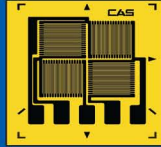
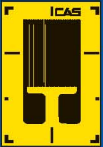


- **Strain gages**
 - 120 Ω
 - 350 Ω
 - Special type
- **Accessories**
- **Measuring Instruments**



Strain Gage

Product Catalog

Total Weighing Solution Company

Total Weighing Solution을 추구하고 있는 CAS는 국내 계량계측 분야의 선두 주자로 일반 상업용 저울은 물론 저울에 필요한 Load cell과 Load cell의 핵심 부품 Strain gage에 이르기까지 모든 관련 제품의 개발, 생산 능력을 갖추고 있는 종합 계량계측 업체입니다.

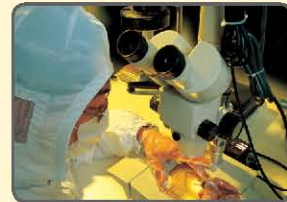
특히 CAS는 국내 계량 업체로서는 유일하게 하중센서의 기본이 되는 Strain Gage 생산 설비를 갖추고 다양한 용도와 형태의 제품을 생산하고 있습니다. 또한 고객의 요구에 맞는 특수한 형태의 strain gage를 생산하며 Strain gage 분야에서 CAS의 영역을 확장시켜 나가고 있습니다.

CAS에서 자체적으로 개발, 제작한 Strain gage를 사용하여 제작된 당사의 Load cell과 전자저울은 국내는 물론 전세계적으로 통용되는 다수의 국제인증을 획득함으로써 다양한 분야에서 그 품질과 기술을 인증 받고 있습니다.



Strain Measurement Technical Support

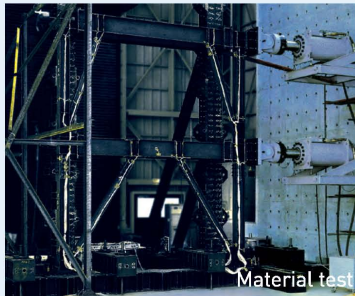
정밀한 Strain 계측을 위해서는 사용하려는 용도에 적합한 Strain gage의 선정이 중요함은 물론, 선정된 Strain gage의 부착 조건 및 결선 조건, 계측 방법 등 여러 가지 조건들을 고려하여 사용하는 것이 중요합니다. CAS는 Strain 계측과 관련된 다양한 현장중심의 기술지원을 통하여 Strain gage의 이해 및 사용에 다양한 편의를 제공하고 있으며 Strain gage와 관련된 사내/외 교육을 진행하고 있습니다.



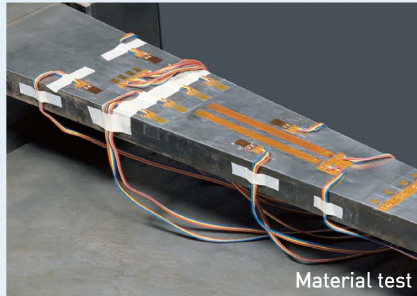
Measurements Applications



Structure test of steel construction



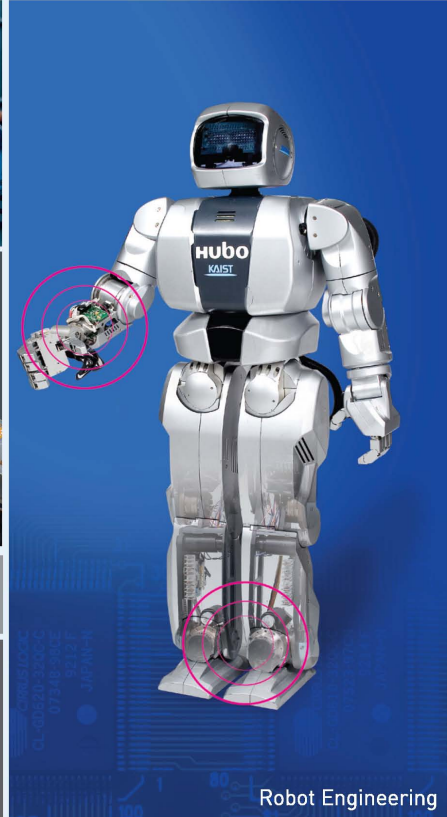
Material test



Material test



Concrete test



Robot Engineering



Divine Bell of King Song-Dok (The Emille Bell)



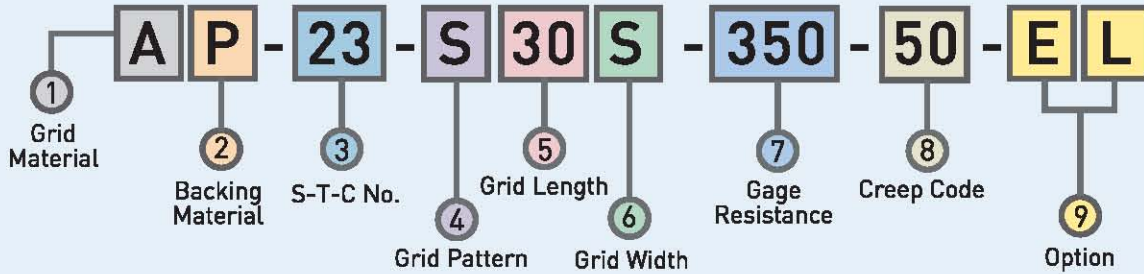
Crane & Hopper Scale



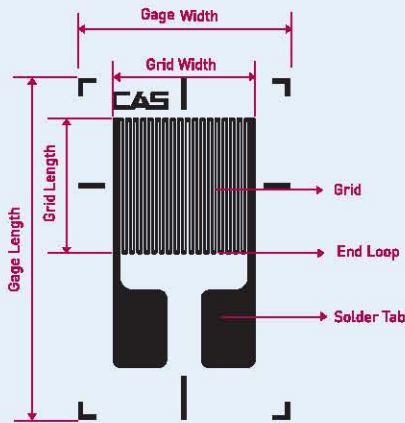
Material test

Coding System

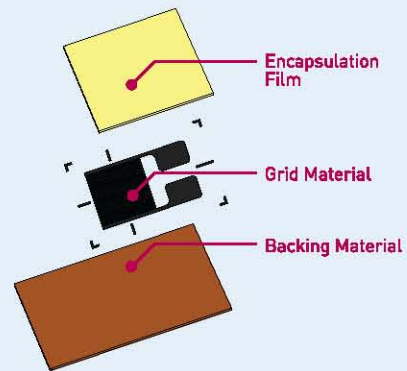
CAS Strain gage는 NAS942, OIML, ASTM 등 국제적으로 공인된 Standard에 의하여 제작되고 있으며 제조사마다 정해진 규칙에 의거하여 Strain gage의 형태, 용도, 재질, 저항 등을 구분할 수 있는 별도의 Coding system을 적용하고 있습니다.



No	Code	Information	
1	A	Grid Material	A : Constantan, K : Karma
2	P	Backing Material	P : Polyimide film, B : Phenolic resin
3	23	S-T-C No.	11 : Steel, 23 : Aluminum
4	S	Grid Pattern	S : Single Linear, T : Tee Rosette, D : Diaphragm, R : 3 elements rosette, Q-Shear
5	30	Grid Length	10(1mm) ~ 900(90mm)
6	S	Grid Width	N : Narrow, S : Same, W : Wide (width-length ratio)
7	350	Gage Resistance	120, 350, 700, 1000, 2000, 3000
8	50	Creep Code	05 ~ 11 (end loop-grid ratio)
9	EL	Option	E : Encapsulated, L : Lead wire attached, C : Cable attached



Strain Gage Terminology

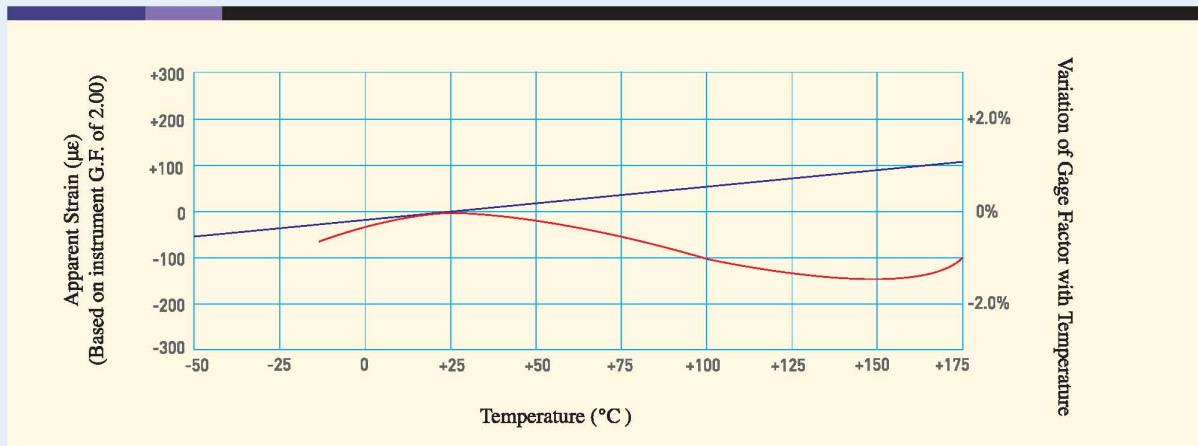


Strain Gage Structure

Technical Property

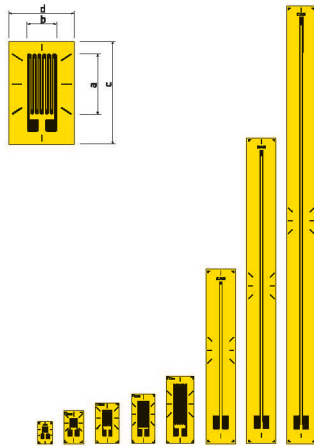
Item	Unit	AP series	AB series
Grid	Material	Constantan	
	Thickness	2.5, 5	
Backing	Material	Polyimide	Phenolic resin
	Thickness	25	
Resistance	Value	120, 350, 700, 1000	
	Tolerance	± 0.2	
Gage factor		2.1 ± 1%	
Gage factor variation with Temp.		1.2 ± 0.1%	
Thermal output	μ ϵ / °C	1.5 ± 0.2	
Transverse sensitivity	%	3.0	
Available temperature range	°C	-30 ~ +80	-40 ~ +100
S-TC no.		Quartz : 0	
		Molybdenum : 5	
		Titanium : 9	
		Steel : 11	
		Stainless steel : 16	
		Aluminum : 23	
		Plastic : 65	
Maximum expansibility	%	3.5	2
Fatigue Life @ ± 1000μ ϵ		10 ⁷	
Transverse Sensitivity	%	1.7 ± 0.2	

Thermal Output



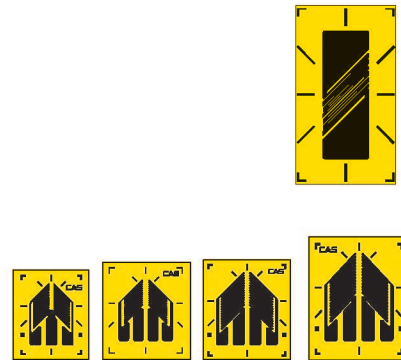
Classification by Grid Pattern

Single Linear Grid Pattern



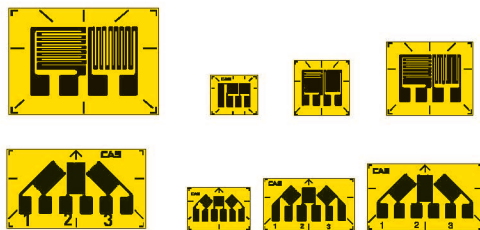
- Widely used general purpose linear type strain gage (S series strain gage)
- Bending application
- Grid size : 1 ~ 90mm
- Resistance : 120 ~ 2000Ω
- Similar geometry pattern available

Shear & Double Shear Grid Pattern



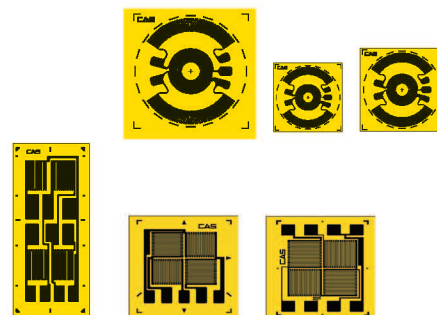
- General shear type strain gage (Q : single shear, T : double shear series)
- Shear & torque application
- Grid size : 1 ~ 10mm
- Resistance : 120, 350, 700, 1000Ω
- Similar geometry pattern available

T & 3-Element Rosette Pattern



- Tee & (delta)Rosette type strain gage (T : 2-90°, TS : 2-90° stacked, R : 3-element, RS : 3-element stacked)
- Shear, torque, point stress analysis application
- Resistance : 120, 350, 1000Ω

Diaphragm & Special Grid Pattern



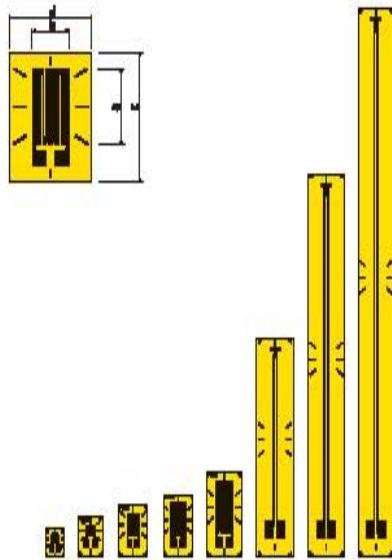
- Diaphragm & other full bridge type strain gage (D : diaphragm, FB : full bridge)
- Pressure sensor or special application
- Resistance : 120, 350 Ω
- Special order made available

Strain Gages

120Ω Strain Gages

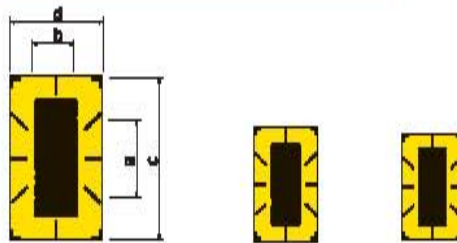
120Ω

Linear S-Series 120Ω



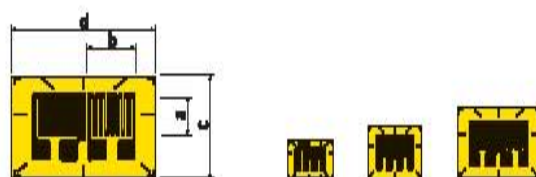
Order#	Dimension (unit : mm)			
Model	a	b	c	d
AP(AB)-11-S10S-120	1.0	1.2	5.0	3.2
AP(AB)-11-S15S-120	1.5	1.5	7.0	4.0
AP(AB)-11-S30N-120	3.0	1.7	9.0	5.0
AP(AB)-11-S50N-120	5.0	2.1	11.0	3.2
AP(AB)-11-S80N-120	8.0	2.5	15.0	6.0
AP(AB)-11-S300N-120	30.0	0.6	40.0	6.0
AP(AB)-11-S600N-120	60.0	0.6	70.0	6.0
AP(AB)-11-S900N-120	90.0	0.9	100.0	6.0
AP(AB)-23-S10S-120	1.0	1.2	5.0	3.2
AP(AB)-23-S15S-120	1.5	1.5	7.0	4.0
AP(AB)-23-S30N-120	3.0	1.7	9.0	5.0
AP(AB)-23-S50N-120	5.0	2.1	11.0	3.2
AP(AB)-23-S80N-120	8.0	2.5	15.0	6.0
AP(AB)-23-S300N-120	30.0	0.6	40.0	6.0
AP(AB)-23-S600N-120	60.0	0.6	70.0	6.0
AP(AB)-23-S900N-120	90.0	0.9	100.0	6.0

Single Shear Q-Series 120Ω



Order#	Dimension (unit : mm)				
Model	a	b	c	d	e
AP(AB)-11-Q15N-120	3.6	1.4	8.0	4.0	1.5
AP(AB)-11-Q30N-120	5.1	2.8	10.0	5.6	3.0
AP(AB)-23-Q15N-120	3.6	1.4	8.0	4.0	1.5
AP(AB)-23-Q30N-120	5.1	2.8	10.0	5.6	3.0

Tee Rosette T-Series 120Ω

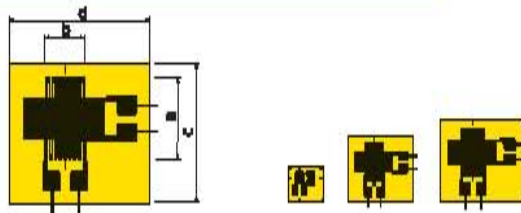


Order#	Dimension (unit: mm)			
Model	a	b	c	d
AP(AB)-11-T10S-120	1.0	1.0	5.3	6.0
AP(AB)-11-T15S-120	1.5	1.5	6.5	7.0
AP(AB)-11-T30S-120	3.0	3.0	9.0	11.0
AP(AB)-23-T10S-120	1.0	1.0	5.3	6.0
AP(AB)-23-T15S-120	1.5	1.5	6.5	7.0
AP(AB)-23-T30S-120	3.0	3.0	9.0	11.0

Strain Gages

120Ω Strain Gages

Tee Rosette TS-Series 120Ω



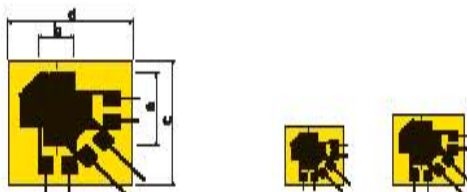
Order#	Dimension (unit : mm)			
Model	a	b	c	d
AP(AB)-11-TS10S-120	1.0	1.2	5.0	6.0
AP(AB)-11-TS30S-120	3.0	1.7	9.0	9.0
AP(AB)-11-TS50S-120	5.0	2.1	11.0	11.0
AP(AB)-23-TS10S-120	1.0	1.2	5.0	6.0
AP(AB)-23-TS30S-120	3.0	1.7	9.0	9.0
AP(AB)-23-TS50S-120	5.0	2.1	11.0	11.0

3-Element Rosette R-Series 120Ω



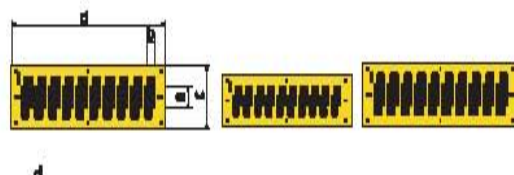
Order#	Dimension (unit : mm)			
Model	a	b	c	d
AP(AB)-11-R10S-120	1.0	1.2	6.0	9.0
AP(AB)-11-R15S-120	1.5	1.5	7.0	12.0
AP(AB)-11-R30N-120	3.0	1.3	9.0	15.0
AP(AB)-23-R10S-120	1.0	1.2	6.0	9.0
AP(AB)-23-R15S-120	1.5	1.5	7.0	12.0
AP(AB)-23-R30N-120	3.0	1.3	9.0	15.0

3-Element Rosette RS-Series 120Ω



Order#	Dimension (unit : mm)			
Model	a	b	c	d
AP(AB)-11-RS30N-120	3.0	1.7	9.0	9.0
AP(AB)-11-RS50N-120	5.0	2.1	11.0	11.0
AP(AB)-23-RS30N-120	3.0	1.7	9.0	9.0
AP(AB)-23-RS50N-120	5.0	2.1	11.0	11.0

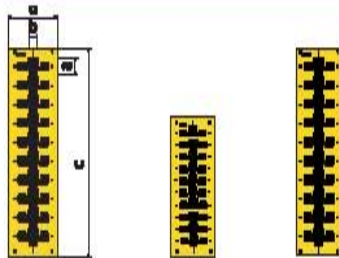
Strip Gage SH-Series 120Ω



Order#	Dimension (unit : mm)			
Model	a	b	c	d
AP(AB)-11-SH15S-120	1.5	1.5	7.6	22.0
AP(AB)-11-SH30N-120	3.0	1.5	9.7	27.0
AP(AB)-23-SH15S-120	1.5	1.5	7.6	22.0
AP(AB)-23-SH30N-120	3.0	1.5	9.7	27.0

120Ω Strain Gages

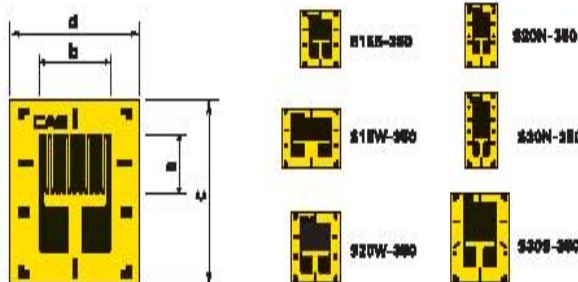
Strip Gage SV-Series 120Ω



Order#	Dimension (unit : mm)			
Model	a	b	c	d
AP(AB)-11-SV15S-120	1.5	1.5	27.0	8.0
AP(AB)-11-SV30N-120	3.0	1.6	44.5	9.8
AP(AB)-23-SV15S-120	1.5	1.5	27.0	8.0
AP(AB)-23-SV30N-120	3.0	1.6	44.5	8.8

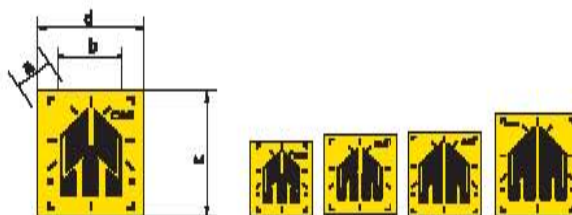
350Ω Strain Gages

Linear S-Series 350Ω



Order#	Dimension (unit : mm)			
Model	a	b	c	d
AP(AB)-11-S15S-350	1.5	1.7	4.8	3.2
AP(AB)-11-S15W-350	1.5	3.5	5.0	5.0
AP(AB)-11-S20W-350	2.0	2.8	8.0	4.0
AP(AB)-11-S20N-350	2.0	1.3	5.4	2.9
AP(AB)-11-S30N-350	3.0	1.3	8.5	2.5
AP(AB)-11-S30S-350	3.0	3.0	7.9	4.9
AP(AB)-23-S15S-350	1.5	1.7	4.8	3.2
AP(AB)-23-S15W-350	1.5	3.5	5.0	5.0
AP(AB)-23-S20W-350	2.0	2.8	8.0	4.0
AP(AB)-23-S20N-350	2.0	1.3	5.4	2.9
AP(AB)-23-S30N-350	3.0	1.3	8.5	2.5
AP(AB)-23-S30S-350	3.0	3.0	7.9	4.9

Double Shear T-Series 350Ω

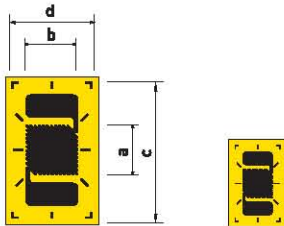


Order#	Dimension (unit : mm)			
Model	a	b	c	d
AP(AB)-11-T15N-350 (3tab)	1.5	3.0	8.5	5.0
AP(AB)-11-T20N-350	2.0	3.6	7.0	8.0
AP(AB)-11-T25N-350	2.5	4.1	7.5	8.4
AP(AB)-11-T30N-350	3.0	4.8	8.5	7.0
AP(AB)-23-T15N-350 (3tab)	1.5	3.0	8.5	5.0
AP(AB)-23-T20N-350	2.0	3.6	7.0	8.0
AP(AB)-23-T25N-350	2.5	4.1	7.5	8.4
AP(AB)-23-T30N-350	3.0	4.8	8.5	7.0

Strain Gages

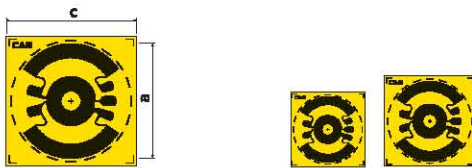
350Ω Strain Gages

Single Shear Q-Series 350Ω



Order#	Dimension (unit : mm)			
Model	a	b	c	d
AP(AB)-11-Q30S-350	3.1	3.1	8.5	5.0
AP(AB)-23-Q30S-350				

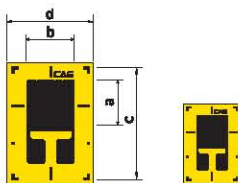
Diaphragm D-Series 350Ω



Order#	Dimension (unit : mm)	
Model	a	b
AP(AB)-11-D100-350	10.0	10.0
AP(AB)-11-D130-350	13.0	13.0
AP(AB)-11-D170-350	17.0	17.0
AP(AB)-23-D100-350	10.0	10.0
AP(AB)-23-D130-350	13.0	13.0
AP(AB)-23-D170-350	17.0	17.0

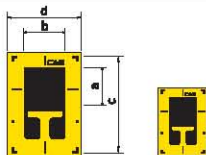
Special type Strain Gages

Linear S-Series 1K(2K)Ω



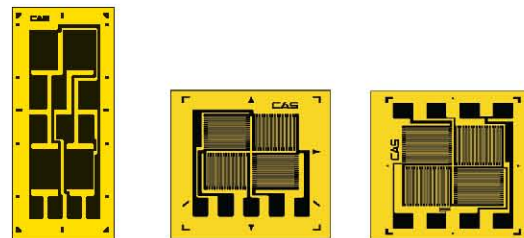
Order#	Dimension (unit : mm)			
Model	a	b	c	d
AP(AB)-11-S30S-1K	3.0	2.7	7.0	4.8
AP(AB)-11-S40S-2K	4.0	3.8	8.0	5.5
AP(AB)-23-S30S-1K	3.0	2.7	7.0	4.8
AP(AB)-23-S40S-2K	4.0	3.8	8.0	5.5

High Temperature K-Series (Only Steel)











Order#	Dimension (unit : mm)			
Model	a	b	c	d
KP(KB)-11-S30S-350	3.0	2.4	7.5	4.4
KP(KB)-11-S40S-1K	3	2.7	7.9	4.9


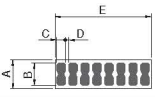
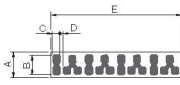
Full-Bridge FB-Series (Special order)



Accessories



	Order #		Item	Package
Solvent Cleaners	SC-1		IPA	500ml
	SC-2		MEK	500ml
	SC-3		ACETONE	500ml
Surface Abrasion Materials	SA-1		Sand Paper 320	1000pcs
	SA-2		Sand Paper 400	1000pcs
Tapes	TP-1		Mylar Tape	13mm x 66mm
Adhesives	Bond-1		Cold curing adhesive	30ml
	Bond-2		Hot curing adhesive	30ml
Wires & Cables	WR-1		Enamel coated wire	150m
	WR-2		2 Wire flat cable	50m
	WR-3		3 Wire flat cable	50m
Protective Coatings	PC-1		Silicone	100g
Solder & Flux	SD-1		Solder	
	FX-1		Flux	ø 0.5 X 2kg
Soldering Station	Bond-1 Bond-2			

Terminals	Drawing	Dimension (mm)					EA / Pack	
		A	B	C	D	E		
	TL1-13		4.5	3.2	1.3	0.9	17.6	50
	TL1-25		8.4	6.4	2.5	1.0	28	50
	TL2-13		4.5	3.2	1.3	0.9	26.4	50
	TL2-25		8.4	6.4	2.5	1.0	44	50

DA1602-A Dynamic Strain Amplifier



Features

- Bridge excitation selection (DC 1V to 10V)
- Fully adjustable gain from 1 to 11,000
- All bridge completion built in, including 120, 350 ohm
- Single shunt calibration
- Selectable cut-off frequency of four low-pass filters
- Wide frequency response (25KHz, -0.5dB)
- Excitation remote sense installed
- DC voltage calibrator built in

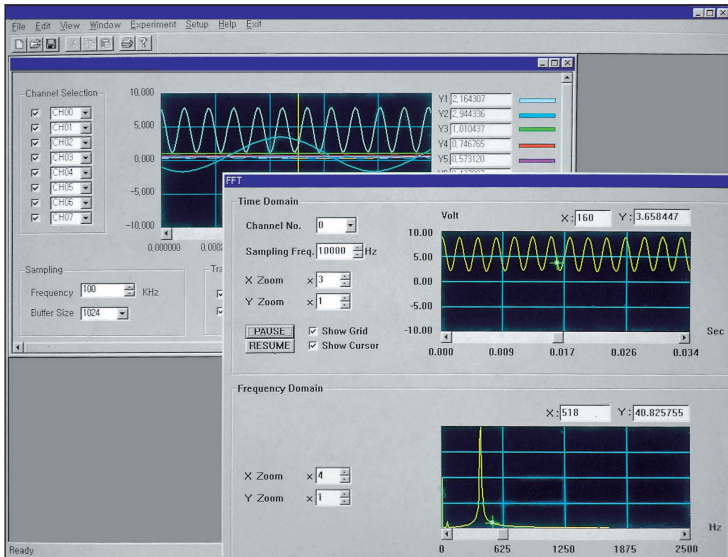
Applications

- Dynamic measurement - Strain, Force, Pressure, DC displacement and High level voltage signal
- Safety diagnosis of structures in civil and architectural engineering
- Lab test equipment with various physical sensors

Specifications

Inputs	straingages : 1/4, half(option), full(50Ω~1kΩ) dummy bridge resistor (120Ω~,350Ω) built in transducer : foil, piezoresistive straingage types potentiometer, dcct, displacement transducer etc, high level : voltage (mV, V)	
Bridge Exditation	voltage : DC ± 1 , ± 2 , ± 3 , ± 5 V ($\pm 0.5\%$) remote sense (0.0005%/Ω, at load resistor 350Ω) current : 0~100mA, max	
Bridge Balance	counter : emf injection method auto balance reset time : 2sec balance data back-up : 3years	ranges : $\pm 5000\mu\epsilon$ 2.5V/V(5% unbalance) manual balance : 50 $\mu\epsilon$ (gain depen.)
Shunt Calibration (Built- In)	standard resistor built -in : 1000 $\mu\epsilon$ (For Straingage 120Ω,350ΩG.F=2) 0.5mV/V (for transducer 350Ω)	
Internal Calibration	precision power built -in	voltage : 10mV, 100mV, 1V ($\pm 0.01\%$)
Amplifier	differential, common mode amplifier input Impeadance: $> 100\text{ M}\Omega$ gain : x1, x10, x100, x1000 rotary sw (err : $\pm 1\%$) x1~x11 continuously variable knob (err : $\pm 0.5\%$) ten-turn volume total gain : x1~x11000 frequency response (two output) ; DC coupled : DC to 65KHz, -3dB max. (30% out put) AC coupled : AC 5Hz to 25KHz, -0.5dB max common mode input : ± 10 V stability : 2 μ V/Ω, max reffered to input (gain over x100) noise : 0.01 to 10Hz : 1 μ V p-p reffered to input 0.5 to 50KHz ; 5 μ V rms, max reffered to input	
Filter	low -pass active 4pole butterworth filter (bessel filter) frequency : 10Hz, 100Hz, 1KHz, 10KHz or wide band AC signal on/off (DC remove)	
Amplifier Outputs	standard output : ± 10 V 5mA,min	monitor output : ± 10 V 5mA,min
Amplifier Indicators	led indicators : power, +bal, -bal, over, cal, autobal	
Power	AC110V /AC 220V 50/60Hz (switch selected) $\pm 10\%$	
Size	217 x 71 x 296 (H x W x D)mm	
Weight	2Kg	

DA1602-B Dynamic Analysis Module



AD Board & Accessories

Features

Program

- Easy operating application software in Windows XP
- Channel information setting
- Data acquisition, save, load and print
- On line strip view (up to 8 channels simultaneously)
- X-T, X-Y and Spectrum view
- Zooming and tracking
- Statistical analysis (Mean, Max., Min., Variance, STD, Peak to Peak)
- Digital filters
- Binary to ASCII conversion
- Static and Dynamic signal analysis

AD Board

(Notebook & Desktop Computer)

• Analog Inputs

- 16 single-ended, 8 differential channels
- 16 bit resolution
- 100 KS/s sampling rate for Desktop PC
- 200 KS/s sampling rate for Notebook PC
- Channel-independent gains and ranges setting
- Software calibration

• Digital I/O

- 8TTL lines

• Counter/Timer

- 2 up/down, 24bit resolution
- 20MHz maximum source frequency

• Shielded I/O Connector Blocks

- Screw terminals for I/O connections
- Shielded enclosure
- On board temperature sensor for thermocouple cold-junction compensation



DA-1602

Global Network



World Class Weighing Solution -

1987년 포르투갈 수출을 시작으로 카스는 도전적인 시장 확장을 통해 세계적 브랜드로 성장했으며 세계 각국의 계량인증 획득과 각국 딜러들과의 탄탄한 파트너십으로 글로벌 기업의 입지를 더욱 확고하게 다져가고 있습니다.

종합계량솔루션을 통해 전세계 고객의 비즈니스를 효과적으로 지원하는 카스, 고객이 인정하고 검증한 품질을 바탕으로 항상 고객님의 파트너가 되겠습니다.



CAS 전국 주요 지점

본사
경기도 양주시 광적면 가남리 19번지
Tel: 031-820-1100

대구지점
대구시 북구 침산 3동 336-21
Tel: 053-356-7111

대전지점
대전시 동구 용전동 49-5
Tel: 042-672-1016

순천지점
전남 순천시 연향동 1518-7 2층
Tel: 061-725-0262

서울영업소
서울시 강동구 성내동 440-1
카스 B/D
Tel: 02-2225-3500

전주지점
전주시 덕진구 여의동 871-1
Tel: 063-211-4661

마산지점
경남 마산시 양덕동 174-29 2층
Tel: 055-255-4371

광주지점
광주시 광산구 도천동 622-6번지
2층 202호
Tel: 062-363-0262

CAS 고객센터
1577-5578

인천지점
인천시 남동구 만수 5동 889-14
보영빌딩 2층
Tel: 032-434-0281

울산지점
울산광역시 남구 삼산동 1631-9
Tel: 052-267-3626

부산지점
부산광역시 사상구 감전1동
165-1 동방 B/D 301호
Tel: 051-313-3626

CAS 구로서비스 센터
서울시 구로구 구로동 1258번지
구로중앙유통단지 라동 1729호
Tel: 02-6679-5567

WE WEIGH THE WORLD™



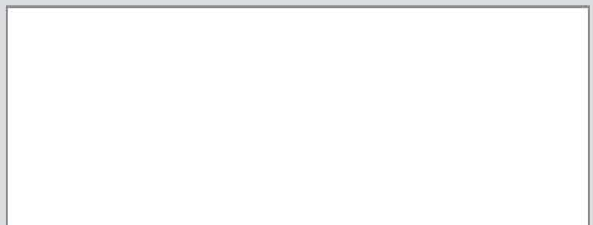
www.cas.co.kr

고객 서비스 지원 센터

무료 상담 센터

1577-5578
수리 및 고장 접수

080-022-0022



■ 제품의 색상은 인쇄상 실제와 다를 수도 있습니다. ■ 제품의 성능 향상을 위해 예고 없이 기능이 변경될 수도 있습니다.

C-906009002