

# Sodick



Linear Motor Driven Wire EDM - Where Speed Meets Accuracy

# AG400L AG600L AG600LH



Create your future

Sodick offers Safe, Reliable, Energy-Saving  
and Eco-Friendly Technologies

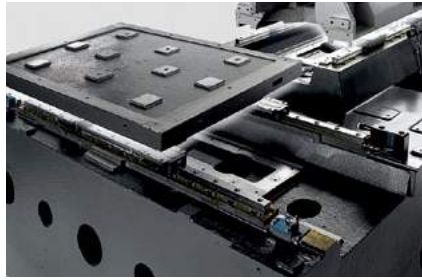
Linear motor driven, high speed, extreme performance **AG SERIES**  
Wire EDMs

**AG** series



Machine Design

## Highly Rigid



Sodick's expertise in EDM innovation using 3D design systems, the latest CAE technologies and numerous simulations has made it possible to create an improved basic machine structure using optimized rib arrangements. This increases rigidity by approximately 70%. Deformation is minimized, allowing optimum performance of the high-speed, rapid acceleration-linear motors. The original design of an independent X and Y-axis; plus an efficient parts layout, lead to a longer stroke, smaller footprint and highly accurate machining capability.

The Ultimate Guarantee

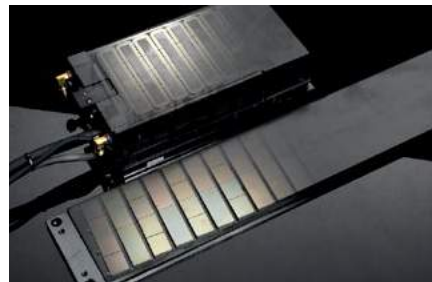


## The World's First 10 Year Positioning Accuracy Guarantee

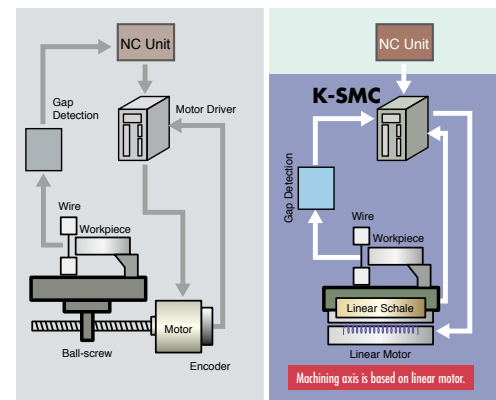
Since 1999, Sodick has manufactured over 25,000 linear motor drives without any defects. Based on this accomplishment, Sodick offers the industries first 10 Year Positioning Accuracy Guarantee on all linear motor driven EDMs. The initial machine accuracy of Sodick Wire EDMs can be maintained for an extended period of time with continuous and reliable machining results. Sodick's linear motor driven Wire EDMs will never lose accuracy due to component wear. The linear motors will eliminate axes delays and provide instantaneous servo response.

Developed and Built by Sodick

## Linear Motor Drives



Sodick's linear motor system features a direct-drive, vibration-free mechanism that has unrivalled acceleration and positioning accuracy with no backlash. The linear motors high dynamic responsiveness, stability for precision machining and performance do not diminish over time and remain maintenance free. The linear motor achieves optimal performance thanks to the Motion Controller (K-SMC) which Sodick has perfected over the years.



Conventional (AG400L/AG600L/AG600LH)

For Continuous High Speed and High Precision Capability

## Ceramic Components



The AG Series is constructed using ceramic components for the work stand table and other critical parts, all of which are built in-house to ensure high precision machining with better electrical insulation, abrasion resistance and rigidity. Ceramics are ideal for high precision machining due to their very low thermal expansion coefficient (less than one third than that of cast iron), high rigidity and resistance to aging.

Technology

## Super Jet AWT

An annealing function has been added to the fastest class auto wire threading device, "Super Jet AWT". This enables the machine to easily straighten and harden wire. Along with the conventional Pipe Jet wire threading system, this function ensures higher wire threading success rates in threading a wire through a hole on a submerged workpiece or a hole with smaller diameter.

## Wire Tension Servo Function

The wire tension servo function is standard on the AG Series, this feature helps to optimize wire tension. This function monitors the state of wire tension to adjust electric current of a servo motor in real time to ensure stable high accuracy machining with optimum wire tension.

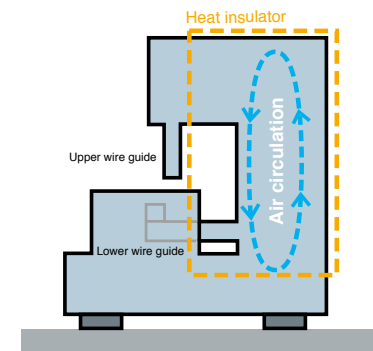
The AG400L and AG600L enable reliable and stable machining throughout the wire diameter range from  $\Phi.002$ " to  $\Phi.012$ " ( $\Phi.05$  to  $\Phi.3$  mm), with available options. The AG600LH enables a wire diameter range of  $\Phi.004$ " to  $\Phi.012$ " ( $\Phi.1$  to  $\Phi.3$  mm).

## Absolute Linear Scale

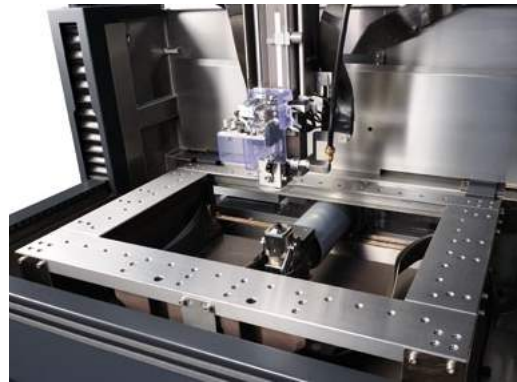
With the use of the Heidenhain ultra-precision absolute linear scale, which is the industry standard, the start-up origin shift operation is not required, so the operability of the machine has been further enhanced.

## Environment Adaptation System

Machine temperature is stabilized by circulating air inside the column. Heat insulation material which covers the entire column prevents the outer air from affecting the temperature inside the column. This adapts the system to the surrounding environment maximizing the advantages of the linear motor drive system.



# High Capability and Easy Operation



## 3-Sided Rise-Fall Worktank

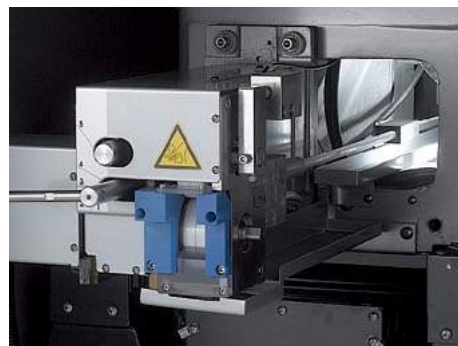
On the AG400L and AG600L the automatic three-sided vertical sliding tank and the square-shaped work stand feature a large setup space. The fluid level is automatically adjusted, so manual adjustment of the fluid level according to the workpiece thickness is not required. Moreover, the operator can easily check progress on machining of thin workpieces because the slide tank can be stopped in the intermediate position while machining. The AG600LH comes standard with a front door automatic sliding tank.



## Easier Maintenance and Work Preparation

### Three Part Filtration System

Enhanced filtration capability makes high speed and accurate machining easy to achieve. The filters can even be changed during machining.



### Wire Ejection Unit

A wear resistance ejection roller and increased rigidity of the wire ejection unit have further improved the unit's reliability. The roller's durability can be increased as the roller's position is adjustable.



### Slide Plate Cleaning Function

The life cycle of the sealing portion of the slide plate can be extended since the machine features a cleaning function for the slide plate. This leads to a reduction of maintenance time and stable high speed machining performance.

Easy Operation  
& Precision

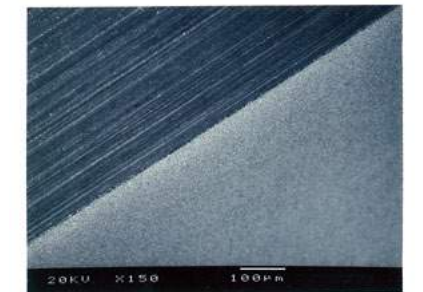
## LN2W Power Supply - High Accuracy and High Speed

The ergonomically designed control panel enables even inexperienced operators to easily handle a variety of machining tasks. The keyboard and remote controller design are built for the operator's view point for improved operability. The large 15.1" TFT-LCD touch screen eliminates glare and is easy to view. The control panel is equipped with a tray so operators can store small tools and items.



## Electrolysis Free Circuit

This circuit is designed to provide high-frequency bipolar pulses between electrodes to prevent the machining surface from suffering electrolysis depletion. For machining cemented carbide, the bonding material (cobalt) is prevented from being extracted. When the workpiece is waiting for the next operation in the dielectric fluid, the alternating voltage is controlled in the optimum state to prevent electrolysis. That leads to high quality surface finish, as well as, an extended service life of molds.



## Automatic Machining Condition Selection

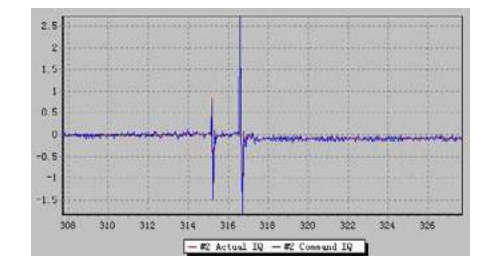
A database containing details on the best conditions for a particular wire diameter, workpiece material or workpiece thickness helps to ensure the best possible machine performance is achieved. The operator can make use of the conditions Sodick provides and also add to the original database with his/her own know-how.



## Collision Protection

Sodick's anti-collision circuit protects the machine from accidental collisions. The circuit constantly monitors voltage in the axes drives. When voltage exceeds a pre-determined load, the machine will automatically stop and give the operator an error message.

With a linear motor drive system, there is no mechanical connection between the linear motor drives and the table, unlike ball-screws, which can incur costly repairs in the event of a collision.

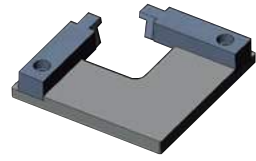


Sodick opens the door  
to the future of manufacturing

# Numerous Options to Support Manufacturing



Wide angle guide which enables taper cutting of 45 degrees



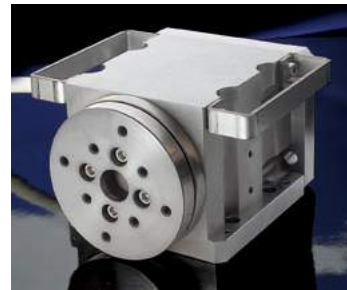
Jig to measure angle error to calculate compensation value.

## Taper Flex

The "Taper Flex" function helps to take advantage of excellent discharge characteristics and meets a variety of cutting needs from draft angle cutting to cutting of highly accurate wide angles.

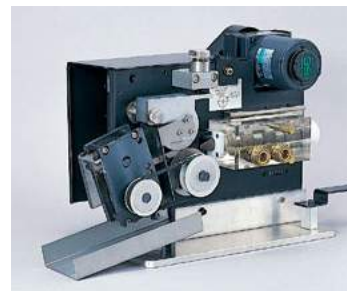
Taper cutting, which has been handled with the techniques of experienced operators, can now be superbly and quickly performed by easily measuring and entering simple compensation values.

Further improvement of shape accuracy is possible by feeding back the machining result.



## W-Axis: Rotary/Index Table

High-level precision rotary or indexing device which can be used even below the fluid level.



## L Cut Wire Chopper

Attaches to the wire ejection unit; the ejected wire is chopped into small pieces for easy disposal.



## Jumbo Feeder

Required for long-run machining. Max. 110 lbs (50 kg) wire bobbin is available.

### Further Options

Fine Wire with AWT	Φ .002" (Φ0.05 mm) and Φ.003" (Φ0.07 mm) are available.
LN20W	Simultaneous 8 axes control.
Signal Tower	Displays machining status. It is available from a 1-light system to a 3-light system.
HTP Circuit	For machining exotic materials (example: PCD).

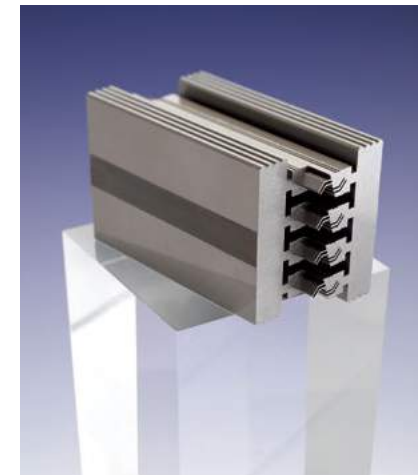
Samples

Options

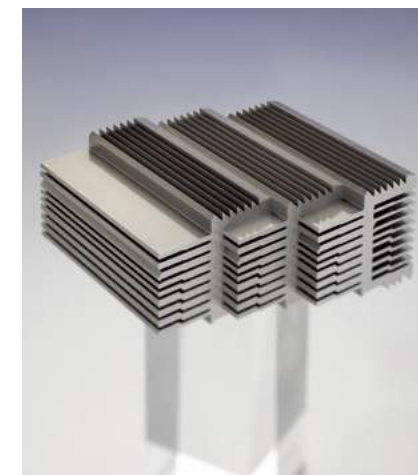
# Samples to Show Case High-Level Machining Performance



Workpiece Material: SKD11  
 Thickness: 1.97" (50 mm)  
 Wire Diameter: Φ.01" (Φ.25 mm)  
 Surface Finish: 4.4 Ra Micro Inch (.78 umRz)

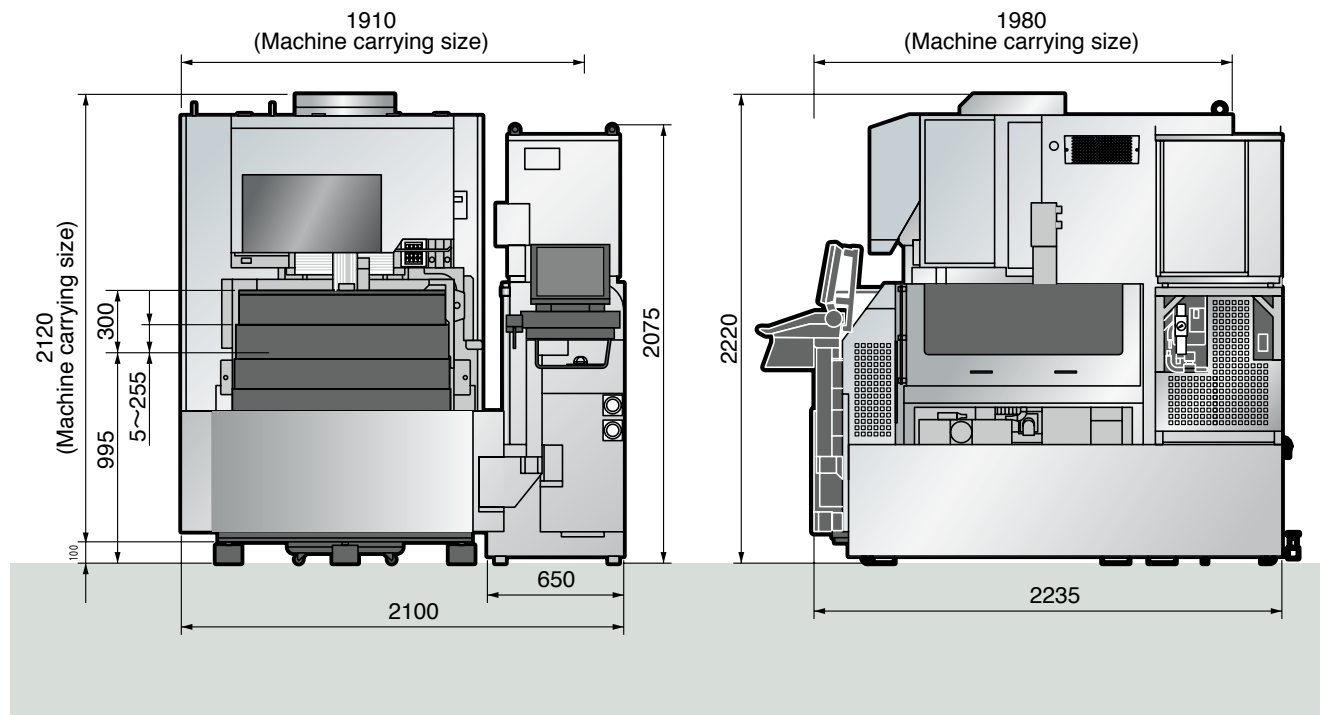


Workpiece Material: SKD11  
 Thickness: 1.97" (50 mm)  
 Wire Diameter: Φ.006" (Φ.15 mm)  
 Form Accuracy: +/- .00059" (+/- 1.5 um)



Workpiece Material: SKD11  
 Thickness: 1.97" (50 mm)  
 Wire Diameter: Φ.008" (Φ.20 mm)  
 Surface Finish: 4.3 Ra Micro Inch (.73 umRz)  
 Form Accuracy: +/- .00059" (+/- 1.5 um)

# AG400L



Machine Tool	AG400L	AG600L	AG600LH
Max. Workpiece Weight	1,102 lbs (500 kg)	2,204 lbs (1,000 kg)	
Work Tank Inner Dimensions (W x D)	33.45" x 24.02" (850 x 610 mm)	41.34" x 27.95" (1,050 x 710 mm)	39.37" x 31.10" (1,000 x 790 mm)
X Axis Travel	15.75" (400 mm)	23.62" (600 mm)	
Y Axis Travel	11.81" (300 mm)	15.75" (400 mm)	
Z Axis Travel	9.84" (250 mm)	13.78" (350 mm)	19.69" (500 mm)
U x V Axis Travel	4.73" x 4.73" (120 x 120 mm)		
Taper Angle (Work. Thickness 3.94" (100 mm))	±25° (±45°: option)	±25° (option: ±45°)	±25° (option: ±45°)
Wire Diameter	.002" ~ .012" (.05 ~ .3 mm)		.004" ~ .012" (.1 ~ .3 mm)
Wire Tension	200 g ~ 2,800 g (3 ~ 23 N)		
Max. Wire Speed	16.54"/sec (420 mm/sec)		
Distance from Floor to Table Top	39.17" (995 mm)		
Machine Tool Dimensions (W x D x H)	82.68" x 87.99" x 86.61" (2,100 x 2,235 x 2,220 mm)	96.46" x 103.15" x 94.09" (2,450 x 2,620 x 2,390 mm)	109.65" x 106.69" x 105.91" (2,785 x 2,710 x 2,690 mm)
Machine Installation Dimensions	125.94" x 125.94" (3,200 x 3,200 mm)	137.80" x 145.67" (3,500 x 3,700 mm)	149.61" x 145.67" (3,800 x 3,700 mm)
Machine Tool Weight	8,377 lbs (3,800 kg)	10,950 lbs (4,950 kg)	11,243 lbs (5,100 kg)
Total Power Input	Normal: 10.5 kVA Max.: 13 kVA		15 kVA

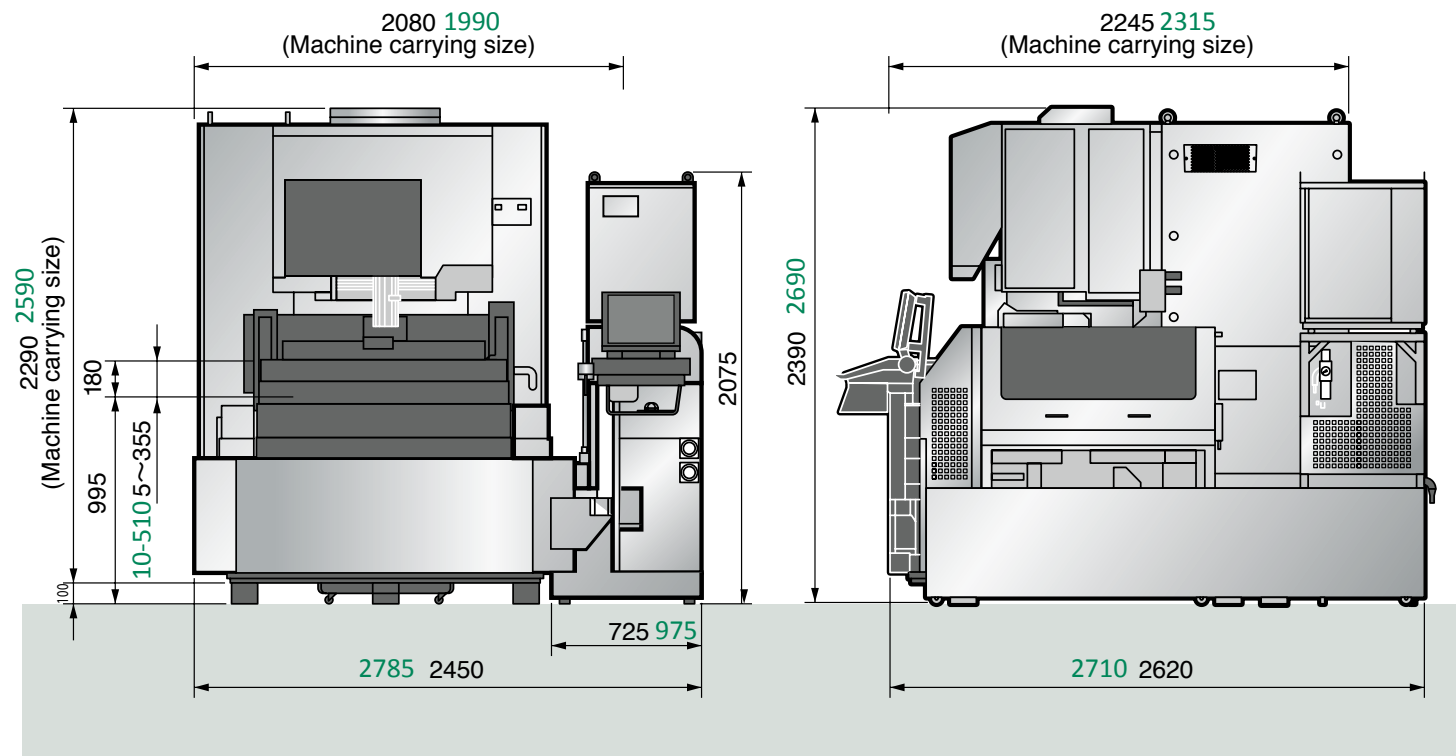
Dielectric Tank	AG400L	AG600L	AG600LH
External Dimensions (W x D)	25.59" x 81.89" (650 x 2,080 mm)	28.54" x 100.39" (725 x 2,550 mm)	38.39" x 95.67" (975 x 2,430 mm)
Weight (Empty)	881 lbs (400 kg)	1,322 lbs (600 kg)	1,389 lbs (630 kg)
Capacity	158.50 gallons (600 liters)	211.34 gallons (800 liters)	285.31 gallons (1,080 liters)
Dielectric Fluid Filtration System	Replaceable Paper Filter, Replaceable Paper Filter (Internal Pressure 3-shell type)		
Deionizer	Ion Exchange Resin (18 lit. type)		

CNC Power Supply LN2W / LN2WH	
Max. Machining Current	40A (60A - AG600LH)
Power Requirement	200/220V 50/60Hz
CNC Unit	Multi-task OS, Sodick Motion Controller
User's Memory Capacity	Edit: 100,000 blocks / Saving: 30MB
Memory Device	Flash Drive, External Memory
Input Format	External Memory, Touch Panel, Keyboard
Display Type	15.1" TFT-LCD (XGA)
Character Set	Alphanumeric and Symbols
Simultaneous Control Axis	Max. 4 axes (LN20W: Max. 8 axes)
Min. Input Command	0.01um
Min. Drive Unit	0.01um
Drive Mechanism	Linear Motor

Standard	
Taper Cut Unit	Tension Servo
Corner Control	FTII (Fine pick-up function)
Energy Saving Circuit	High Speed Electrolysis Free Circuit
Dielectric Cooling Unit	Automatic Voltage Regulator
Super Jet AWT	.1 um Linear Scale (X, Y, U, V Axis)
Air Filter	Wire Tip Disposal Unit
Paper Filter (3)	Z-Axis Automatic Fluid Level Control
Ion-Exchange Unit (18 lit)	Tool Kit

Please consult your sales representative for more details.

# AG600L/AG600LH



AG600LH differences are shown in green. AG600LH has automatic sliding tank.

## For Installation

### Machine Installation Environment

The machine shall be installed in a proper place, with the following points taken into account.

Required floor space	Specified in the layout drawing (The required floor space is subject to change due to optional equipment or additional specifications, if any.)
Floor condition	The floor shall be free from vibrations or impulses from other equipment. The recommended vibration level is less than 0.1 m/s <sup>2</sup> (0.01G), with the maximum amplitude of 1um.
Ambient condition Temperature and humidity	The installation location shall be free from dust. The recommended room temperature is 20±1°C with temperature changes minimized. The machine installation point shall be free from direct sunlight, air-conditioner wind, or heat exhausted from other equipment.
Radio disturbance countermeasure	A shielded room may be required depending on the radio disturbance.

### Ancillary Works

#### Electrical Work

Electric power supply	3-phase AC200V±10% with 50/60 Hz
Earth leakage circuit breaker	3-phase input and earth: 14 mm <sup>2</sup> x 4 cores
Installation work	Breaking current: 75A (LN2WH/20WH) or 50A (LN2W/20W) Compatible with inverter circuit, Rated sensitive leakage current: 100 mA to 200 mA, Independent Class C grounding work (earth resistance: 10Ω or less) Only if there is little noise inflow, the common earth is possible. In that case, the ground cable shall be connected to the grounding electrode independently.

#### Pneumatic Power Source:

Supply air pressure	0.5 MPa or more
Supply flow rate	30 lit/min (ANR) or more (Air compressor output of 0.75 kW or more is recommended.)
Air connection port	8 to 10-mm (ID) hose and hose band (equipped with 8 HI-Coupler)

---

Export of our products and the related technologies (including programs) is controlled under the Foreign Exchange and Foreign Trade Law of Japan. Also, some of them are controlled under the U. S. Export Control Rules when they are re-exported. Therefore, in the case where you try to export or transfer our product from Japan, please contact our sales department.

The specifications contained in this catalog are subject to change without notice due to continual improvements.

This catalog was printed in January 2012.

B201201-B-AG400600L

**Sodick**

1605 N. Penny Lane Schaumburg, IL 60173

Ph: 847-310-9000 Toll Free: 888-639-2325 Fax: 847-310-9011

[www.sodick.com](http://www.sodick.com)