CAT.No.CBB371E-1

Liquid

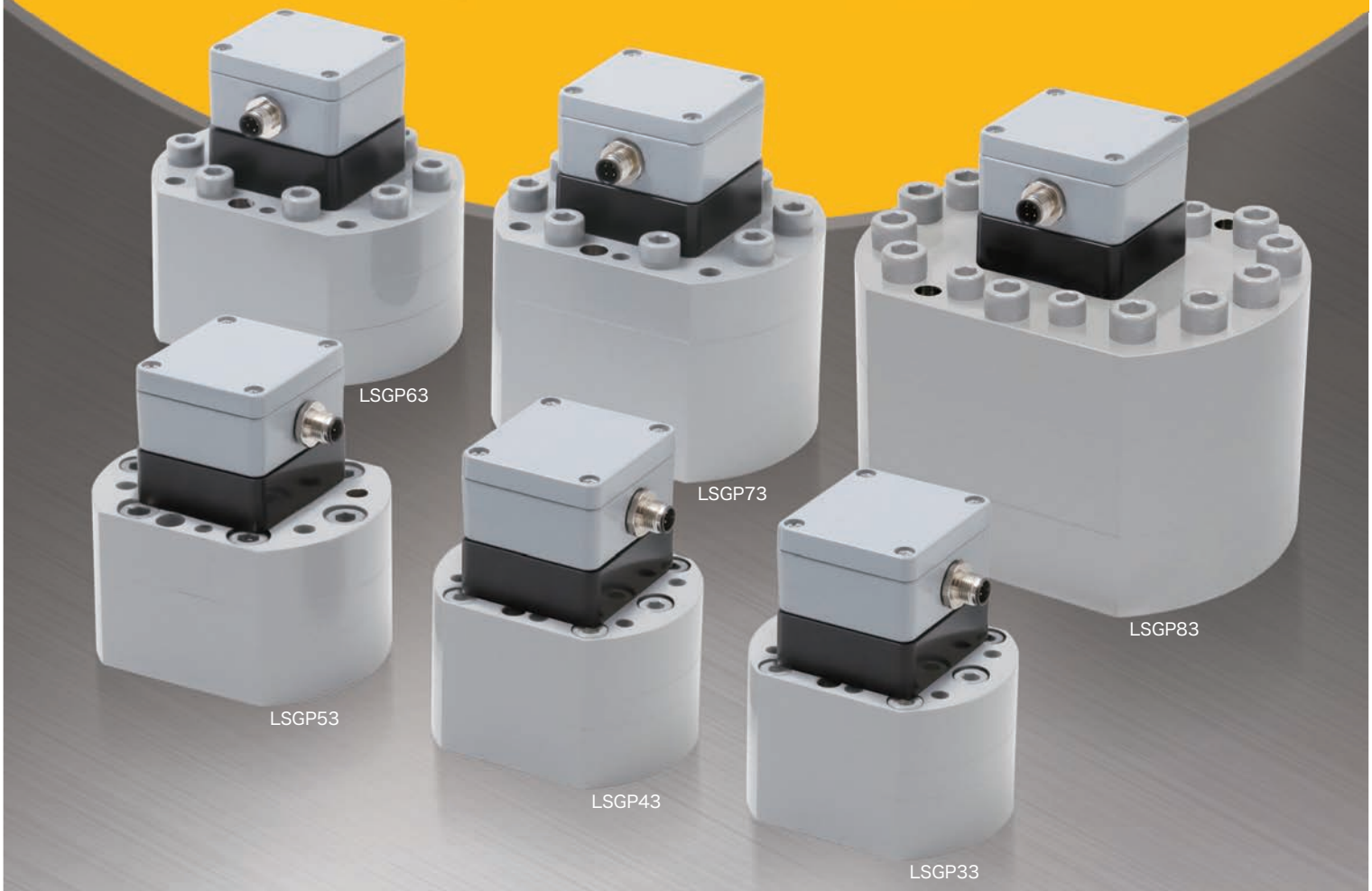
OVAL

Circular gear positive displacement flowmeter

Hi SHOTGEAR

LSGP Series

High-accuracy Flowmeter High Resolution and High Pressure Supported



- Circular gear positive displacement flowmeter made in Japan
- High pressure specification (35 MPa)
- Robust design
- Ideal for hydraulic processes
- Compact design, ideal for integration into equipment

The precision-machined, high-accuracy circular gear positive displacement flowmeter's circular gears rotate when the fluid flows. The rotation is detected by a non-contact external detection unit, and a signal is output. Since each gear tooth can be detected one at a time, fast-response and high-resolution signals are obtained. Since the body has a robust design with high pressure support, the Hi SHOTGEAR can be used for all processes, including hydraulic pressure and automotive oil.

■ GENERAL SPECIFICATIONS

●Body specifications

Model		LSGP33	LSGP43	LSGP53	LSGP63	LSGP73	LSGP83
Nominal resolution		0.1000mL/P	0.2000mL/P	0.4000mL/P	1.000mL/P	2.000mL/P	5.000mL/P
Accuracy		±0.5%RD					
Max allowable pressure		35MPa					
Temperature range		0 to 120℃					
Material	Body	S25C					
	Front lid	SUS316L					
	Back lid	S25C					
	Rotor	S45C					
	Shaft	SUS420J2					
	Bearing	SUJ2 ball bearing					
	Sealing	Standard FKM (Special support available)					
Connection (※1)		ϕ9 (Rc1/4)	ϕ9 (Rc1/4)	ϕ16 (Rc1/2)	ϕ16 (Rc1/2)	ϕ16 (Rc1/2)	ϕ30 (Rc1・1/4)

※1: Specifications shown in the parentheses are those when a sub-plate for GM (optional) is used.

●Transmitter specifications

Power supply specification	10 to 28VDC
Output specification	Voltage pulse (1/0 = Power supply voltage - 2V/1V) Single sensor: Single-phase output Double sensor: Double-phase output (phase difference of 90°)
Current consumption	Single sensor: 15mA Double sensor: 20mA
Explosionproof	Non-explosionproof

■ FLOW RANGE, FILTER SIZE

Model	Standard flow range (※1) 30mPa・s or more 1000mPa・s or less	Maximum flow range (※2) less than 100mPa・s	Low viscosity flow range (※3) 1.5mPa・s or more, less than 30mPa・s	Recommend filter-opening
	L/min	L/min	L/min	μm
LSGP33	0.03 to 7	0.03 to 10	0.2 to 7	10
LSGP43	0.09 to 18	0.05 to 18	0.3 to 18	20
LSGP53	0.2 to 40	0.1 to 40	0.5 to 40	20
LSGP63	0.4 to 80	0.2 to 80	1 to 80	50
LSGP73	0.7 to 120	0.4 to150	2 to 120	50
LSGP83	1.8 to 300	1 to300	4 to 300	50

※ 1：Flow range that guarantees accuracy.
※ 2：Flow range which the flowmeter can work.
※ 3：Flow range which the flowmeter can work when low viscosity fluids are used.

■ PRODUCT CODE EXPLANATION

●Main code

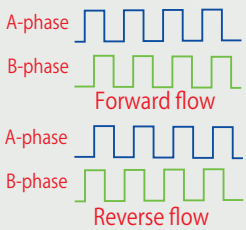
	①	②	③	④	⑤	⑥	—	⑧	⑨	⑩	⑪	⑫	—	⑭	⑮	—	⑰	⑱	—	⑳	㉑	㉒	㉓	㉔	Description
Model	L	S	G																						GEAR METER
Meter size				P	3	3	—																		0.03 to 7 L/min
				P	4	3	—																		0.09 to 18 L/min
				P	5	3	—																		0.2 to 40 L/min
				P	6	3	—																		0.4 to 80 L/min
				P	7	3	—																		0.7 to 120 L/min
				P	8	3	—																		1.8 to 300 L/min
Fluid category								L																	Liquid
Temperature category									1																Fluid temperature: 120°C or lower
Major material										G															Body: S25C Bearing: Ball bearing
Process connection											C	0	—												Standard (Without adapter)
											T	C	—												Rc screw (Adapter included)
Explosionproof														0											Non-explosionproof
Always "0"															0										
Hyphen																—									
Transmitter																	B								PA1N (Single sensor)
																	C								PA1N (Double sensor)
Version																		A	—						Varsion code
Sealing material																				F					O-ring: FKM
																				Z					O-ring: Special
Always "0"																					0				
Accessory 2 (GM harness)																						0	0		Not included
																						0	5		Included Length: 5m (standard)
																						1	0		Included Length: 10m
																						2	0		Included Length: 20m
																						3	0		Included Length: 30m
																						9	9		Included Length: Customer specific (Maximum 30m)
Special specification																								0	Standard
																								Z	Special

●Additional code

Document			
S	E	J	Inspection Certificate (Calibration report) (Japanese)
S	E	E	Inspection Certificate (Calibration report) (English)
S	T	J	Pressure test report (Japanese)
S	T	E	Pressure test report (English)

■ DOUBLE-PHASE OUTPUT

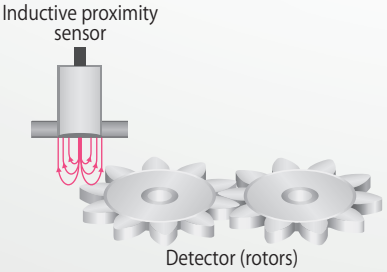
A double-phase output with a phase difference of 90° is provided when a double sensor is selected.
Signal processing at the receiver side enables forward and reverse flow discrimination and improved resolution.



■ PRINCIPLE OF MEASUREMENT

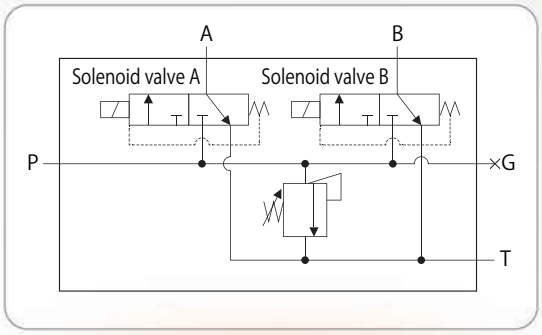
Inductive proximity sensor

An inductive proximity sensor is a proximity switch that generates a magnetic field in the detection area.
It has the feature of high resolution because it can detect each tooth on the sensing element (rotor) one by one.
This method uses a coil coupled to a high-frequency oscillation circuit as the sensing element, and when the sensing body (rotor) approaches, electromagnetic induction causes an induction current to flow and changes the inductance and loss of the sensing coil, causing the oscillation circuit constant to change and the oscillation amplitude and frequency to change, which are used to detect the number of rotations.

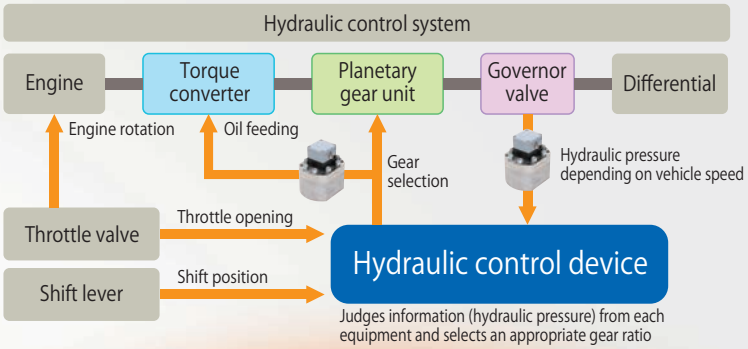


■ APPLICATION EXAMPLE

Hydraulic equipment performance test



Automatic transmission performance test



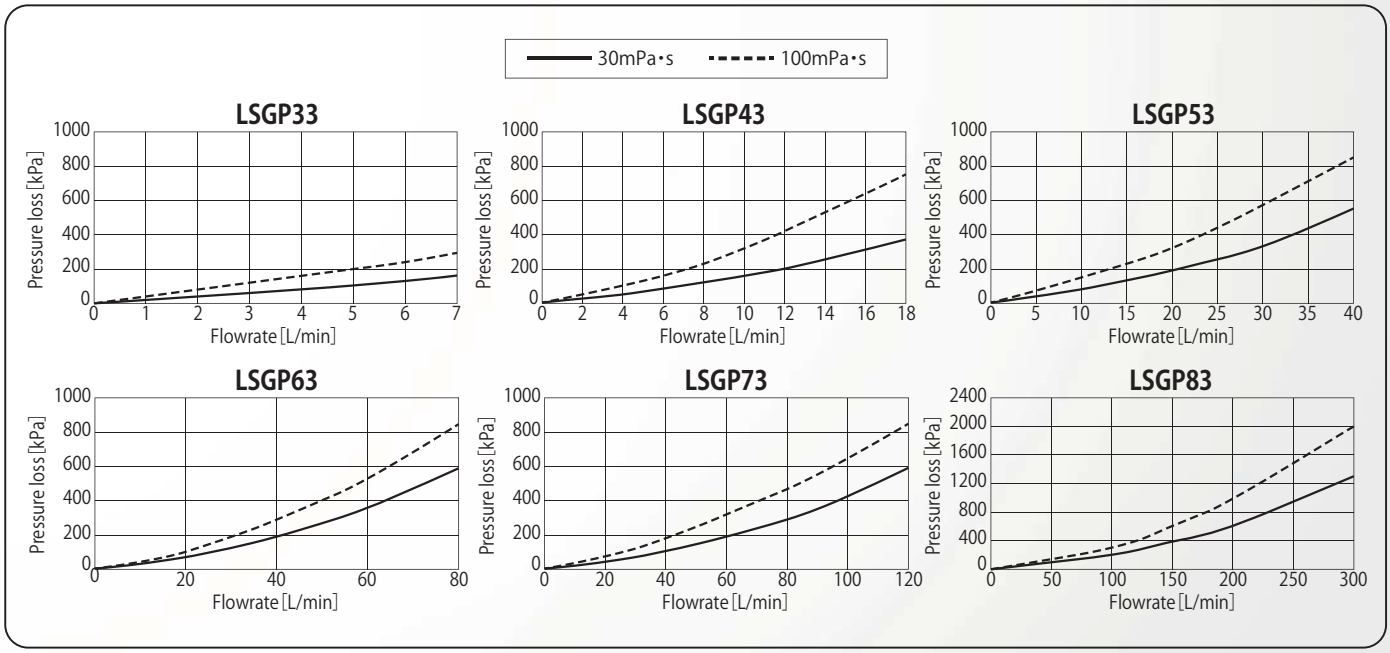
Ideal for performance tests of hydraulic equipment such as valves, pumps and cylinders



Ideal for performance test devices for automatic transmission and engine oil



■ PRESSURE LOSSES



■ INSTALLATION CONDITIONS

●Mounting orientation

There is no restriction on mounting orientation.

●Piping procedure

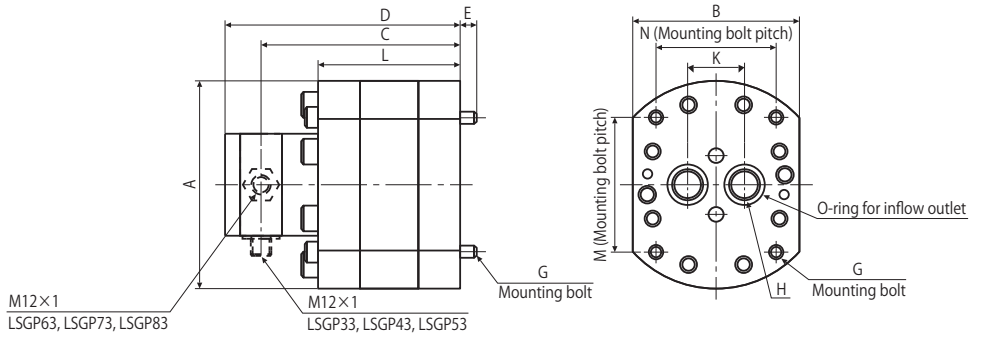
(1) The sensor part of the gear flowmeter uses a proximity sensor and is highly sensitive to external magnetic fields. Therefore, to eliminate the effects of external magnetic fields, please install it at a location 5 meters or more away from equipment and wires that generate strong magnetic fields or electric fields, such as motors and generators.
(2) If you need to install an electric trace, please consult OVAL sales office or nearest representative.
(3) When heat insulating, please make sure that the insulation material does not touch the transmitter.

●Wiring procedure

Because of the circuit design, the housing and COM. (one potential of the power supply) for this product are common.

■OUTLINE DIMENSIONS

Unit: mm

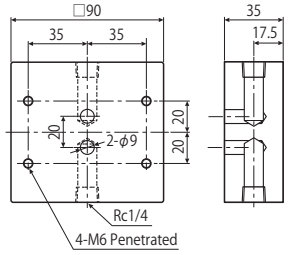


Model	A	B	C	D	E	G ※1	H	K	L	M	N	O-ring for inflow outlet
LSGP33	ϕ100	80	93	114.5	11.5	M6×70	ϕ9	20	58.5	70	40	P14
LSGP43	ϕ100	80	95.3	116.8	14.2	M6×75	ϕ9	20	60.8	70	40	
LSGP53	ϕ115	90	99.6	121.1	14.9	M8×80	ϕ16	34	65.1	80	38	P21
LSGP63	ϕ130	100	102.5	124	12	M8×80	ϕ16	34	68	84	72	
LSGP73	ϕ130	100	119.5	141	15	M8×100	ϕ16	34	85	84	72	
LSGP83	ϕ180	140	146.4	167.9	18.1	M12×130	ϕ30	45	111.9	46	95	P36

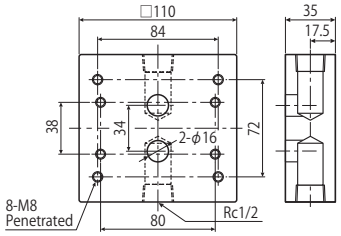
※1: A bolt of the dimension G is included with the GEAR METER.

■SUB-PLATE FOR GM (SOLD SEPARATELY) DIMENSIONS

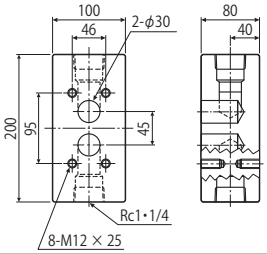
Adapter for LSGP33 and 43



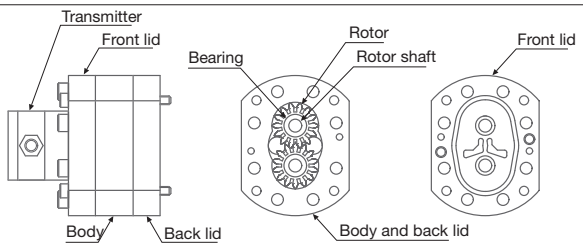
Adapter for LSGP53, 63 and 73



Adapter for LSGP83

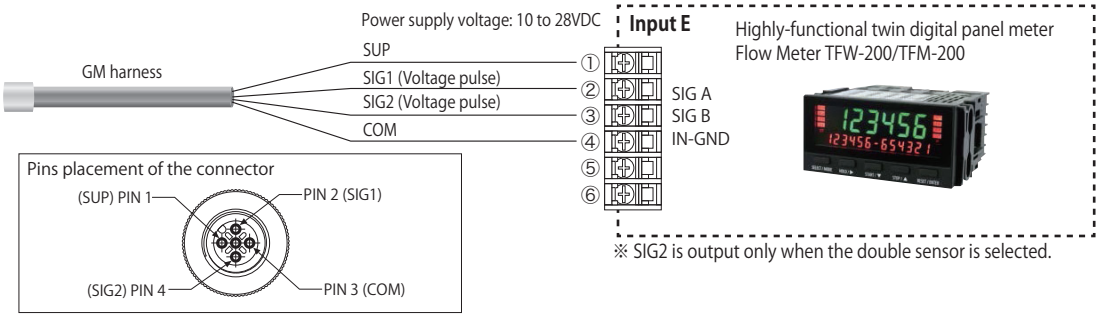


■ NAME OF EACH SECTION



■ WIRING DIAGRAM





For Hi SHOTGEAR, Flow Meter (TFM-200, TFW-200) with capabilities of various calculation such as high frequency input is the best!

(Note) TFM-200 and TFW-200 are products of ATSENSE INC.

■ CAUTIONS (Please note the following points for correct and safe use of this flow meter.)

1. Select the appropriate pump and install the appropriate valve based on the data from the flow meter and strainer's flow range, operating pressure, and pressure loss to ensure the required flowrate and pressure and to prevent excessive flow or pressure rise.
2. Place the flow meter body and GM harness as far as possible from electromagnetic field sources such as pumps, solenoid valves, and electric valves. (For example, keep at least 10cm away from a solenoid valve with a power consumption of around 10W.)
3. Install a sunshade or similar protection if there is a risk of the counting part being exposed to high temperatures due to direct sunlight or reflected heat.
4. This flow meter is intended for indoor use only. Do not use it outdoors.
5. The flow meter does not have a subtraction function. In applications with fluid pulsation (where fluid moves back and forth in the piping due to pressure fluctuations) or backflow, pulses will be output regardless of the flow direction.
6. If the secondary side is opened and high-pressure fluid suddenly flows, the bearing will be loaded and may fail. Also, do not repeatedly start and stop the operation suddenly.

The specification as of November, 2025 is stated in this catalog. Specifications and design are subject to change without notice.

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