ISO 9001

HANSEN

PRODUCTS GUIDE

Hall Effect Current & Voltage Sensors

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HANSEN HANKOOK SENSOR CO., LTD.

GENERALIFORMATION

The difference point between Current Transformer and Hall effect Current & Voltage Sensors

- Open loop & Closed loop Type - Current sensor
- Open loop & Closed loop Type - Voltage Sensor
- Application field of Current and Voltage Sensor
- Hall effect Current & Voltage Sensors - Selection Guide

PRODUCTS

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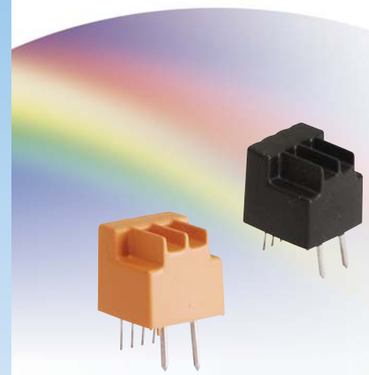
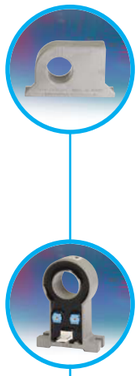


The difference point between Current Transformer and Hall effect Current Sensor

電流測定のための間接測定方法としては電流磁気効果型と電子誘導型に区分されます。

電子誘導型は電磁界の誘導現象を利用したもので、交流電流測定には有利だが、非整形波及び直流電流波形の測定には別途の周辺回路を含まなくては測定に困難が多いのが短所です。
また周波数備え出力信号の非線形性や過電流時に現われる破壊現象も CTの使用に困難を現わす現象たちです。



しかし、電流磁気効果型の電流センサーは上記の CTが持つ問題点を解決したのが長所です。それはホール効果理論を利用した磁-電変換素子(ホール素子)と磁性材料、これらを組み合わせた電子回路が一体化されて電流センサー(電流検出器)で構成されます。
ですから製品の小型化が可能で、測定電流電源と完全に絶縁された状態で非常に優秀な線形性を持って(0.1% ～ 1.0%)、過電流時にも非破壊特徴と優秀な温度特性を維持し、なおかつ CTができない直流電流波形や非整形交流電流波形の測定に全然問題がない、全ての範囲の測定が可能であるのが特徴です。

The ways of indirect measurement are divided electromagnetic induction and galvano-magnetic effect for current measurement.

The electromagnetic induction utilizes electronic induction phenomenon in electronic system.
But electromagnetic induction isn't available to measure atypical Wave forms and current DC without extra additional factors except AC current. In addition, frequency contrast output character is different in AC current waveforms and destructive phenomenon appears more than rated current condition.

Nevertheless galvano-magnetic effect changes all weak points of electromagnetic induction to advantage.
Electrical (Ha~ effect) Current Sensor uses the above galvano-magnetic effect. And then Current Sensor consists of hall element and magnetic material and electric circuit unifying these.
These facts represent that magnetic material, hall element and saturation region maintains very excellent straight linear type (0.1 % ~ 1.0%) and don't differentiate between AC current wave and DC current wave.

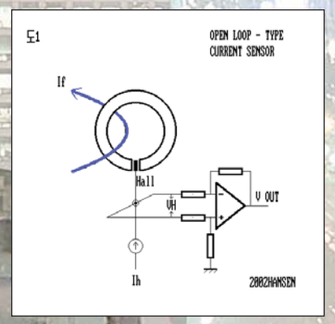
Open loop & Closed loop - Type - Current Sensor Feature

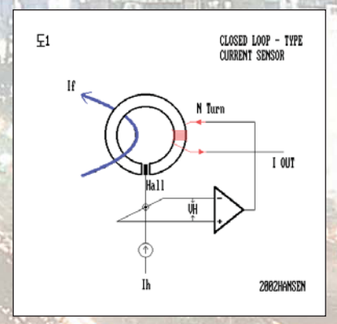
Open loop current Sensorは開放型回路で構成されて、測定電流備え出力信号が電圧信号として出力される特徴があります。これはセンサー内部の演算増幅器を通じて測定電流と等しい形象と比例値の信号で出力されるので、使用者が電流センサーと共通電源を通じて受信回路の A/D 変換器や演算増幅器及び制御回路の入力端に、特別な構成を添加しないで手軽く連結することができる長所があります。

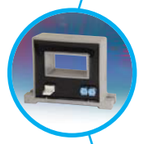
Open loop current Sensor is consists of open circuit so output appears measurement current contrast output voltage.
Power resource voltage supplied to sensor appears output voltage, As this output voltage is shown as power resource voltage supplied in sensor, the same appearance with measurement current and potential value through the operational amplifier inside sensor, it has advantage of connecting easily AID converter and control circuit board of though common power resource or input of operational circuit.

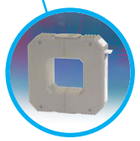
Zero Flux 概念で構成された電流検出器です。これは磁性体の磁束密度が常に ‘0’ 状態を維持させる方法で測定電流の流れと反対の出力信号(x N Turn)の電流を逆に流すことで可能になるのです。ですから磁性体の特性に寄り掛からない結果、より高い周波数帯域幅と応答度、磁性体の温度変化特性を著しく改善させる長所があります。

This type is the current sensor with zero flux conception.
“Zero Flux concept’ means that keeping magnetic flux density of magnetic body ‘0’ condition, In other word& this type of current sensor make it possible by sending the output signal of current (X N Turn) to the reverse direction of measuring current.





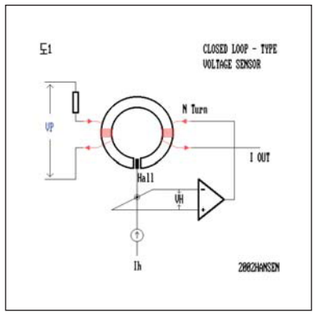




Open loop & Closed loop - Type - Voltage Sensor Feature

電圧検出器の原理は既存の電流検出器を基本として、次の図面のように測定電圧から抵抗 Rを通過した電流が x N Turnの割合で巻いている電圧測定用コイルを通過する時に電流検出器が電流の量として読み込む方法です。ところで抵抗を通過する電流の形象は電圧と等しいので、電流センサーの出力信号をそのまま電圧信号として活用したのが電圧検出器の原理です。

The main principle of voltage sensor is that current sensor can read the current passed resistance “R” and current measuring coils(coiled at x N Turn rate) as amount of current. In other words, the output signal of current sensor is considered as voltage signal because the signal of current passed resistance “R” is same as voltage.



Application field Current and Voltage Sensor
電流、電圧検出器の応用分野

■ 電力変換器、電力転換器、SMPS、Servomotor装置、電源装置、その他
Inverter, Converter, AMPS, Power supply, Servomotor system, and etc.

■ 整流器、溶接機、無停電電源装置、自動電圧調整器、蓄電池制御装置、その他
Rectifier, Welding machine, UPS, AVR, Battery supplies system, and etc.

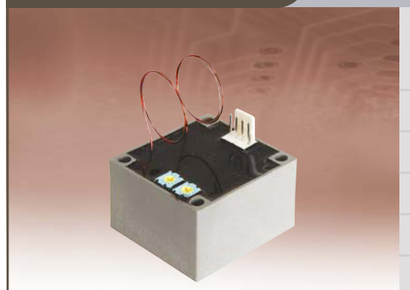
■ 電気自動車、電動フォークリフト、無人搬送車、ゴルフカー、船舶、鉄道車両、その他
Electric motors, Electric forklift, Golf car, Shipment, Electric rail car, Self-control function and Battery current control abservation of automated guide vehicle and etc.

■ 昇降機、自動階段、建物自動化装置、工場自動化装置、自動機械装置、その他
Elevator, Escalator, Inteligent building system, Factory automation system, Robot System and etc.

■ Power audio system、冷蔵庫、P.D.P TV、高級民需用品
Self-diagnosis of civilian good and power audio system, air conditioner, P.D.P TV, and application for high class products.

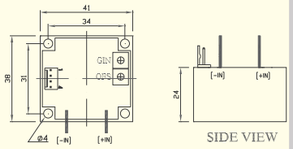
■ 軍需用品、その他
Munitions-supplies, and etc.

XM-A·S

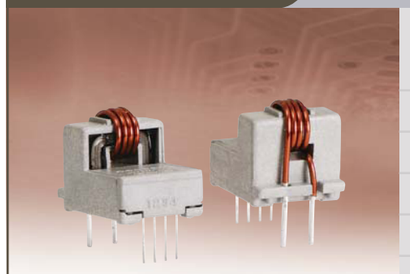


SPECIFICATION	
Reted Current	0.5A, 0.8A, 1.0A, DC or AC
Output Signal	±4V ±1% at If = F.S.
Supply Voltage	±12V or ±15V ±5%
Accuracy	±1.0% at 1_{PN}, T_A = 25˚C
Linearity	±1.0% of Vh at If = F.S
Response Time	5μs ~ μs
Thermal Drift	±0.1% / ˚C

DIMENSION

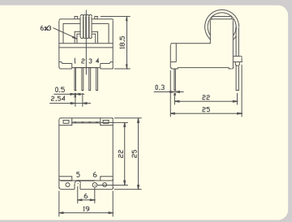


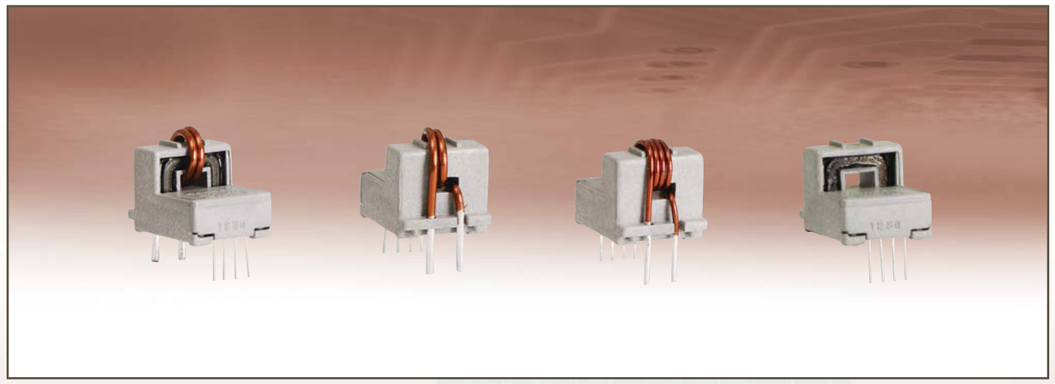
PP-A·S



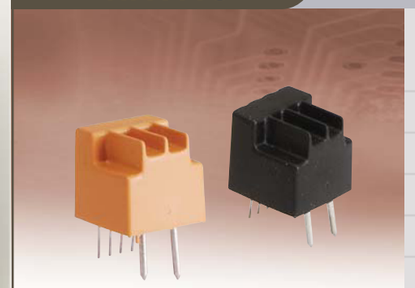
SPECIFICATION	
Reted Current	3A, 5A, 10A, 15A, 20A, 25A, 30A, 40A, DC or AC
Output Signal	±4V ±1% at If = F.S.
Supply Voltage	±12V or ±15V ±5%
Accuracy	±1.0% at 1_{PN}, T_A = 25˚C
Linearity	± 1.0% of Vh at If = F.S
Response Time	3μs ~ 15μs
Thermal Drift	±0.1% / ˚C

DIMENSION



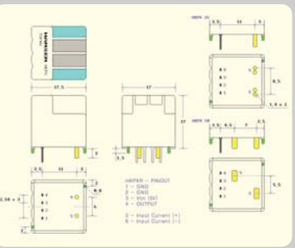


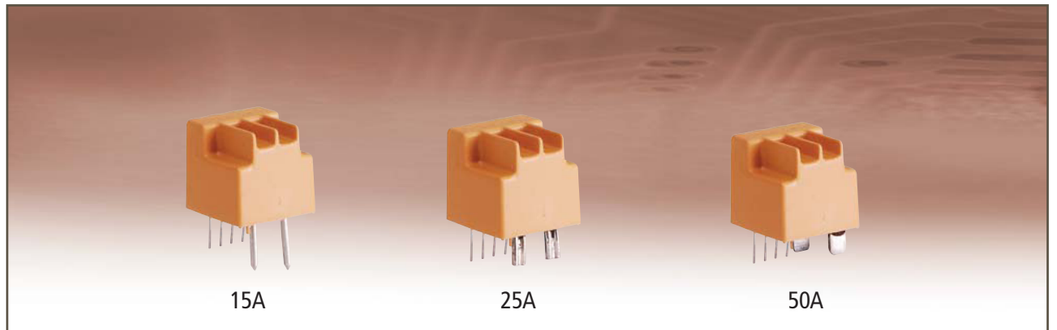
HPX-A·S



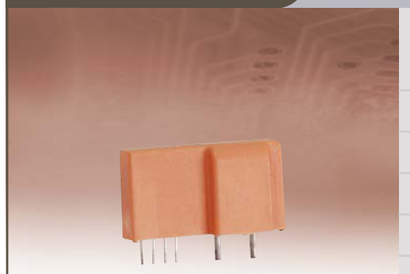
SPECIFICATION	
Reted Current	5A, 10A, 15A, 20A, 25A, 50A, DC or AC
Output Signal	±4V ±1% at If = F.S.
Supply Voltage	±12V or ±15V ±5%
Accuracy	±1.0% at 1_{PN}, T_A = 25˚C
Linearity	±1.0% of Vh at If = F.S
Response Time	5μs ~ 20μs
Thermal Drift	±0.1% / ˚C

DIMENSION



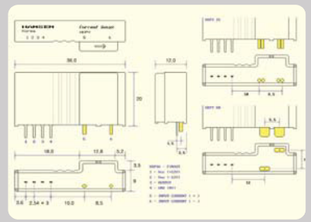


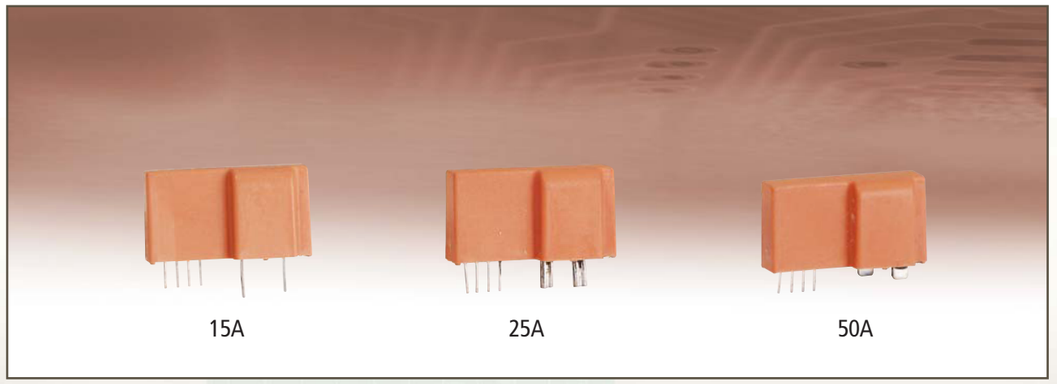
HPY-A·S



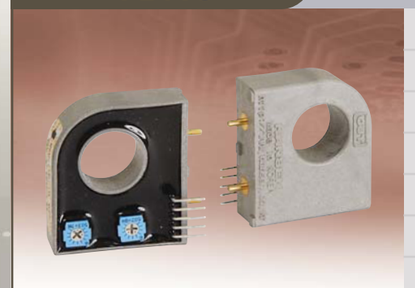
SPECIFICATION	
Reted Current	5A, 10A, 15A, 20A, 25A 50A, DC or AC
Output Signal	±4V ±1% at If = F.S.
Supply Voltage	±12V or ±15V ±5%
Accuracy	±1.0% at 1_{PN}, T_A = 25˚C
Linearity	± 1.0% of Vh at If = F.S
Response Time	3μs ~ 20μs
Thermal Drift	±0.1% / ˚C

DIMENSION



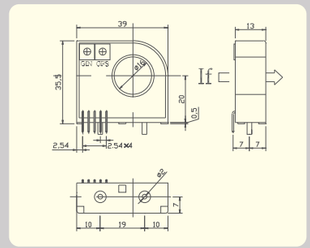


PL-A·S



SPECIFICATION	
Reted Current	25AT ~ 250AT DC or AC
Output Signal	±4V ±1% at If = F.S.
Supply Voltage	±12V or ±15V ±5%
Accuracy	±1.0% at 1_{PN}, T_A = 25˚C
Linearity	± 1.0% of Vh at If = F.S
Response Time	5μs ~ 20μs
Thermal Drift	±0.1% / ˚C

DIMENSION

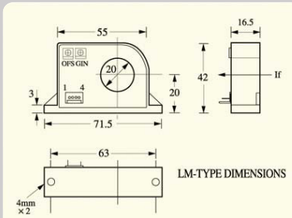


Hall effect Current & Voltage Sensors

LM-A·S·R·D

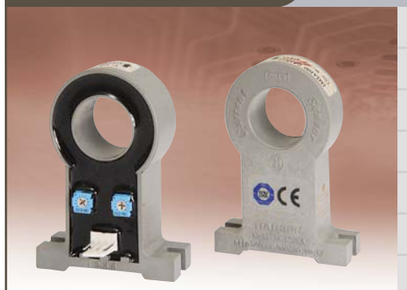
SPECIFICATION	
Reted Current	40AT ~ 400AT DC or AC
Output Signal	±4V ±1% at If = F.S.
Supply Voltage	±12V or ±15V ±5%
Accuracy	±1.0% at 1_{PN}, T_A = 25℃, ±1.5%
Linearity	±1.0% of Vh at If = F.S
Response Time	5μs ~ 20μs
Thermal Drift	±0.1% / ℃

DIMENSION



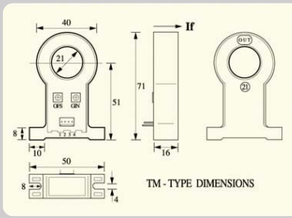
LM-TYPE DIMENSIONS

TM-A·S·R·D



SPECIFICATION	
Reted Current	40AT ~ 400AT DC or AC
Output Signal	±4V ±1% at If = F.S.
Supply Voltage	±12V or ±15V ±5%
Accuracy	±1.0% at 1_{PN}, T_A = 25℃
Linearity	± 1.0% of Vh at If = F.S
Response Time	5μs ~ 20μs
Thermal Drift	±0.1% / ℃

DIMENSION

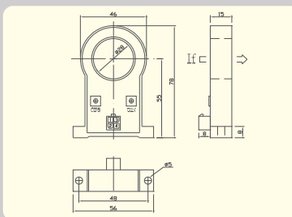


TM - TYPE DIMENSIONS

TM3-A·S

SPECIFICATION	
Reted Current	40AT ~ 400AT DC or AC
Output Signal	±4V ±1% at If = F.S.
Supply Voltage	±12V or ±15V ±5%
Accuracy	±1.0% at 1_{PN}, T_A = 25℃
Linearity	±1.0% of Vh at If = F.S
Response Time	7μs ~ 20μs
Thermal Drift	±0.1% / ℃

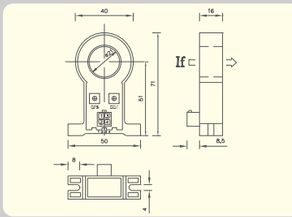
DIMENSION



TM4-A·S

SPECIFICATION	
Reted Current	40AT ~ 400AT DC or AC
Output Signal	±4V ±1% at If = F.S.
Supply Voltage	±12V or ±15V ±5%
Accuracy	±1.0% at 1_{PN}, T_A = 25℃
Linearity	± 1.0% of Vh at If = F.S
Response Time	5μs ~ 20μs
Thermal Drift	±0.1% / ℃

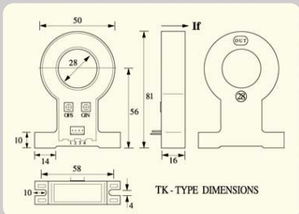
DIMENSION



TK-A·S·R·D

SPECIFICATION	
Reted Current	40AT ~ 600AT DC or AC
Output Signal	±4V ±1% at If = F.S.
Supply Voltage	±12V or ±15V ±5%
Accuracy	±1.0% at 1_{PN}, T_A = 25℃
Linearity	±1.0% of Vh at If = F.S
Response Time	7μs ~ 20μs
Thermal Drift	±0.1% / ℃

DIMENSION

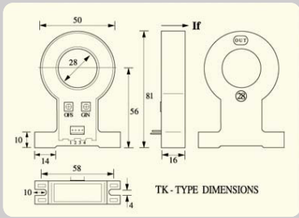


TK - TYPE DIMENSIONS

TK3-A·S

SPECIFICATION	
Reted Current	40AT ~ 600AT DC or AC
Output Signal	±4V ±1% at If = F.S.
Supply Voltage	±12V or ±15V ±5%
Accuracy	±1.0% at 1_{PN}, T_A = 25℃
Linearity	±1.0% of Vh at If = F.S
Response Time	7μs ~ 20μs
Thermal Drift	±0.1% / ℃

DIMENSION

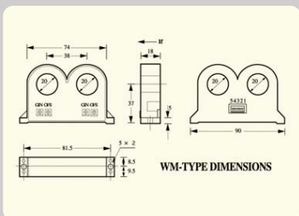


TK - TYPE DIMENSIONS

WM-A·S

SPECIFICATION	
Reted Current	40AT ~ 300AT DC or AC
Output Signal	±4V ±1% at If = F.S.
Supply Voltage	±12V or ±15V ±5%
Accuracy	±1.0% at 1_{PN}, T_A = 25℃
Linearity	±1.0% of Vh at If = F.S
Response Time	5μs ~ 20μs
Thermal Drift	±0.1% / ℃

DIMENSION

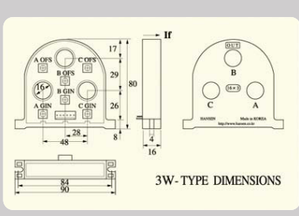


WM-TYPE DIMENSIONS

3W-A·S

SPECIFICATION	
Reted Current	25AT ~ 200AT DC or AC
Output Signal	±4V ±1% at If = F.S.
Supply Voltage	±12V or ±15V ±5%
Accuracy	±1.0% at 1_{PN}, T_A = 25℃
Linearity	±1.0% of Vh at If = F.S
Response Time	5μs ~ 20μs
Thermal Drift	±0.1% / ℃

DIMENSION



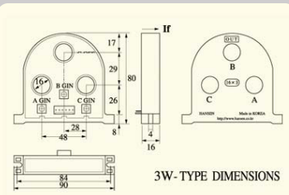
3W- TYPE DIMENSIONS

Hall effect Current & Voltage Sensors

3WD

SPECIFICATION	
Reted Current	40AT ~ 200A
Output Signal	ab±4V at If = F.S.
Linearity	±1.0% of Vh at If = F.S
Supply Voltage	±12V or ±15V ±5%
Response Time	25μs
Thermal Drift	±0.1% / ℃

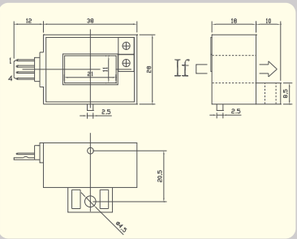
DIMENSION



SM-A·S·R

SPECIFICATION	
Reted Current	40AT ~ 400A DC or AC
Output Signal	±4V ±1% at If = F.S.
Supply Voltage	±12V or ±15V ±5%
Accuracy	±1.0% at 1_{PN}, T_A = 25℃
Linearity	±1.0% of Vh at If = F.S
Response Time	5μs ~ 20μs
Thermal Drift	±0.1% / ℃

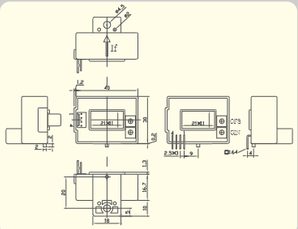
DIMENSION



SM3A-A·S·R

SPECIFICATION	
Reted Current	40AT DC ~ 400AT DC
Output Signal	±4V ±1% at If = F.S.
Linearity	±1.0% of Vh at If = F.S
Supply Voltage	±12V or ±15V ±5%
Response Time	7μsec ~ 20μsec
Frequency Range	DC~ AC20KHz and 25KHz Max
Thermal Drift	±0.1% / ℃

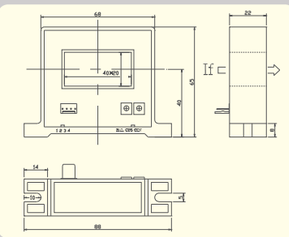
DIMENSION



BS-A·S

SPECIFICATION	
Reted Current	200AT ~ 1,500AT DC or AC
Output Signal	±4V ±1% at If = F.S.
Supply Voltage	±12V or ±15V ±5%
Accuracy	±1.0% at 1_{PN}, T_A = 25℃
Linearity	± 1.0% of Vh at If = F.S
Response Time	15μs
Thermal Drift	±0.1% / ℃

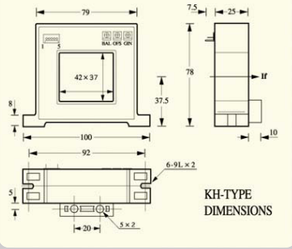
DIMENSION



KH-A·S

SPECIFICATION	
Reted Current	200AT ~ 2,000AT DC or AC
Output Signal	±4V ±1% at If = F.S.
Supply Voltage	±12V or ±15V ±5%
Accuracy	±1.0% at 1_{PN}, T_A = 25℃
Linearity	±1.0% of Vh at If = F.S
Response Time	< 15μs
Thermal Drift	±0.1% / ℃

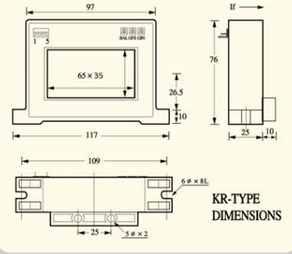
DIMENSION



KR-A·S

SPECIFICATION	
Reted Current	400AT ~ 2,500AT DC or AC
Output Signal	±4V ±1% at If = F.S.
Supply Voltage	±12V or ±15V ±5%
Accuracy	±1.0% at 1_{PN}, T_A = 25℃
Linearity	±1.0% of Vh at If = F.S
Response Time	< 15μs
Thermal Drift	±0.1% / ℃

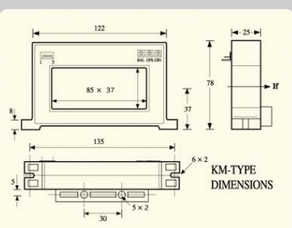
DIMENSION



KM-A·S

SPECIFICATION	
Reted Current	400AT ~ 3,000AT DC or AC
Output Signal	±4V ±1% at If = F.S.
Supply Voltage	±12V or ±15V ±5%
Accuracy	±1.0% at 1_{PN}, T_A = 25℃
Linearity	±1.0% of Vh at If = F.S
Response Time	< 15μs
Thermal Drift	±0.1% / ℃

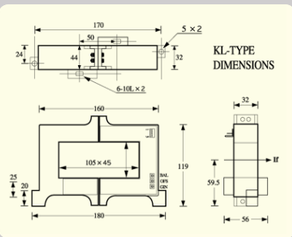
DIMENSION



KLL-A·S

SPECIFICATION	
Reted Current	600AT ~ 5,000AT DC or AC
Output Signal	±4V ±1% at If = F.S.
Supply Voltage	±12V or ±15V ±5%
Accuracy	±1.5% at 1_{PN}, T_A = 25℃
Linearity	±1.0% of Vh at If = F.S
Response Time	< 15μs
Thermal Drift	±0.1% / ℃

DIMENSION

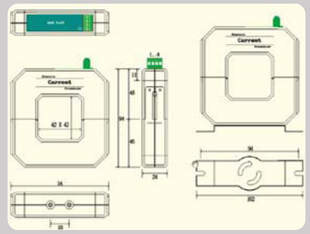


Hall effect Current & Voltage Sensors

SU1

SPECIFICATION	
Reted Current	50A ~ 500A
Output Signal	50mA ~ 200mA
Linearity	±0.1%
Supply Voltage	±12V ~ ±18V
Response Time	1μsec
Frequency Range	DC ~ AC100KHz
Output Volage Temperature Coef	0.05%

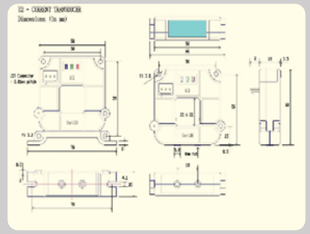
DIMENSION



SU2

SPECIFICATION	
Reted Current	25A ~ 100A
Output Signal	50mA ~ 200mA
Linearity	±0.1%
Supply Voltage	±12V ~ ±18V
Response Time	1μsec
Frequency Range	DC ~ AC100KHz
Output Volage Temperature Coef	0.05%

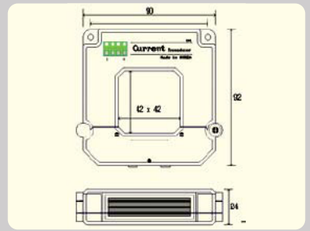
DIMENSION



SU3

SPECIFICATION	
Reted Current	100A ~ 400A
Output Signal	50mA ~ 200mA
Linearity	±0.1%
Supply Voltage	±12V ~ ±18V
Response Time	1μsec
Frequency Range	DC ~ AC100KHz
Output Volage Temperature Coef	0.05%

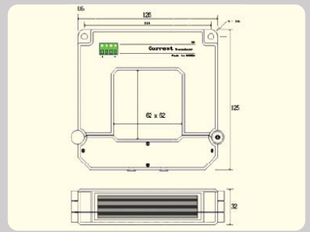
DIMENSION



SU4

SPECIFICATION	
Reted Current	300A ~ 600A
Output Signal	50mA ~ 200mA
Linearity	±0.1%
Supply Voltage	±12V ~ ±18V
Response Time	1μsec
Frequency Range	DC ~ AC100KHz
Output Volage Temperature Coef	0.05%

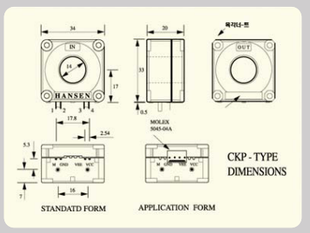
DIMENSION



CKP

SPECIFICATION	
Reted Current	50AT, 100AT DC or AC
Output Signal	±50mA at If = F.S
Supply Voltage	±12V or ±15V ±5%
Accuracy	±0.5% at 1_{PN}, T_A = 25°C
Linearity	±0.5% of Vhat If = F.S.
Response Time	< 3μs
Frequency Range	DC ~ AC100KHz and 200KHz Max
Thermal Drift	±0.05% / °C

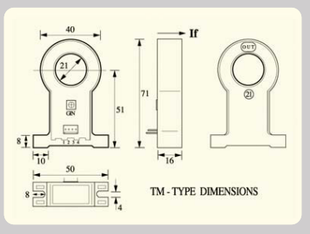
DIMENSION



CTM

SPECIFICATION	
Reted Current	50AT, 100AT, 200AT DC or AC
Output Signal	±50mA or ±100mA at If = F.S
Supply Voltage	±12V or ±15V ±5%
Accuracy	±0.5% at 1_{PN}, T_A = 25°C
Linearity	±0.5% of Vhat If = F.S.
Response Time	< 3μs
Frequency Range	DC ~ AC100KHz and 200KHz Max
Thermal Drift	±0.05% / °C

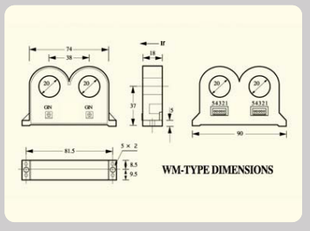
DIMENSION



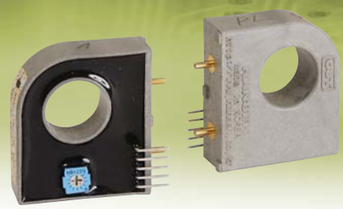
CWM

SPECIFICATION	
Reted Current	50AT, 100AT DC or AC
Output Signal	±50mA at If = F.S
Supply Voltage	±12V or ±15V ±5%
Accuracy	±0.5% at 1_{PN}, T_A = 25°C
Linearity	±0.5% of Vh at If = F.S.
Response Time	< 3μs
Frequency Range	DC ~ AC100KHz and 200KHz Max
Thermal Drift	±0.05% / °C

DIMENSION

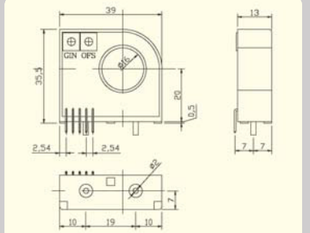


CPL



SPECIFICATION	
Reted Current	50AT, 100AT DC or AC
Output Signal	±50mA at If = F.S
Supply Voltage	±12V or ±15V ±5%
Accuracy	±0.5% at 1_{PN}, T_A = 25°C
Linearity	±0.5% of Vh at If = F.S.
Response Time	< 3μs
Frequency Range	DC ~ AC100KHz and 200KHz Max
Thermal Drift	±0.05% / °C

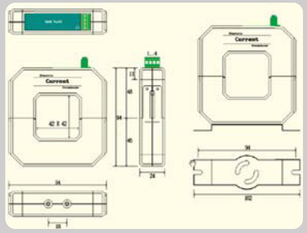
DIMENSION



TU1

SPECIFICATION	
Reted Current	50A ~ 500A
Output Signal	DC 0mA ~ 20mA DC 4mA ~ 20mA DC 0 ~5V, DC 0 ~ 10V
Linearity	0.1%
Supply Voltage	+24V
Response Time	< 0.5μs
Frequency Range	DC ~ AC200KHz
Output Volage Temperature Coef	0.05%

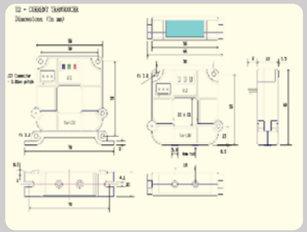
DIMENSION



TU2

SPECIFICATION	
Reted Current	25A ~ 100A
Output Signal	DC 0mA ~ 20mA DC 4mA ~ 20mA DC 0 ~5V, DC 0 ~ 10V
Linearity	0.1%
Supply Voltage	+24V
Response Time	< 0.5μs
Frequency Range	DC ~ AC200KHz
Output Volage Temperature Coef	0.05%

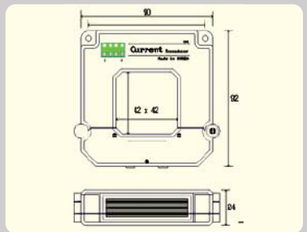
DIMENSION



TU3

SPECIFICATION	
Reted Current	100A ~ 400A
Output Signal	DC 0mA ~ 20mA DC 4mA ~ 20mA DC 0 ~5V, DC 0 ~ 10V
Linearity	0.1%
Supply Voltage	+24V
Response Time	< 0.5μs
Frequency Range	DC ~ AC200KHz
Output Volage Temperature Coef	0.05%

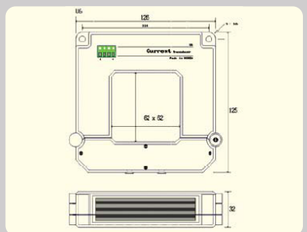
DIMENSION



TU4

SPECIFICATION	
Reted Current	300A ~ 600A
Output Signal	DC 0mA ~ 20mA, DC 4mA ~ 20mA DC 0 ~5V, DC 0 ~ 10V
Linearity	0.1%
Supply Voltage	+24V
Response Time	< 0.5μs
Frequency Range	DC ~ AC200KHz
Output Volage Temperature Coef	0.05%

DIMENSION

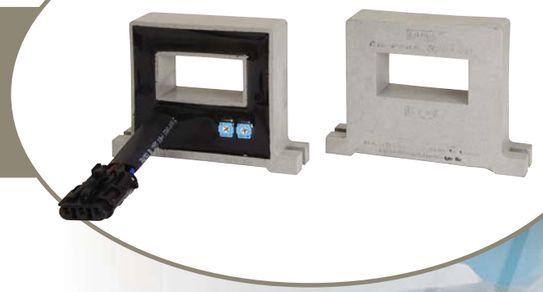


Hall effect Current & Voltage Sensors

HM-SERIES
300A
Supply Voltage
Accuracy

HM-SERIES
120A~300A
Supply Voltage
Accuracy

NBS-SERIES
500A
Supply Voltage
Accuracy



AI-SERIES
500A~600A
Supply Voltage
Accuracy