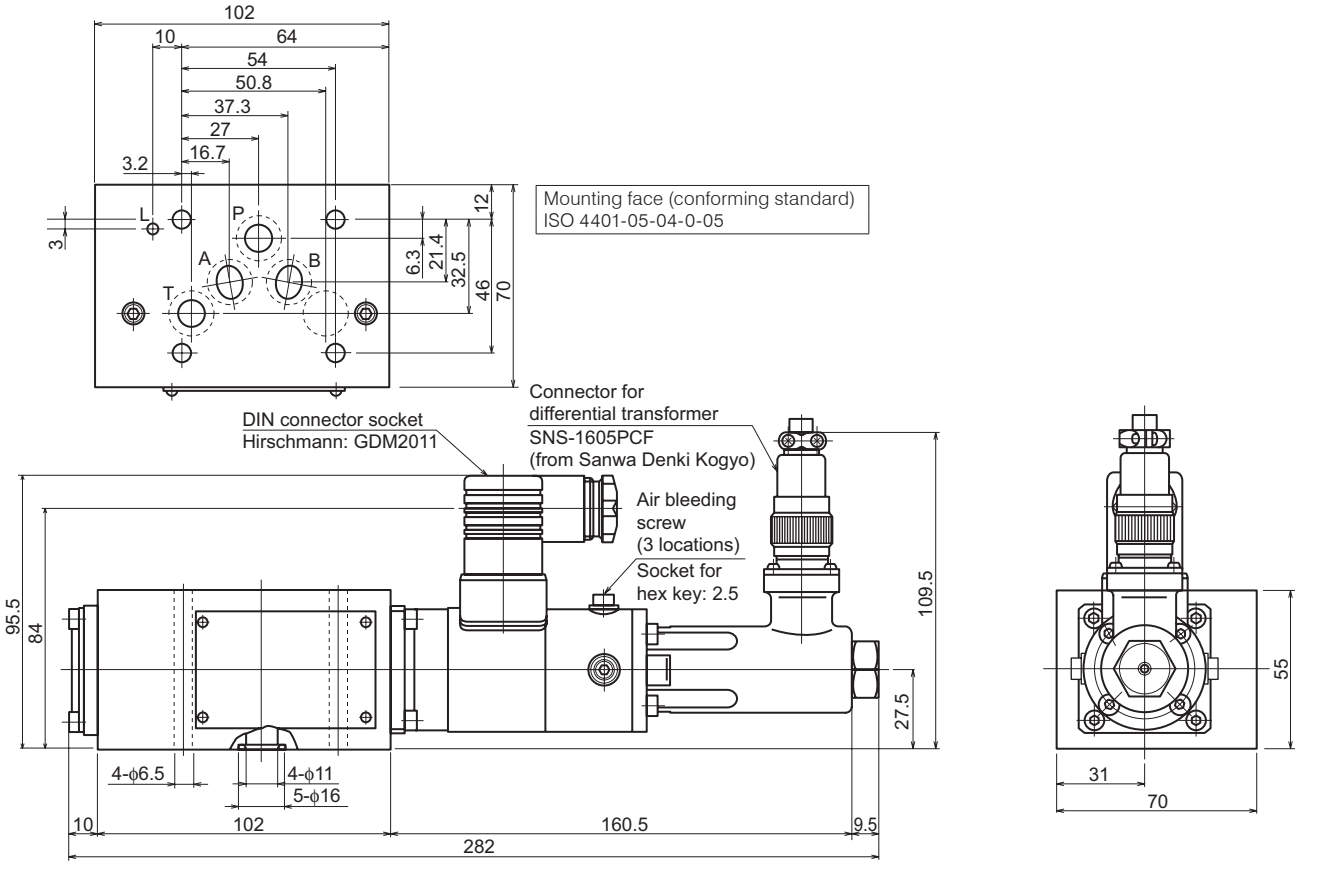


External dimension diagram

LEMS-02P(T)

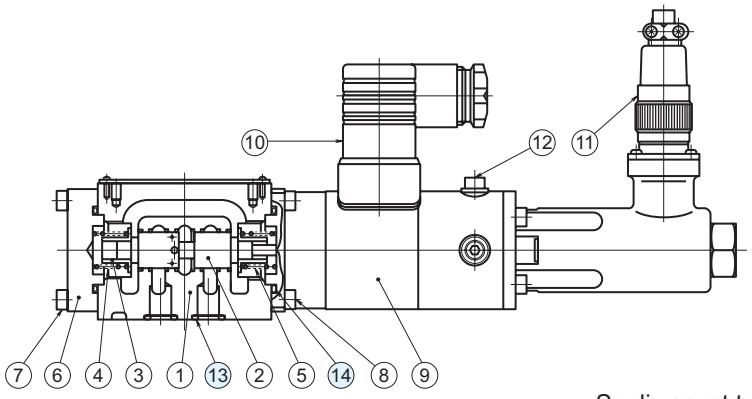


LEMS-03T



Sectional structural diagram

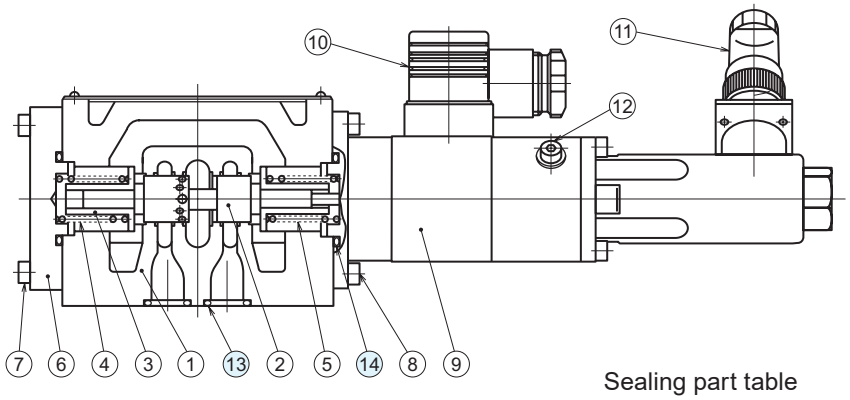
LEM-G02



Sealing part table

Part No.	Name	Quantity	Part specifications
13	O-ring	4	JIS B 2401 1B P9
14	O-ring	2	AS568-121 (NBR, Hs90)

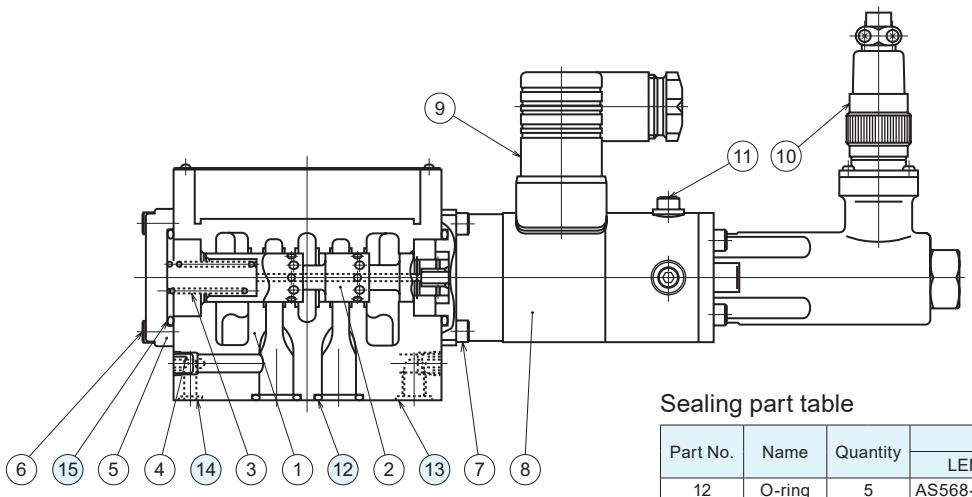
LEM-G03



Sealing part table

Part No.	Name	Quantity	Part specifications
13	O-ring	5	JIS B 2401 1B P12
14	O-ring	2	AS568-121 (NBR, Hs90)

LEMT-G03

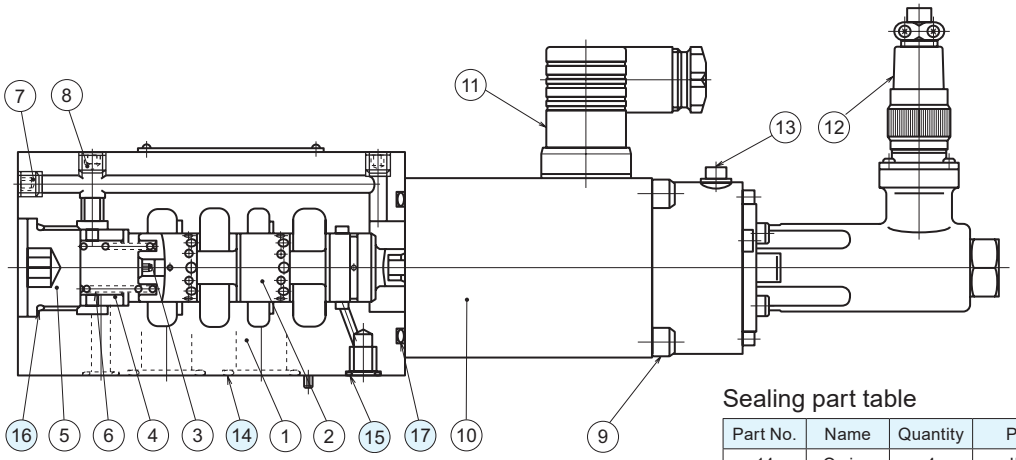


Sealing part table

Part No.	Name	Quantity	Part specifications	
			LEMT-G03-F-20	LEMT-G03-F-20-LX
12	O-ring	5	AS568-014 (NBR, Hs90)	AS568-014 (NBR, Hs90)
13	O-ring	1 2	JIS B 2401 1B P9	JIS B 2401 1B P9
14	O-ring	1	–	AS568-008 (NBR, Hs90)
15	O-ring	2	AS568-121 (NBR, Hs90)	AS568-121 (NBR, Hs90)

Sectional structural diagram

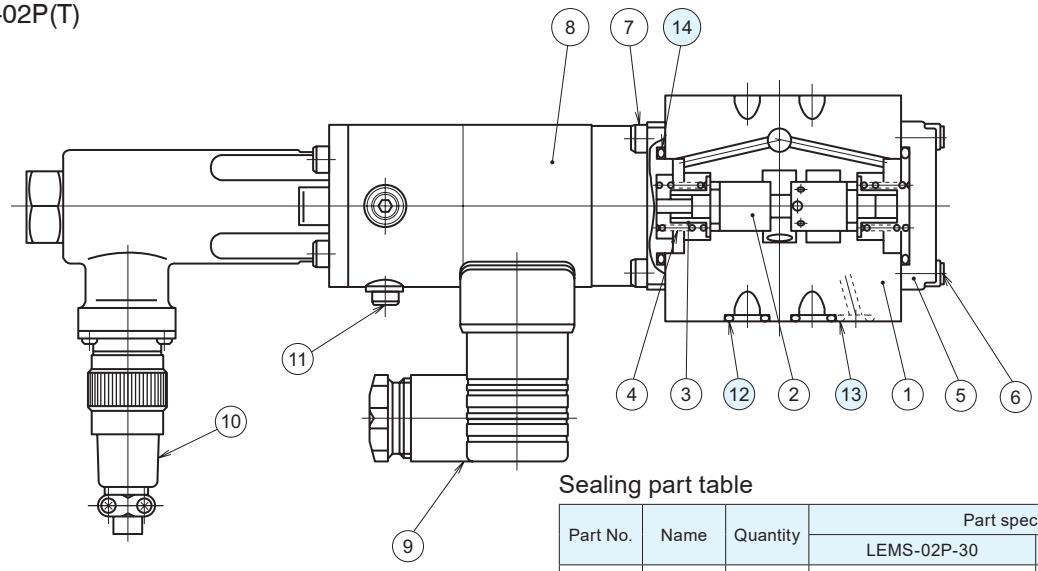
LEMT-G04



Sealing part table

Part No.	Name	Quantity	Part specifications
14	O-ring	4	JIS B 2401 1B P22
15	O-ring	2	JIS B 2401 1B P9
16	O-ring	1	AS568-021 (NBR, Hs90)
17	O-ring	1	JIS B 2401 1B P44

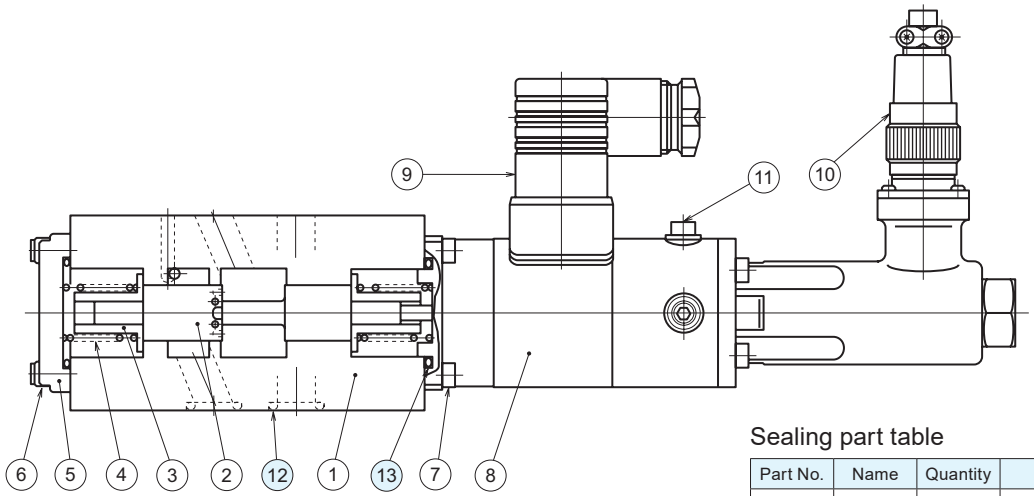
LEMS-02P(T)



Sealing part table

Part No.	Name	Quantity	Part specifications	
			LEMS-02P-30	LEMS-02T-30
12	O-ring	4	JIS B 2401 1B P9	JIS B 2401 1B P9
13	O-ring	1	JIS B 2401 1B P7	–
14	O-ring	2	AS568-121 (NBR, Hs90)	AS568-121 (NBR, Hs90)

LEMS-03T



Sealing part table

Part No.	Name	Quantity	Part specifications
12	O-ring	5	AS568-014 (NBR, Hs90)
13	O-ring	2	AS568-121 (NBR, Hs90)