

Model DS100

Detect Doubles From One Side

- Thickness range** .05 mm to 1.5 mm (.002" to .060"), provides flexibility for a broad range of thickness applications with one detector **at power-up, detector** identifies probe model and adjust signal for probe variations
- Automatic**
- Calibration** **Push-button**, one push instantly measures single metal blank thickness, calculates double thickness, sets reject value
- Double Output** form "C" contact relay, rated at 10 AMPS (½ HP) @ 240 VAC, 8 AMPS @ 24 VDC.
- Proximity Output** for single blank present for counting or part verification with same probe
- Diagnostic** warning alternately blinking lamps for error and probe failure, fail safe output
- Quick** connect terminals for fast replacement and to reduce downtime
- Fast response** detects a double in 3 mS to 21mS
- Power input** 120 or 240 VAC @ 50-60 Hz



Model CBL100 mini-connector, 3 or 6 meter cable



30 mm diameter stainless steel housing, 30 mm thread, quick disconnect, sealed to IP67

Prime's **Model DS100, Single Probe** Double Metal Sheet Detector operates in locations where space limits a dual probe detection system. It detects steel or tinplate (ferrous metals) over a thickness range of .05 mm to 1.5 mm (.002" to .060"). It works by measuring a change in a magnetic field on the probe face. Models PM4, PM10 and PM15 operate with the Model DS100. Each model represents a different housing size, magnetic strength and maximum detectable thickness. A table on the back page illustrates the differences

The DS100 is simple to calibrate. Place a metal sheet on the front of the probe and push the calibrate button once. With one push of the button, the Model DS100 *automatically measures the thickness, calculates its double value and sets the reject threshold midway between the single and double values.* That's it.

The reject output is a form "C" contact relay. This fail-safe output de-energizes when the thickness is greater than the reject threshold limit; power is lost or when a fault is detected.

An **additional** transistor (PNP) output turns on for each **single** sheet or blank. This may be used to **count** sheets or as a **last sheet** indicator.

Power input: Configurable 120 Volts Max or 240 Volts AC Max, 50 to 60 Hz, 300 mA operating load

Outputs: **SPDT contact relay**
Double detected, NC closed
Max. load 10 Amps @ 240 V ac,
8 Amps @ 24 V dc
½ HP @ 240 V ac

Output response: < 10 mSec.
PNP transistor
Nothing detected
single = 24 V dc
nothing = 0 V dc
load source 24 Volts, 100mA max.

Output fail Safe: Contact goes to double condition.
PNP changes to nothing condition.

Metal Sensitivity: Ferrous metal, steel, tinplate

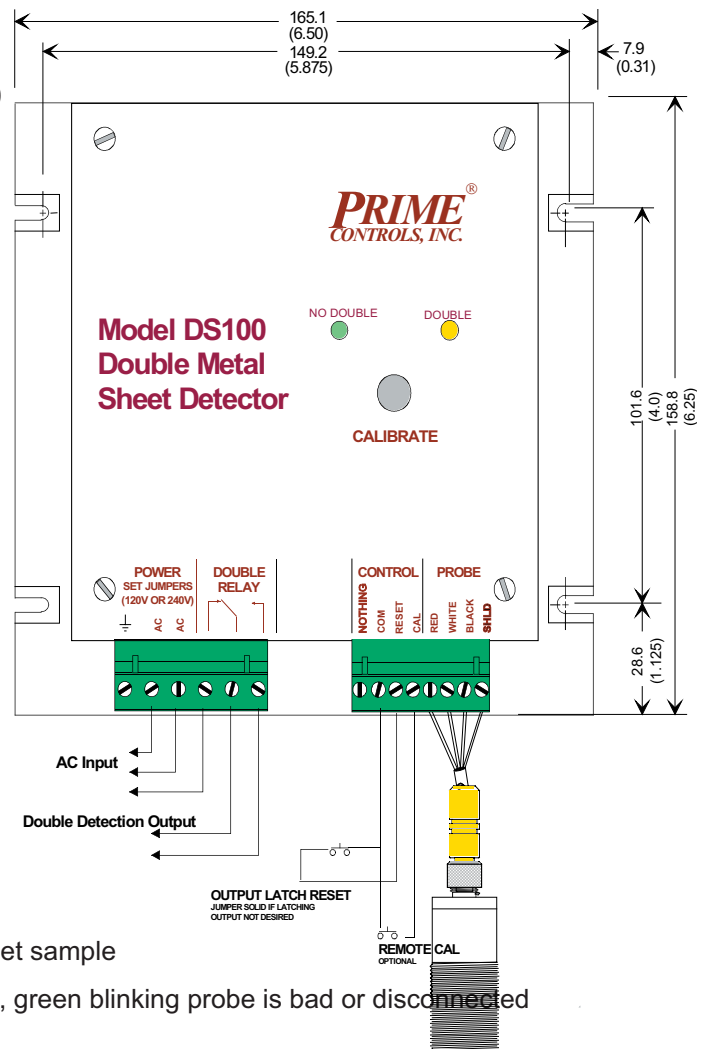
Thickness range: 04mm to 1.5mm (.002" to .060")

Calibration: Push-button switch with single sheet sample

Indicators: Green for single, amber for double, green blinking probe is bad or disconnected

External inputs: Calibrate & output latched reset

Sensor Operation: Permanent magnetic flux field is shunted across sensor poles by the thickness of metal. Maximum thickness is limited by the diameter of the probe. The chart below provides a range for each probe.



Probe Model	Probe Diameter	Breakaway Force	Min Thickness	Max Thickness
PM4	18 mm (.7")	.9 Kg*	.04mm (.0015")	.4mm (.015)
PM10	30 mm (1.18")	4.5 Kgs*	.1mm (.004")	1.0mm (.040)
PM15	36 mm (1.85")	9.0 Kg*	.15mm (.006")	1.5mm (.060")

* Worst case. Straight away force, perpendicular to face. Shear force is approximately 1/4 BF
2.2kg = lb

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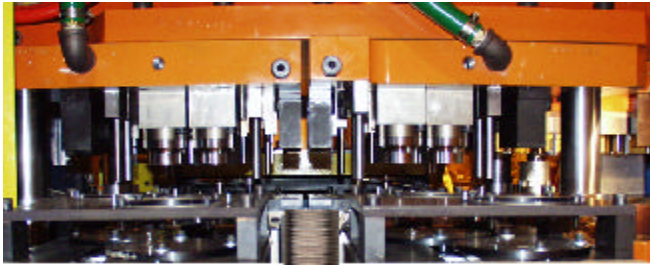
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MODELS PM4, PM10, PM15

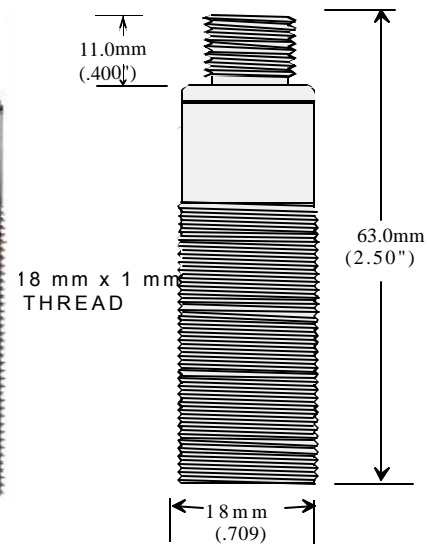
Single Probe Double Metal Detection



Prime's Single Probes are ideal for use in machines where sensing metal blanks or sheets are accessible only on one side. The probe face has a permanent magnet that is used as part of the sensing circuit as well control the sheet. It monitors the magnetic attraction of ferrous metal. The attraction strength is proportional to metal thickness. Either of the three probes described in this sheet operate with either Prime Model DS100 or DS101 Double Sheet Detector. Each detector provides power conversion from 120 or 220 Vac 50-60 Hz, calibrate and threshold logic and output switching (max. up to 240 Vac at 10 amps).

Specifications:

Thickness Detection:	.04 mm (.0015") to .4 mm (.015")
Probe to Metal Range:	0 to 2 mm (.006")
Metal Sensitivity:	Ferrous, Magnetic Stainless
Compatibility:	with Models DS100, DS101
Operating Temp.:	5°C to 75°C (25° to 150°F)
Housing Material:	#303 Stainless Steel
Mounting:	Secured with two nuts to
Brackets	BR18SR, BR18PS, BR18PA

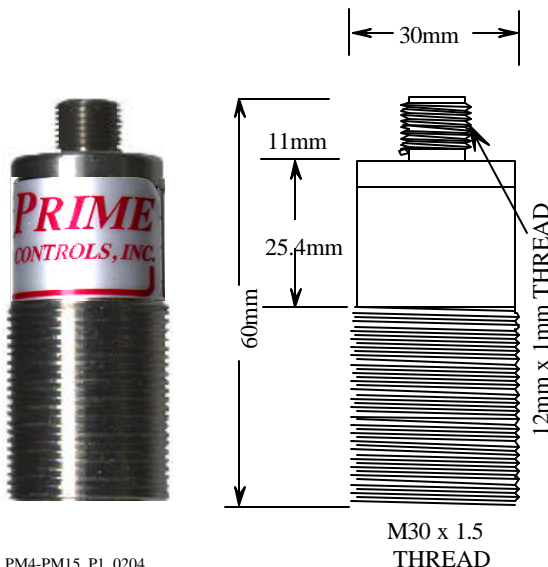


Prime's **18 mm Model PM4**, above, detects light gauge ferrous metal ranging from .04 mm (.0015") to .4 mm (.015") thick. It is encapsulated in a threaded 18 mm #303 stainless steel barrel. The Model PM4 is ideal for applications where the sheet or blank touches or slides across the sensor face. A limited air gap is possible between metal and the sensor face. The air gap is approximately 1/3 the maximum detectable gauge or .2 mm (.006"). For connectivity the probe has a quick-disconnect molded connector for connecting a cable. Standard cable lengths are available in *three* or *six* meters. Up to 50 meters of cable may be added.

Prime's **30 mm Model PM10**, to the left, detects medium to light gauge ferrous metal ranging from .1 mm (.004") to 1.0 mm (.040"). Nonferrous plating will not effect detection. The sensor is encapsulated in threaded 30 mm x 1.5 thread 303 stainless steel. It is normally used in applications where the sheet or blank touches or slides across the sensor face. A limited air gap is possible between metal and the sensor face of approximately 1/3 the maximum detectable gauge or 4 mm (.015").

Specifications:

Thickness Detection:	.1 mm (.004") to 1.0 mm (.040")
Probe to Metal Range:	0 to 4 mm (.015")
Metal Sensitivity:	Ferrous, Magnetic Stainless
Compatibility:	with Models DS100, DS101
Operating Temp.:	5°C to 75°C (25° to 150°F)
Housing Material:	#303 Stainless Steel
Mounting:	Secured with two nuts to
Brackets:	BR18SR, BR18PS, BR18PA



PD PM4-PM15 P1 .0204

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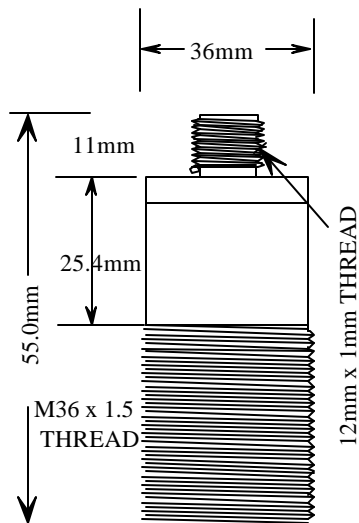
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Model PM15

Prime's Model PM15, below, detects medium to heavy gauge ferrous metal ranging from .15 mm (.006") to 1.5 mm (.060"). Nonferrous plating will not effect detection. The sensor is encapsulated in a threaded 36 mm barrel made of #303

stainless steel. It is normally used in applications where the sheet or blank is picked up with metal in contact with the sensor face.

These are typically found in general sheet and blank handling operations for automotive, appliance and the hardware industries. A limited air gap is possible between metal and the sensor face of approximately 1/3 the maximum detectable gauge or .5 mm (.020").



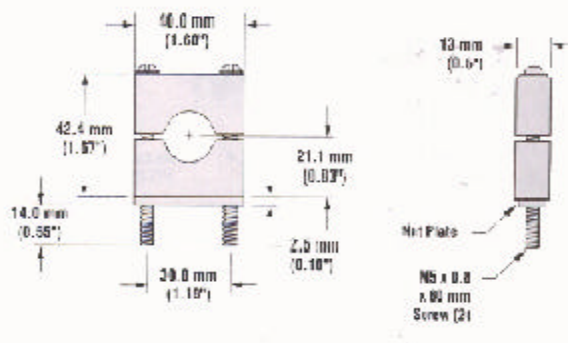
Specifications:

Thickness Detection:	.15 mm (.006") to 1.5 mm (.060")
(Ferrous Metal Only)	
Probe to Metal Range:	0 to 4 mm (.015")
Metal Sensitivity:	Ferrous, Magnetic Stainless
Compatibility:	with Models DS100, DS101
Operating Temp.:	5°C to 75°C (25°F to 150°F)
Housing Material:	#303 Stainless Steel
Mounting:	Secured with two nuts to
Brackets	BR18SR, BR18PS, BR18PA

Sensor Operation: A magnetic field is shunted across sensor poles by the thickness of metal. Maximum thickness is limited by the diameter of the probe. The table below provides a range for each probe.

Probe Model	Probe Diameter	Breakaway Force	Min Thickness	Max Thickness
PM4	18 mm (.7")	$\frac{\text{Thickness (mm)}}{.8 \text{ mm}} \times 1.3 \text{ kgs}^*$.04mm (.0015")	.4mm (.015)
PM10	30 mm (1.18")	$\frac{\text{Thickness (mm)}}{2 \text{ mm}} \times 6 \text{ kgs}$	0.1mm (.004")	1.0mm (.040)
PM15	36 mm (1.85")	$\frac{\text{Thickness (mm)}}{3 \text{ mm}} \times 14 \text{ kgs}$.15mm (.006")	1.5mm (.060")

* For example: $\frac{.09 \text{ mm}}{.8 \text{ mm}} \times 1.3 \text{ kgs} = 0.146 \text{ kg}$ or .32 lbs 1 kg = 2.2 lbs, 1 mm = .039 inch



For Models PM4, P70T18S

Refer to "Mounting Bracket" sheet for additional bracket

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