

 Single turn absolute position sensor VRE	 Multi turn absolute position sensor MRE	 Single turn absolute heavy-duty position sensor VRE	 Multi turn absolute heavy-duty position sensor MRE	 Dual rod absolute linear sensor VLS	 Single rod 1 pitch linear sensor VLS
 Heavy duty linear sensor for AGC VLS-BSM	 Cylinder in-rod linear sensor IRS	 Smart linear position cylinder CYLNUC	 Magnet proximity sensor ABSO PX	 Eddy current displacement EZGAP	 Magnetic reluctance tension detect VR TENSION
 Non contact & wireless power transfer ABSO COUPLER	 Non contact & wireless temperature transfer ABSO COUPLER	 Silver alloy slip-ring BAUMCOUPLER	 Wire position detect Wire Runner	 Pulse Count Selectable Electro-Magnetic Rotary Sensor ezABSO	 Pulse output converter ABSO PULPUL
 Binary / Gray output converter NCV-20	 DeviceNet converter NCV-DN	 SSI converter NCV-SSI	 Switch output controller for VRE VARICAM	 Switch output controller with motion-control VARILIMIT	 Analog output controller VARIANA
 Mitsubishi Melsec-Q PLC built-in controller VS-Q62	 SIEMENS profibus controller NCW-3DH	 TMEIC PLC built-in controller AB93	 PLC built-in controller YASKAWA 2YE FUJI NCV-HFE	 Water gate controller GCW	 AGC up/down pulse converter NP-SCALE

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True Heavy Duty & Fully Absolute Position Sensor

Sensor Solution

True Heavy Duty and Fully Absolute Position Sensor
Factory Automation sand System Control Industry



SENSOR SOLUTION

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NSD PROVIDES ACCIDENT-FREE AND MAINTENANCE-FREE HEAVY DUTY POSITION SENSOR



NSD provides a wide selection of rugged and customizable position sensors that utilize premium performance to deliver the reliable position sensing solutions in harsh and maintenance poor environments. NSD's true heavy duty and fully absolute position sensor ABSOCODERs are ideal for long-term installation with extremely less down-time in industrial applications where continuous position measurement is needed. These prevision engineered and durable sensors are superb stability and resistance to interference.

Anyone who has ever worked in the tire and rubber industry recognizes the potential dangers inherent with the industry's working environment. Unless suitable and stringent precautions are observed, employees may be exposed to these dangers.

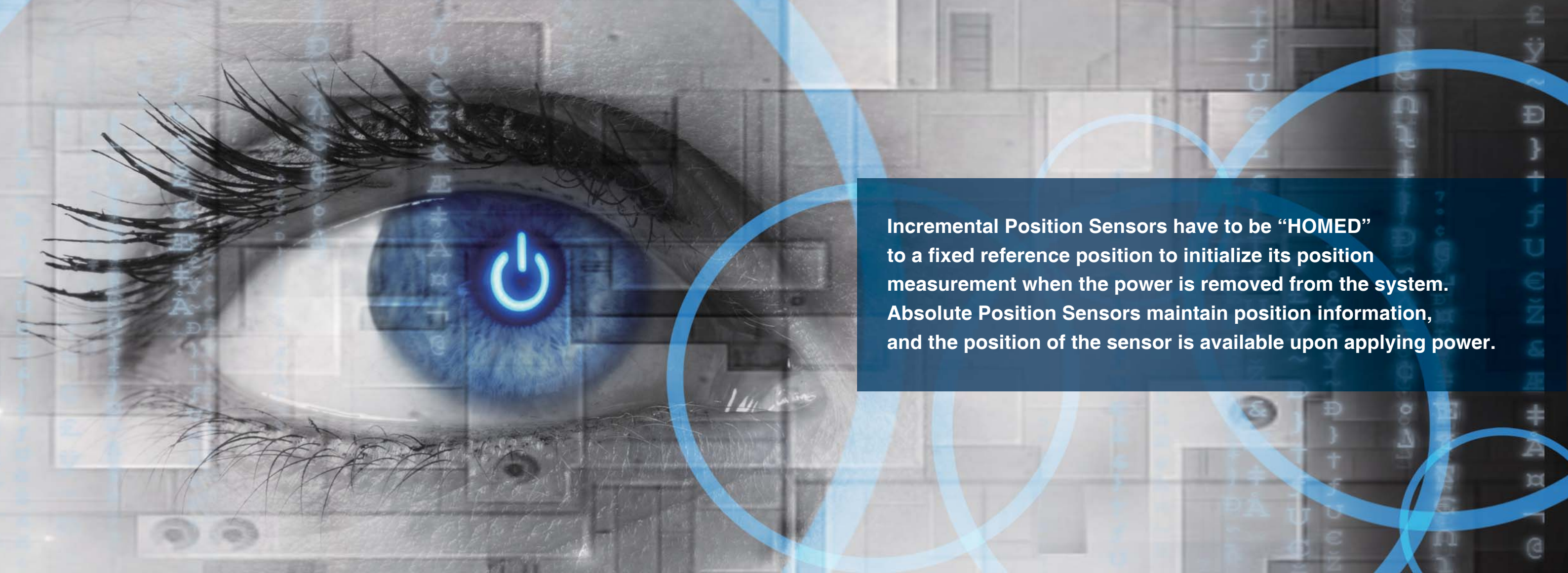
Position sensor maintenance is integral to any steelmaking process. Time spent on calibration, troubleshooting, repair, and replacement can all but be significantly reduced or eliminated by switching to ABSOCODER. The harsh environment of the tire and rubber making process results in breakdowns and damage of position sensors.

NSD's True Heavy Duty Position Sensor ABSOCODER has been engineered to withstand the harshest environments. ABSOCODER is a robust, heavy duty position sensor that is virtually failure-free and extremely reliable even in environments that contain moisture, hot temperature, mechanical vibration, high shock, chemical fumes / sulfur, and dust contaminations.

ABSOCODER's outstanding durability is achieved through innovative design and construction which eliminates electronics and optics inside the sensor.

NSD has engineered a sensor that utilizes magnetic reluctance change to sense and measure the position.





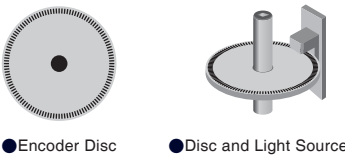
Incremental Position Sensors have to be “HOMED” to a fixed reference position to initialize its position measurement when the power is removed from the system. Absolute Position Sensors maintain position information, and the position of the sensor is available upon applying power.

Position Sensors are electro mechanical devices used for converting the angular or linear position into an analog or digital data code. In other words, they convert mechanical movement into an electrical signal.

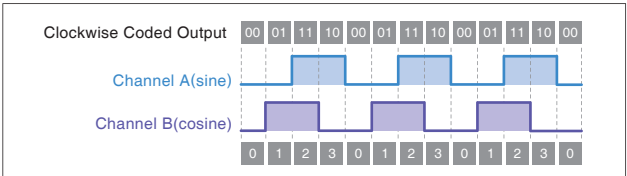
One method of determining a position, is to use either ‘distance’, which could be the distance between two points such as the distance traveled or moved away from some fixed point, or by ‘rotation’. For instance, the rotation of a robots wheel to determine its distance traveled along the ground. Either way, position sensors can detect the movement of an object in a straight line using linear sensors or by its angular movement by using rotational sensors. A rotation position sensor, also called a rotary encoder, is an electro-mechanical device that converts the angular position or motion of a shaft or axle to an analog or digital data code. There are two main types of rotation position sensors - Incremental and Absolute. The output of absolute position sensors indicates the current position of the shaft. The output of incremental sensor provides information about the motion of the shaft, which is typically further processed elsewhere into information

such as speed, distance and position. Rotation position sensors are used in wide range of applications that require precise shaft unlimited rotation, including industrial controls, robotics, press equipment, crane wire hoist, water gate, elevator position, and motor speed feedback.

Incremental Position Sensors are commonly used for position and motion sensing. Basically, a disc with a pattern of cutouts around the circumference is positioned between an LED and a light detector, as the disc rotates, the light from the LED is blocked in a regular pattern. This patterns is processed to determine how far the disc has rotated. Typically the disc of an incremental sensor is made from glass or steel strip. The incremental sensor accurately records changes in position, but does



not power up with a fixed relation between sensor state and physical position. Devices controlled by incremental sensors may have to be “Homed” to a fixed reference position to initialize the position measurement. They employ two outputs called A & B, which are called quadrature outputs, as they are 90 degrees out of phase.



These signals are decoded to produce a count down pulse.

Absolute Position Sensors maintain position information when power is removed from the system. The position of the sensor is available immediately on applying power. The relationship between the sensor data and the physical position of the controlled machinery is set at assembly, the system does not need to return to a calibration point to maintain position accuracy. They are always excellent choices in systems that require a failsafe operation. There are also several different types of absolute position sensors.

Optical absolute position Sensors also have a similar disc with an incremental position sensor. A light source and photo detector array reads the optical pattern that results from the disc’s position at any one time. This code can read a controlling device, such as a microprocessor to determine the angle of the shaft. The absolute analog type produces a unique dual analog code that can be translated into an absolute angle of the shaft. This type of sensor uses a battery for retaining the counts power cycles.

Magnetic absolute position Sensors use a series of magnetic stators to represent the sensor position to a magnetic sensor. The traditional type of this sensor is Synchro and Resolver. Synchro is a transformer whose primary to secondary coupling may be varied by physically changing the relative orientation of the two windings. Synchro is often used for measuring the angle of a rotation machine such as an antenna platform. The most common type of Resolver is the brushless transmitter, and it may look like a small electrical motor having a stator and a rotor. The Resolver can perform a very accurate analog conversion from polar to rectangular coordinates. Resolvers with four output leads are generally sine/cosine computational devices.

True Heavy Duty and Fully Absolute Position Sensor

ABSOCODER

Fully absolute position sensors that operate with magnetic reluctance change theory have NO electronics, optics, glass discs, or microprocessors inside the sensor which in turn drastically reduces the sensors failure rate and breakdown under harsh production environments.

True Heavy Duty and Fully Absolute Position Sensor

Rotary ABSOCODER

Single turn ABSOCODER is used when the full range of positioning in the application is not greater than one full revolution (360°)
Multi Turn ABSOCODER is used when the full range of positioning in the application requires multiple turns of the sensor shaft.

1 Stainless Hard Case

Rust-Proof and
Stain-Resistance

Because stainless steel is non-porous, it resists foreign material and water condition more effectively than iron case

2 Robust & Heat Resistance Bearing

Shock Resistance
Vibration Resistance
and
Heat Resistance
Robust Bearing

Max.120°C
20G Vibration
500G Shock

3 Near-Zero-Backlash Gear

Variables such as manufacturing errors, mounting tolerances often increase the amount of backlash

Higher precision of ABSOCODER's inner gear achieves near-zero-backlash

5 Absolute Sensor Unit

Fully Absolute with
Magnetic Reluctance Change Theory

Zero Electronics
Zero Optics
Zero Glass Disc
Zero Microprocessor
Zero Contact Parts
Only Coils, Stator and Eccentric Rotor

4 Double Protection Oil Seal and O-Ring

Increase wheel-end reliability by aggressively deflecting dirt, moisture and other contaminants

ABSOCODER ALWAYS senses its current position. When the sensor is powered up, it will detect and deliver its position without the need of a reference position even if the sensor has lost power or the cable has been cut or damaged. This means ABSOCODER does not need to be calibrated when powered up or the cable has been replaced. ABSOCODER is a fully absolute position sensor that doesn't have optics or glass discs inside the sensor.

When an incremental sensor powers up, it must be re-homed before operation can commence. An absolute sensor always indicates its current position. That can be an enormous benefit of an Absolute sensor.

Re-homing of incremental sensor is just not practical, especially in a general steel making application. The construction of the absolute optical device is similar to an incremental sensor where there is a light source, an LED, and a rotation disc. These components are unable to withstand harsh production environments.

ABSOCODER, NSD's absolute position sensor, doesn't have any electronics and optics inside the sensor. It detects and measures the position through the phase difference between primary input and secondary output under the magnetic reluctance change.

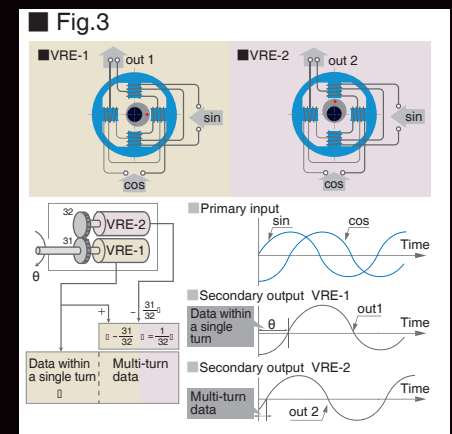
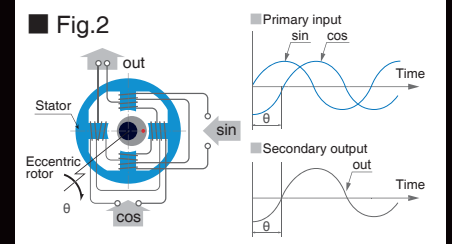
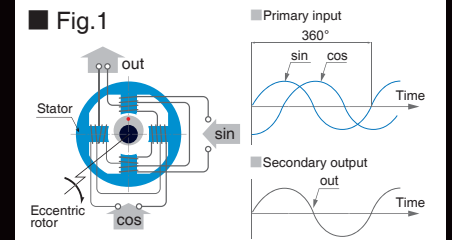
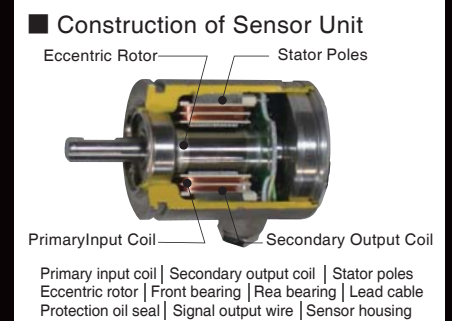
Single turn ABSOCODER named VRE is used when the full range of positioning in the application is not greater than one full revolution, 360 degree. The principle of VRE is as shown in the diagram Figure 1 / Figure 2.

VRE operates as variable coupling transformer, with the amount of magnetic coupling between the primary winding input coils ('a sin θ ' and 'a cos θ '), and secondary output coils which are wound at four stator poles ('k sin ($\omega t - \theta$ '), according to the position of the rotating element (eccentric rotor). VRE ABSOCODER is typically mounted on the 360° turn table and cam press equipment application. Heavy duty VRE series is the best solution for looper arm angle detection at the hot strip mill, open/close position of re-heater door angle, walking beam position, and hot mill run-out table position in the steel industry.

Multi turn ABSOCODER named MRE is used when the full range of positioning in the application is greater than one full revolution. The principle of MRE sensor is as show in the diagram Figure 3 / Figure 4.

In order to detect more than one revolution angles, two single turn ABSOCODERs are connected with gears with different ratios. VRE-1 sensor unit measures the full range of 360 degree, and VRE-2 sensor unit measures the number of VRE-1 turns through the connecting gears. The angle position is detected by the phase differences among the primary and secondary winding coils of VRE-1 and VIRE-2 according to the position of sensor shaft and connecting gears.

The standard of MRE has up to 3072 multi turns, and special purpose MRE is available up to 8192 multi turns with 8192 sensing resolution.

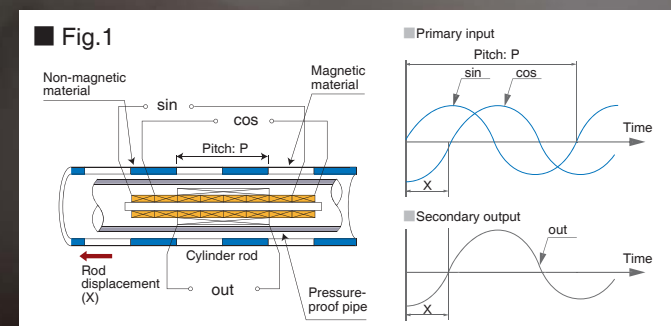
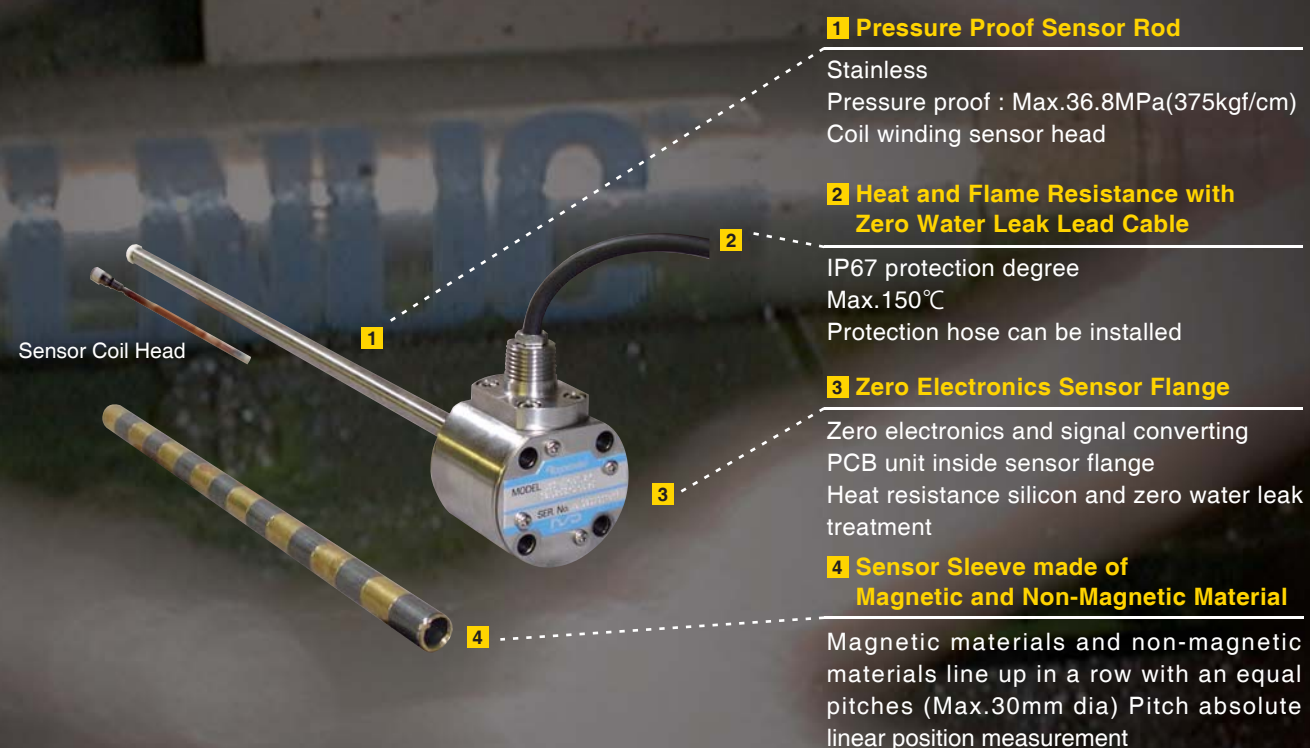


True Heavy Duty and Smart Linear Position Sensor

INRODSENSOR

Non-contact and wear-free linear position sensor IRS is suitable for a direct installation in hydraulic cylinders. The established magnetic-reluctance-change method provides for a precise and reliable position response without fail.

NSD's smart linear position sensor, IRS (In-Rod-Sensor) is the most accurate and durable linear position sensor available in a usual industry (0.001mm~0.065mm), enabling highly accurate position detection, improving operation efficiency and safety. It's non-contact design with zero electronics and zero optics concept eliminates mechanical failure mechanisms, reducing wear and tear, improving reliability and durability, and minimizing down-time. True heavy duty IRS series has been proven its excellent performance under the most harsh environment for instance ladle turret, mold width, slide nozzle, AWC, side guide, mandrel, wrapper roll, and so on.



As shown in the picture, a series of magnetic materials and non-magnetic materials are lined up in a row with an equal pitch (51.2mm). Primary and secondary coils are wound into the sensor head inside of the pressure-proof sensor rod, with 'a sin ωt ' and 'a cos ωt ' for input signal. When the rod moves to a distance 'X', 'k sin ($\omega t - 2\pi x/p$)' will be induced onto the secondary coil. The value of position of 'X' can be with 'a sin ωt ' for input, and 'k sin ($\omega t - 2\pi x/p$)' for output.

Eddy Current Displacement Gap Sensor

EZGAP

" Rubber Thickness Measurement at Calendring Machine "

EZ-GAP measures the rubber thickness in 1um high sensing resolution on the mixing and calendar roll under hot temperature and extremely smoky environments.

Compared to other non-contact sensing technologies such as optical, laser or capacitive, high performance eddy-current sensors have some outstanding advantages as right below.

- Tolerance of dirty and harsh environments / Not sensitive to material in the gap between the sensor head and target / Less expensive and much smaller than laser interferometers

The output of EZ-GAP always indicate the size of the gap between the sensor head and the target (mixer / calendar roll). When the sensor head is stationary, any changes in the output are directly interpreted as changes in position of the target.

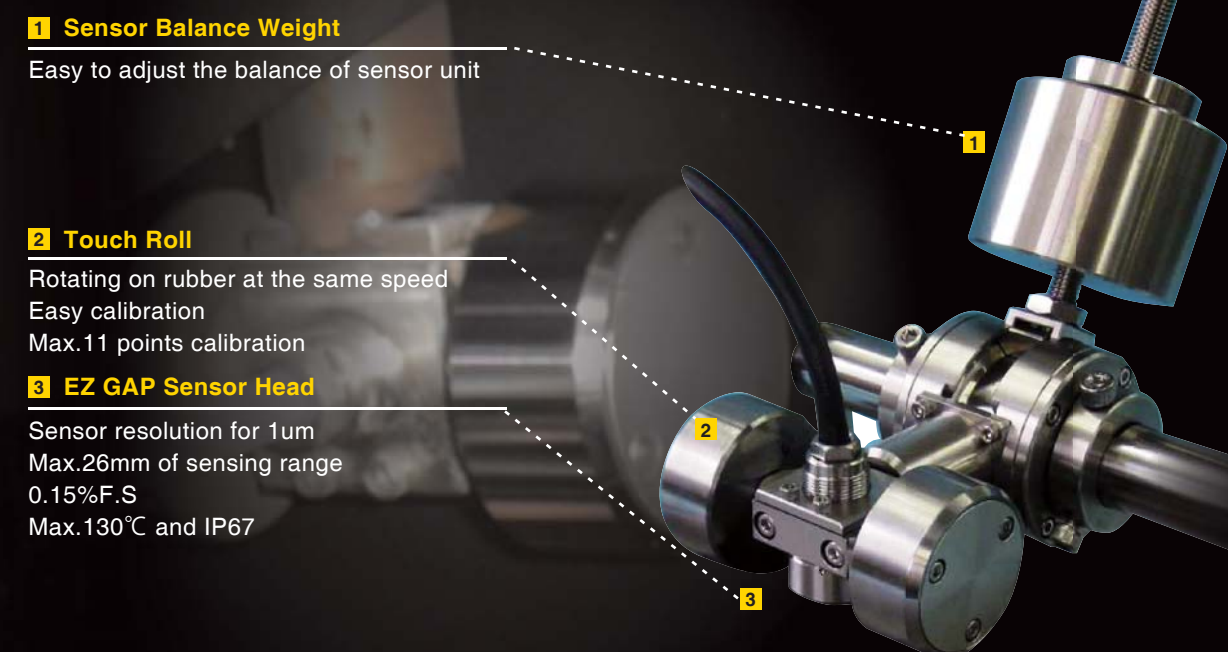
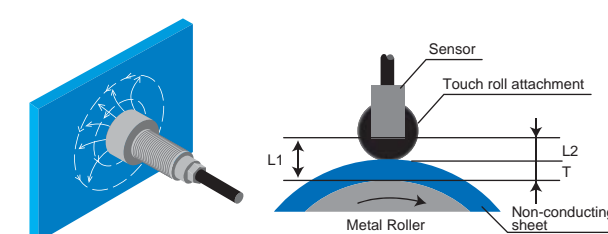


Fig.2



Eddy-Current sensors operate with magnetic fields. The driver creates an alternating current in the sensing coil in the end of the sensor head. This creates an alternating magnetic field with induces small currents in the target material; these currents are called eddy currents. The eddy currents create an opposing magnetic field which resists the field being generated by the sensor coil. The interaction of the magnetic fields is dependent on the distance between the sensor head and the target.

CAR MAKING PROCESS

Press Position Control Caster & Cam Shaft Position Measurement



Optimizing the automotive manufacturing process with NSD's absolute position sensing solution. As a position sensing technology provider of the automotive industry, NSD has developed an integrated and absolutely aligned set of solution for the entire process from press shop to final assembly line. NSD's ABSOCODERS offer performance-oriented solutions for a wide range of tasks that include positioning, transport, handling, and controlling for heavy duty applications.

User friendly digital cam switch controller VARICAM and VARILIMIT offers freely selectable and configurable cam switches & limit switches with ABSOCODER.

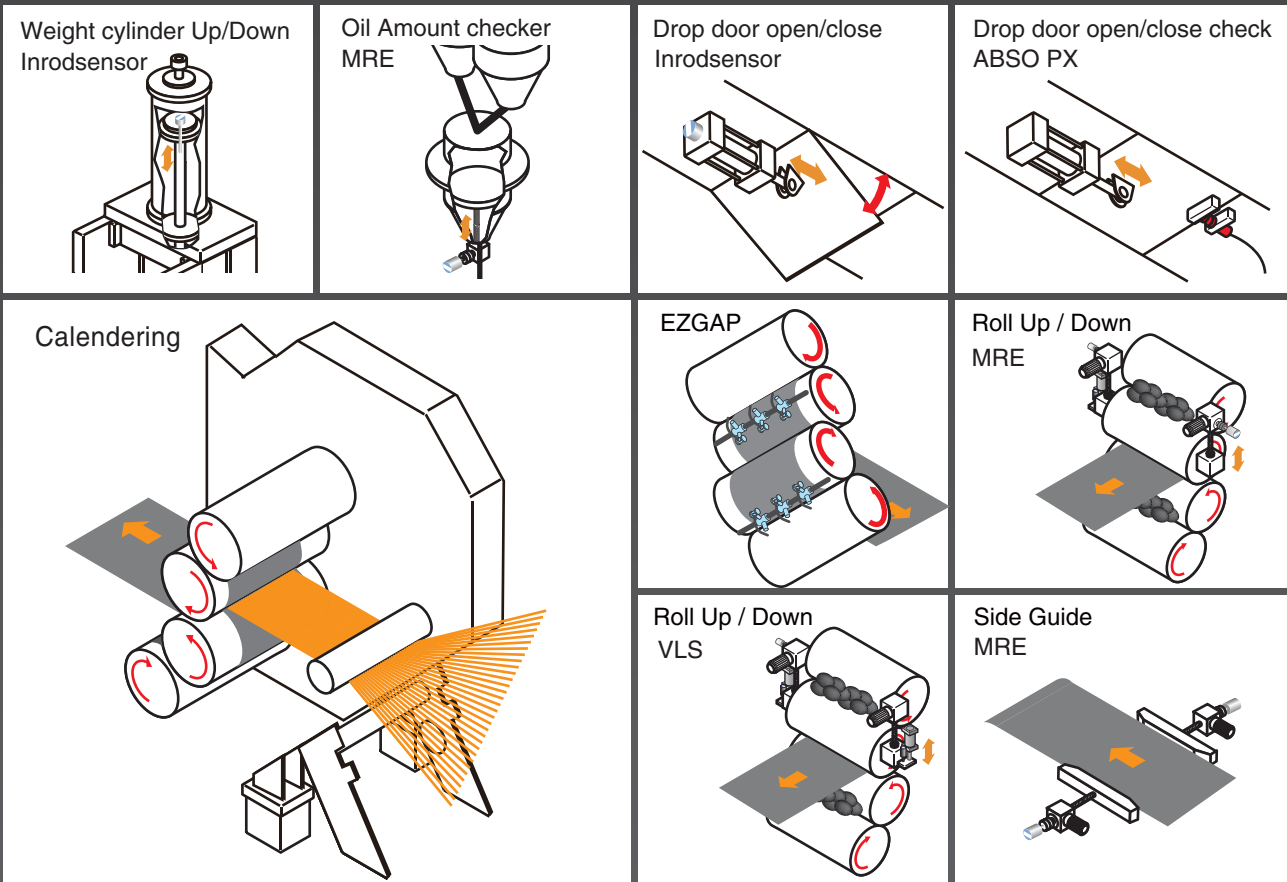
<p>Body Press Process Measurement of coil's outside diameter with cylinder linear sensor</p>	<p>Body Press Process Measurement of coil's width with cylinder linear sensor</p>	<p>Body Press Process Fully absolute detection of the precise amount of leveler's press movement</p>	<p>Body Press Process Position adjustment of sheet feeder, carrier and side guide with multi-turn absolute sensor, MRE series</p>
<p>Body Press Process Rotary cam switch</p>	<p>Body Press Process Best solution for slide adjustment process with fully absolute position detection and higher durability</p>	<p>Welding Process Fully absolute detection of up/down linear travel length with VLS dual rod ABSOCOER</p>	<p>Welding Process One of the standard position sensors for nut welder with smart linear position sensor</p>
<p>Pusher of the painting process conveyor Multi-turn absolute sensor for MRE Motion controller for VS-10F</p>	<p>Positioning of Up/Down Pusher for Body Paint Multi-turn absolute sensor for MRE Motion controller for VS-10F</p>	<p>Positioning of Body Shuttle Conveyor Travel Best solution for the replacement of existing limit switches Multi-turn absolute sensor for MRE Motion controller for VS-10F</p>	<p>Cast process Injection and mold clamping of the die-casting machine</p>

<p>Cast process Mold clamping of the low-pressure casting machine</p>	<p>Melting Liquid Level Check for Casting Process Best solution for heat-resistance with fully absolute rotary position sensor for VRE</p>	<p>Deburring Positioning of Casting Process Smart linear position cylinder sensor for CSA Motion controller for VS-10F</p>	<p>Machining process Cam distinction in the cam shaft process</p>
<p>Assembly process Crank shaft conveyor</p>	<p>Valve Sheet and Guide Fitting Press Dual rod with fully absolute linear position sensor for VLS Motion controller for VS-10F</p>	<p>Machining Process Lathe tail stock</p>	<p>Machining Process Lathe's work chunk check</p>
<p>Machining Process Work identification in the machining center</p>	<p>Assembly Process Bush press-in machine of the suspension arm</p>	<p>Mold Process Ejector of the injection molding machine</p>	<p>Press fitter</p>

TIRE MAKING PROCESS



Proven solutions for every process of tire manufacturing. As an absolute and heavy duty sensor provider, NSD supports tire manufacturers and their suppliers in every step of the tire manufacturing process from raw materials processing and mixing and component preparation, to tire assembly and curing, through to final finish and inspection. NSD also provides the best solution for sulfuration process environment with sulfuration-proof technology.

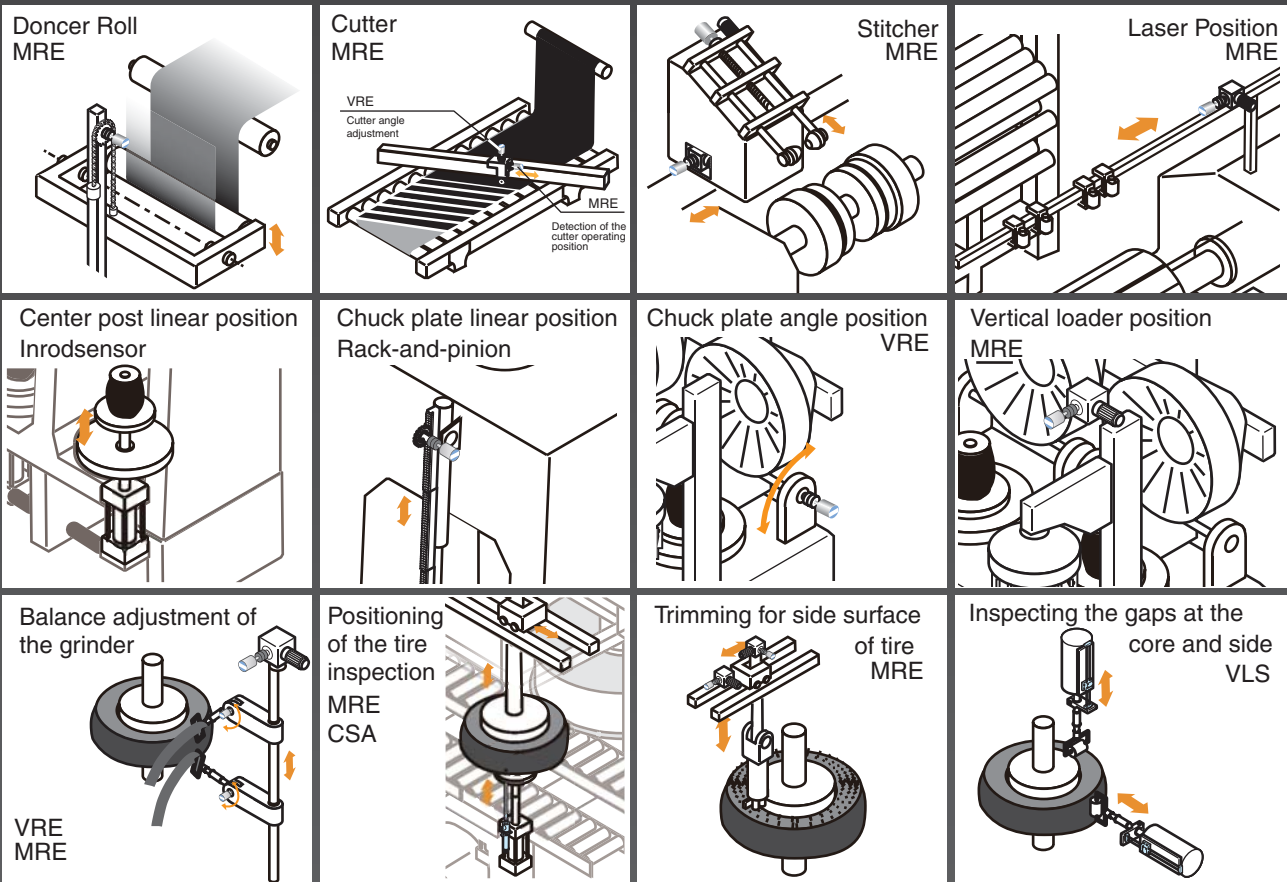


Rubber Thickness Measurement at Calendaring Machine

Chuck Plate Rotation or Linear Position Measurement



NSD's eddy current EZGAP is often used in application where high heat & vibration environments such as rubber thickness at extrusion or calendaring machine.



WATER GATE APPLICATION

Gate Rotation Angle Position Measurement Smart Water Gate Controller



A water gate or dam is a barrier that impounds water. The reservoirs created by dams not only suppress floods but provide water for various needs to include irrigation, human consumption, industrial use, aquaculture, and navigability. Our optimized technology is the best fitted for the water gate position control, and we provide you the heavy duty and water-proof absolute position sensors with the smart gate controller.

NSD's water-proof and under-water rotary encoder we call ABSOCODER is the very first sensor to apply at flap gate in Thailand since 2015 with excellent performance and zero breakdown.

ASCODOER
Fully Absolute & True Heavy Duty Position Sensor for Underwater Position Sensor

Magnetic Reluctance

- Magnetic reluctance Change
- Coil and Eccentric Rotor
- Single / Multi-Turn Rotary
- High Precision / Repeatability

Heat Resistance

- Max. 120deg.

Smart Flexibility

- Various of Signal Output
- BCD, Binary, Analog Position
- Max. 500m Cable

Water Proof

- IP 67
- Stainless Sensor Body

Zero Electronic Parts

- No Electrical and Optical Components inside Sensor

Absolute Position

- Absolute Position Detection
- Even Power is Off and Cable is Cut

Anti Vibration & Shock

- Vibration Resistance
- Stainless Shaft
- Max. 4,000 rpm

Wire Hoist Water Gate

ABSOCODER Motor Gate

Radial Water Gate

Motor ABSOCODER Gate

Water Flap Gate

ABSOCODER Hydraulic Cylinder

Messenger Wire

ABSOCODER

GATE CONTROLLER
User Friendly Operating & Smart Gate Control Function for Water Gate Controller that Market Has Been Waiting For

Limit Switches Output

- 15 points of limit switches input/output with digital function key

Scaling Function

- User friendly easy to select the parameter units of gate movement, angle (degree) or length (mm/cm)

Calibration Function

- Max. 128 points calibration to enhance and raise the sensing accuracy / linearity

Preset Function

- Best solution for the wire rope length change due to temperature change with this function
- User select the fixed-fiducial-point for the controller preset position

Digital Setting and Display Function

- Digital press button with real-time display

Auto-Compensation Function

- Fully automatic compensation for wire multi-level movement
- 1st Wire - 0% of compensation
- 2nd Wire - +2% of compensation
- 3rd Wire - +3% of compensation

Limit Switch Output Function

Not only deliver the current position of the water gate, but also select 15 points of limit position, the same like limit switch. Allowing you to make a wide control of the gate and more safe operate the gate.

Auto-Compensation Function

Fully automatic compensation for wire multi-level movement. The wire rope winding is corrected / compensated by the pre-determined multistage winding function.

Gate Movement Adjustment

User can simulate the gate movement by GCW controller, and adjust its movement by actual gate position.

Current Position Preset Function

Best solution for the change of wire rope length because of temperature change. User friendly easy to select the fixed-fiducial-point for the controller preset function.

Calibration Function

Maximum 128 points calibration to enhance and raise the sensing accuracy.

Scaling Function

User can select the position value Gate Angle (degree) or Gate Height (mm/cm). Best solution for Radial Gate and Flap Gate which move.

ROLL TO ROLL PROCESS

Non-Contact and Wireless Temperature Measurement Device 1um of High Resolution Linear Position for Roll to Roll



There is no best universal platform or solution for the factory automation because each one has its particular strengths for specific types of applications. There is also no single leading automation system, as many factors and ideas lead to the best choice for each production field. However, position sensors are always applied to the factory automation system, and ABSOCODER is the best choice if your production field is required for absolute position sensing within a harsh environment.



NSD's brand new device we call ABSOCOUPLER is the non-contact and wireless data transmit device which mainly detect the roll temperature as real time.

Air Knife Gap Detection VLS-8PS	Tenter Clips Position MRE	Near Roller Position MRE VLS CYLNUC	Linear Position of Holder Switch Inrodsensor
Coater Head Gap VLS-EXI8PSM	Accumulator Position MRE VLS	Dancer Roll Angle VRE VLS VARIANLOG	Tension Measurement VR TENSION
Calendar Roll Gap MRE Inrodsensor	Turret Angle VRE BAUM COUPLER ABSO COUPLER	Slitter / Cutter MRE ABSO SERVO MOTOR	Roller Temperature ABSO COUPLER

Roll Position Checker ABSO PX	Roll Tension VR TENSION	Valve Open/Close Check ABSO PX	Press Roll & Cylinder Position Check ABSO PX
Cleaner Nozzle Position Check ABSO PX	Drier Door Open/Close Check ABSO PX	Drier Roll Speed Feedback VRE ABSO PULPUL	Nozzle Cutter ABSO PX
Slitter Position Control MRE	Blade Coater Angle Position Sensing VRE	Gantry Crane Position Sensing MRE	Core Check Cylinder Linear Position Sensing VLS

ABS0 Solution for Crane Application



A crane is a type of machine, generally equipped with a hoist, wire ropes or chains that can be used both to lift and lower materials and to move them horizontally. It is mainly used for lifting heavy things and transporting them to other places. In the area of crane control, it is very critical to track each individual object throughout each phase in the process. NSD provides total solution for the each position of crane movement, boom hoist / crane hook angle / main hoist up & down / rail or rubber tire position.

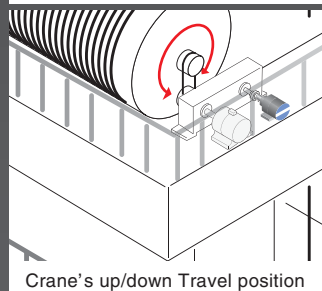
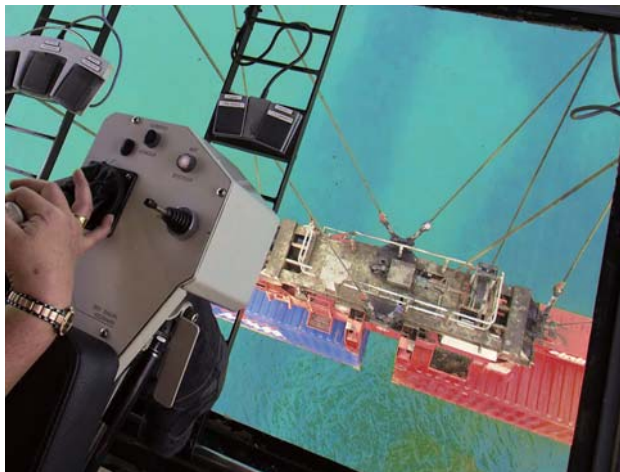
Ladle Crane at Continuous Casting

Ladle cranes are primarily used at steel plants for the transportation of molten iron and steel.

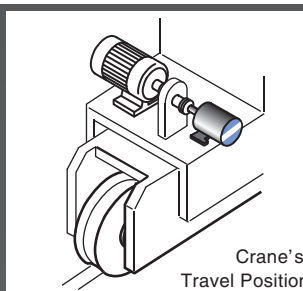


STS/RTG/RGM Crane at Container Terminals

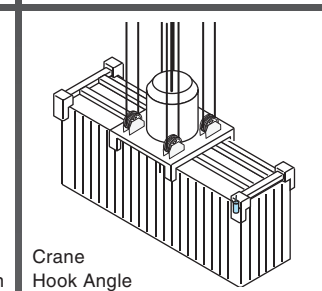
Container cranes are a type of load dockside gantry crane found at container terminals for loading/unloading containers.



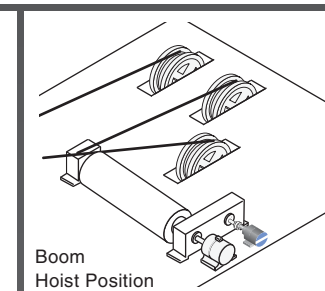
Crane's up/down Travel position



Crane's Travel Position



Crane Hook Angle



Boom Hoist Position

ABS0 Solution for Beverage/Food Application



A precise & heavy duty position sensor for beverage and food applications is getting more important since the degree of automation is increasing continuously. Our mission is to offer the technology that allows customers to essentially facilitate both modernization of existing and creation of new solutions.

ABS0 Solution for Energy Application



For the energy applications, NSD continues to manufacture new designs for the most challenging applications. NSD also provides explosion-proof solution into this application.

NSD MONOZUKURI

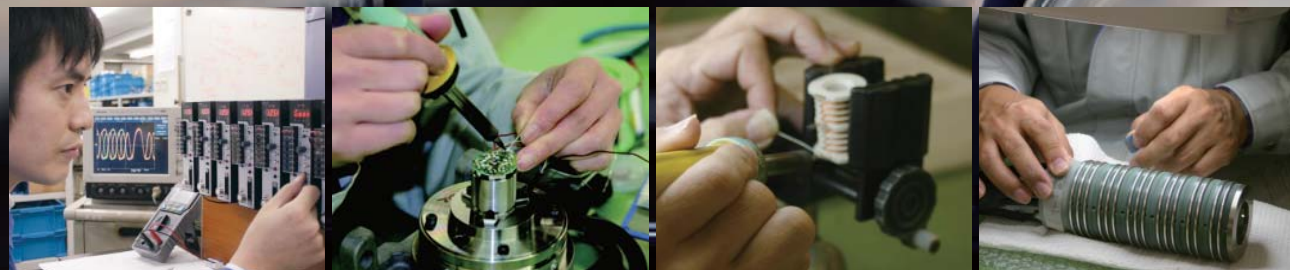
MONOZUKURI is the Japanese word for manufacturing.

This word is about having a state of spirit & principle to produce not only excellent products, but also have the ability to constantly improve the production system.

NSD has our own MONOZUKURI system which is the best indicator to understand our products.

A rigorous and steady MONOZUKURI system of NSD has clearly proved to the world the best quality.

We make most of our components in-house with this system to ensure the highest quality products.



NSD COMES FROM HARSH ENVIRONMENT

Ever since it opened its doors, NSD has been at the fore-front of the evolution, development and manufacture of sensor technology, and is always ready to respond to new technologies.

NSD is committed to continuous improvement in our product design, quality, fabrication, and our production system to give you, our customer, the most reliable product in the steel industry.



Sensor Solution

The world runs on wheels, and all automotive wheels essentially need tires.

A huge majority of the world rubber production is consumed by the tire industry. The tire industry has been growing tremendously over the past decade, both in terms of volume and revenue, due to the increase in demand.

According to the recent report, the global automotive tire industry expected to reach an estimated value of \$249.9 billion by 2019. Technological innovations and increasing factory automation are likely to propel the global automotive tire industry in the near future.

Tire manufacturing demands that combine high production output, consistent reliability and product quality with low manpower requirements and low maintenance costs.

Alongside high speed production, flawless product quality is also priority.

Cost-efficient tire production under increasingly stringent quality requirements becomes more demanding in the industry's current economic environment.

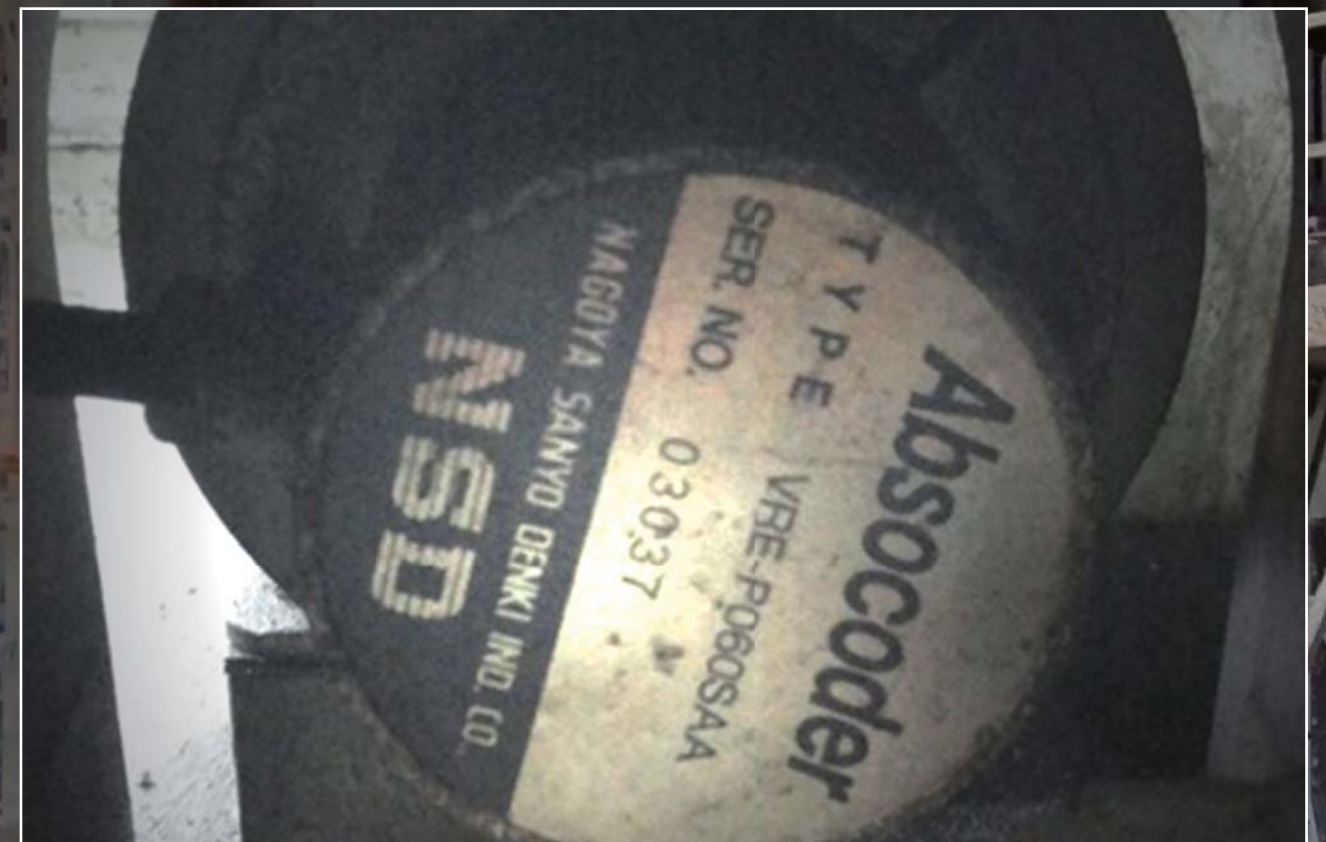
The ever-continuing requirement for cost-effective tire production means that your production system is running without much down-time.

Japanese company Corporation, one of the worldwide leading manufactures for position measurement sensors provide you less down time.

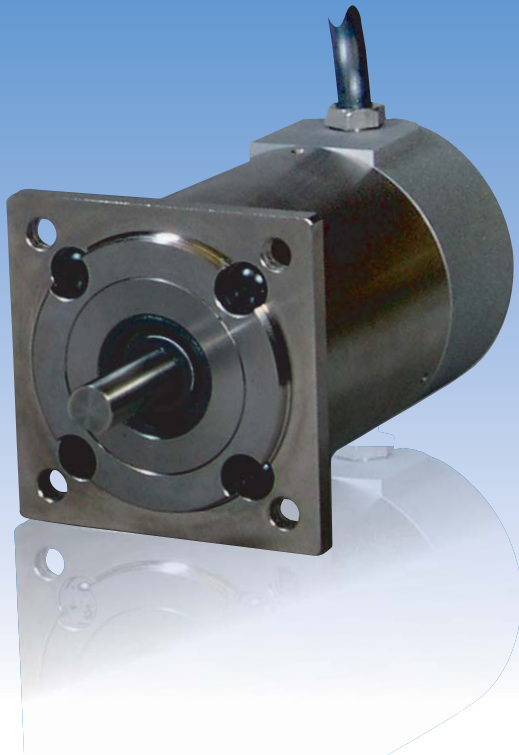
True heavy duty and fully absolute position sensor ABSOCODER is reliable, durable and it has a minimum of unplanned down-time even under the most harsh environment.

ABSO SOLUTION

True Heavy Duty & Fully Absolute Position Sensor



The above ABSOCODER is the earliest version made about 35 years ago has been operating at actual production line without any damages and malfunctions.



*When ABSOCODER is powered up
it will report its current position without the need for
any reference information
ABSOCODER is considered one of the most durable and
accurate position sensor in the world*



Absolute Rotation Position Sensor

The distinguishing feature of an incremental position sensor is that it reports an incremental change in position. When an incremental position sensor is powered up, it does not report its current position until it is provided with a reference and/or original zero position from which it can measure. An absolute sensor unambiguously reports its position within a scale or range. In other words, when an

absolute sensor is powered up it will report its position without the need for any reference information. A good test to differentiate the two types of sensors, is to see what happens when powered up. If the sensor has to go through some form of calibration step - it is incremental, if it does not - it is absolute position sensor. Some sensors claim absolute measurement performance because

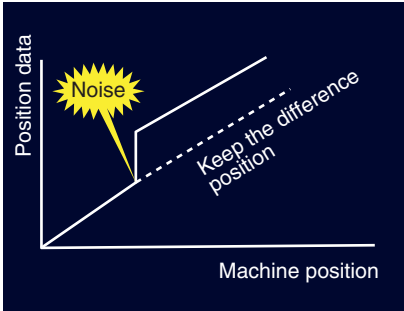
a battery stores position information from the incremental sensor when power is lost. All very well, but what happens when the battery runs out? NSD's true-absolute position sensor named ABSOCODER measures the angular position under a magnetic reluctance change method. The output of ABSOCODER always indicates the current position of the mechanical site even under power lost and/or connecting cable cut condition. ABSOCODER has no battery inside the sensor unit and it's signal converting (transmitter) device, as well.

Zero Electronics & Zero Optics & Zero Glass Disc

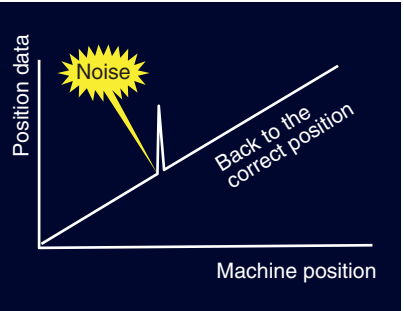
Optical rotation encoders have proven a more economical solution for many applications. But the relative fragility of their constructions typically leads to the need for frequent replacement and more maintenance time. Unlike conventional optic encoders, NSD ABSOCODER does not rely on signal converter, light source, and discs made of glass to determine rotation position.

Depending on the material employed to make these components, they are traditionally susceptible to breakage, dirt and/or debris, all of which corrupt accurate rotation position sensing. ABSOCODER detects and measures the position through the phase different between primary input and secondary output under the magnetic reluctance change. ABSOCODER's outstanding

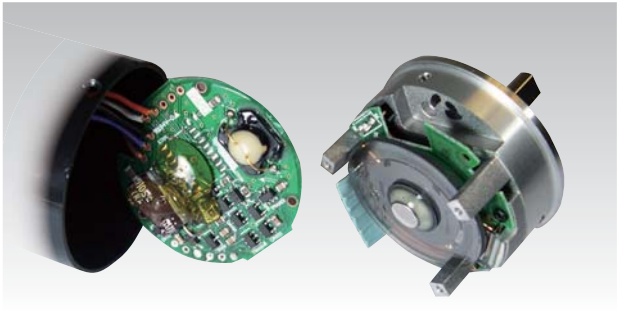
durability with field proven excellent performance is achieved by a creative construction of the design which eliminates physical contact parts and satisfy zero-electronics / zero-optics inside the sensor body. Used for decades with zero-breakdown by the most steel plants, ABSOCODER is considered one of the most stable, durable and accurate in the world.



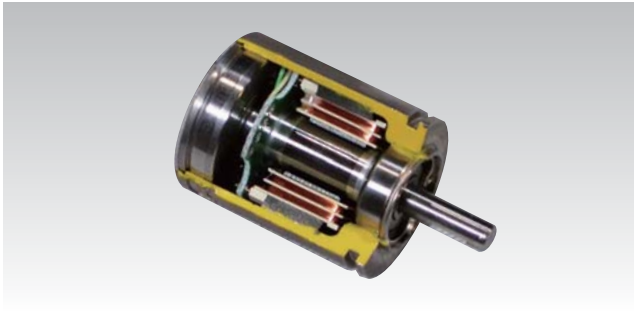
Incremental encoder
(Pulse cunt format)



ABSOCODER
(Absolute format)



Optic Rotary Encoder
LED with Microprocessor Transducer



NSD ABSOCODER
Magnetic Reluctance, Only Coil and Stator

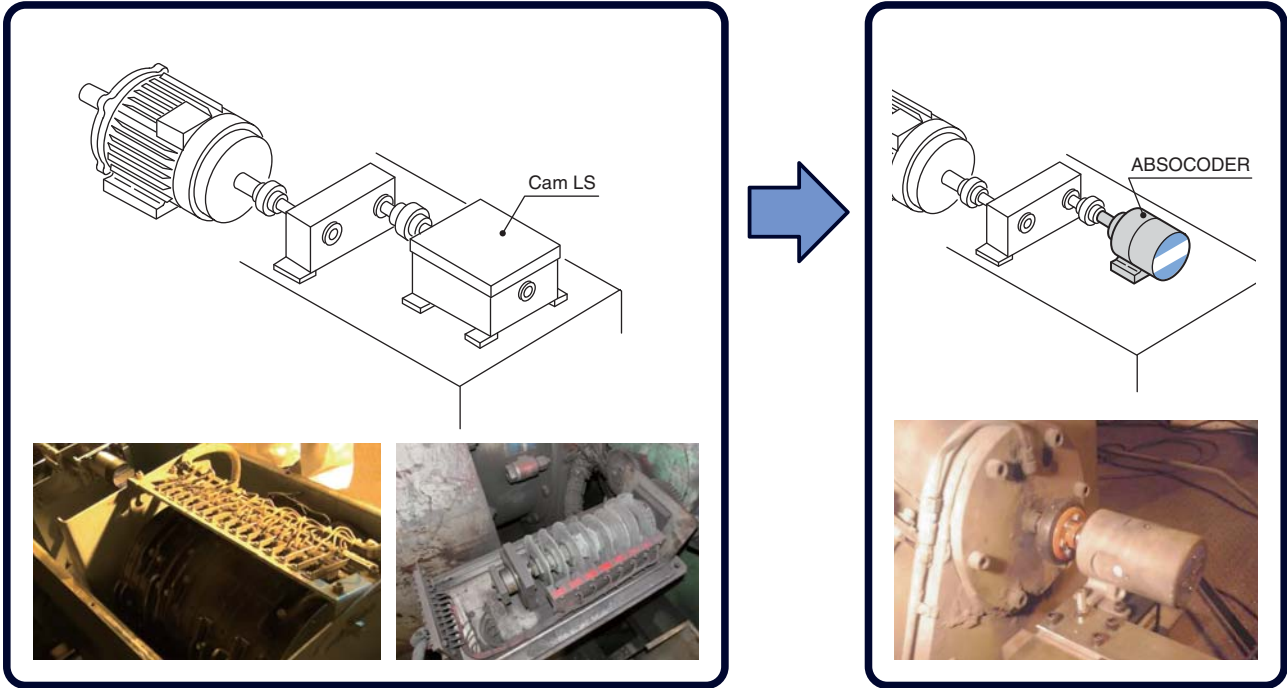
VRE Specification

Single turn ABSOCODER, VRE is the rotation sensor that specifies the absolute position for one turn of the sensor shaft, 360 degree. The rotation application is not greater than one full revolution.

Product Family	General Specification				Environmental Specification			
	Dimension	Resolution	RPM (r/min)	Cable Length	Temperature	IP Rating	Vibration Resistance	Shock Resistance
VRE-P028	Φ28x50mm	8,192	6,000	100m	60℃	40	20G	500G
VRE-P062	Φ62.5x101.5mm	8,192	3,600	100m	60℃	52	20G	500G
VRE-16TS062	Φ62x93mm	65,536	3,600	100m	60℃	52	20G	500G
VRE-WP062	Φ62.5x101.5mm	8,192	3,600	100m	60℃	67	20G	500G

VRE Application

Rotary cam limit switch is used to convert a mechanical motion into an electrical control signal for automatic controls for positioning and for end-of-travel switching onto mechanical side as actuators. Most of the cam limit switch directly connects with a motor, and each cam should be set with using the cam-adjusting screws. Therefore, operators should maintain this at actual mechanical site where the possibility for unexpected accident is high. VRE ABSOCODER measures the angle-position of motor and digital function VARICAM controller output the same on/off signal with the existing cam limit switch. Unlike the cam limit switch, NSD sensor can provide the various optional functions, such as current motor position data, preset function, motion control, and error indicator.



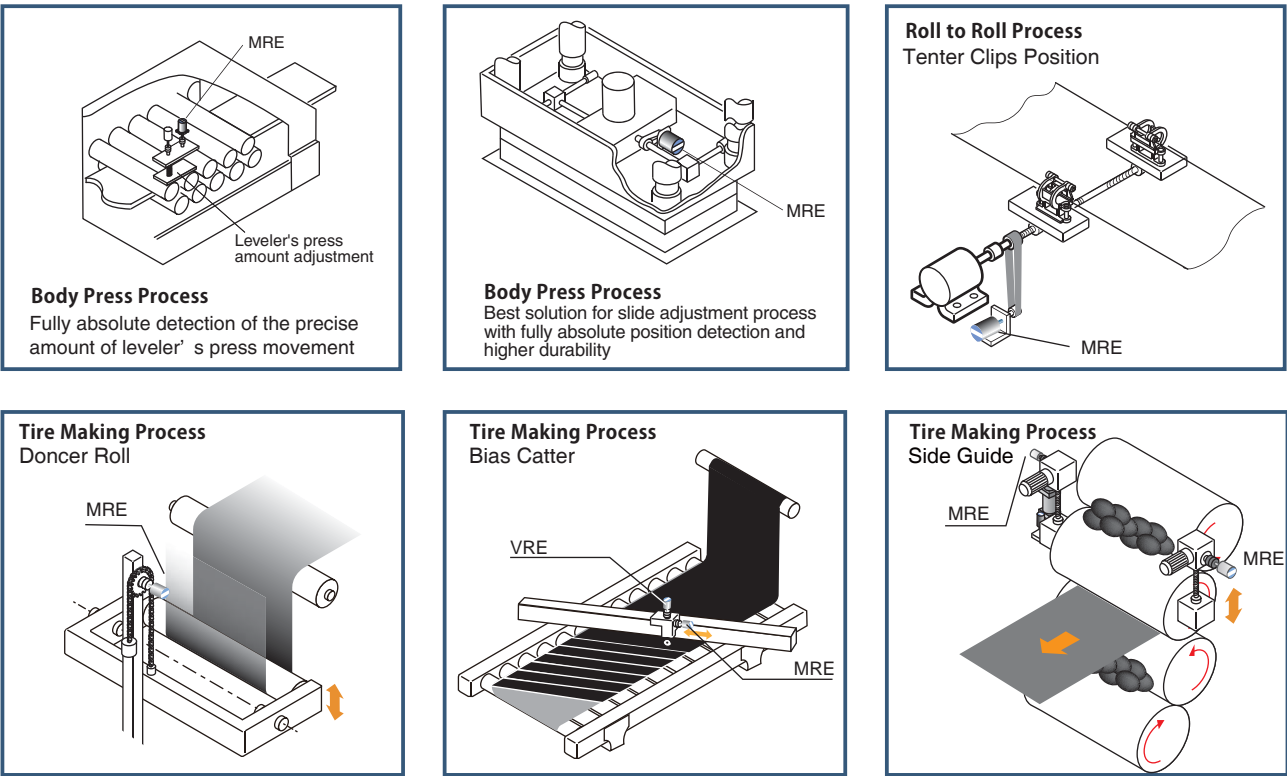
MRE Specification

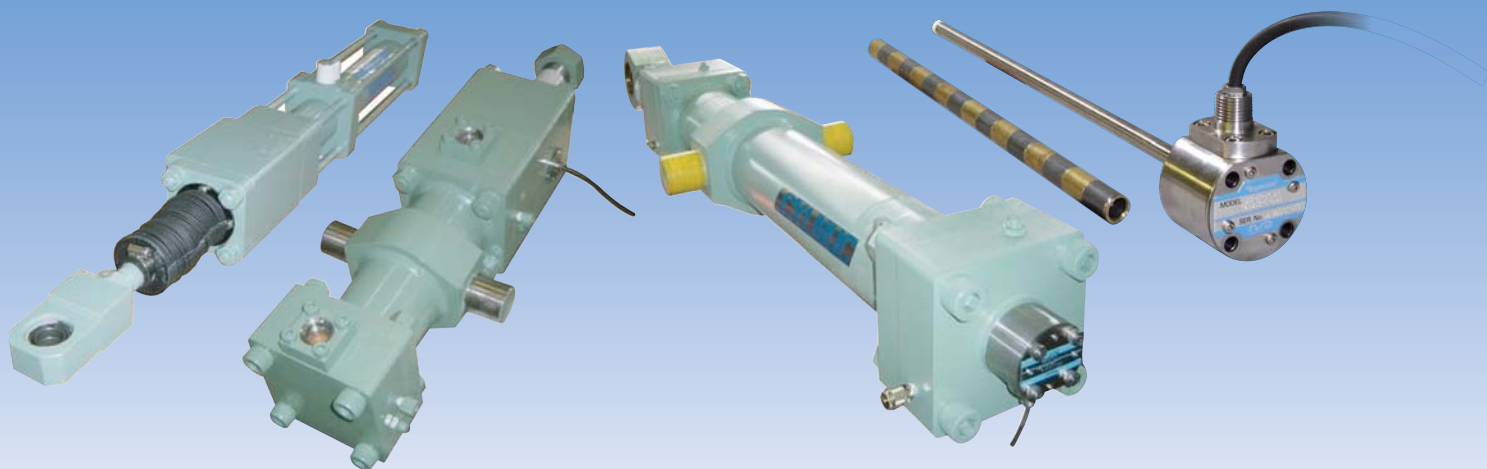
Multi-turn ABSOCODER “MRE Series” are used when the full range of position in the application is greater than one full revolution. In order to measure more than one revolution angle, two VRE sensors are connected with different ratios.

Product Family	General Specification			Environmental Specification			
	Dimension	Number of Turns	Cable Length	Temperature	IP Rating	Vibration Resistance	Shock Resistance
MRE-□SP062	Φ62.5x135m	32 / 64 / 160 / 256 / 320	100m	60℃	52	20G	500G
MRE-□SS062	Φ62.5x126.5mm	32 / 64 / 128 / 160 / 256 / 320 / 640 / 1280 / 2560	100m	60℃	52	20G	500G
MRE-32S16TS	Φ62x116.5mm	32 (65,536 resolution per revolution)	100m	60℃	52	20G	500G
MRE-1024S16TS	Φ62x116.5mm	1024 (65,536 resolution per revolution)	100m	60℃	52	20G	500G
MRE-W□SP062	Φ62.5x135mm	32 / 64 / 160 / 256 / 320	100m	60℃	67	20G	500G

MRE Application

Multi Turn ABSOCODER model MRE meets the specification of heavy-duty applications requiring long cycle and high reliability. MRE offers absolute detection through a range of up to 8192 revolutions. The sensors are robust, and with the absence of any electronics / optics linkages. MRE is suitable for use in harsh environments where debris, fluids, vibration, and high shock are present.





IRS Specification

Non-contact and wear-free linear position sensor IRS is suitable for a direct installation in hydraulic cylinders. NSD's IRS (In-Rod-Sensor) can have the best of both precise sensing and physical durability for smart cylinders. IRS satisfies IP67 protection degree, 20G for vibration, 500G for shock, and up to 120°C of high temperature with zero electronics, zero microprocessor unit, and sensitive core unit inside the sensor unit.

Product Family	General Specification				Environmental Specification			
	Absolute Pitch	Rod Diameter	Resolution	Cable Length	Temperature	IP Rating	Vibration Resistance	Shock Resistance
IRS-51.2P12A	51.2mm	12mm	6.25um	Max.200m	120°C	67,69K	20G	500G
IRS-51.2P18A	51.2mm	18mm	6.25um	Max.200m	120°C	67,69K	20G	500G
IRS-51.2P30A	51.2mm	30mm	6.25um	Max.200m	120°C	67,69K	20G	500G
IRS-32.8P18A	32.8mm	18mm	1.00um	Max.200m	120°C	67,69K	20G	500G

IRS Application

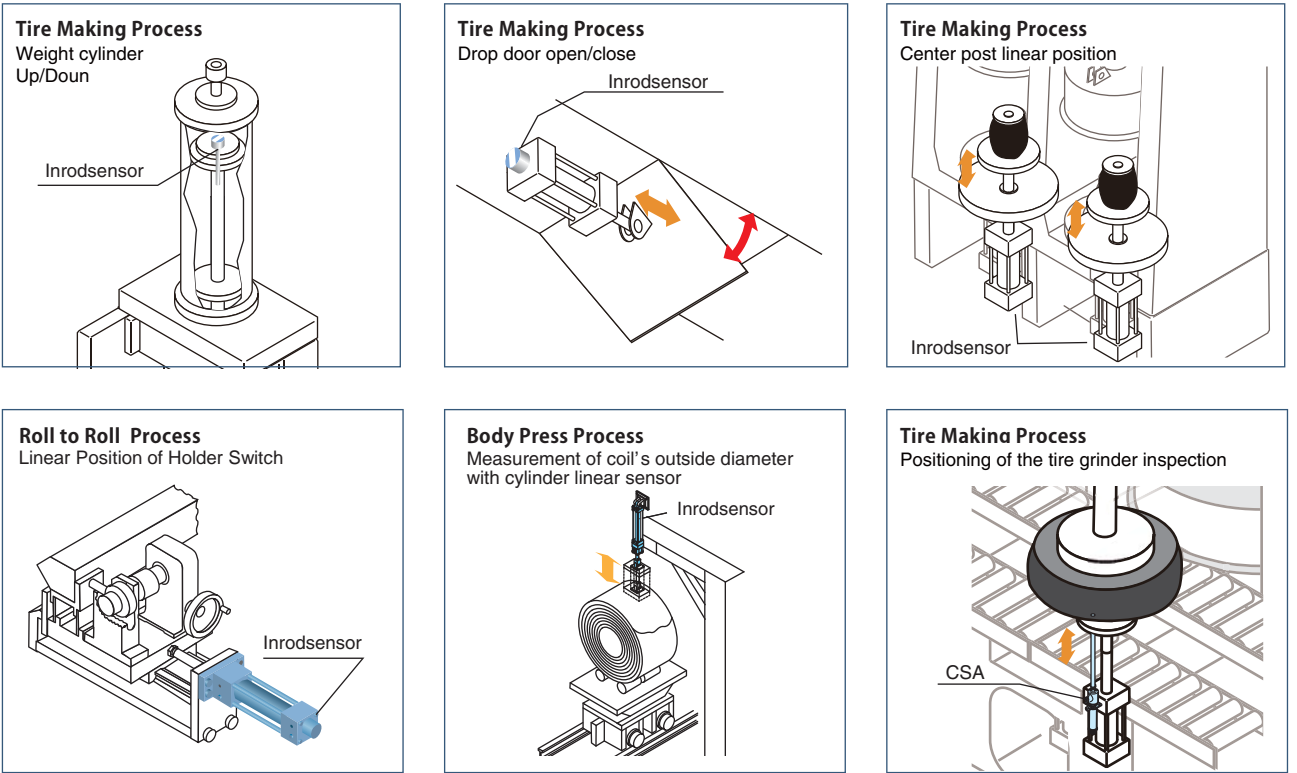
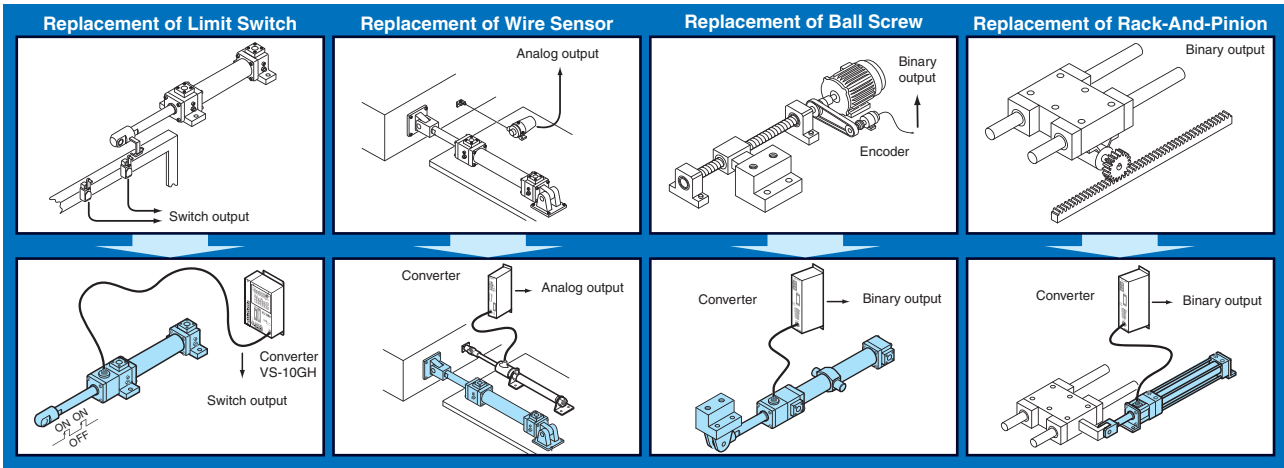
Current hydraulic cylinders for steel industry requests for position-sensing option, such units are also referred to as an electro-hydraulic control or a smart position sensing hydraulic cylinder. IRS is the best solution for a cylinder built-in linear position sensor.

Smart Linear Position Sensing Hydraulic Cylinder

Hydraulic cylinders get their powers from pressurized hydraulic fluid. The hydraulic cylinder consists of a cylinder barrel, in which a piston connected to a piston rod moves back and forth. The barrel is closed on one end by the cylinder bottom and the other end by the cylinder.

Hydraulic cylinders have many applications in the steel industry, because the extremely harsh environment of the tire industry demands highly resistant finishing and quality sealing material. Add to this fact that machines are required to run 24 hours and 7 days per week, and the machinery of the highest quality is demanded.

NSD CYLNUC and IRS is the best solution for linear position sensing cylinder application to satisfy both heavy-duty and high-accuracy demands.



EZGAP

Eddy Current Displacement Rubber Thickness Measurement Sensor

Advantages of EZGAP

Temperature measuring function

The temperature at the sensor head can be monitored. This function makes soundness of the sensor check, so the products can stabilize the quality.



State of the temperature display

Reducing the temperature drift

The temperature drift is less than $\pm 0.015\%$ F.S./ $^{\circ}\text{C}$ by the temperature drift adjustment function. (within a range less than a half of the rated detection range)

Improved the maintenance efficiency!

It can be replaced individually even if the sensor or amplifier has a malfunction.

Extendable up to 20m

The sensor cable can be extended up to 20 m. It is easier to wire. Each connector is plated with gold, which gives resistance to improper contact.

Easy calibration setting

The corrected points can be set from 2 to 11 points freely at the your desired sensor position. As the number of corrected points increases, The linearity error become smaller. (linearity error: $\pm 0.15\%$ F.S.) The non-magnetic metal (SUS 304, A5052) objects also can be detected by the sensor.

High environmentally-resistant sensor

Sensor's materials are used with SUS and PPS. Clears the IP rating 67, and withstands the temperature of up to 130°C . Proves the sensor's ability under the poor environment.

Highly Performance Eddy Current Displacement Sensor | EZGAP

Eddy current displacement sensors are widely used for noncontact position and gap measurement. Operating on the principle of magnetic induction. The driver creates an alternating current in the sensing coil in the end of the probe, this creates an alternating magnetic field with induces small currents in the target material, these currents are called eddy current.

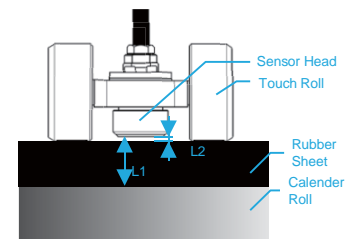
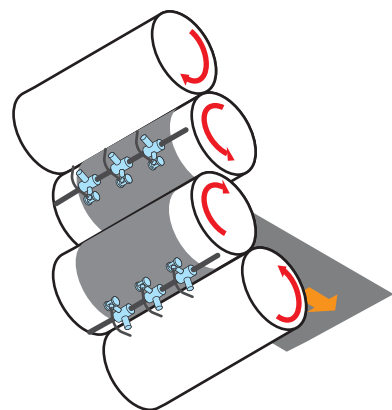
Eddy current sensors offer extremely precise measurement where micron resolution is required.

Eddy current sensors do not recognize non-conductive materials.

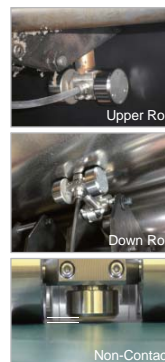
For this reason, dust, dirt, oil, and rubber do not affect the measurement. NSD's eddy current sensor EZGAP is often used in applications where harsh ambient conditions and extreme temperature are distinctive features such as rubber thickness at extrusion and/or calendering machine.

When it comes to rubber thickness measurement applications in the tire industry, the traditional non-contact sensing device such as laser are damaged / breakdown a lot because of the harsh process environment.

Highly performance NSD's eddy current displacement sensor EZGAP with touch roll measures the thickness of rubber sheet under the hot temperature (Max. 130°C), machine vibration, and oily smoky environment (IP67) at calender roll (upper roll and down roll).



RT : Actual rubber sheet thickness
L1 : Actual EZ GAP sensing distance to the metal roll form the EZ GAP sensor head surface
L2 : Non contact sensor offset gap
 $RT=L1-L2$

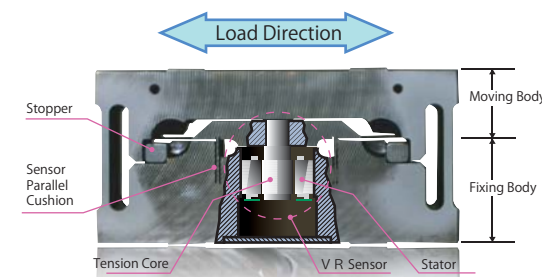


VR TENSION

High Durable Tension Measurement for Rubber Sheet

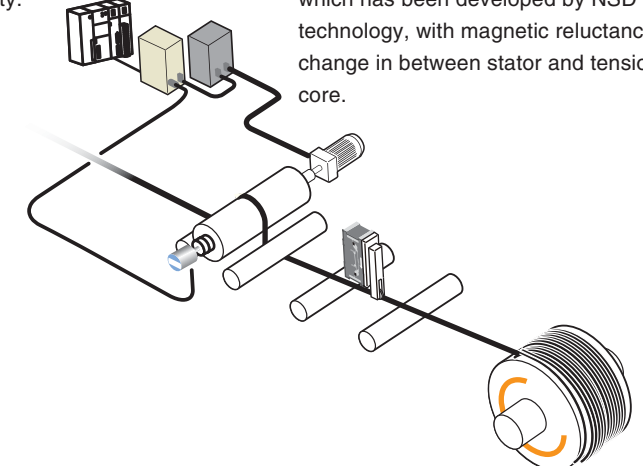
Very New Solution for Web Tension Measurement

Web tension control refers to the various methods used to measure and adjust tension in a moving web. A web is any material continuously pulled from a roll through some manufacturing process. Tension is the measurable force that stretches or elongates the web. Most processes involved in the production or converting of rubber sheet, paper, film, plastic, wire, textile, and cable requires some from of tension control. It is also necessary on products that require winding onto rolls, printing, coating, laminating, slitting, and extruding.



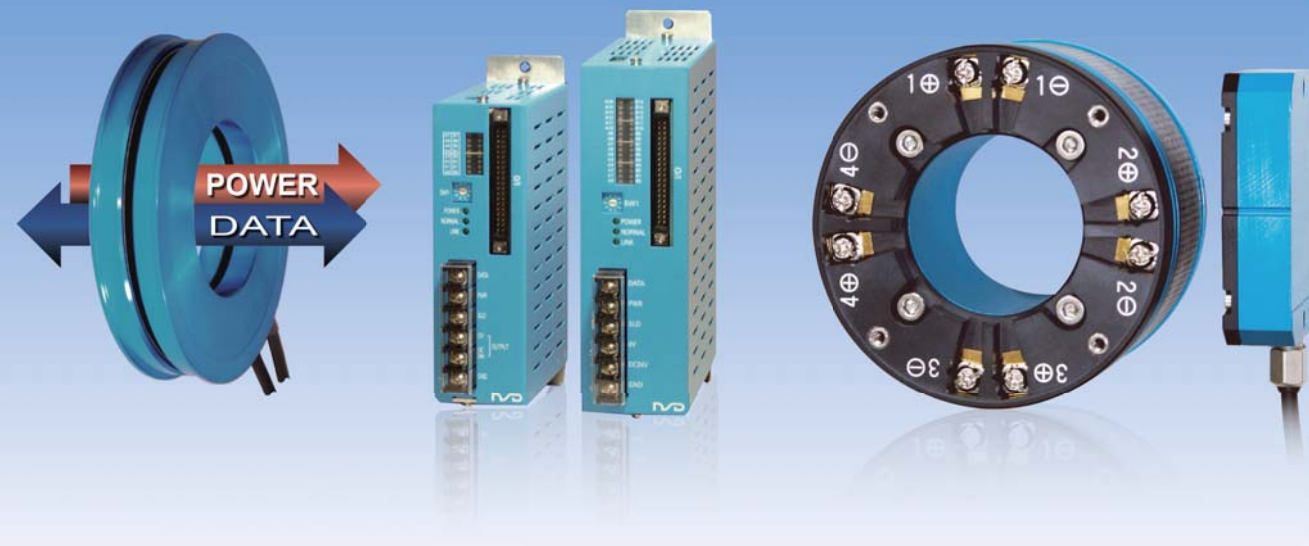
Properly controlling web tension results in higher quality product and produces greater throughput. If the tension is not properly controlled, wrinkles in the material may occur resulting in defective or wasted product. If a roll of material is wound without proper tension control, the outer layers may crush the inner layers leading to starring, or the inner layers may telescope out resulting in ruined product. Proper tension control allows the process to run at high speeds without sacrificing product quality.

Very unique detection system with VR Sensor, and the creative construction way for the mechanical moving in the same direction with load direction is to enable NSD's tension meter VR TENSION to perform with the highly durability and precisely detection. VR TENSION is able to withstand the weight over 20 times heavier than the rating load while it is detecting the infinitesimal tension change. VR Sensor (Variable Reluctance Sensor) is unique principle detecting system which has been developed by NSD own technology, with magnetic reluctance change in between stator and tension core.



ABSOCOUPLER

Non contact and Wireless Data Transmission Device



ABSOCOUPLER | Wireless Slip Ring

ABSOCOUPLER, power and position data transmission device, is a highly integrated system for non-contact and wireless transmission of electric power & position data.

Specializing in demanding application environments, ABSOCOUPLER offers unique features and flexibility. ABSOCOUPLER is ideal for eliminating cables, slip rings, on rotating or moving devices.

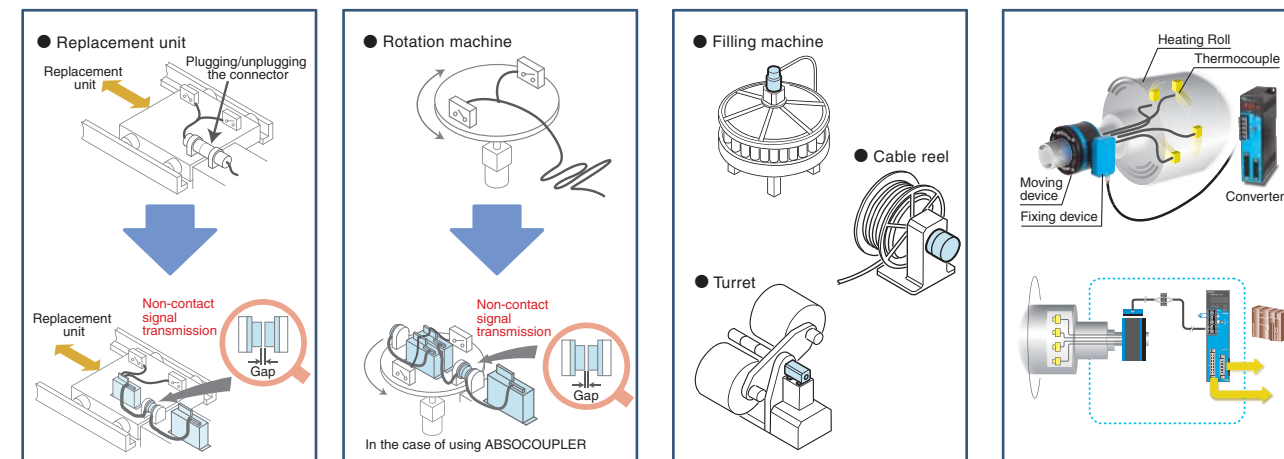
Compact and wireless slip ring ABSOCOUPLER is suitable for continuous casting ladle torrent control system.

ABSOCOUPLER | Heating Roll

4-channel measurement data is transferred by moving the device to a stationary device without a contact, and analog data signals are output from the amplifier of the stationary device.

Advantages

- Temperature measurement up to 1350°C
- K type thermocouple with 4-channel
- Hollow shaft for heating roll application



ezABSO

Electro-Magnetic Rotary Encoder



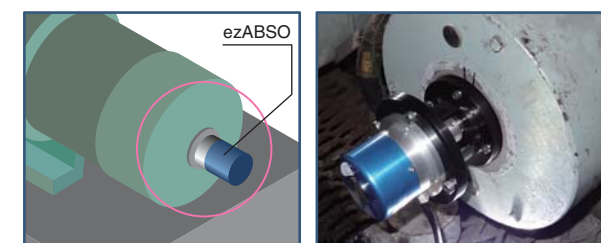
Pulse Count Selectable Heavy Duty Sensor

ezABSO is a smart sensor which is exactly what the market has been waiting for. Users can select the 16-different pulse counts per revolution by sensor DIP switches. In order to withstand the harsh process environment in a steel plant, it is designed to eliminate optical light sources and fragile glass discs from the sensor unit. ezABSO counts and measures the machine speed under the electro-magnetic-induction principle which is a very unique technology. ezABSO series are used for machine feedback in order to control the speed and the sequence of the individual process steps.

Advantages

- User selectable pulses per revolution by DIP switches
- Zero optics components and zero fragile discs inside

Application | Main Motor Speed Feedback



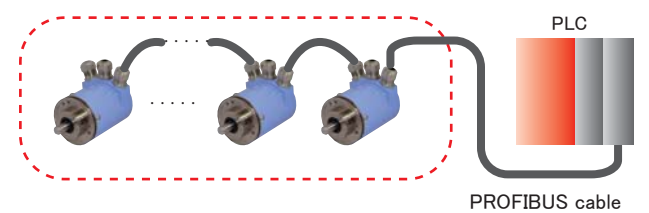
Field Bus and Industrial Network Encoder

ezABSO is a brand new Rotary Encoder which is adopted Electromagnetic Induction Type. ezABSO is able to detect positions singly because the converter system is built in the sensor.

Advantages

- High Reliability
The detection part of the sensor has a long lifespan due to non-contact structure. Moreover, life-limited components aren't used.
- Excellent durability
Vibration resistance: 200m/s²,
Shock resistance: 2000m/s²
Protection rating: IP66
- High resolution
Binary code
Single-turn: max 262,144 divisions(18-bit),
Multi-turn : max 2,301,100,032 divisions
(8,778-turn x 262,144)

*:262,144 is the number of divisions per turn.



Up to 124 slave units can be connected for PROFIBUS.
(If 32 or more slave units are connected, please use a repeater.)

Sensor Solution

The top priority for every manufacturing facility is to keep its workforce safe. One effective way to keep your employees safe is to limit the time they spend working on and around hazardous area.

By using position sensors that have a near zero failure rate and are maintenance free, you drastically reduce the amount of maintenance time spent in a dangerous environment.

When we talk about accidents and maintenance, we should also think about the cost of tire making cost. Today's competitive market condition requires that industries try to sustain full-production-capabilities, while minimizing capital investment.

Wise operation, careful maintenance while using maintenance-free products will together deliver cost-effective production reliability.

Down-time seriously hinders a tire making production capabilities, reduces average rate of output, and increases operating costs. It will also increase as a result of the ineffective implementation of just-in-time and lean total-quality management procedures.

NSD's position sensor ABSOCODER was developed and improved to eliminate unexpected down-time while decreasing operating expenses throughout the tire making process.

NSD is producing products to meet individual customer's demands & their diverse and changing needs or custom-tailored products with near mass production efficiency.

combines the technical-flexibility and service-personalization of custom made products with production efficiency to satisfy the current market needs.

ABSO SOLUTION

True Heavy Duty and Fully Absolute Position Sensor



Actual EZ GAP (NSD's eddy current displacement sensor for rubber thickness measurement) converter which is installed at calendering machine.

NCV
Digital Output Converter

Digital Binary / Gray Code Output Converter



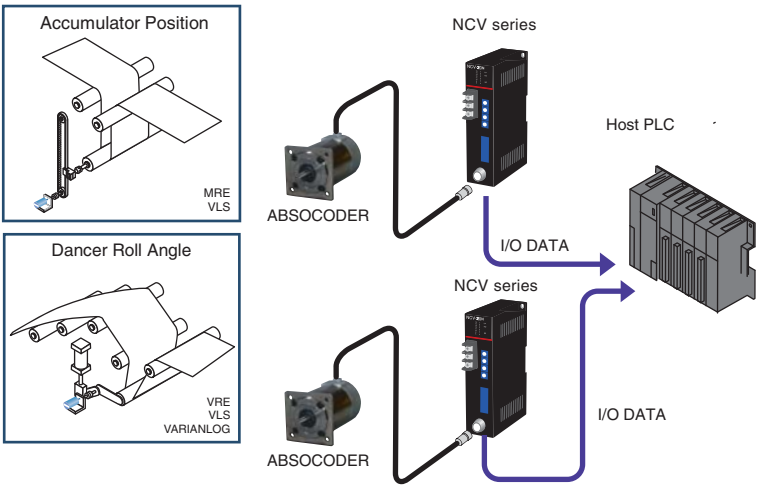
The most common types of numerical encoding used in the absolute position sensor are binary and gray codes. Binary code can have a large number of changes between one code and the next. Gray code, on the other hand, has the important characteristic that only one bit changes between one code and the next. See the table for examples of binary code and gray code for the codes from 0 to 15 for a 4 bit code. The advantage of binary code is that is easy to convert to a numeric value. The advantage of gray code is that makes very stable position digitizers, because only one bit changes at a time, resulting in uncertainty of only 1 bit. NSD offers both binary and gray code output converters for rotation and linear ABSOCODER.

Decimal Code	Rotation Range (deg.)	Binary Code	Gray Code
0	0 ~ 22.5	0000	0000
1	22.5 ~ 45	0001	0001
2	45 ~ 67.5	0010	0011
3	67.5 ~ 90	0011	0010
4	90 ~ 112.5	0100	0110
5	112.5 ~ 135	0101	0111
6	135 ~ 157.5	0110	0101
7	157.5 ~ 180	0111	0100
8	180 ~ 202.5	1000	1100
9	202.5 ~ 225	1001	1101
10	225 ~ 247.5	1010	1111
11	247.5 ~ 270	1011	1110
12	270 ~ 292.5	1100	1010
13	292.5 ~ 315	1101	1011
14	315 ~ 337.5	1110	1001
15	337.5 ~ 360	1111	1000

Application Example | Accumulator / Dancer Roll



With a conventional gravity operated `Swing Arm` type dancer roll, maximum storage equals the length of web material required to drop the dancer from its highest possible position to its lowest possible position. NSD's fully absolute position is directly detected the swing arm, and NCV converter delivers its position data to PLC.



Specification

Product Family	Applicable ABSOCODER	Dimension mm	Resolution	Power Supply	Output	Sample Time	Cable Length
NCV-20NB(G)NVP	VRE	39x155x93	8192	24VDC	Binary / Gray	0.2ms	Max. 100m
NCV-20NB(G)NMP	MRE	39x155x93	65,536	24VDC	Binary / Gray	0.2ms	Max. 100m
NCV-20NB(G)NLP	VLS	39x155x93	8192	24VDC	Binary / Gray	0.2ms	Max. 60m
NCV-30NB(G)NLC	CSA / SBA / SBH	39x155x93	1.56 μ m	24VDC	Binary / Gray	0.2ms	Max. 100m
NCV-40HB(G)NM5	MRE-1024S16T	39x155x93	67,108,864 (1024turns x 65,536)	24VDC	Binary / Gray	0.1ms	Max. 100m

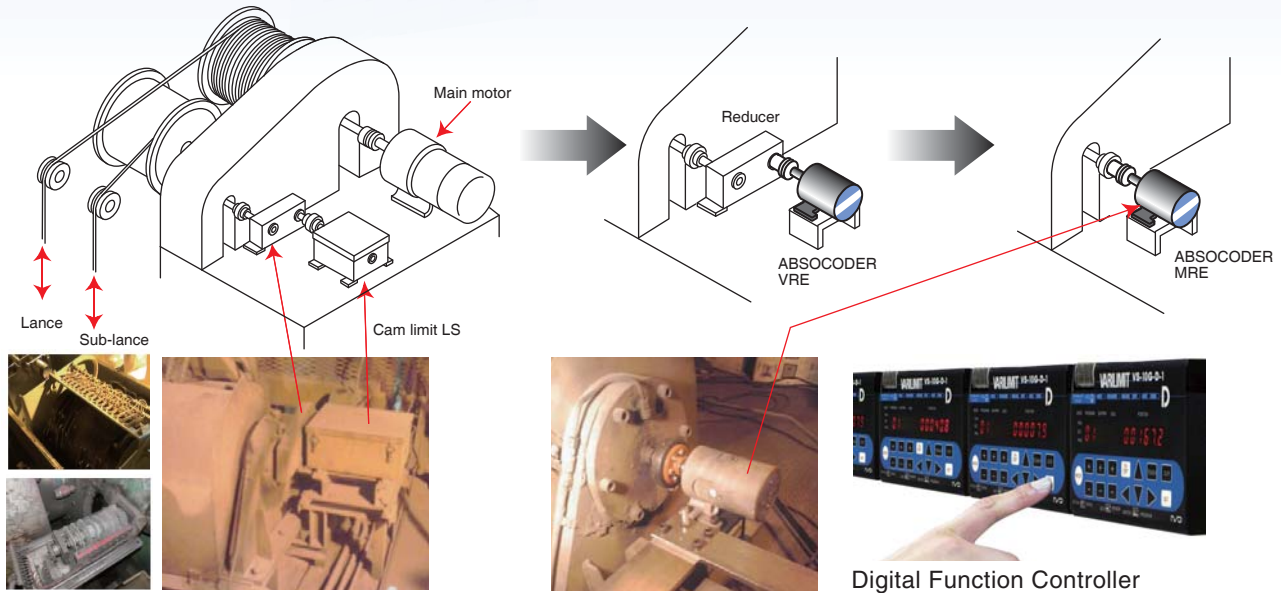
VARICAM / VARILIMIT
Electrical Cam Switch Controller

On / Off Cam Switch /
Limit Switch Signal Output Controller



The cam switch and limit switch are used to convert a mechanical motion into an electrical control signal with on/off formation, and for end-of-travel switching onto mechanical site. Cam switches are mounted in one enclosure and are activated by individual & adjustable cams. Switches can be set to be activated in fully open / close positions. It uses physical contact to detect the presence of an object, therefore operators should maintain the cam switch at the actual production site where the possibility for accident is high. Limit contact switches are consumable parts, and it requires periodic maintenance for replacement. User friendly digital cam switch controller, VARICAM / VARILIMIT offers freely selectable and configurable cam switches and limit switches with ABSOCODER. The position data is provided to VARICAM / VARILIMIT by a position sensor ABSOCODER. For easy configuration, NSD controllers provide optional signal formation according to the connecting upper controller (PLC), for instance, on/off limit switches•analog voltage•analog current•BCD binary code•motion detection signal.

Application Example | Replacement of CAM Switch



Specification

Product Family	Applicable ABSOCODER	Dimension mm	Power Supply	Output	Cable Length
VS-5F(D)X	VRE	130x81x99	24VDC	Switch / Timing Pulse / System Ready / BCD / Latch Pulse / RS232C	Max. 100m
VS-5FXG-1	VRE	130x81x99	24VDC	Switch / Timing Pulse / BCD / Top Dead Center / Advanced Angle/ RS232C	Max. 100m
VS-10F	MRE / VLS / CSA SBA / SBH / RP	130x81x99	24VDC	Switch 15 Point / Motion Detection Switch / BCD / RS-232C / RS-485 / Latch Pulse / System Ready	Max. 100m
VS-10G	MRE / VLS / CSA SBA / SBH / RP	130x91x99	24VDC	Switch 30 Point / Motion Detection Switch / BCD / RS-232C / RS-485 / Latch Pulse / HOLD Measuring	Max. 100m

GCW-10F / GCS-1
Gate Controller & Glue Gun Dispensing Controller



Smart Gate Controller

Water level in a dam needs to be maintained effectively to avoid complications. This is generally performed manually which requires full time supervision by the operators and have fairly large staff complements. Moreover, the quantity of water released is hardly ever correct resulting in wastage of water & it is impossible for a man to precisely control the gates without the knowledge of exact water level. NSD's smart gate controller GCW will control the gate position and water level precisely.

Limit Switch Output Function

Not only deliver the current position of the water gate, but also select 15 points of limit position, the same like limit switch. Allowing you to make a wide control of the gate and more safe operate the gate.

Auto-Compensation Function

Fully automatic compensation for wire multi-level movement. The wire rope winding is corrected / compensated by the pre-determined multistage winding function.

Gate Movement Adjustment

User can simulate the gate movement by GCW controller, and adjust its movement by actual gate position.

Current Position Preset Function

Best solution for the change of wire rope length because of temperature change. User friendly easy to select the fixed-fiducial-point for the controller preset function.



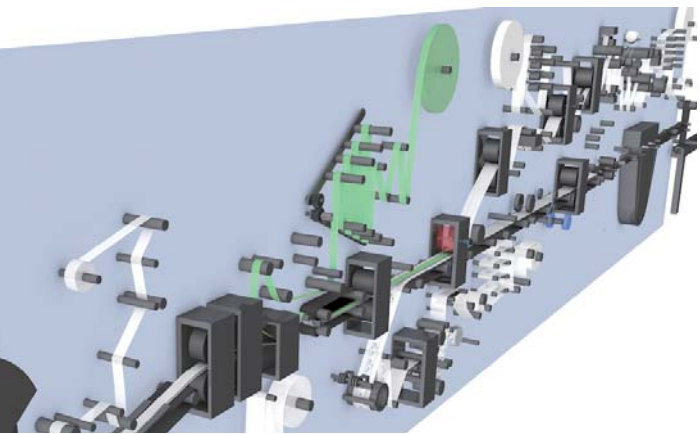
Smart Glue Gun Dispensing Controller

The glue gun dispensing controller is specifically designed for controlling glue dispensing position on the paper or non-woven fabric delivered on carrier equipment. It is installed and used in diaper or napkin making machine.

Dispensing Example

Simulation Function

It allows to simulate operation as if ABSOCODER is actually rotating when machine is not in operation. Measuring dispensing amount and checking valve operation can be easily done at the time of starting up the production lines.



VS-Q62 / VS-R62
Mitsubishi MELSEC Communication

Mitsubishi MELSEC communication controller

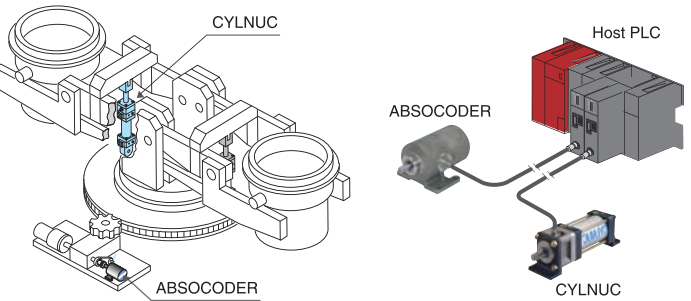
The MELSEC system is a powerful modular PLC with multiprocessor technology. Modular means that the configuration of the system can be adapted to an application individual and optimal. Communication between the CPU and the individual modules are performed via an internal bus connection of the base unit. NSD VS-Q62 series is a MELSEC base unit built-in controller as an MELSEC individual module for position sensing control unit.



Application Example | Ladle Tower Position



Rotating ladle turret is one of the devices in a continuous casting machine that requires the highest position control. There is one rotating arm on each side of the turret. The arm with the ladle will stop over the tundish after rotating 180°, then open the slide gate in the ladle to pour the molten metal into the tundish. NSD's heavy duty position sensors are installed at the ladle turret to measure the rotation angle of turret.



Specification

Product Family	Applicable ABSOCODER	Dimension mm	Resolution	Output	Sensor Channel	Cable Length
VS-Q62B-V1PG	VRE	27.4x98x90	8192	Binary	1 axis	Max.100m
VS-Q62B-V2	VRE	27.4x98x90	65536	Binary	1 axis	Max.100m
VS-Q262B-V2	VRE	27.4x98x90	65536	Binary	2 axis	Max.100m
VS-Q62B-M2PG	MRE	27.4x98x90	131072(8192X32turn ~ 32X2048turn)	Binary	1 axis	Max.100m
VS-Q262BH-M2PG	MRE	27.4x98x90	131072(8192X32turn ~ 32X2048turn)	Binary	2 axis	Max.100m
VS-Q62B-C	CYLNUC / IRS	27.4x98x90	1.56um(VLS) 6.25um(IRS)	Binary	1 axis	Max.100m
VS-Q262B-LC	CYLNUC / IRS	27.4x98x90	1.56um(VLS) 6.25um(IRS)	Binary	2 axis	Max.100m
VS-R62B-VP	VRE	27.8x106x107.1	8192	Binary	1 axis	Max.100m
VS-R62B-MP	MRE	27.8x106x107.1	131072(8192X32turn ~ 32X2048turn)	Binary	1 axis	Max.100m

VE/VM-2PR
PROFIBUS Converter



PROFIBUS-DP Network

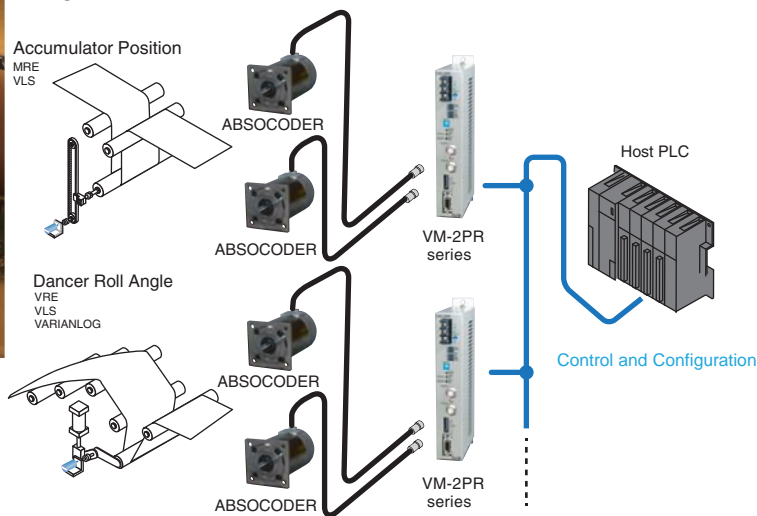
NSD's PROFIBUS-DP output solution is exactly what field engineer and market have been waiting for. The idea and basic configuration of NSD's PROFIBUS comes from entirely creative and different way. Physical position change and movement is detected by ABSOCODER which is true heavy duty position sensor under the most poor and harsh environment. 2PRH series electrically converts the position data and outputs binary coding with PROFIBUS-DP.



Application Example | Accumulator / Dancer Roll



With a conventional gravity operated `Swing Arm` type dancer roll, maximum storage equals the length of web material required to drop the dancer from its highest possible position to its lowest possible position. NSD's fully absolute position is directly detected the swing arm, and VM-2PR converter delivers its position data to PLC.



Specification

Product Family	Applicable ABSOCODER	Dimension mm	Resolution	Power Supply	Sample Time	Baud Rates kbps	Cable Length
VE-2PR	VRE	37x250x130	8,192	24VDC	0.2ms	9.6kbps/19.2kbps	Max.100m
VE-2PR-V2	VRE-16TS	37x250x130	65,536	24VDC	0.2ms	45.45kbps/93.75kbps 187.5kbps/500kbps	Max.100m
VM-2PR	MRE	37x250x130	131,072	24VDC	0.2ms	1.5Mbps/3Mbps/ 12Mbps	Max.100m

NCV-3DNIP
EtherNet IP Converter



EtherNet IP Network

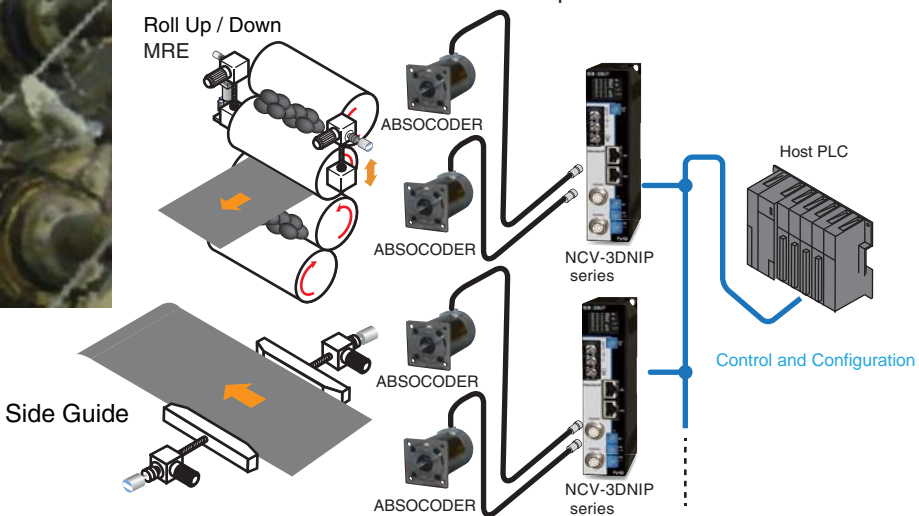
NSD's Ethernet IP output solution is exactly what field engineer and market have been waiting for. The idea and basic configuration of NSD's Ethernet IP come from entirely creative and different way. The physical position change and movement are detected by ABSOCODER which is the true heavy duty position sensor under the most harsh environment.



Application Example | Calendering



With textiles, fabric is passed under rollers at high temperatures and pressures, Calendering is used on fabrics such as moire to produce its watered effect and also on cambric and some types of sateens. NSD rotary and linear position sensor ABSOCODER is one of the best known sensor to detect calender rolls and machine position measurement. Customer can use Ethernet IP converter to convert position datas from ABSOCODER and communicate with PLC via Ethernet IP protocol.



Specification

Product Family	Applicable ABSOCODER	Dimension mm	Resolution	Power Supply	Sample Time	Baud Rates	Cable Length
NCW-3DNIPVP	VRE	39x155x93	8,192	24VDC	2ms	100Mbit/s, 10Mbit/s, Auto-Negotiation	Max.100m
NCW-3DNIPV2	VRE-16TS	39x155x93	65,536	24VDC	2ms		Max.100m
NCW-3DNIPMP	MRE	39x155x93	131,072	24VDC	2ms		Max.100m

ABS0 Solution for Steel Making Application



n the sensing coil in the end of the sensor head.
 This creates an alternating magnetic field with induces small currents in the target material; these currents are called eddy currents.

<p>Tilting Runner Position</p>	<p>Ladle Turret Angle</p>	<p>LD Furnace till angle</p>	<p>Mold-width varabel</p>
<p>Torch Cutter</p>	<p>Roll Gap</p>	<p>Mold-width varabel</p>	<p>Side Guide</p>
<p>AGC (HGC Cylinder)</p>	<p>Looper Arm</p>	<p>Work Roll Shift</p>	<p>Down Coiler (Wrapper Roll)</p>

Heavy Duty Absolute Position Sensor



The eddy currents create an opposing magnetic field which resists the field being generated by the sensor coil.
 The interaction of the magnetic fields is dependent on the distance between the sensor head and the target.

<p>Coke Coal Cart Position</p>	<p>Tar Machine Height Position</p>	<p>Extruder rack position</p>	<p>Extruder cart running position</p>
<p>Crane's up/down Travel position</p>	<p>Lance and sub-lance up/down position</p>	<p>Reheat Furnace Door Position</p>	<p>Main Motor Roll Speed Feedback</p>
<p>Coil Gauging</p>	<p>Looper Car Position</p>	<p>Anonizing Air Knife Position</p>	<p>Skin Pass Press</p>



GLOBAL ACTION

Promote NSD Solution Actively and Globally

NSD Tire Industry Support | POLAND

The Polish tire industry has been developing rapidly since the early 1990s, with the average annual rate of growth of production exceeding 20%. It seems that even despite the present slump on the automotive market the production of tire will continue to be high. In accordance with global trends, the Polish tire sector is strongly concentrated. Bridgestone, Michelin, and Goodyear, the three world giants are already present in Poland and it can hardly be expected that another large supplier could try to enter the Polish market. According to the market requirements, the most of tire suppliers in Poland increase the tire production capacity and expect to stable production system. Needing a local agent is really a thing of the past, and NSD has an local agent in Poland, we provide our real-time service to Poland tire industry in order to satisfy local tire suppliers including other markets as well.



Stamping Press System Improvement | MALAYSIA

Unfortunately, if you are working with anything that is not brand new, you run the risk of not being able to find the components you need. When it is no longer profitable or feasible for the manufacturer to build parts, they will stop. But you do not have to worry about this matter with NSD items.

One of our customer in Malaysia, they use a lot of aging press machines which is used to shape and cut metal sheet by deforming it with a die tools.

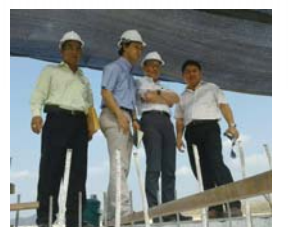
There are many of old NSD position sensors and controllers which has been more than several decades installed. NSD and our local agent, we provide our very new replacement solution and support to set-up install at actual customer site.



Full Automation Water Gate Control | THAILAND

Many parts of Thailand has experienced severe flooding in recent years after heavy rains hit. The office of the NESDB released the official report, and the report says that employment in the agricultural sector fell by 17.5% or 2.86 million. RID (Royal Irrigation Department) is a government agency of Thailand. They are a leading organization in water resources development and have integrated water management in order to improve the recent flooding situation in Thailand. NSD provides the most fit technology of fully automotive water gate control to RID Thailand.

NSD actively engages in their several projects, for instance, improvement of water gate control, revamping of position sensors, underwater position sensor for flap gates.



NSD Automotive Support | INDIA

The Indian automotive industry is one of the largest in the world with an annual production of 20~30million vehicles and it is still one of the fastest growing market globally. The automotive industry accounts for 22 percents of the country's manufacturing gross domestic product.

Car market leader Martui Suzuki, Honda and Hyundai Motor India reports that an expanding middle class and a young population are the major consumer of the Indian automotive market.

Reducing machine down time has an instant beneficial effect on manufacturing operational availability.

NSD has two solution for the less machine down.

NSD provides reliable, durable and highly performance position sensors to automotive industry, and our local partner continuously and periodically monitors NSD items status at actual production line.



Trust Based Partnership with Global Partner

Press Controller | Taiwan

Modern industry is looking for flexible solutions that will be able to provide some new technologies of press machine, such as the ability of controlled motion, simple data transfer, and the possibility for continuous control of the required values. Presses and blanking machines are one of the most commonly used in industry for the forming of metal sheet. NSD is a leading manufacturer of stand alone controllers for the usual Automotive Press industry. ABSOCODER and VARICAM represents over 30 years of engineering experience, and manufacturing expertise in the field of metal stamping fabrication, and metal sheet forming. VARICAM is packaged with software to control programmable cam limit switch outputs for crankshaft synchronization. NSD provides customers with flexibility while ensuring the reliable operation of the customer's press machine, and our Taiwan local distributor named FAPRO will keep in touch with Taiwan customer for this industry.



Die Casting System Improvement | INDONESIA

Die casting is a metal casting process that is characterized by forcing molten metal under high pressure into a mold cavity. Position sensors are available to directly measure critical process variables. If critical variables are continuously monitored and controlled, production problems can be detected and solved during the casting cycle. NSD's heavy duty position sensor ABSOCODERs will lead to less scrap, improved surface finish, higher dimensional repeatability, and improved internal integrity. Our Indonesian customer had an ageing die caster, and NSD introduced and installed the highly performance position sensors to improve their existing system.



Partner Interview | Enprotech, USA

Enprotech is a global provider of products and services to automotive, beverage, and steel industries from USA. Enprotech is NSD's distributor in USA for general FA industries.



NSD : Please introduce Enprotech

Enprotech : Enprotech is a provider of high-value-added services, products, systems and solutions for customers in automotive, steel, beverage and other heavy industries. We started working with NSD in the mid 1980's and entered into a joint development project for a custom position sensor used on Large Transfer Presses. This is a relationship we maintain to this day by providing sales and support for NSD's products here in North America.

NSD : What is your experience with NSD products and service in the U.S. market?
Enprotech : The reliability of the NSD line, coupled with the flexibility of the products, enables us to solve many automation problems. In our experience over the last 30 years, NSD's commitment to quality control is of the highest standard. This commitment is evident to those who use NSD products, as once they start using them, they continue to use them.

NSD : What are the advantages you see in NSD products and how clients evaluate our performance?

Enprotech : NSD takes the time to ask its customers to identify problem applications as well as looking at industry trends; to adapt and develop new products to. A perfect example is its research into the effects of the tire manufacturing environment to the life span of PC boards, and its development of the "R" series of controllers.

NSD : What are your expectations for further?

Enprotech : Our renewed commitment to work together to develop new products promises a very exciting future for both companies.



From Japan to The World Over

METEC 2015 | GERMANY

NSD presented a range of innovative products and introduced a total sensor solution to meet the needs of the steel industry at METEC. There is no event that can compare with the METEC in this industry.

For five days Messe Dusseldorf delivers a very positive summary of 'The Bright World of Metals'. The metal fairs quartet registered good marks on the exhibitors' as well as the visitors' side. In particular the internationality again increased distinctly and now amounts to 56 percents at the visitors and 51 percent at the exhibitors.

With 78,000 visitors from more than 120 countries METEC 2015 in Dusseldorf were on the level of the previous events. The experts presented themselves in high spirits to invest and the 2,214 exhibiting companies reported on numerous business transactions with customers from all over the world.

NSD demonstrated a range of innovative position sensor that improve reliability, durability, and efficiency for various steel making applications ; material, cokes, blast furnace, crane, caster, plate mill, hot rolling mill, cold rolling mill, structure mill, rod mill, bar mill, seamless pipe, and so on. NSD's true heavy duty and fully absolute position sensors had caused a big interest and good reputation throughout the entire METEC 2015. VLS-8SM for HGC/AGC linear position sensor attracted the biggest attention from the visitors which has 1um high resolution, outstanding sensor durability under mill stands' harsh environments. NSD will participate in the next METEC to keep up our successful promotion, and see you next time at METEC.

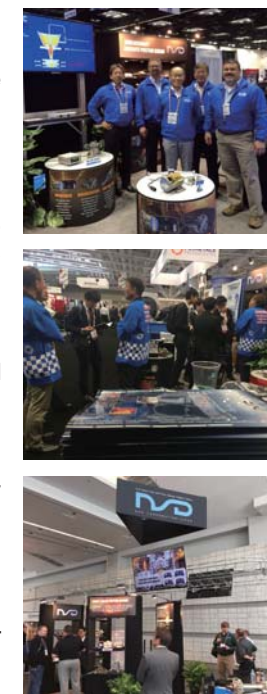


AISTech | USA

The steel's premier technology event AISTech was held at David L Lawrence Convention Center at Pittsburgh in 2016, USA. It was a great success with numbers of visitor. NSD Corporation participated since 2014 as the only company to exhibit the true heavy duty and fully absolute position sensors.

During the show, NSD introduced our total-sensing-solution for position sensing at steel industry. Most of visitors express their interests.

NSD will also exhibit at AISTech 2017, Nashville Tennessee, USA. Please come and see our new sensor technology at the show.



SEAISI Conference | ASIA

SEAISI (The South East Asia Iron and Steel Institute) Conference and Exhibition is one of the best known for developing a competitive steel industry in ASEAN. This event offers a great opportunity to learn and discuss key issues that could contribute to greater efficiency and profitability of the steel business in Asia.

NSD Corporation, we have participated in SEAISI Conference for three years in a row from 2014, and introduced the latest sensor technologies for position sensing applications of steel industry.

NSD has a great reputation during the show and received a lot of attention from the visitors, especially heavy duty position sensors.

