

GAS, STEAM, LIQUID, OIL MASS FLOWMETER Specialty Manufactures

Company Profile

www.goldenrules.co.kr



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1-1. Company Profile

CEO Greeting

Golden Rules Co., Ltd. is the only professional manufacturer of mass flow meters in Korea with trust and expertise.

Based on 37 years of experience in Konix, Woojin Group, and Hightroll, as well as accumulated German technology, a mass flowmeter was developed in Korea after much effort, and after verifying its performance in the field of Pilot Plant and R&D, the Procurement Service and We supply to all industries and export to overseas.

Our company's only domestic thermal mass flowmeter and FN mass flowmeter are used in plants such as aerospace industry, semiconductor, steel, power plant, chemical, shipyard, etc. for steam, hydrogen, oxygen, nitrogen, argon, LNG, LPG, CO2, It is delivered for precise flow measurement such as oil, and all employees are doing their best for quality control to satisfy customer needs.

We promise that customers who have used our products even once will be lifetime customers, and with the best domestic technology, solutions, and service spirit, we promise to be the golden rule to run wherever the customer calls and take responsibility until the end.

Golden Rules CEO Hong Han-mo

Management philosophy



-God and the world -Company and people -CEO and employee

The middle † means the power of Jesus to connect the two worlds. "Do you also treat others as you wish to be treated by others, for this is the law and the prophets" (Matthew 7:12).



1-2. Company Profile

Vision

-Golden Rule Co., Ltd. strives to help partners succeed and create value with the spirit of the golden rule.

-Golden Rule Co., Ltd. is committed to product development research, management guidance, education and training, with the commitment to become God's entrepreneur.

-Golden Rules CO., Ltd. becomes a professional total flow meter manufacturers recognized to excel in the domestic industry.

-Golden Rule Co., Ltd. becomes a manufacturing company that always provides the best quality to customers.

-Golden Rule Co., Ltd. becomes a company that practices the best A/S wherever customers call

History

Jun. 2023 Received order for FN mass flow meter and other orders as the first domestic import substitute for steam facility improvement in Gochang, Korea Apr. 2023 After passing the FN mass flowmeter performance and durability test for steam at LG Electronics' Cheongju plant, it is being applied to large companies such as POSCO.

January 2023 Supply for hydrogen and gas trading to large companies (Hyundai Motors, LG Energy Solutions, Toray Advanced Materials, EcoPro BM, etc.) December 2022 First implementation of mass flow meter pilot plant for precise measurement of lithium hydroxide crystallization facility for semiconductor secondary fuel cell

November 2020 Acquisition of direct production confirmation certificate (the first thermal mass flow meter in Korea)

Sep. 2020 Compressed air exclusive signal & communication product release

June 2020 Pitot tube type FN mass flow meter product launch

Feb. 2020 Korean Fighter KF-21 Fuel System Integrated Rig Test Facility FN Mass Flow Meter Pilot Plant for the first time for precise measurement

June 2019 Acquisition of Environmental Management System Certificate (ISO 14001:2015)

March 2019 Completed OEM manufacturing of mass flow meter for steam and electromagnetic flow meter for liquid

Jan. 2018 Acquired KC certificate (registration number R-REM-GRc-2610GI)

September 2016 Patent registration by the Korean Intellectual Property Office (Patent No. 10-660226): Thermal mass flow meter March 2016 Patent registration by

the Korean Intellectual Property Office (Patent No. 10-1606497): FN-mass flow meter

February 2016 Company expansion and relocation (Smart Valley Building A 1805, 30 Songdo Mirae-ro, Yeonsu-gu, Incheon)

Nov. 2015 Supplied 56 units of LNG, in-line, and explosion-proof type for burner supply to Hyundai Powertech Dangjin Plant

July 2015 Patent Office Trademark Registration (Registration No. 40-1118499)

August 2014 Supplied 59 units of hydrogen gas mixture explosion-proof type to POSCO Pohang 1,2,3DNL electric steel sheet

June 2014 Established Golden Rule Co., Ltd. Jan. 2014 Relocated the company (Songdo New Town Smart Valley Building A 1810) Apr. 2012 Obtained explosion proof certificate from Gas Safety Corporation (Ex d(ib) llc T4) Oct. 2011 Launched mass-produced thermal mass flow meter Sep. 2011 Completed quality supplementation for mass production and sales of thermal mass flow meters Jan. 2009 Launched a new thermal mass flow meter (model: KC-2600 Series) Nov. 2008 Patent Office trademark registration application (Registration No. 40-1118499 No. 09 flowmeter, etc. 250 cases) November 2008 Completed field test for new thermal mass flow meter June 2008 Imported thermal mass flow meter module type flow sensor Feb 2008 Completed development of a transmitter for thermal mass flow meters December 2006 Started research and development of transmitters for thermal mass flow meters Jan. 2005 Imported thermal mass flow meter and sold OEM products Established KC Mes Korea in October 2004





3. Products



Golden Rule Co., Ltd. manufactures the most advanced and technologically superior thermal and differential pressure mass flow meters in Korea, and is striving to leap into a total flow meter specialized company with the goal of increasing domestic and overseas exports. Golden rule is to produce the most advanced and technologically superior thermal mass flow meters and pressure differential in the country, aimed at increasing domestic and foreign exporters strive to become a total flowmeter specialist. The thermal mass flowmeter produced by Golden Rule Co., Ltd. was the first in Korea to be patented for polluted gas (No. 10-166026), and

the differential pressure mass flowmeter, which was developed domestically, is being supplied to large companies and government offices. Provides all input/output specifications and accurate flow information required by the user.

For more information, please visit our website, www.goldenrules.co.kr.

Guaranteed performance

The KC-2600 series model and KC-7730 series produced by Golden Rule Co., Ltd. are state-of-the-art mass flow meters with the latest technology and are used to measure the flow rate of general gas, steam, liquid, oil, etc., and 0.5% RD when installed on site. Maintain its precision.

Products

Main Product 1 •KC-2600 Series: Thermal mass flow meter that measures flow with gas insertion valve type and flange connection type

•KC-7730 Series: Differential pressure mass flow meter for high temperature and high pressure measuring the flow rate of steam, oil, liquid, air and gas

•KC-2700 Series: MFC & MFM measuring gas flow





Product 3-1 : FN-MASS FLOWMETER

performance

Golden Rule's KC-7730 Series high-performance differential pressure mass flow meter senses the flow of fluid in industrial sites, and is applied to places such as fluid flow adjustment and measurement. It is a fixed type sensor installation and uses a microprocessor to measure flow, adjust flow, and diagnose at the same time. It can be applied according to the instantaneous value of mass flow rate, accumulated amount and environment setting, and is displayed on the 2*6 LCD panel.

Programmable transmitters are easily configured via RS-485S communication port and Golden Rule high performance interface software or instrument panel display.

In Golden Rule's KC-7730 Series, instantaneous flow rate, accumulated flow rate, response speed, potential cut-off, flow rate correction factor, etc. are initially protected by a passwor and can be changed by the user.

You can check the performance of the instrument through Golden Rule's smart interface[™] software guide, and you can select input power, output, installation, and packaging method according to the user's request.

Features

The KC-7730 Series differential pressure mass flow meter for high temperature and high pressure has various advantages as follows.

- \cdot Microprocessor converter MC
- · Quick maintenance possible through localization
- \cdot Accuracy (R.D \pm 0.5%)
- Turndown ratio 20:1 (Option 50:1)
- \cdot basic Instantaneous and accumulated flow display (LCD)
- · Measurement method of mass flow rate
- Measurement flow velocity (0.1~100m/s)
- \cdot Explosion-proof type (Ex-proof IP67: Ex d IIC T6) Atex
- \cdot Simple signal processing and calibration in the field
- \cdot DC24V, DC4~20mA, RS-485 basic function
- \cdot Fast response speed, high accuracy, excellent durability, low price
- \cdot Excellent reproducibility and repeatability, excellent long-term stability
- \cdot Best price/performance ratio, no moving parts
- Easy adaptability to other applications
- \cdot Wide flow range (small flow rate 20A~50A, large flow rate 50A~500A)
- There are few straight pipes of the upper pipe (insertion type 10D, in-line type 5D) However, lines with almost no straight pipe parts can be adjusted by adjusting the flow nozzle.
- Fast response speed according to flow rate change (0.1 sec)
- \cdot For steam: -20~400°C, For gas: -40~400'C, For liquid and oil: -20~400°C
- Operating pressure: 10Bar (Option: 400 Bar)
- Use loss: As it is a direct calculation method, it is very small compared to the existing differential pressure method (less than 0.1~0.3Bar)
- \cdot Almost no breakdown, low maintenance cost
- · Inexpensive installation construction cost (integral type that does not require installation of interface devices for temperature and pressure compensation)
- \cdot Almost no option specifications compared to imported products



Product 3-1 : FN-MASS FLOWMETER

World's first integrated differential pressure mass flow meter patent

Volume and mass flow rate (instantaneous, accumulated) /temperature/pressure/density/energy quantity display and RS485 communication data with one flow meter Controllable

Responding to customer needs with fast response speed and \pm 0.5% R.D precision control Energy savings due to Can be minimized.

Temperature pressure compensation type differential pressure mass flow meter Patent No. 10-1606497

- The world's first developed new technology certified domestic product
- Gas, corrosive gas, steam, liquid, oil can be measured
- Flange & flangeless installation possible
- Applied to places that cannot be measured with existing flow meters (for high temperature and high pressure)
- High temperature, high pressure and pressure loss, in lines without straight pipes at the front and rear ends Available by adjusting flow nozzle and orifice
- Explosion proof certificate (IP67: Ex d IIC T6) Atex

Temperature pressure compensation type differential pressure mass flow meter

General type KC-7730 Series Expolsion Proof type KC-7730-FM153B Series





3-1. Technical

Differential pressure mass flow meter with integrated temperature and pressure compensation



V-Cone type

Flow measurement principle

■D/P type-Mass Flow Sensing

The unique mass flow meter of Golden Rule Co., Ltd. guarantees the excellent accuracy, robustness and reliability of industrial flow meters. The Mass Flow sensor is a mass flow meter that uses a flow nozzle with the lowest pressure loss. It is a calculation method using its own patented technology. It is a mass flow meter that has obtained a new technology certification that derives the flow rate with advanced calculation under the variable physical properties of the actual fluid. It is capable of engineering under demanding conditions in the industrial field and is developed with domestic proprietary technology to minimize industrial losses and secure technician guidance, and is a measuring device with excellent accuracy and stability. By configuring a communication network (RS-485), you can monitor the progress of the mass flow meter, and install an automatic valve to control the mass flow rate set by the user. It complies with ISO 5167 industry standard for Flow Nozzle and is made with ISO 9001 quality management system.

Application

Simply select to suit the application

	Туре		Thermal mass			FI	D.111	
Application			Inline	Insertion	Ultrasonic	Electromagnetic	Diff_pressure	Vortex
	Object of Gas			0	0	0	0	0
Object of			0		Х	Х	0	0
Measurement	Va	por	0		Х	Х	0	0
	Steam		0		Х	Х	0	0
	Cor	ntrol	0		0	0	0	0
Application	Monitor		0		0	0	0	0
	Supply		0		Х	0	Х	Х
				-40 to 400℃	-40 to 200℃	-20 to 120℃	-40 to 600℃	-40 to 200℃
	Temperature		Liquid	-20 to 400°C				
Operating				-20 to 400°C				
condition	Pres	Pressure		x 400 bar	-	-1 to 2 Mpa	-1 to 42 Mpa	Max 5 Mpa
	Pressure loss Range ability		Negligible		None	None	None	Small
			Large		Large	Large	Small	Medium
	Bore		Ø8	to Ø6000	Ø13 to Ø6000	Ø2.5 to Ø300	Ø2.5 to Ø300	Ø4 to Ø100
Installing	Straight upstream		1D	7D	10D	10D	30D	15D
condition	Pipe length	Downstream	0D	3D	5D	5D	15D	5D
condition	Piping work		Required		Not required	Required	Required	Required
Explosion-proofing		n-proofing	0		Х	Х	0	0
	Accuracy		Gas	±0.5% R.D		±0.5% of rate		
Performance -			Liquid	±0.5% R.D	±1% of rate		±1.5% of rate	±1% of rate
			Steam	±0.5% R.D				
	Velocity		Gas	0.1~100m/s		0.3~10m/s	2.0~120m/s	1.5~80m/s
			Liquid	0.1~100m/s	-16~+16m/s		1.0~10m/s	0.5~10m/s
			Steam	0.1~100m/s				



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Product 3-2 : THERMAL MASS FLOWMETER

Performance

Golden Rule's KC-2600 Series high-performance mass flow meter senses the flow of fluid in industrial sites and is applied to places such as fluid flow adjustment and measurement. It is a fixed type sensor installation and uses a microprocessor to measure flow, adjust flow, and diagnose at the same time. It can be applied according to the instantaneous value of mass flow rate, accumulated quantity and environment setting, and is displayed on 2Line X LCD panel.

The programmable transmitter is easily configured via the RS-485S communication port and Golden Rule high-performance interface software or the instrument panel display. In Golden Rule's KC-2600 Series, instantaneous flow rate, accumulated flow rate, response speed, potential cut-off, flow rate correction factor, etc. are initially protected by password and can be changed by the user.

The performance of the instrument can be checked through Golden Rule's smart interface[™] software guide, and input power, output, installation and packaging methods can be selected according to the user's request.

Features

The KC-2600 Seres thermal mass flow meter has various advantages, including:

·Microprocessor converter MC ·Quick maintenance possible through localization ·Accuracy (F.S \pm 0.5%) •Turndown ratio 1000:1 default Instantaneous and accumulated flow display (LCD) ·Measurement method of mass flow rate •Measurement flow rate (Gas 0.01~66.2m/s) ·Indoor and outdoor use (IP67, IP65) and explosion-proof type (intrinsically safe + pressure hydrogen explosion-proof type Ex-proof: IP66) ·Simple signal processing and calibration in the field ·DC24V (or general type: AC100~240V), DC4~20mA, Pulse, RS-485 basic function •Fast response speed, high accuracy, excellent durability, low price •Excellent reproducibility and repeatability, excellent long-term stability ·Best price/performance ratio, no moving parts Easy adaptability to other applications •Wide flow range (small flow 1/4"~1", large flow 1" or more~118") ·Less straight pipe part of upper pipe (insertion type 7~3D, inline type 3~0D) •Response speed according to flow rate change is fast (1 second) •For gas (air, various gases, biogas): -40~150°C •Operating pressure: 10Bar (Option: 70Bar, 3/4" robust sensor probe) Very simple installation and low maintenance cost ·Installation construction cost is very low ·Almost no option specifications compared to imported products



Product 3-2. : THERMAL MASS FLOWMETER

Patent for the first thermal mass flow meter in Korea Thermal mass flowmeter measuring without temperature and pressure correction Monitoring through display and RS485 communication data

Responding to customer needs with fast response speed and $\pm 0.5\%$ control Applicable to HN mixed gas process of biogas production site and steel mill. It can be used at low flow rate and natural pressure.

THERMAL MASS FLOWMETER Patent No. 10-1660226

- · First developed domestic product in Korea
- \cdot Very poor flow meter for polluted gas
- Measurement in the environment (moisture, dust, etc.)
- \cdot Measurement flow rate: Measured from a low flow rate of 0.01 m/s
- \cdot Applied to places where measurement is impossible with existing flow meters
- Excellent for high and low pressure lines and low flow measurement The only domestic XT (internal pressure) + sensor (intrinsically safe) Acquired hydrogen explosion proof certificate (Ex d(ib) IIC T4)

For Polluted gas THERMAL MASS FLOWMETER KC-2600 series



What is a thermal mass flow meter



Flow measurement principle

■Ther mal Mass Flow Sensing

Golden Rule's unique Mass Flow probe guarantees the excellent accuracy, robustness and reliability of industrial flow meters. The Mass Flow sensor is composed of two sensing units, one is a flow rate sensor and the other is a temperature sensor that automatically compensates for changes in gas temperature. The new device consists of two thermal platinum resistors on a single chip. A high ohm resistor is used to measure the reference temperature, while a low ohm resistor is used as a heater. By using a bridge circuit, self-heating occurs with different resistance values of the two elements. Self-heating depends on the supply voltage, mass flow and the medium in which the sensor is located. Higher voltage increases self-heating, and higher flow increases cooling. If self-heating is continuously maintained by a suitable controller, the voltage will increase with a high flow rate, so mass flow can be measured.

Application

Simply select to suit the application

Application	Т			mal mass insertion	Utrasonic	Electromagnetic	Diff_pressure	vortex
	Li	Liquid		Х	0	0	0	0
Object of	Gas			0	Х	Х	0	0
Measurement	V	Vaper		0	Х	Х	0	0
	steam		Х		Х	Х	0	0
	cc	ontrol	Х		0	0	0	0
Application	Ma	onitor	0		0	0	0	0
	Su	upply		0	Х	0	Х	Х
Operating	Temperature		Air Gas Bio Gas	- 40 to 150°C - 40 to 150°C - 40 to 150°C	-40 to 200°C	-20 to 200°C	-40 to 600°C	-40 to 200°C
condition	Pressure		Ma	x 70bar	-	1 - 2 Mpa	1 - 42 Mpa	Max 5 Mpa
	Pressure loss		Ne	gligible	None	None	None	Small
	Range ability			Large	Large	Large	Small	Medium
	Bore		Ø8 t	o Ø6,000	Ø13 to Ø6,000	Ø2.5 to Ø300	Ø2.5 to Ø300	Ø4 to Ø100
Installing	Straight	upstream	1D	7D	10D	10D	30D	15D
	Pipe length	downstream	0D	3D	5D	5D	15D	5D
	Pipiı	ng work	Required		Not Required	Required	Required	Required
	Explosion-proofing		0		Х	Х	0	0
Derferrer	Accuracy		Air Gas Bio Gas	±0.5% F.S ±0.5% F.S ±0.5% F.S	±1% of rate	±0.5% of rate	±0.5% of rate	±1% of rate
Performance ·	Velocity		Gas	0.01~66.2m/s 0.01~66.2m/s 0.01~66.2m/s	—16 ~ 16m/s	0.3 ~ 10m/s	2.0 ~ 120m/s 1.0 ~ 10m/s	1.5 ~ 80m/s 0.5 ~ 10m/s



3-2. Technical

Thermal mass flow meter insertion type installation method



Installation of Golden Rule Thermal Mass Flow Meter (Ball Valve Mounting Type)

- 1. Install the provided NIPPLE vertically and horizontally in the center of the pipe.
- 2. Connect the ball valve to the installed NIPPL.
- 3. Attach a 25A-20A bushing to the ball valve and install a fitting 3/4".
- 4. Insert the sensor so that the front side of the flow meter is visible.
- 5. As shown in the drawing, the location of the sensor detection unit is installed according to the midpoint of the pipe.

Notes

1. After installing the nipple, ball valve, bushing, and compression fittings (NIPPLE, BALL VALVE, BUSHING, FITTING), insert the flow meter, and then tighten the nut of the compression fitting at least 3 turns.

At this time, be careful as it may leak if it is tightened loosely.

2. In case of using DC type, the power must be 24V 2A or higher. Otherwise, the sensor may be damaged by overloading.

3. For wiring method, refer to manual and wiring diagram. Or, please refer to the manual and wiring diagram in the data room on the website of www.goldenrules.co.kr.



4-1. Delivery performance 1 : 1,991 EA Thermal Mass Flowmeter

Compressed air energy management system Project ~ 192 EA	aegu Dalseong Industrial Complex & Gumi Industrial Complex, currently 99 units installed after receiving 250 units (Korea Sinter Metal Co., Ltd., Daehan Textile Co., Ltd., Daedong Metal Co., Ltd., FoodWill Co., Ltd., SJ Tech Co., Ltd., L&F Co., Ltd., Taekyung Nongsan Co., Ltd., Daegeon Industrial Co., Ltd., Hot Air Heat Treatment Seongseo Plant, Woorim Industrial Co., Ltd., Woosung Powertech Co., Ltd., Jinyoung R&S, ILJIN Composites etc), Gyeongnam & Busan Industrial Complex, Daehan Textile, Yujin Fluid, SK Chemicals, Namdong Industrial Complex Yeonwoo, Daeyoung & Samhwan Dyeing, Fuso Engineering Gwangju		
EXPORT ~ 111 EA	Exported to Pakistan, Indonesia, Philippines, Vietnam, Ukraine, Nigeria, Iran, Poland, China, Romania, etc.		
CITY GAS ~ 36 EA	Daesung Energy, Korea Gas, KC Heat, Korea Gas Corporation (Samcheok, Tongyeong), Seongmun Industry, KCC Daejuk Plant, Gaswell, Dongseo & Jinyang Ascon, Daejeon Sewage Treatment Plant, Dangjin Dongbu Steel, Eugene MS Daegu, Busan Environment Corporation Myeongji Office, AKC INC., Daechang Co., Ltd., Kolon Glotech, Doosan Energy		
SHIPYARD ~ 88 EA	Hanjin Heavy Industries, Philippines Subic Shipyard, Hyundai Heavy Industries Special Ship, Daewoo Shipbuilding & Marine Engineering, Daehan Chosun Yeongam, etc.		
R&D ~ 131 EA	POSCO Research Institute, Pohang Institute of Industrial Science and Technology, KRISS, Korea Electric Power Research Institute, Defense Science and Technology Center, Seoul National University, Yonsei University, Kyungpook National University, Pusan National University, KIST, Doosan Heavy Industries & Construction Research Institute, U.S. UTC POEER, Hydrangea, Samsung Electronics Gwangju Research Institute, China Carbon Black, Cheonan Automotive Parts Research Institute, Meteorological Research Institute, Samsung Techwin, Kenertech, Embroidery Tech Research Institute, Korea Institute of Machinery and Materials, Korea Aerospace Research Institute, Korea Institute of Energy Research, Korea Institute of Energy Research, Institute of Energy Technology Evaluation, Korea Aerospace Industry, Korea Institute of Energy Research, Institute of Energy Technology Evaluation and Planning, Korea Aerospace Industries, KEPCO Research Institute, Gwangmyeong Electric, Innowill, Techwin, Sungkyunkwan University, Doosan Fuel Cell, Doosan Energity		
STEEL ~ 394 EA	POSCO Pohang/Gwangyang (259 units), Hyundai Steel Incheon/Dangjin (16 units), Y.K Steel, Steel Ceramics, Korea Steel, China Jilin Integrated Steel, Dongbu Steel Dangjin Plant, Dongkuk Steel Pohang, Hyundai Steel Suncheon Plant (25 units), Hyundai Yulchon Forging Plant (2 units), Shinhwa ENG (6 units)		
WATER REGENERATION CENTER & WATER PURIFICATION PLANT ~ 384 EA	Tancheon, Nanji, Mansu, Goseong-gun, Yangpyeong, Suwon, Daejeon, Busan Jangrim, Busan Suyeong, Donghae, Hoengseong Raincheon, Cheongju Environmental Office, Anseong 2nd Industry, Gunsan, Mungyeong, Damyang, Gwangju Docheok, Busan Jangrim, Dangjin-gun Ancient Bugok, Gwangju Mangwol-dong, Goryeong-gun Dasan, Gajwa, Lotte Samgang, Dongkuk Pharmaceutical, Gyeongnam Yangsan, Asan-si, Taebaek, Shinae-ri, Sujirespia, Powol Agricultural Industrial Complex, Incheon Metropolitan Area Landfill, Chukryeongsan Natural Recreation Forest Drainage, Busan Environmental Corporation, Geoje Island, Jeonju Gui Land, Kim Hae-rye sewage treatment plant, Yeoju, Incheon Gongchon, Ansan, Chilgok, Pocheonil-dong Sewage Treatment Plant, Ilto C&M Longevity Office, Yangju, Yongin Incineration Plant, Wonju I-Sense, Jinro Fermentation Ansan, Panasia, Dongdaemun Environment Corporation, KEC, Daejeon Wolpyeong Water Purification Plant, Water Resources Corporation, Gwangyang Municipal Industrial Complex Wastewater, Jeonbuk Sewage Treatment Plant, Yeosu Dundeok Water Treatment Plant, Mokpo Water Quality Management Facility, Cheongsong, Sangju Sewage Treatment Plant, Metropolitan Area Landfill, Jeonnam Gurye, Gangwon-do Sewage, Jeonnam Sewage, Hoengseong Sewage, Pocheon Incinerator, Wonju Sewage, Jeonbuk Iksan Sewage , Hwasundong-myeon wastewater, Gwangju Environment Corporation, Sokcho sewage, Water Resources Corporation Cheongsong, Jeonnam Gurye sewage, Najusanpo sewage, Jincheon sewage, Wonju Enterprise City, Gongju sewage, Busan Nambu sewage, Daegu public facilities Dalseong, Muju sewage, Haenam Water Purification Plant, Gimpo City Clear Water Office, Naju Sanpo Sewage Treatment Plant, Changwon Vibration Sewage Treatment Plant,		



4-1. Delivery performance 2 : 1,991 EA Thermal Mass Flowmeter

BIO GAS ~ 239 EA	Vietnam Pok-Hip, Jangsu Combined Heat and Power Plant, Gimpo, Gyeongbuk Yeongcheon, Mokpo Landfill, Damyang Livestock Manure, Chungnam Asan, Seogu Landfill, Songpari Clean Center, KT Chemical, Hongcheon, Jeju, Jeonju Paper Cycling Town, Cheongju Environment Office, Gyeongsan Surplus Gas Burner, Songdo Re-Clean Center, Incheon Negative Wastewater Biogas, Incheon Metropolitan Area Landfill, Incheon Dream Park Cultural Foundation, Gyeongbuk Yeongcheon Bio, Daejeon City Corporation, Coca-Cola Yeoju, PR Energy, Gwangju Environment Corporation, Jeonju Public Sewage Treatment Plant, Pyeongtaek Livestock Wastewater, Hanmi Pharmaceutical Pyeongtaek, Daekyung Esco, Iksan Sewage Treatment Plant, Uljin Livestock Manure Treatment Plant, Daegu Yeongcheon, Guri, Gulpocheon Sewage Treatment Plant, Seoanju Jeong Gunsan, Gaswell, Yeosu Landfill, Miryang Livestock Waste Treatment Plant, Cheonan Sanitary Landfill, Yangsan Cogeneration, Daegu Environmental Corporation, Gunwi Livestock Manure, Bio Energy Farm Asan, Daegu Environment Corporation Sangri, Hallasan Bio, Korea Environment Corporation Sokcho sewage sludge, Haenam Water Purification Plant, Gimpo Clear Water Office, Korea Environment Corporation Unjeong-dong Landfill, Yeoncheon Public Sewage Treatment Facility Phase 3, Korea Environment Corporation Sokcho Dregs			
Automatic Clean Net Room for Food Waste~17 EA	Seongnam Pangyo, Daejeon, Songdo, Gwangmyeong, Sejong City's first village			
POWER PLANT ~ 35 EA	Yeongdong, Jeju, Ulsan complex, Hadong thermal power plant, Osan thermal power plant, GS Dangjin Power Plant, KEPCO Nuclear Fuel, Oksan NT Power Plant			
CHEMICAL ~ 34 EA	KP Chemical, Hyosung (Ulsan, Vietnam, China), LG Life Science Jeonju Plant, Taekyung Chemical, Kumho Petrochemical Ulsan, LG Chemical Daesan/Cheongju, SK Chemicals Ulsan, Hanmi Fin Chemicals, Hanwha Chemical Yeosu, Lotte Chemical Ulsan, Shinchang Yeosu Plant, POSCO Chemical, KCC Yeosu Plant, KCC Daejuk Plant, HRS Pyeongta, Heesung Catalyst			
MACHINE ~ 34 EA	Bearing Art Yeongju Plant~17 units, NSK Korea Cheonan Plant~14 units			
Medicine,food,communication,cement ~ 16 EA	Samsung Biologics ~ 2 units / Dongseo Food, Namyang Dairy ~ 3 units / KT Busan ~ 2 units / Halla Cement (1 unit) & Hanil Cement (Gongju, Mokpo, Haman, Gaya Plants ~ 4 units) Maeil Dairies Gochang Sangha Factory,			
Bridge, resource recovery ~ 28 EA	Busan Gwangan Bridge, Yeongjong Bridge ~ 20 units / Gyeongnam Yangsan & Mokdong Yangcheon			
Car, engine ~ 82 EA	Hyundai Powertech Dangjin plant (56 units), Hyundai's Ulsan plant (5 units), Kia's Hwaseong plant (1 unit), etc.			
Semiconductor ~ 61 EA	Samsung Electronics Suwon/Hwaseong Plant, LG Siltron Gumi Plant, LG Electronics Cheongju Plant			
Construction, engineering company~109 EA	POSCO E&C, Samsung C&T, Lotte E&C, Hyundai E&C, Hanwha, Halla OMS, Doosan E&C, Taeyoung E&C, Hanyang Engineering			



Golden Rules 4-2. Delivery performance 1 ~ 345 EA

Client	Enduser	Model		
The Yoon Synergy	The Yoon Synergy	FN-MASS KC-7730A, Compressed Air		
ILJIN AIR TECH	ILJIN AIR TECH	FN-MASS KC-7730A, Compressed Air		
COMP KOREA	COMP KOREA	FN-MASS KC-7730A,Compressed Air ~ 17EA		
Daejeon Urban Railway Corporation	Yuseong Hot Spring Pumping Station	FN-MASS KC-7730L, Water		
BELTECH CO.,LTD	BELTECH LAP	FN-MASS KC-7730L, Water		
Korea Institute of Machinery and Materials	Korea Institute of Machinery and Materials	KC-7730G-FM153BEx, 25A, LPG		
Sepratech Co., Ltd.	Hanwha Ulsan Plant	FN-MASS KC-7730A, Compressed Air ~ 4EA		
GTC CO., LTD.	GTC CO., LTD.	FN-MASS KC-7730A, Compressed Air ~ 12EA		
Bugang Tech	Icheon (Remnant Corpse Disposal System)	KC-7730G-FM153BEx, 25A, LPG		
BELTECH CO.,LTD	Beltech test league	FN-MASS KC-7730A, Compressed Air ~ 4EA		
Sambu General Machinery	Sambu General Machinery	FN-MASS KC-7730A, Compressed Air		
Gyeongsan Paper	Gyeongsan Paper	KC-7730S-FM153BEx, 250A, Steam		
Act Co., Ltd.	Act Co., Ltd.	FN-MASS KC-7730A, Compressed Air ~ 10EA		
SEON BO INDUSTRY	Busan (Gupyeong 2nd Factory)	FN-MASS KC-7730A, Compressed Air		
Korea Institute of Machinery and Materials	Cheonan, Chungcheongnam-do (Puritech)	KC-7730G-FM153BEx,40A,O2 Gas ~ 4EA		
Korea Institute of Machinery and Materials	Cheonan, Chungcheongnam-do (Puritech)	FN-MASS KC-7730A, Compressed Air ~ 4EA		
TURBO MAN	Iksan, Jeollabuk-do (Hite Jujeong)	KC-7730L-FM153BEx, 25A, Ethanol		
Pukyong National University	YONDANG CAMPUS	FN-MASS KC-7730A, Compressed Air		
DONGIL CNE	Hanwha Onsan Plant	FN-MASS KC-7730A, Compressed Air		
Kunyoung Machinery	Kunyoung Machinery	FN-MASS KC-7730A, Air ~ 10EA		
SUNHWAN ENG	Kunyoung Machinery	KC-7730OP-FM153BEx, 50A, NG		
SEA ANTLE	SEA ANTLE	FN-MASS KC-7730A, Compressed Air ~ 2EA		
COMP KOREA	COMPRESSURED AIR	FN-MASS KC-7730A, Compressed Air ~ 3EA		
FINETECH	FINETECH	FN-MASS KC-7730A, Compressed Air ~ 15EA		
ILJIN MATERIAL	IKSAN PLANT	FN-MASS KC-7730A, Compressed Air ~ 2EA		
PURITECH	PURITECH	FN-MASS KC-7730A, Compressed Air ~ 4EA		
J KEISIS CO.,LTD,	J KEISIS CO.,LTD.	FN-MASS KC-7730A, Compressed Air ~ 22EA		
JUNG WOO FLOW	JUNG WOO FLOW	FN-MASS KC-7730A, Compressed Air ~ 3EA		
Kunyoung Machinery	Kunyoung Machinery	FN-MASS KC-7730A, Compressed Air ~ 10EA		
Wonkwang valve	STX ENGINE	KC-7730H-FM153B-G050-H2 Mixture		
Kunyoung Machinery	Kunyoung Machinery	FN-MASS KC-7730GF, Compressed Air ~ 10EA		
VPE KOREA	VPE KOREA	FN-MASS KC-7730GF, Compressed Air		
Kunyoung Machinery	Kunyoung Machinery	FN-MASS KC-7730GF, Compressed Air ~ 20EA		
Kunyoung Machinery	Kunyoung Machinery	FN-MASS KC-7730GF, Compressed Air ~ 30EA		
Kunyoung Machinery	Kunyoung Machinery	FN-MASS KC-7730GF, Compressed Air ~ 30EA		
BOYN E&M CO.,LTD.	Urban Railroad Corporation	FN-MASS KC-7730GF, Compressed Air		
Kukdong Jeyeon	Kukdong Jeyeon	FN-MASS KC-7730WF, Water		
Kukdong Jeyeon	Kukdong Jeyeon	KC-7730L-FM153B-G080-Ethylene Glycol		
Korea Aerospace Research Institute	Korea Aerospace Research Institute	FN-MASS KC-7730G-FM153B, H2 Mixture ~ 3EA		
LG ELECTRONICS	Cheongju Factory	FN-MASS KC-7730S,스팀,100A,125A,200A ~ 3EA		
LG ELECTRONICS	Cheongju Factory	FN-MASS KC-7730G-FM153BEx,LNG,50A(2),65A(2),80A(1),100A, 125A,150A ~ 8EA		
Kunyoung Machinery	Kunyoung Machinery	FN-MASS KC-7730GF, Compressed Air		
SAMSUNG ELECTRONICS	For precise measurement of gas accumulation	KC-7730GF O2-65A, N2-32A ~ 2EA		
Korea Water Resources Corporation	Korea Water Resources Corporation	FN-MASS KC-7730SF 25A Steam, Water ~ 2EA		
Chungbuk Sewage Treatment Plant	For testing of water and wastewater facilities	KC-7730B-FM153BEx, 300A, 350A, Bio gas~ 2EA		
Innowill Co.,Ltd.	Korea Energy Research Institute	FN-MASS KC-7730GF,100A,50A,Blower Air ~ 2EA		

C Golden Rules

4-2. Delivery performance 2 ~ 345 EA

Client	Enduser	Model
INFORAD CO.,LTD.	Korea Energy Research Institute For vacuum pump precision flow test	FN-MASS KC-7730OP 공기 25A, 40A
Korea Energy Research Institute	Hydrogen charging station 1st and 2nd plants	KC-7730G-FM153B, H2 Mixture, 50A, 8.2barg 25.2-252 kg/h, 200'C
INNO WILL CO.,LTD.	Korea Energy Research Institute	FN-MASS KC-77300P 50A, 65A, AIR ~ 2EA
		FN-MASS KC-7730OP-FM153B ~ 2EA
Toray Advanced Materials.	For precise measurement of gas accumulation	O2-65A, N2-32A
Energy Technology Evaluation Institute	Ammonia decomposition hydrogen production purification system	FN MASS KC-7730OP-FM153B ~ 2EA 20A,NH3 Mix, 7.43barg, 20A-H2 Mix, 6.93barg
Korea Aerospace Industries' Sacheon site	Korean fighter KF-21 fuel system integrated rig test equipment	FN MASS KC-7730OP-FM153B ~ 12EA JP-5,100A(2),15A(3), Liquid, 20A(6),32A(1)
Energy Technology Evaluation Institute	Alkaline water electrolysis for BOP hydrogen measurement	FN-MASS KC-7730OP-FM153B, ½:",5Nm3/h
KEPCO Electric Power Research Institute (Daejeon)	For precision measurement of hydrogen generators	FN-MASS KC-7730OP-FM153B 3/8", 200 LPM, 3-5 Barg
POSCO KWANG YANG	Nitrogen gas purification system	FN-MASS KC-7730OP, 150A, 5,000Nm3/h
POSCO Pohang Stainless Steel 3	For precise measurement of gas cutters	KC-7730OP-FM153B, 25A, LNG, O2 ~ 2EA
SK Innovation	For precise measurement of hydrogen gas	KC-7730H-FM153BEx, ½", 55-1520LPM, Nor17 Max 30Barg
Guri Sewage Treatment Plant	For precise measurement of biogas consumption	KC-7730G-FM153BEx, Bio gas, 80A ~ 3EA
INNO WILL CO.,LTD.	Korea Energy Research Institute	FN-MASS KC-7730OP 150A, AIR
Haesung DS Co., Ltd. Changwon Headquarters	For precision measurement of semiconductor plasma process and hydrogen generator	KC-7730H-FM153BEx, 3/8",15-150LPM,3-5Barg
Uljin Livestock Manure Treatment Plant	For precision measurement of biogas for supply to generators	KC-7730B, Bio Gas, 50~500mmH20,,40~60'C 100A-800Nm3/h, 80A-500Nm3/h ~ 3EA
LS Cable & System / POSCO R&D Center	For precise measurement of LNG consumption	LNG,80A,160Nm3/h,31′C,30Kpa,24V.RS-485~ 6EA
POSCO R&D Center	1For sintering steam research project	KC-7730S,Steam,250A,8-80Ton/h,193'C,8BAR
Posco kwang yang	For precise steam measurement	KC-7730S,Steam,100A,7000kg/h,190'C,7Bar
Lithium Plus Geumsan Plant	Sodium hydroxide crystallization facility pjt for semiconductor fuel cell	KC-7730S,Steam,200A,150A,100A ~ 6EA KC-7730L,Liquid,80A,40A,25A ~ 10EA
Hyundai Motor	For precision testing of hydrogen generator	KC-7730H-FM153BEx, H2,3/8",2-40m3/h,8.2Barg ~ 2EA
LG Energy Solution	Danil Gaschem Co., Ltd., for precise measurement of nitrogen gas	KC-7730G,N2 Gas,7.5Bar,70-1200Nm3/h,25'C
ECO PRO CO.,LTD.	For air precision measurement in laboratory test facilities	KC-7730G,Air,300A,130m3/min,95-101Kpa,25'C
Eumseong Livestock Manure Treatment Plant	For precision measurement of biogas for supply to generators	KC-7730B, Bio Gas, 50~300mmH20,,40~60'C 125A-125Nm3/h, 208Nm3/h ~ 3EA
Posco Pohang	For precision measurement of air lines	KC-7730G,50A,800Kpa,25′C,63-630Nm3/h
Water Resources Corporation	Membrane filter for precise measurement of air	KC-7730G,300A,25'C,0.8Bar,800-8000Nm3/h
Daejeon Techno Park Hydrogen Electric		KC-7730H-FM153BEx, H2 GAS, ½", 1~10Nm3/min, 20'C,
Vehicle	charging stations	250Bar
Ulsan Sewage Treatment Plant	For precise steam line measurement	KC-7730S-FM153BEx, Steam, 50A, 1~10Ton/h, 205'C, 17Bar
Korea Land & Housing CorporationHwaseong Dongtan 2 Clean Energy C	For precision measurement of biogas trade	KC-7730B-FM153BEx, Bio gas, 250mmAq, 30~40'C, 50A, 20-200Nm3/h ~ 2EA 100A, 28~280Nm3/h ~ 1EA
Hyundai Motor	Hydrogen equipment, for precise measurement of hydrogen gas	KC-7730H-FM153BEx, 10A, H2 GAS, 5000SLPM -50~95'C, 40BAR ~ 3EA
Posco Pohang	For precision measurement of air lines	KC-7730G,50A,800Kpa,25'C,63-630Nm3/h ~ 3EA
Maeil Dairies Gochang Cheese Factory	For Steam EMS System Project	KC-7730S,80A,125A179'C,7.9BAR ~ 2EA
ECO PRO CO., LTD.	For O2 Gas trading	KC-7730-FM153B, 80A, O2 Gas, 30-1,500Nm3/h 25'C, 8. 8 Bar
Hyundai Rotem Tongyeong Hydrogen Refueling Station	For hydrogen gas trading	KC-7730H-FM153B,20A,2-70kg/h,40' C,200Bar~ 3EA
Gunpo Biomass Plant	for biogas trade	KC-7730B-FM153B,200A,120-4,200Nm3/h
Environmental Facility Management Co., Ltd.		KC-7730B-FM1535,200A,120-4,200NIII5/II KC-7730B-FM153BEx, Bio gas, 250mmAq, 20~30' C, 100A, 10-300Nm3/h ~ 3EA
KEPCO Research Institute	For hydrogen generator measurement	KC-7730H-FM153B,20A-20Nm3/h,100Nm3/h,40- 90' C,9.7Bar, 15A-140Nm3/h, 100' C, 200Bar ~ 3EA



Explosion-proof, in-line type ~ 63 units for overseas LPG & AIR Mixer delivery (domestic & export)



Busan Gwangan Bridge & Yeongjong Bridge Thermal flow meter for cable air Insertion valve type ~ 20 units delivered



Daegu Dalseong & Gumi Industrial Complex Energy Management SYS' PJT Compressed Air ~ 250 units 99 units delivered and installed



4-3-2. Delivery site photo



Hyundai Steel, Hyundai/Renault Samsung Motors, Korea NSK, burner supply and other gas ~128 units supplied





Korea Gas Corporation (Samcheok & Tongyeong Base) Flare Stack Fuel Gas & LNG Main supply ~ 3 units sup

Tancheon Environment Aeration Tank Air Flow Delivery of ~196 units other than for measurement



Golden Rules A-1805, 30 Songdomirae-ro, Yeonsu-gu, Incheon, Korea TEL:032-817-1240 FAX:032-817-1250 www.goldenrules.co.kr

4-3-3. Delivery site photo



Paper mill steam line



Ethanol production process line

Yeongcheon Sewage Sludge Bio Gas



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Participated in companies such as Hanwha Chemical, Lotte Chemical, Hanwha Energy, BASF, and Yeocheon NCC







4-3-5. Headquarters technical training

Participated in 13 agencies of Golden Rule Co., Ltd.









5. Certification





Thank you very much!

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