



**Are you in the market for Molten Metal Level Control?**

***Look no further; all our sensors are LASER CLASS II!***

PreciMeter has developed a line of level control systems based on our patented CCD Laser Sensor Technology, for applications in your troughs, launders, molds and head-boxes.

## 1 Systems

PreciMeter has developed level control systems for automating the casting process aluminum foundries.

In direct chilled molds, the system consists of a laser sensor and a pin-positioner for each mold plus the PLC control system.

The PreciMeter level control system for trough and launder applications consists of a laser sensor at each control position.

In tap-out applications the typical system configuration consists of a laser sensor, a PreciMeter tap-out pin-positioner and PLC controller.

The PreciMeter level control system can be integrated into most PLC or process control systems. The process control system, however, must be capable of performing PID functions at a loop frequency of 10-25 Hz.

## 1.1 Level control for Mold and Head-box applications

Typically in this application, the laser sensor's analog output, 4-20 mA, is connected to the process control system's analog input. The process control system controls the laser diode's on/off power through a digital output signal to the laser sensor.

The laser sensor has a digital output signal that tells the process control system that a measurement is taken place. The laser sensor also has a temperature sensor that gives an analog signal for temperature supervision. The Pin-Positioner's controller has an analog input (4-20 mA) to control pin position, which is operated by the plant's PLC or a process control system through one of its analog outputs. The pin-positioner also has digital inputs that drive the pin to a normally closed or full opened position when activated. This feature is used for calibrate of the pin position to either closed or opened.

## 1.2 Level control for Trough and Launder applications

Typically in this application, the laser sensor's analog output, 4-20 mA, is connected to the process control system's analog input. The process control system controls the laser diode's on/off power through a digital output signal to the laser sensor.

The laser sensor has a digital output signal that tells the process control system that the measurement is taken place. The laser sensor also has a temperature sensor with a 4-20mA output that should be connected to an analog input on the process control system for supervision of the laser sensors operating temperature. The Pin-Positioner's controller has an analog input (4-20 mA) to control pin position, which is operated by the plant's PLC or a process control system through one of its analog outputs.

In a tap-out application, the level is controlled in the same fashion as for a mold level control system, either using a Tap-out actuator or by providing the signal for tilt-control of the furnace.

## 1.3 Furnace Level Control

In furnace applications it is important to be able to accurately determine the level in the furnace for metallurgical control and to avoid over or under-filling of the furnace.

## 1.4 Options

PreciMeter ProH sensors can be delivered with a PI-controller designed into the sensor itself or with customer specific functions.

## 1.5 Scope of supply

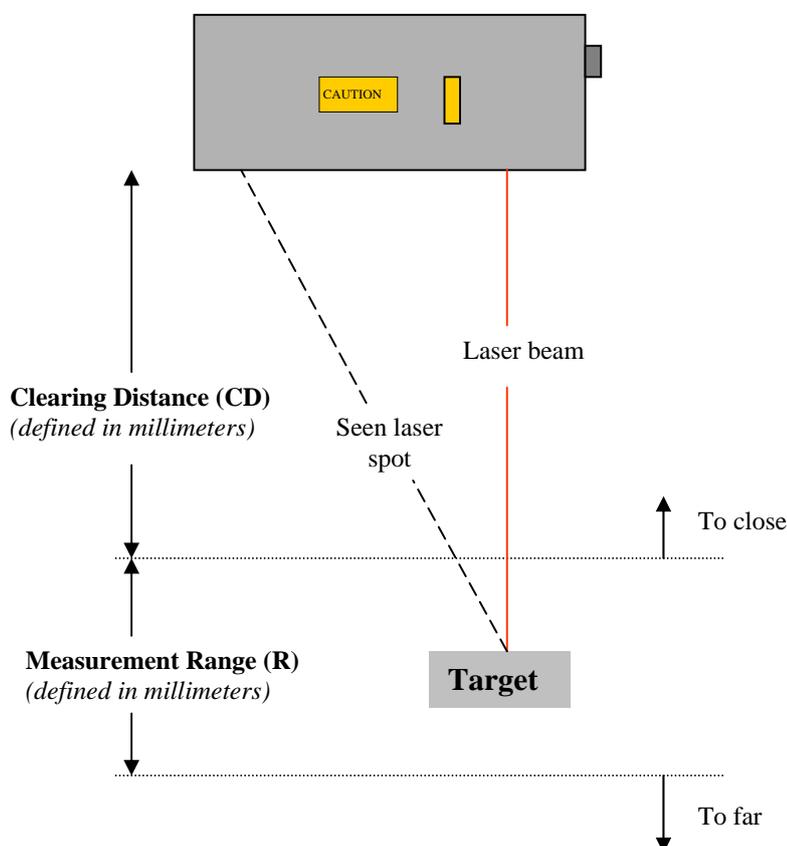
PreciMeter supplies the mechanical and electrical drawings as well as block-function and basic information for programming the control system.

PreciMeter does not normally supply the control system since most of the plants already have an existing process control system. PreciMeter can, as an option, design, program and deliver process control systems.

## 2 System descriptions

### 2.1 Laser Sensor, **PRECIMETER**®ProH

Sensor operation:



PreciMeter®Pro is a line of laser-based displacement sensors featuring advanced triangulation technology in a compact housing. The sensors have built-in signal processing that eliminates the need for external controllers and allows direct connection to PLC's, PC's or other equipment via standardized interfaces.

The visible red laser simplifies installation and alignment. It is Laser Class II and operates at a low output power, which does not require additional safety measures in the industrial environment.

The CCD-based image detector provides to a high degree impervious to stray light and secondary reflections. PreciMeter's patented technology combines the advantages of the digital image detector with advanced modulation of the laser. This enables measurement on a wide range of surfaces of varying reflectivity and colors without need for re-calibration.

## 2.2 Mold, Head-box, Trough and Launder level control

Typically one laser sensor, model **ProH CD700R300-HPS**, per launder is used. The laser sensor is mounted in a protective shield and is ready to be installed 700 mm (27.6") above and a little bit outside the trough or launder in order to minimize the need of cooling air.

The laser sensor measures the level of molten metal within the measurement range of zero to 300 mm (12") at a distance of 700 mm (27.6") from the sensor.

For cooling purposes dry and oil-free compressed air at a minimum pressure of 30 PSI and no warmer than 35°C (approx.100°F) should be used – warmer cooling air can be chilled by a Vortex cooler or similar. In the case of very high ambient temperatures, a water-cooled version of the protection shield can be supplied.

## 2.3 Holding Furnace level control.

The **ProH CD800R1500-HPS** has been developed for areas where a large measurement range in combination with a large clearance distance is important.

The distance from the front of the laser to the point furthest out in the measurement range is 2300 mm (90.5").

Furnace sensors can be supplied with special air lock chambers heat protection. As an option the sensor can be delivered with a water-cooling jacket, WCJ for hot environments.

## 2.4 Pin-positioner, PXP2000-2-E

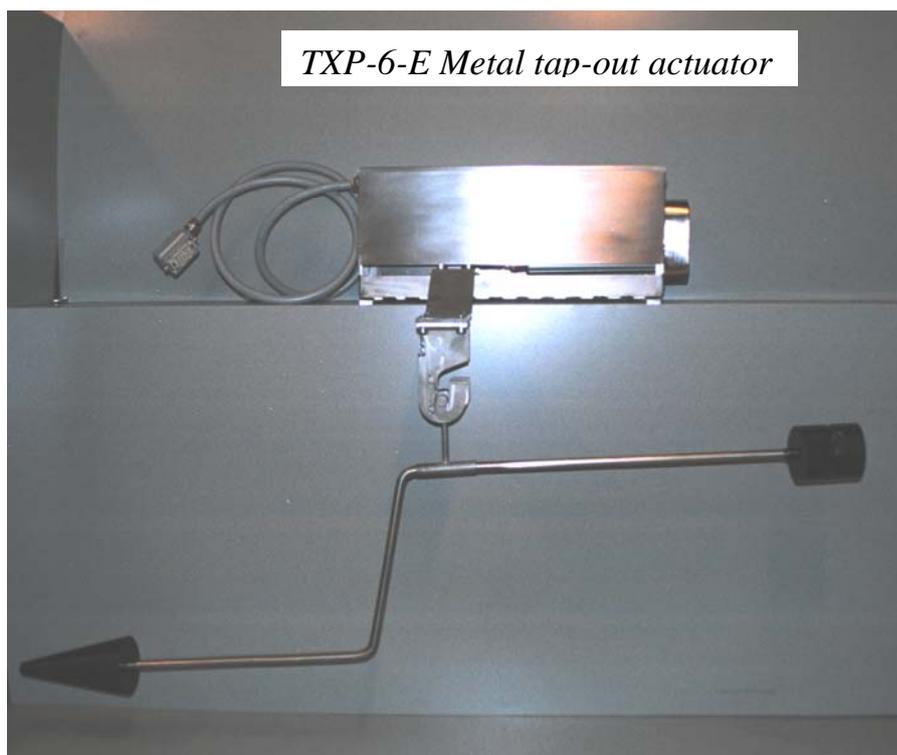
A special motor controls the Pin-positioner. The position can be adjusted from 0-50 mm (0-2"). The pin-positioner is equipped with a spring-loaded air cylinder for emergency closure of the pin.

## 2.5 Tap-out actuator, TXP-6-E

The metal tap-out actuator TXP6-E is mounted to the furnace with a steel bracket.

The steel bracket is hinged to allow the actuator to be swung out of the way between casts or during maintenance.

The actuator is mounted with an offset of 350mm (13.5") from tap-out hole to minimize the effects of heat radiation from the molten metal.



### 3 Specifications

#### 3.1 Laser Sensor, ProH CD240R325-HPS, Class II and ProH CD250R500-HPS, Class II

The laser sensor is mounted in an air-purged stainless steel protective shield for applications where molten metal is measured. The protection shield is mounted either by using bolts or welding it to a fixture.

The laser sensor comes equipped with a flexible stainless steel hose for cable protection and air-purge supply.

At the end of the cable is an industrial grade 16-pin Harting connector.

	<u>CD200R200-HPS</u>	<u>CD240R325-HPS</u>	<u>CD250R500-HPS</u>
Part number Side outlet	84013	84005	84008
Part number Top outlet	85013	85005	85008
Clearance distance (CD):	200mm (7.8")	240mm (9.4")	250mm (9.8")
Measurement range (R):	200mm(7.8")	325 mm(12.8)	500 mm (19.7")
Analog output:	4-20 mA (optional 0-20 mA or 0-10 V DC)		
Communication:	RS 232		
Digital input:	Laser On/Off		
Digital output:	Ready!		
Temperature Output:	4-20 mA (optional 0-20 mA or 0-10 V DC)		
Power requirements	18-32 V DC, <1.0 A		

Picture: Top version of ProH CD (200-500) R (200-500)-HPS



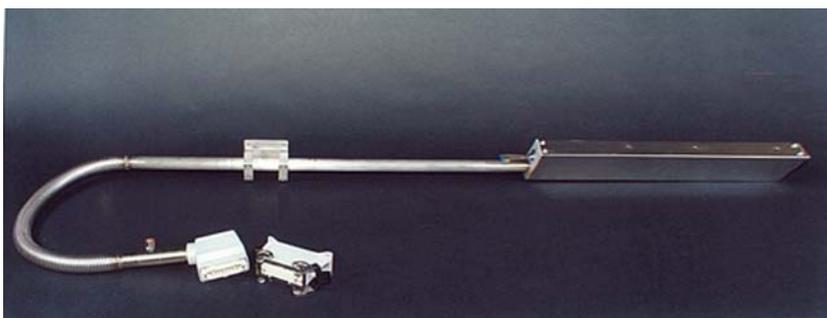
### 3.2 Laser Sensor, ProH CD700R300-HPS, Class II and ProH CD900R500-HPS, Class II

The laser sensor is mounted in an air purged stainless steel protection shield for applications measuring molten metal. Means of mounting the protection shield is either by using bolts or welding it to a fixture.

The laser sensor comes equipped with a flexible stainless steel hose, for cable protection and air-purge supply, and a cable.

At the end of the cable is an industrial grade 16-pin connector by Harting.

	<u>CD700R300-HPS</u>	<u>CD900R500-HPS</u>
Part number Side outlet	84002	84009
Part number Top outlet	85002	85009
Clearance distance (CD):	700 mm (28")	900 mm (35.4")
Measurement range (R):	0-300 mm (12")	0-500 mm (19.7")
Analog output:	4-20 mA (optional 0-20 mA or 0-10 V DC)	
Communication:	RS 232	
Digital input:	Laser On/Off	
Digital output:	Ready !	
Temperature Output:	4-20 mA (optional 0-20 mA or 0-10 V DC)	
Power requirements	18-32 V DC, <1.0 A	



*Mechanics for side outlet, PreciMeter part number 840xx*

#### **Standard Side outlet mechanics:**

- Heat shield for side assembly.
- 0.5m (19.7") metal tube
- 1m (39.4") flexible metal hose
- Bracket
- 16 pin Harting Heavy Duty connector



*Mechanics for Top outlet sensors, PreciMeter part number 850xx*

#### **Standard Top outlet mechanics:**

- Heat shield for Top assembly.
- 1.5m (39,4") flexible metal hose
- Universal brackets
- 16 pin Harting Heavy Duty connector

### **3.3 Laser Sensor, ProH CD800R1500-HPS, Class II**

The laser sensor is mounted in an air purged stainless steel protection shield for applications measuring molten metal. Means of mounting the protection shield is either by using bolts or welding it to a fixture.

The laser sensor comes equipped with a flexible stainless steel hose, for cable protection and air-purge supply, and a cable.

At the end of the cable is an industrial grade 16-pin connector by Harting.

These sensors have been developed for areas where a large measurement range in combination with a large clearance distance is important.

	<u>CD800R1500-HPS</u>
Part number Side outlet	84006
Part number Top outlet	85006
Part number WCJ	85106
Clearance distance (CD):	800 mm (31.5")
Measurement range (R):	0-1500 mm (59")
Analog output:	4-20 mA (optional 0-20 mA or 0-10 V DC)
Communication:	RS 232
Digital input:	Laser On/Off
Digital output:	Ready !
Temperature Output:	4-20 mA (optional 0-20 mA or 0-10 V DC)
Power requirements	18-32 V DC, <1.0 A

### 3.4 Pin-Positioner , PXP2000-2-E

The Pin-Positioner consists of an electrically actuated motor operating an indexing unit. It is also equipped with an air cylinder with a spring return is used for emergency closing (or opening) of the pin.

The Pin-positioner also has an inbuilt 4-20mA device for position feedback and a magnetic limit switch mounted on the air cylinder to indicate spring loaded.

The Pin-Positioner is connected to the control unit with a 2-meter (78,7") cable. The cable has a 10-pin connector and is protected by a flexible metal hose.

Power requirement: 24 V DC, 1.2 A per unit.



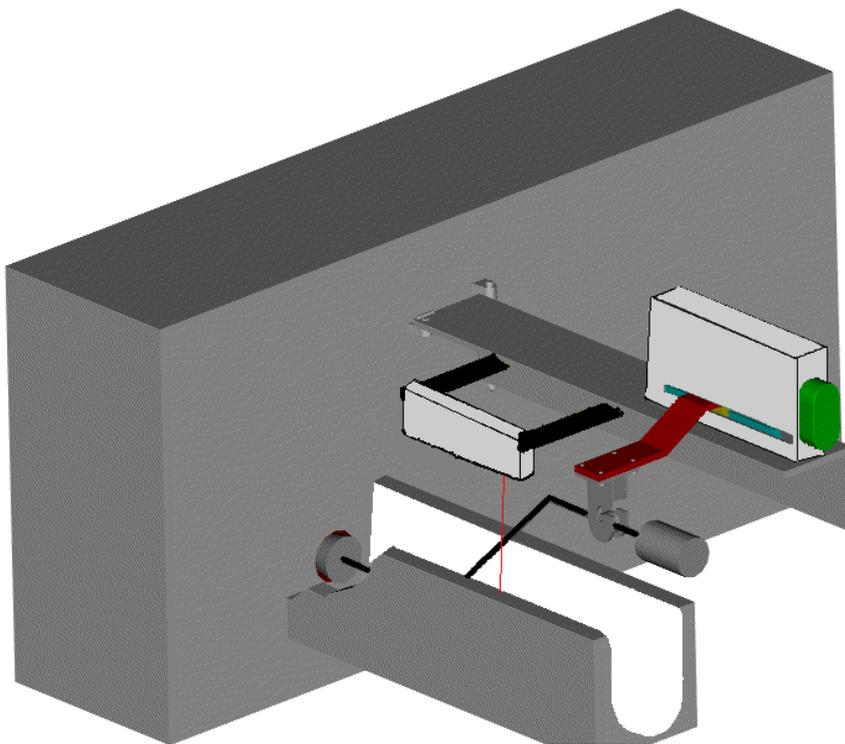
- |                                   |  |
|-----------------------------------|--|
| • Part number                     | 86011                                  |
| • Stroke                          | 50 mm (2")                             |
| • Type of motor                   | Stepper motor                          |
| • Emergency operation             | Spring-back spring                     |
| • Dimensions                      | 450 x 188 mm (17.7" x 7.4")            |
| • Weight (without cables)         | 9.7 Kg (21.6 lbs)                      |
| • Analog input                    | 4-20mA (optional 0-10 V DC or 0-20 mA) |
| • Power requirement               | 18-32 V DC, 1.2 A                      |
| • Housing                         | Stainless steel                        |
| • Air pressure spring-back spring | min 57 psi, max 86 psi                 |

### 3.5 Metal Tap-out actuators

#### Metal Tap-out Actuator, TXP-6-E

Designed for accurate flow control from gravity furnaces with a capacity of less than 45 metric ton

- Part number 86003
- Dimensions 630 x 255 x 112mm (24.8 x 10 x 4.4")
- Weight (less mounting bracket) 22 Kg (48 lb)
- Closing force 800 Nm (600lbs/ft)
- Stroke 150 mm (5.9") (longer stroke available)
- Power requirement 24 V DC +/- 20%, 4 amps.
- Positioning stepper motor 10A
- Interface 24 V DC Digital I/O
- Position control signal level Voltage or Current



Metal tap-out actuator

## 4 Documentation

User manuals and spare parts lists are provided in English.

### 4.1 Drawings

Electrical: - recommendation of type of cable, cable routing and selection of external equipment when needed.

Mechanical: - recommendation of mounting surfaces, protection plates and external equipment when needed.

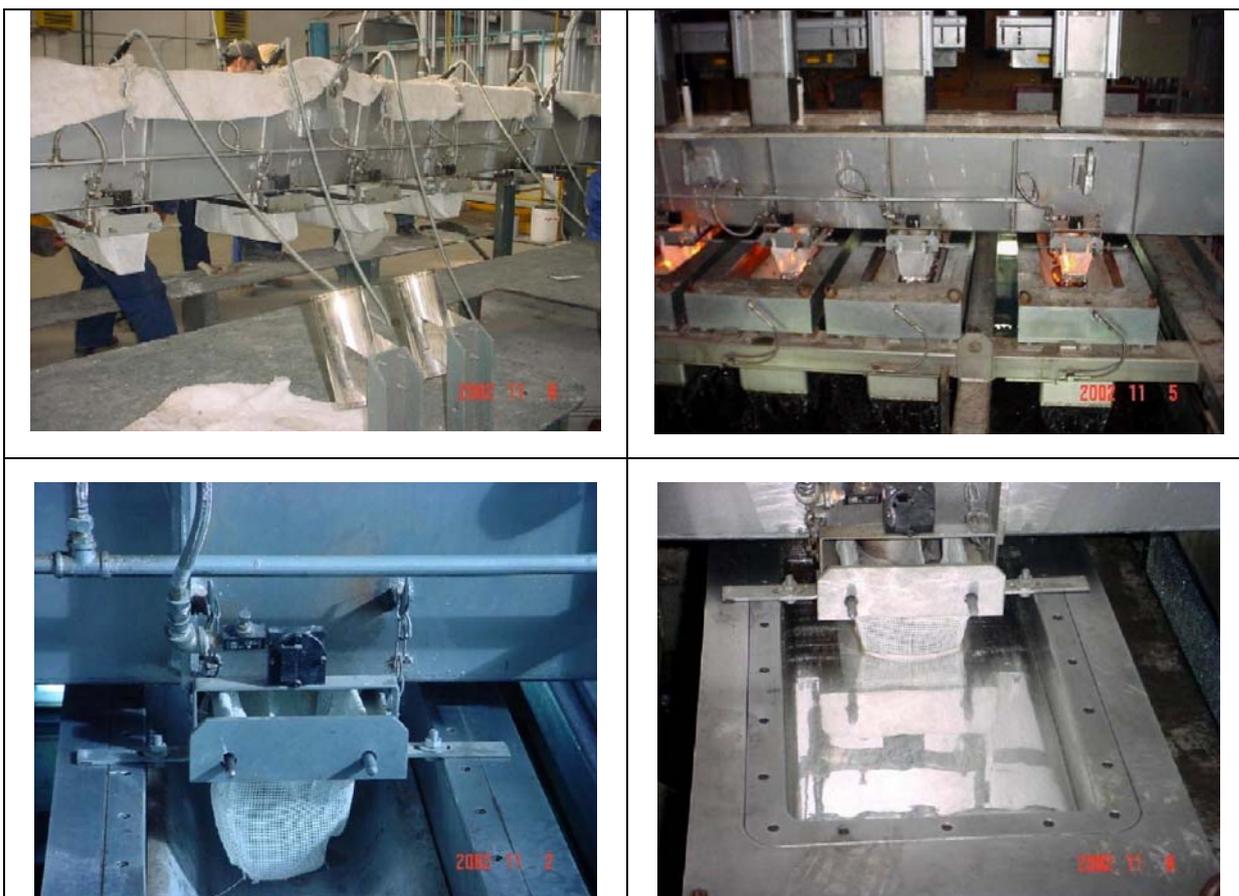
Air: - recommendation of emergency stops, surge tank and air supply.

Programming: - block diagrams, programming recommendations.

## 5 Programs, project meeting and commissioning

This does not include travel expenses, which will be added.

Additional time is billed at standard rates.



## International distribution:

### USA and CANADA

Sentech Controls Inc  
2215 S 48th Street, Suite C  
Tempe  
AZ 85282-1004  
Phone: (480) 829-1923  
Fax: (480) 894-5546  
E-mail: [sentecaz@aol.com](mailto:sentecaz@aol.com)

### Local representatives in North America

Molten Metals Technology, Wally Hinkle  
2136 Vestridge Drive  
Birmingham  
Alabama 35216  
Phone: (205) 823-3231  
Fax: (205) 823-2081  
Cell: (205) 527-6575  
E-mail: [wallywade@aol.com](mailto:wallywade@aol.com)

Gordon Wegener  
P.O Box 1585  
Gresham  
Oregon 97030  
Phone/Fax: (503) 663-9039  
E-mail: [wegassoc@gte.net](mailto:wegassoc@gte.net)

Pyroser Inc, Serge Dubé  
3176, St-Patrick  
Jonquiére (Quebec)  
Canada, G7S 5R1  
Phone: (418) 548-8812  
Fax: (418) 548-8818  
E-mail: [pyroser@simpatico.ca](mailto:pyroser@simpatico.ca)

### Germany, Switzerland, Austria, Benelux

Delta Consult Dr.Wilhelm  
Speestrasse 2  
D-40885 Ratingen, Germany  
Phone: +49 2102 136 330  
Fax: +49 2102 136 331  
E-mail: [hans.wilhelm@laserconsult.de](mailto:hans.wilhelm@laserconsult.de)

### England

BSG, 33 Becher Close, Renhold, Bedford, MK41 0LP,  
England  
Phone: +44 1234 87 06 98  
Fax: +44 1234 87 06 98  
E-mail: [barriejwade@aol.com](mailto:barriejwade@aol.com)

### Korea

Hanmi Corporation,  
#125, D-Dong, Megapolis Officetel, 2164-2, Jeongwang-  
Dong, Siheung-City, Gyeonggi-Do, 429-453, KOREA  
Phone: +82 (0)31 497 4624  
Fax: +82 (0)31 497 4644  
E-mail: [sales@hanmicorp.net](mailto:sales@hanmicorp.net)

### Turkey

METEK Engineering, Representation & Trading Ltd.  
Bagdat Cad. No.415 Feza Apt. D:10, 81070 Sasinbakkal,  
Istanbul, Turkey  
Phone: +90 (216) 369 95 93  
Fax +90 (216) 369 91 58

### Italy

Elekton S.N.C.  
Via Assunta 61, Nova Milanese 20054, Italy  
Phone: +39 0362 3675 50  
Fax: +39 0362 3342 70  
E-mail: [inf@elekton.com](mailto:inf@elekton.com)

### South Africa

AGE Technologies KZN (Pty) Ltd  
Barry Mann  
Shop 1, Athlone Park Court Centre, Abelia Rd  
4126 Durban, South Africa  
Phone: +27 31 904 1854  
Fax: +27 31 904 1852  
E-mail: [agetech@iafrica.com](mailto:agetech@iafrica.com)

### Asia

Precimeter Asia Ltd  
19th Floor, Pacific Place One  
140, Sukhumvit Road  
Bangkok 10110  
Thailand  
Phone: +66 2-653 2748  
Fax: +66 2 653 2749  
E-mail: [precimeter@novoteam.com](mailto:precimeter@novoteam.com)

### India

Jiwanram Sheodutrai Group  
30-D Jawaharial Nehru Road  
Kolkata – 700 016  
India  
Phone: +91 33 249 6507  
Fax: +91 33 249 9511  
E-mail: [jiwanram@jiwan.com](mailto:jiwanram@jiwan.com)

## **Indonesia**

PT Persada Mandiri Sentosa  
Jl. Rawa Bahagia ½, Grogol  
Jakarta Barat 11450

Indonesia

Phone: +62 21 5660975

Fax: +62 21 56968323

E-mail: [eveline@pms-indonesia.com](mailto:eveline@pms-indonesia.com)

## **Egypt**

International Traiding Group  
58 Youssef Abbass St.

Nasr City

Cairo 11 371

EGYPT

Phone: +20 2 405 0687

Fax: +20 2 402 2111

E-mail: [maged@itgegypt.com](mailto:maged@itgegypt.com)

## **Malaysia and Singapore**

BMS Metalurgical Pte Ltd

66 Tannery Lane

#02-05B Sindo Building

Singapore 347805

Phone +65 6749 5117

Fax +65 6749 4135

Mobile +65 9666 4591

E-mail: [bmsmetal@pacific.net.sg](mailto:bmsmetal@pacific.net.sg)