

Flue Gas Analyzer

DONGWOO OPTRON PRODUCTS GUIDE



 **DONGWOO OPTRON Co., Ltd.**



DONGWOO OPTRON Co., Ltd.

Through consistent technical developments and quality improvement, DONGWOO OPTRON is now recognized as one of the leading manufacturer of flue gas analyzer. We are grown up rapidly through aggressive attitude and logical stretching and consistent innovation. Also we are pursuing a convenience of the customers happiness of mankind.

DONGWOO OPTRON will continue to invest in this business to meet the increasing demands for high quality products.

DONGWOO OPTRON has a mission statement to development and produce high performance products using the most advance technology and quality control system.



DONGWOO OPTRON Technology for Flue Gas Monitoring System

The DONGWOO OPTRON's products support industrial FGMS process throughout the world.

Power Plant
Incinerator
Cement
Chemical Oil & Gas
...

Flue Gas Analyzer
NOx, SOx, NH₃, CO, CO₂, O₂, Dust, HCl



세계속의 경기도
Global Inspiration



성능인증제품

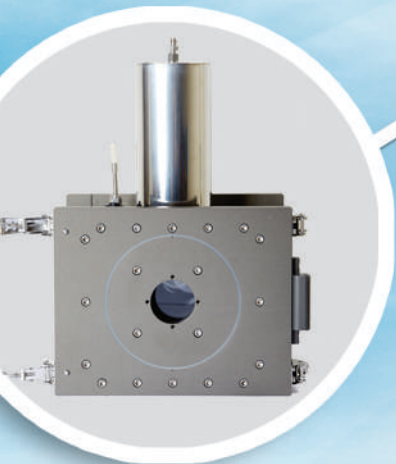


중소기업 상명 1357
중소기업청
Small and Medium Business Administration



특허청

INNOBIZ
기술혁신형중소기업



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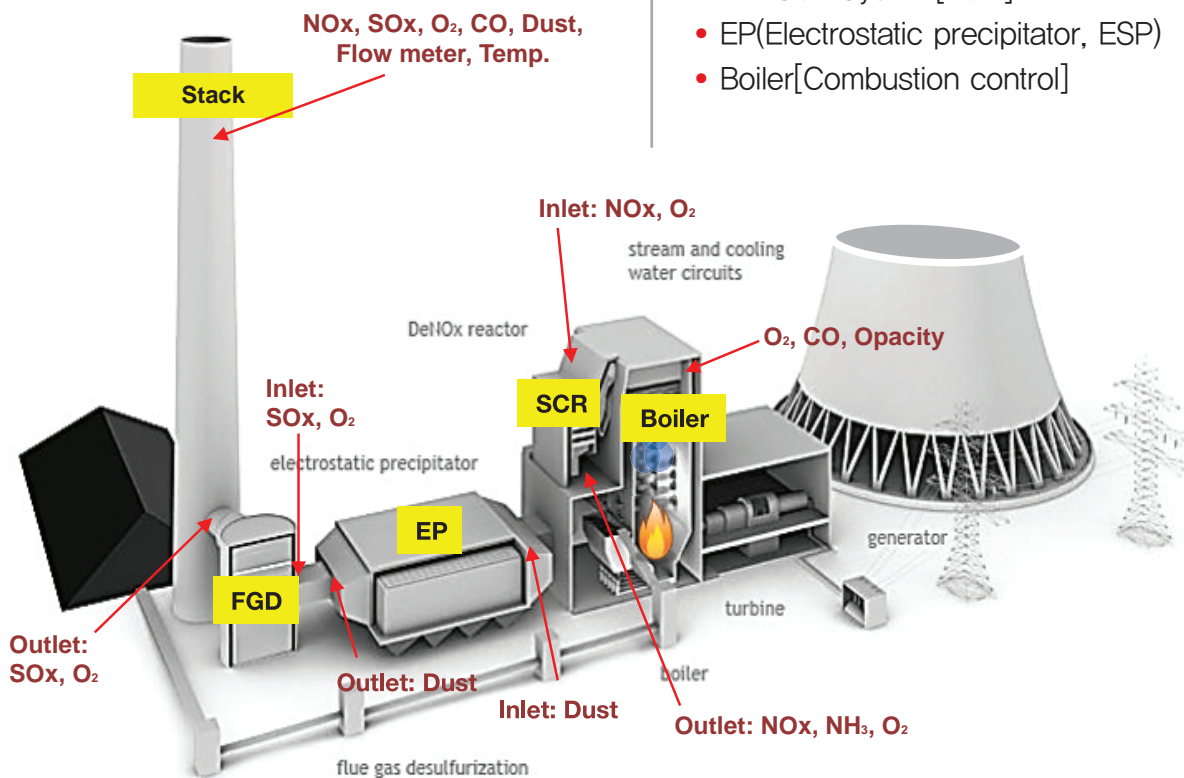
Flue Gas Analyzer Application

Application

1. Power Plant
SOx, NOx, NH₃, CO, O₂, Opacity, Dust, Flowmeter, Temperature
 2. Incinerator (Waste Recycling)
HCl, NOx, CO, O₂, H₂O, Flowmeter, HF, SOx, Opacity, Dust, Temperature
 3. Cement SOx, NOx, CO, O₂, HCl, HF, Dust, Flow meter, Temperature
 4. Chemical Oil & Gas VOC, CO, NOx, SOx, O₂, H₂O, Flowmeter
 5. Metals & Steel Production CO, CO₂, SOx, NOx, HCl, O₂, Flowmeter, Temperature
 6. Glass & Ceramic CO, NOx, SOx, O₂, H₂O, Flowmeter, Temperature
 7. Pulp & Paper SOx, H₂S, Flowmeter, Temperature
 8. Maritime NOx, SOx, CO₂, O₂, Flowmeter, Temperature
- * CEMS, AMS, TMS

Process (For example – Power Plant)

- Stack
- De-NOx System[SCR, SNCR]
- De-SOx System[FGD]
- EP(Electrostatic precipitator, ESP)
- Boiler[Combustion control]



Flue Gas Analyzer Measuring Principles

In-Situ Gas Analysis

- Continues and quick response
- No need sampling
Direct monitoring
- Simple installation
- Quick response time
- Low effect from the
Humidity and Dust

Composition

Probe + Analyzer + Local Panel

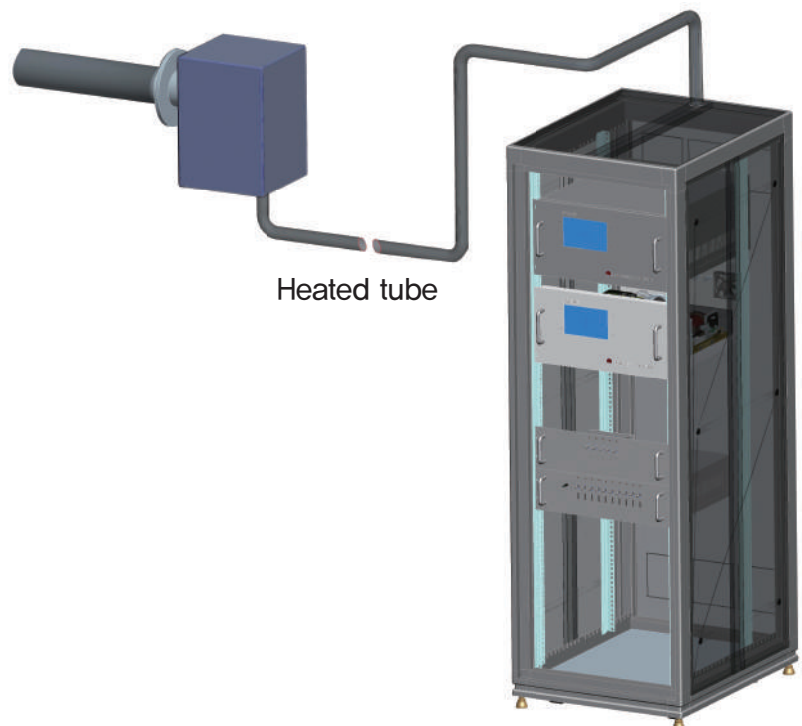


Extractive Gas Analysis

- Optimized analyzer module
composition for measuring gas
- Sampling line
- Need to preprocessing device
- Good maintenance and easy
operation
- Mainly use to Stack application
- Applicable to SCR application in
according to ambient dust condition

Composition

Sample Probe + Sampling line +
Preprocessing Device(Gas sampler) +
Analyzer(Rack Mount) + Local Panel

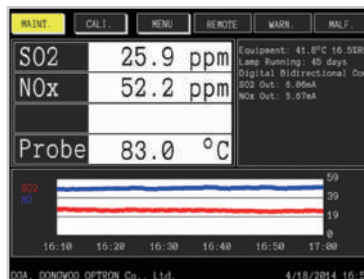


DGA-X [NO_x, SO_x, NH₃ Analyzer]



DGA-X Multi Gas Analyzer

Power 100~240VAC, 50/60Hz
 Power Consumption main 500W
 Gas Temp < 550 °C
 Ambient Temp -20°C ~ 55°C
 Gas Pressure ± 60 hpa (±611 mmH₂O)
 Dust 30g/m³
 Analog Output 2 Channel 4~20mA
 Digital Output 4 Channel
 RELAY Output 4 Channel
 Digital Input 2 Channel
 System Response Time < 5 second
 Resolution NO_x / SO_x : 0.1 ppm, NH₃ : 0.01 ppm



DGA-X Multi Gas Analyzer

Features

- Principle of In-situ / UV DOAS
- No need sampling/ Direct monitoring
- Quick response time
- Low maintenance costs
- No interfere of dust and humidity
- Practicable of Remote calibration
- SO_x, NO_x, NH₃ multi-time measuring

List	Specification
Measuring	SO _x , NO, NO ₂ , NH ₃ (Multi Gas Analyzer)
Principle	UV Absorption
Structure	In-situ
Display	7" LCD Monitor
Communication	RS232-422-485 / TCP-IP Via Ethernet (Applied of Digital communication) HART Communication
Measuring Range	
NO _x	0~40, 0~150, 0~200, 0~500, 0~1000, 0~2000 ppm
SO _x	0~100, 0~200, 0~500, 0~1000, 0~3000 ppm
NH ₃	0~10, 0~20, 0~50 ppm
Repeatability	< 1% FS
Linearity	< 1% FS

GGA-70 [O₂ Analyzer]

GGA-70 O₂ Analyzer

Features

- In-situ type Zirconia Sensing
- No need sampling / Direct monitoring
- Quick response time
- Low maintenance costs
- No interfere of dust and humidity
- Practicable of Remote calibration



GGA-70 O₂ Analyzer

Power 100~240VAC, 50/60Hz

Power Consumption 300W (Max)

Gas Temp < 550 °C

Ambient Temp -20°C to 55°C

Gas Pressure ± 250 kpa

Analog Output 2 Channel 4~20mA

Digital Output 4 Channel

RELAY Output 4 Channel

Digital Input 2 Channel

System Response Time < 5 second

Oxygen Concentration 0.001 to 100 vol% O₂



List	Specification		
Measuring	O ₂		
Principle	Zirconia Sensing		
Structure	In-situ		
Display	4.3" LCD Monitor		
Communication	RS232-422-485 / TCP-IP Via Ethernet (Applied of Digital communication) HART Communication		
Measuring Range			
O ₂	0~25%, 0~100 vol% O ₂		
Sensor Heating Temp	750 °C		
Repeatability	< 1% FS	Linearity	< 1% FS

LCD-80 [Dust-Opacity Analyzer]



LCD-80 DUST-OPACITY Analyzer

Features

- Principle of In-situ / (Cross-duct type) Laser transmission type
- No need sampling/ Direct monitoring
- Quick response time
- Low maintenance costs
- No interfere of dust and humidity

LCD-80 DUST-OPACITY Analyzer

Power 100~240VAC, 50/60Hz
 Power Consumption 300W (Max)
 Gas Temp < 550 °C
 Ambient Temp -20°C ~ 55°C
 Gas Pressure -50 hPa to +30 hPa
 Measuring Range 0~5,000mg/m³
 0~10,000mg/m³
 Analog Output 2 Channel 4~20mA
 Digital Output 4 Channel
 RELAY Output 4 Channel
 Digital Input 2 Channel
 System Response Time < 5 second



List	Specification
Measuring	Dust
Principle	Light Transmission measurement
Structure	In-situ (Cross-duct type)
Display	4.3" LCD Monitor
Communication	RS232-422-485 / TCP-IP Via Ethernet (Applied of Digital communication) HART Communication
Measuring Range	
Transmission	100~0%
Opacity	0~100%
Extinction	0~2.5
Repeatability	< 1% FS
Linearity	< 1% FS

PGA-90 [Flowmeter]

PGA-90 FLOWMETER

Features

- In-situ type
- Pitot tube
- Quick response time
- Low maintenance costs
- Transmit of real-time measuring value of flow velocity in stack & duct
- Calculation of Density fluctuation by temperature, pressure, atmospheric condition



PGA-90 FLOWMETER

Power 100~240VAC, 50/60Hz

Power Consumption main 200W

Ambient Temp $-18^{\circ}\text{C} \sim 60^{\circ}\text{C}$

Dynamic pressure 2.5~254 mmH₂O

Atmospheric 500~1100 hPa

Analog Output 2 Channel 4~20mA

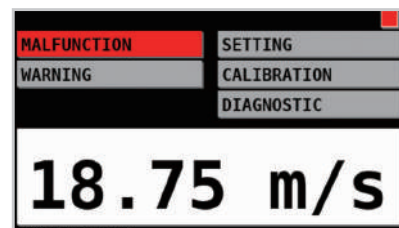
Digital Output 4 Channel

RELAY Output 4 Channel

Digital Input 2 Channel

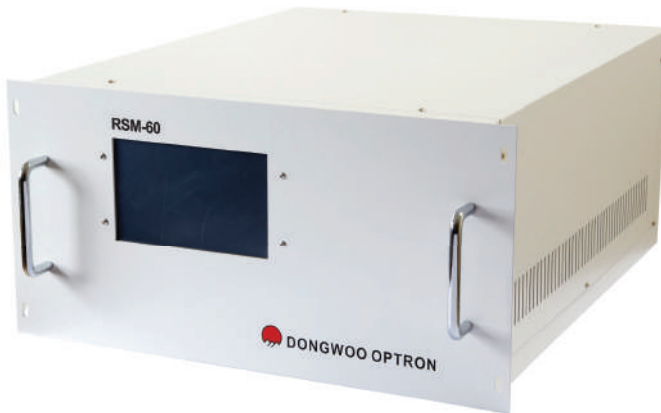
System Response Time < 5 second

Accuracy 0.5% F.S



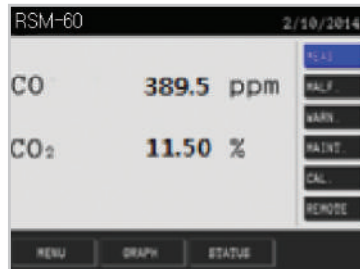
List	Specification
Measuring Range	
- Velocity	0~50 m/s
- Atmosphere Pressure	500~1100 hpa
- Stack Temperature	0~300 °C
- Dynamic Pressure	0~250 mmH ₂ O

RSM-60 [CO/ CO₂ Analyzer]



RSM-60 CO-CO₂ Analyzer

Power 88~264VAC, 50/60Hz
 Display 7" LCD Touch Panel
 Power Consumption 300W Max
 Gas Pressure 3bar (3000kpa)
 Analog Output 2 Channel 4~20mA
 Digital Output 4 Channel
 RELAY Output 4 Channel
 Digital Input 2 Channel



RSM-60 CO-CO₂ Analyzer

Features

- Sampling type
- Composition with Gas sampler
- Applied of digital communication function for new environmental regulation

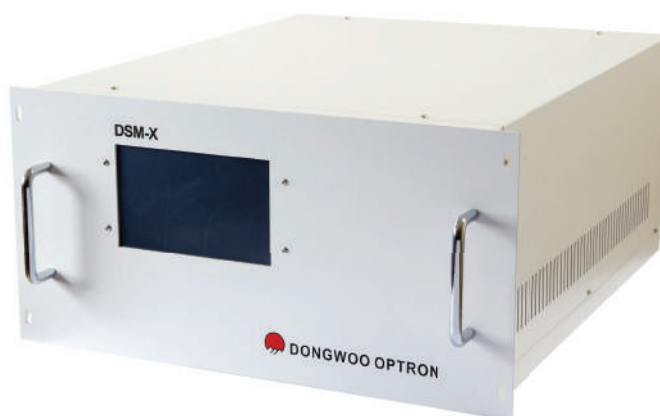
List	Specification		
Measuring	CO-CO ₂		
Principle	NDIR		
Structure	Extractive (Sampling Type)		
Measuring Range(MAX)	CO 0~5000PPM, CO ₂ 2~25 VOL/%		
Digital communication	LAN(TCP/IP), RS232/ RS485/ RS422/ USB2.0		
Ambient Temp	-20~ +60 °C		
Ambient Humidity	0~95% RH		
System Response Time	< 5 second		
Repeatability	< 1% FS	Linearity	< 1% FS

DSM-X [NO_x, O₂]

DSM-X Extractive Gas Analyzer

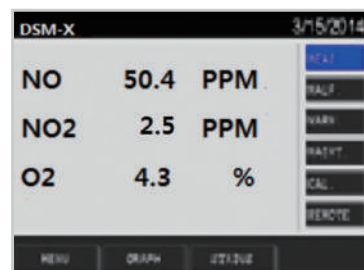
Features

- Sampling type
- Composition with Gas sampler
- Applied of digital communication function for new environmental regulation



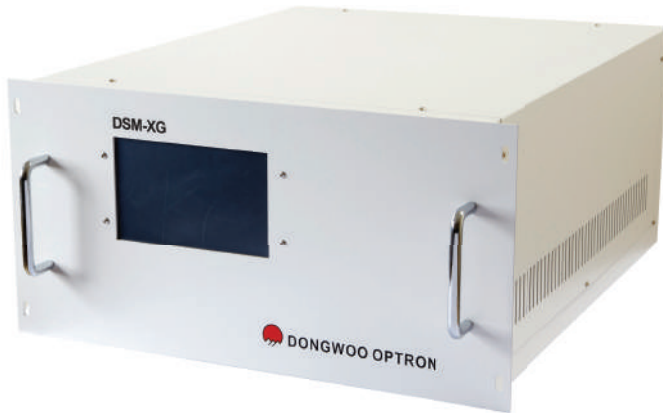
DSM-X Extractive Gas Analyzer

Power 88~264VAC, 50/60Hz
 Display 7" LCD Touch Panel
 Power Consumption 500W Max
 Gas Pressure 800~1200mbar
 Analog Output 2 Channel 4~20mA
 Digital Output 4 Channel
 RELAY Output 4 Channel
 Digital Input 2 Channel



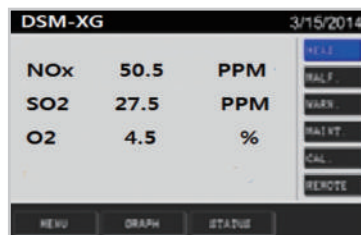
List	Specification
Measuring	NO _x , O ₂ (Multi Gas Analyzer)
Principle	UV(NO _x) / Paramagnetic, Zirconia (O ₂)
Structure	Extractive (Sampling Type)
Measuring Range(MAX)	NO _x 0~1000 ppm
	O ₂ 0~25 Vol.%
External input	USB
Communication	RS232-422-485 / TCP-IP Via Ethernet (Applied of Digital communication) HART Communication
Repeatability/Linearity	± 1% FS / ± 1% FS
System Response Time	< 5 second

DSM-XG [NO_x, SO_x, O₂]



DSM-XG Extractive Gas Analyzer

Power 88~264VAC, 50/60Hz
 Display 7" LCD Touch Panel
 Power Consumption 500W Max
 Gas Pressure 800~1200mbar
 Analog Output 2 Channel 4~20mA
 Digital Output 4 Channel
 RELAY Output 4 Channel
 Digital Input 2 Channel



DSM-XG Extractive Gas Analyzer

Features

- Sampling type
- Composition with Gas sampler
- Applied of digital communication function for new environmental regulation

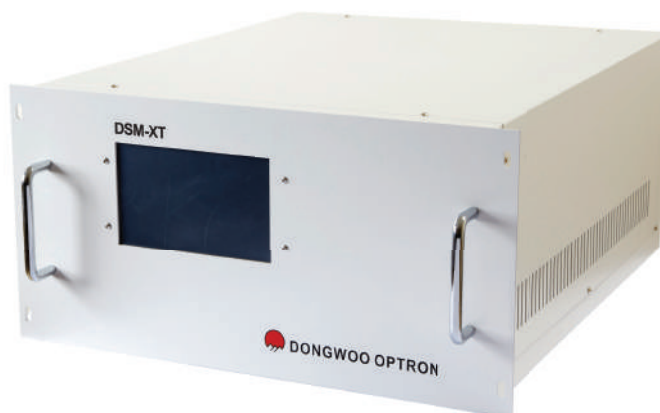
List	Specification
Measuring	NO _x , SO _x , O ₂ (Multi Gas Analyzer)
Principle	UV(NO _x , SO _x) / Paramagnetic, Zirconia (O ₂)
Structure	Extractive (Sampling Type)
Measuring Range(MAX)	
NO _x	0~1000 ppm
SO _x	0~2000 ppm
O ₂	0~25%
External input	USB
Communication	RS232-422-485 / TCP-IP Via Ethernet (Applied of Digital communication) HART Communication
Repeatability /Linearity	± 1% FS / ± 1% FS
System Response Time	< 5 second

DSM-XT [NO_x, SO_x, O₂, CO]

DSM-XT Extractive Gas Analyzer

Features

- Sampling type
- Composition with Gas sampler
- Applied of digital communication function for new environmental regulation



DSM-XT Extractive Gas Analyzer

Power 88~264VAC, 50/60Hz
 Display 7" LCD Touch Panel
 Power Consumption 500W Max
 Gas Pressure 800 ~ 1200mbar
 Analog Output 2 Channel 4~20mA
 Digital Output 4 Channel
 RELAY Output 4 Channel
 Digital Input 2 Channel

DSM-XT			3/15/2014
NO _x	50.5	PPM	MENU
SO ₂	27.5	PPM	RELAY
CO	75.1	PPM	WARN
O ₂	12.5	%	PRINT
			CAL
			REMOTE
			MENU
			GRAPH
			STATUS

List	Specification
Measuring	NO _x , SO _x , O ₂ , CO (Multi Gas Analyze)
Principle	UV(NO _x , SO _x), NDIR (CO) / Paramagnetic, Zirconia(O ₂)
Structure	Extractive (Sampling Type)
Measuring Range(MAX)	
NO _x	0~1000 ppm
SO _x	0~2000 ppm
CO	0~2000 ppm
O ₂	0~25 %
External input	USB
Communication	RS232-422-485 / TCP-IP Via Ethernet (Applied of Digital communication) HART Communication
Repeatability/Linearity	± 1% FS / ± 1% FS
System Response Time	< 5 second

LSM-30 [HCL]



LSM-30 Extractive Gas Analyzer

Features

- Sampling type
- Composition with Gas sampler
- Applied of digital communication function for new environmental regulation

LSM-30 Extractive Gas Analyzer

Power 88~264VAC, 50/60Hz
 Display 7" LCD Touch Panel
 Power Consumption 200W Max
 Gas Pressure 800~1100 mbar
 Analog Output 2 Channel 4~20mA
 Digital Output 4 Channel
 RELAY Output 4 Channel
 Digital Input 2 Channel



List	Specification
Measuring	HCL
Principle	Tunable Diode Laser Spectrometry (TDLS)
Structure	Extractive (Sampling Type)
Measuring Range(MAX)	
HCL	0~100 ppm
External input	USB
Communication	RS232-422-485 / TCP-IP Via Ethernet (Applied of Digital communication) HART Communication
Repeatability/Linearity	± 1% FS / ± 1% FS
System Response Time	< 5 second

Certification

Multi-gas analyzer Certification (SOx,NOx)

(앞쪽)

승인번호	환경측정기기 형식승인서			
제ATMSGM-2011-4호				
①상 호(사업장명칭)	동우옵트론(주)			
②상 명(법인의 경우 대표자)	김 영 준			
③주 소	경기도 광주시 오포읍 배산리 611-5 (전화번호 : 031-765-0300)			
④사업 장소 개 지	경기도 광주시 오포읍 배산리 611-5 (전화번호 : 031-765-0300)			
승 인	⑤제 작 사	동우옵트론(주)	⑥제 작 국	대한민국
	⑦기 기 명 칭	공통배출가스(NOx, SOx) 연속자동측정기기 및 부속기기	⑧형 식	DGA-X
내 용	⑨상 품 명 (고 유 명 칭)	Multi-gas(NOx, SOx) Analyzer	⑩측정범위	NOx : 0~500ppm SO ₂ : 0~200ppm
	⑪최소단위(단위)	NO _x : 0.1ppm SO ₂ : 0.1ppm	⑫공인측정오차범위	NO _x : 0.0% SO ₂ : 0.1%
⑬승 인 조 건	환경분야 시험·검사 등에 관한 법률 제9조 준수			
<p>「환경분야 시험·검사 등에 관한 법률」 제9조제5항과 같은 법 시행규칙 제5조 제3항에 따라 위와 같이 승인합니다.</p> <p style="text-align: center;">2011년 9월 7일</p> <p style="text-align: center;">국립환경과학원장 (인)</p>				

O₂ gas analyzer Certification

(뒷쪽)

■ 환경분야 시험·검사 등에 관한 법률 시행규칙 [별지 제23호의4] 제4항 2012.5.30

측정기기 형식승인서

(앞쪽)

승인번호	제ATMSGM-2011-7호			
상 호(사업장명칭)	동우옵트론(주)			
상 명(법인의 경우 대표자)	김 영 준			
주 소	경기도 광주시 오포읍 배산리 611-5 (전화번호 : 031-765-0300)			
사업장소재지	경기도 광주시 오포읍 배산리 611-5 (전화번호 : 031-765-0300)			
제 작 사	동우옵트론(주)	제 작 국	대한민국	
	기 기 명 칭	공통배출가스(산소) 연속자동측정기기 및 부속기기	형 식	GG470
승 인 내 용	상 품 명 (고 유 명 칭)	GG475	측정범위	최소 : 0 % 최대 : 25 %
	최소단위 (단위)	0.01 %	공인측정오차범위(선형성)	0.05 %
승 인 조 건	환경분야 시험·검사 등에 관한 법률 제9조 준수			
<p>「환경분야 시험·검사 등에 관한 법률」 제9조제5항과 같은 법 시행규칙 제5조제3항에 따라 위와 같이 승인합니다.</p> <p style="text-align: right;">2011년 09월 09일</p> <p style="text-align: center;">국립환경과학원장 (인)</p>				

Excellent Performance Certification DGA-X

제15-794호

성능인증서

- 제조업체명: 동우옵트론(주)
- 대표자성명: 김 영 준
- 소재 지: 경기도 광주시 오포읍 배산리 611-5
- 인 중 품 목: 공통배출가스 연속자동측정기기 [DGA-X]
- 성능검사 규격기준: 한국동시발전주식회사 규격확인 (신정업체 제시규격)
- 인 중 유효 기 간: 2011. 12. 20 ~ 2014. 12. 19
- 인 중 품 목 의 용 도: 공공기관 납품용

「중소기업제품 구매촉진 및 판촉지원에 관한 법률」 제15조 및 같은 법 시행규칙 제11조 제4항에 따라 위와 같이 성능인증을 합니다.

2011년 12월 20일

중소기업청 (인)

Excellent Performance Certification DGA-X(NH₃,NOx)

제15-1056호

성능인증서

- 제조업체명: 동우옵트론(주)
- 대표자성명: 김 영 준
- 소재 지: 경기도 광주시 오포읍 회안대로 102-8
- 인 중 품 목: 탈질원리(SCR/SNCR)용 멀티가스(NH₃, NO_x) 분석기 [DGA-X50(NO_x: 0~150ppm, NH₃: 0~10ppm)]
- 성능검사 규격기준: 한국동시발전 규격확인(신정업체 제시규격서)
- 인 중 유효 기 간: 2013. 09. 30 ~ 2016. 09. 29
- 인 중 품 목 의 용 도: 공공기관 납품용

「중소기업제품 구매촉진 및 판촉지원에 관한 법률」 제15조 및 같은 법 시행규칙 제11조 제4항에 따라 위와 같이 성능인증을 합니다.

2013년 9월 30일

중소기업청 (인)

Certification

Flow-meter Certification

■ 환경분야 시험·검사 등에 관한 법률 시행규칙 [별지 제22호의3] <제90 조제3항>

속정기기 형식승인서 (국문)

승인번호	제1809-2014-1호		
승인년도	2014		
승인대상	상호 (사외명명부) 동우옵트론(주) 설립(합계) 업무 대표자 김 영 준	제1차국	대한민국
신청인	주소 경기도 광주시 오포읍 매산리 811-5 (전화번호 : 031-765-0300) 서울강소벤처 경기도 광주시 오포읍 매산리 811-5 (전화번호 : 031-765-0300)	형식	PGA 90
승인내용	제작사 동우옵트론(주) 기기명칭 공역배출가스 연속자동측정기(유속) 및 그 부속기기 상품명(고유명칭) PGA 90 최소능력 (단위) 0.01 m/s 승인조건 환경분야 시험·검사 등에 관한 법률 제90 조 준수	측정범위	0 ~ 25 m/s 공인측량도차범위(반복성) ± 0.17 %

「환경분야 시험·검사 등에 관한 법률」 제90조제6항과 같은 법 시행규칙 제50조제3항에 따라 위와 같이 승인합니다.

2014년 1월 2일

국립환경과학원장

[210x130mm(제1차) 130g/㎡]

Research Institute Certification

제 20001830 호

기업부설연구소인정서

1. 연구소명 : 옵트론연구소
(소속기업명 : 동우옵트론(주))

2. 소재지 : 경기도 광주시 오포읍 매산리 811-5

3. 신고연월일 : 2000년 5월 10일

기술개발촉진법 제16조 및 동법 시행령 제15조 제1항의
규정에 의하여 위와 같이 기업부설연구소로 인정합니다.

2001년 11월 12일

한국산업기술진흥협회장

CE

Declaration of Conformity

DONGWOO OPTRON Co.,Ltd
Stack Gas Analyzer
DGA-X

The above product has successfully demonstrated that its product is in compliance with

Electromagnetic Compatibility Directive 2004/108/EC

EN 50270 : 2006
EN 61000-6-4 : 2007 / A1 : 2011

We, the undersigned, hereby declare that the equipment specified above conforms to the above Directive(s)

Manufacturer Signature: Young Jaon Kim President

CE

Certificate of patent

특허증
CERTIFICATE OF PATENT

특허 제 10-1076295 호 등록번호 2011-092860 호
(PATENT NUMBER) (REGISTRATION NUMBER)

발명의명칭 (TITLE OF THE INVENTION)
인시추 가스 측정 장치

특허권자 (PATENTEE)
동우옵트론 주식회사 (110111-1*****)
경기 광주시 오포읍 매산리 811-5

발명자 (INVENTOR)
동우옵트론 주식회사

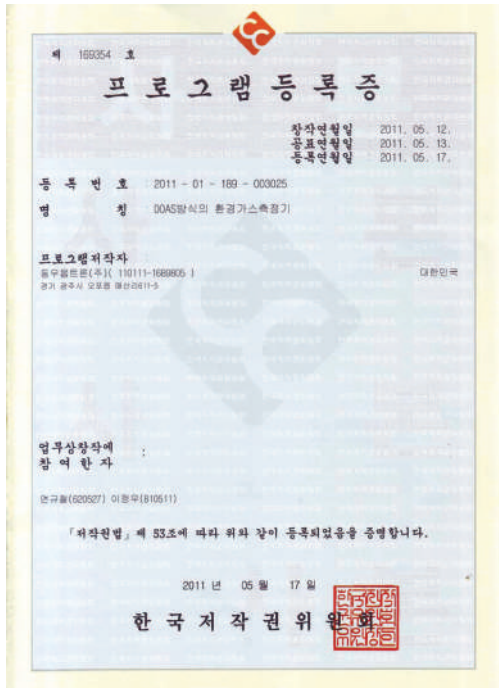
위의 발명은 「특허법」에 의하여 특허등록원부에 등록되었음을 증명합니다.
(THIS IS TO CERTIFY THAT THE PATENT IS REGISTERED ON THE REGISTER OF THE KOREAN INTELLECTUAL PROPERTY OFFICE.)

2011년 10월 18일

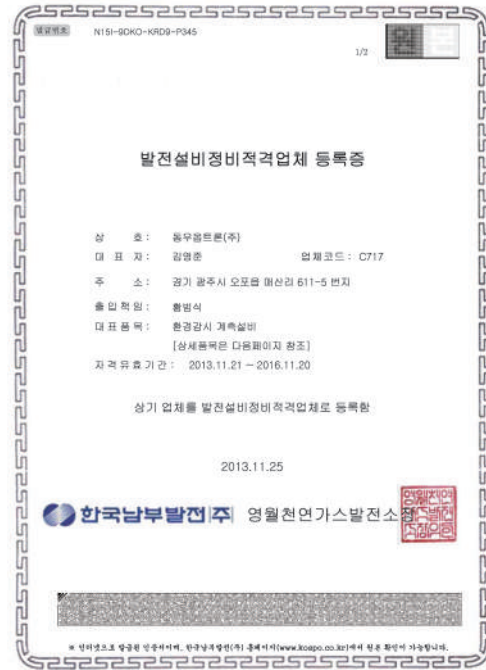
특허청
COMMISSIONER OF THE KOREAN INTELLECTUAL PROPERTY OFFICE

Certification

Program Registration Certification



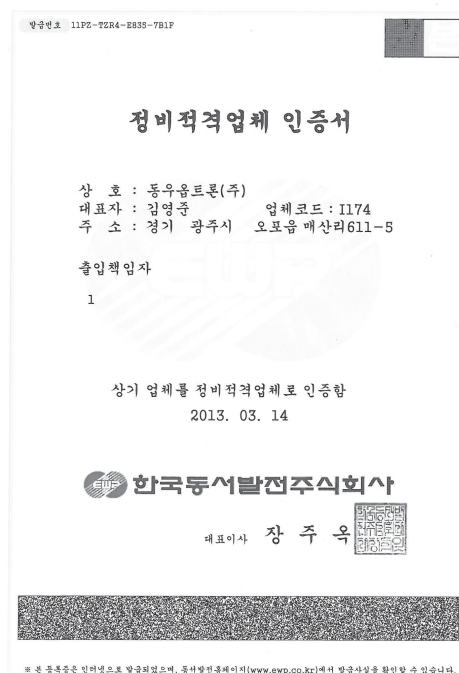
Qualified maintenance company by KOSPO(Korea southern power)



Qualified maintenance company by KOMIPO(Korea midland power)



Qualified maintenance company by EWP(Korea east-west power)



Certification

Qualified supplier certification by KOMIPO(Korea midland power)



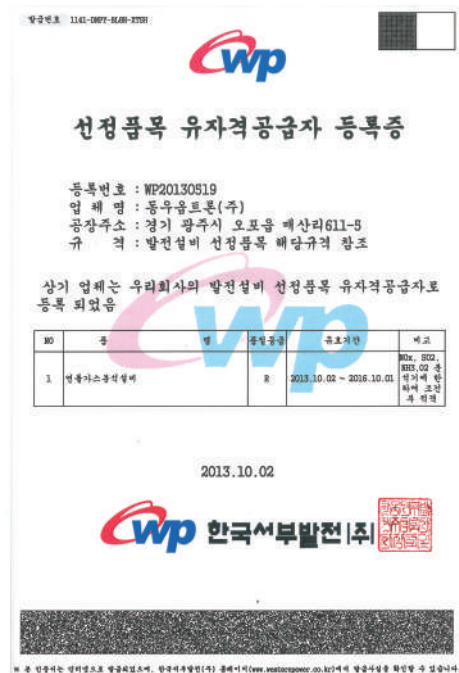
Qualified supplier certification by KOSEP(Korea south east power)



Qualified supplier certification by KOSPO(Korea southern power)



Qualified supplier certification by WP(Korea Western power)



Reference

Reference list



STACK

2011-12	Dangjin thermal power #1~#8	8EA	SO _x , NO _x
2012-03	Boryeong thermal power #1~#2	2EA	SO _x , NO _x
2012-04	Jeju thermal power #2	1EA	SO _x , NO _x
2012-05	Hadong thermal power #1~#8	8EA	SO _x , NO _x
2012-07	Korea environment Corp	1EA	SO _x , NO _x
2012-12	Samcheonpo thermal power #5	1EA	SO _x , NO _x
2013-06	Buk-pyeong thermal power #1~#2	4EA	SO _x , NO _x

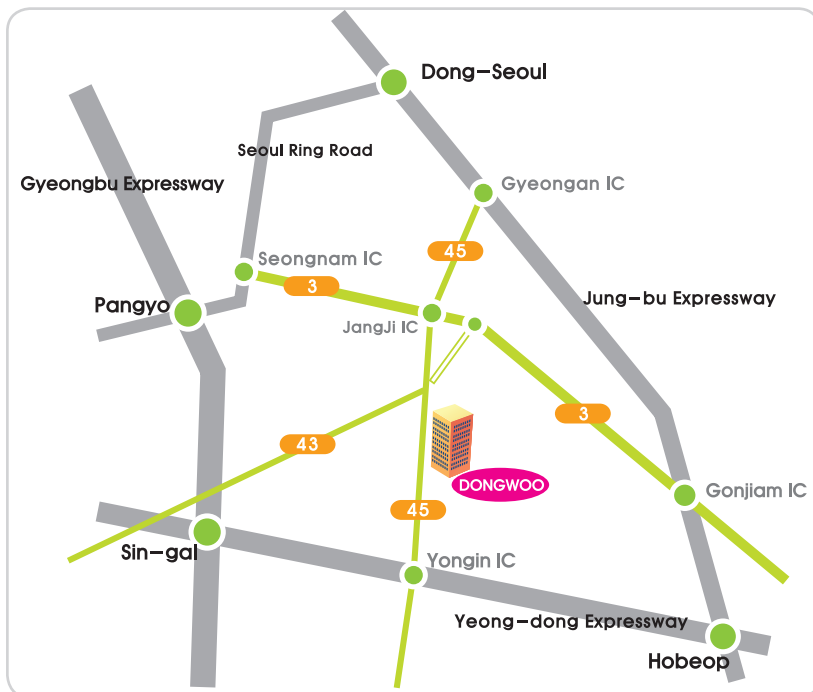
SCR

2011-12	Taeon thermal power # 1,3,5,6	16EA	NO _x
2012-08	Dangjin thermal power #5	2EA	NO _x
2012-11	Yeongheung thermal power#3, #4	4EA	NO _x
2012-12	Samcheonpo thermal power #3, #4	4EA	NO _x
2013-04	Samcheonpo thermal #3, #4	4EA	NO _x , NH ₃
2013-04	Taeon thermal power #2, #4	8EA	NO _x
2013-05	Hadong thermal power#5, #8	8EA	NO _x
2013-05	Taeon thermal power #8	4EA	NO _x
2013-12	Samcheok Green power #1, #2	16EA	NO _x
2013-12	Samcheok Green power #1, #2	8EA	NO _x , NH ₃
2013-12	Samcheok Green power #1, #2	16EA	O ₂
2014-01	Hadong thermal power #1, #2	4EA	NO _x
2014-05	Pyungtak thermal power #2	4EA	NO _x

FGD

2009-07	Ulsan thermal power #6	1EA	Sox,
2010-03	Dangjin thermal power #1	1EA	SO _x
2011-12	Hadong thermal power #1, #3	2EA	SO _x
2012-05	Hadong thermal power #2,#4,#5,#6	4EA	SO _x
2012-12	Samcheonpo thermal power #3, #4	4EA	SO _x
2013-10	Ulsan thermal power #2	2EA	SO _x
2014-04	Dangjin thermal power #9, #10	12EA	SO _x
2014-04	Dangjin thermal power #9, #10	4EA	O ₂

Flue Gas Analyzer



DONGWOO OPTRON Products Guide

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