

Insertion/Submersion Flow Through Sensor

- **ADVANCED ON-LINE SENSOR DIAGNOSTICS** (Model 381+ only), for use with the Models 54e pH/ORP and 1055 Analyzers and 81, 3081, 4081, 5081-P, and Xmt-P pH/ORP Transmitters, predict and identify process-related sensor failures.
- **MODULAR DESIGN** facilitates maintenance by eliminating terminal and mounting brackets and extraneous hardware.
- **DOUBLE-JUNCTION, GEL-FILLED REFERENCE CELL** provides high temperature performance, extended service life, and resistance to the effects of pumping, dilution, and contamination.
- **MOLDED POLYETHERSULFONE (PES) BODY** provides compatibility with a variety of processes.
- **OPTIONAL FLOW-POWERED CLEANING** provides trouble-free service in difficult applications.



FEATURES AND APPLICATIONS

The Rosemount Analytical Model 381 Sensor measures the pH or the Oxidation Reduction Potential (ORP) of aqueous solutions in pipelines, open tanks, or ponds. The sensor is suitable for use in most industrial applications, including water and waste treatment plants.

The Model 381+ features a stainless steel solution ground. The solution ground provides advanced sensor diagnostics for preventative maintenance when used with the Models 54e pH/ORP and 1055 analyzers and 81, 3081, 4081, 5081-P, and Xmt-P pH/ORP transmitters. Sensor diagnostics result in time and money savings by reducing the guesswork in sensor maintenance and replacement requirements.

The sensor is housed in a molded PES body and has two O-ring seals with breach lock threads that secure the PES cover. This provides a waterproof union for long operating life and easy removal for routine maintenance.

The modular body design eliminates the need for internal mounting brackets, terminal brackets, and screws. All components are screw-type or plug-in-place, allowing for fast simple service.

The integral preamplifier conditions the high impedance glass electrode signal at the sensor, providing a transmission capability of up to 1000 ft (304.8 m). The Rosemount Analytical method of preamplification has become the industry standard for reliable pH measurement. In submersion applications at temperatures greater than 80°C, the preamplifier must be located in a remote junction box or in the instrument.

A double-junction, gel-filled reference cell, a standard feature of the Model 381, improves sensor life when unknown reference cell contaminants, such as sulfides, may exist. The gel solution maintains its viscosity at high temperatures, and resists the effect of pumping and dilution, resulting in an extended

Continued on page 2

FEATURES AND APPLICATIONS

Continued from page 1

service life. A choice of a wood or ceramic liquid junction allows the user to optimize performance by emphasizing reference life (wood) or chemical resistance (ceramic).

In many flow applications, crystalline or viscous coatings are present, such as calcium carbonate or petroleum oils, which may coat the electrode surfaces and impede the sensor's performance. The flow-powered cleaning option may be used in these instances. A specially designed flow chamber directs the process

fluid in a circular path carrying three Teflon¹ balls that clean the electrode surface, physically preventing accumulation of coating materials. Flow-powered cleaning is suitable for all hazardous area applications.

The Model 381 is available with 3K Balco or Pt 100 temperature compensation and is compatible with all Rosemount Analytical pH/ORP Analyzers.

¹Teflon is a registered trademark of E.I. du Pont de Nemours & Company.

SPECIFICATIONS

Materials of Construction:

Body, Cover and Flow Cell: Polyethersulfone (PES)

O-Rings: Viton²

Measuring Electrode: Glass (and platinum or gold for Model 381 ORP)

Liquid Junction: Kynar³/wood (Code 20) or Kynar/ceramic (Code 21)

Solution Ground: 316 Stainless steel (Code + only)

Sensor Process Connections:

Submersion: 3/4 in. MNPT

Insertion: 2 in. MNPT

Flow Through Cell: 3/4 in. MNPT inlet and outlet

Measuring Ranges:

ORP; -1500 to +1500 mV

pH; ACCUGLASS⁴ 0-14

Minimum Conductivity: 75 μ S/cm, nominal 100 μ S/cm

Temperature Compensation: Automatic, 0 to 100°C (32 to 212°F)

Maximum Pressure/Temperature Rating: 790 kPa (abs) at 100°C (100 psig at 212°F)

Cable: For Code pH, pHE, ORP: 4 conductor, 22 GA with common shield. Code +: 10 conductor, shielded cable

Weight/Shipping Weight: 1.0 kg/1.7 kg (2.2 lb/3.7lb)

²Viton is a registered trademark of E.I. du Pont de Nemours & Co.

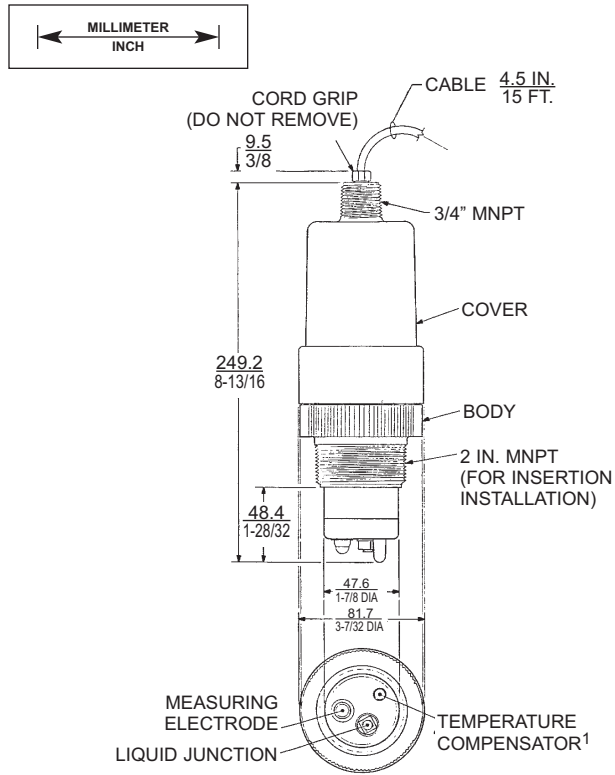
³Kynar is a trademark of Elf Atochem North America, Inc.

⁴ACCUGLASS is a trademark of Rosemount Analytical.

Percent Linearity Over pH Range		
	General Purpose and Ruggedized glass (codes -10 &-12)	High pH glass (code -11)
0-2 pH	97%	94%
2-12 pH	99%	97%
12-13 pH	96%	98%
13-14 pH	92%	98%

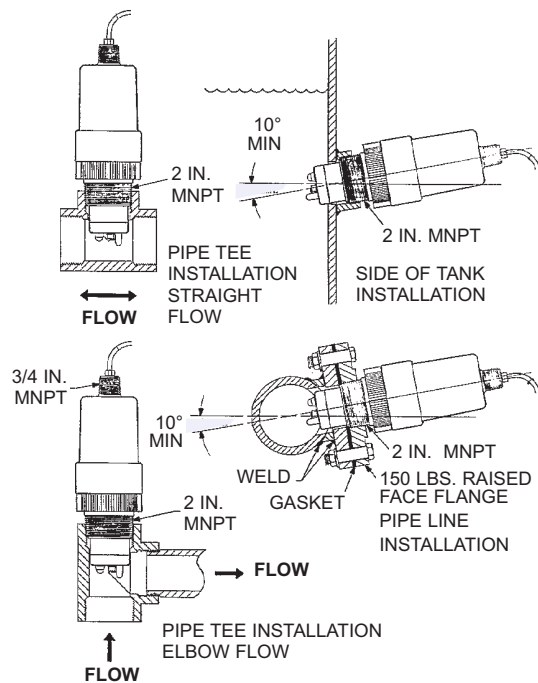
* Note: Ruggedized glass electrodes are ideal for abrasive applications, but response times are typically slower than other glass formulas.

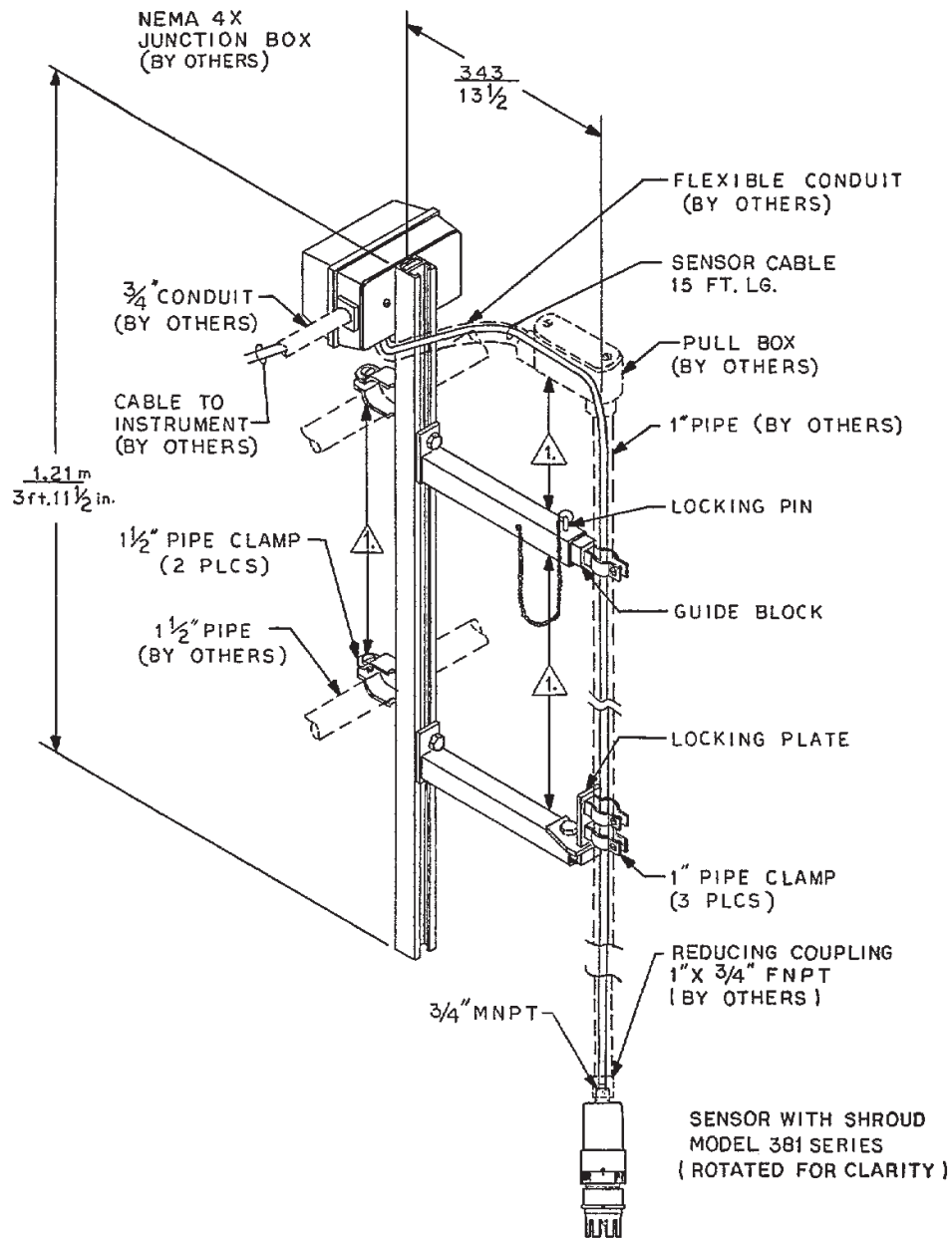
MOUNTING AND DIMENSIONAL DRAWING



¹ ALSO SERVES AS SOLUTION GROUND FOR 381+

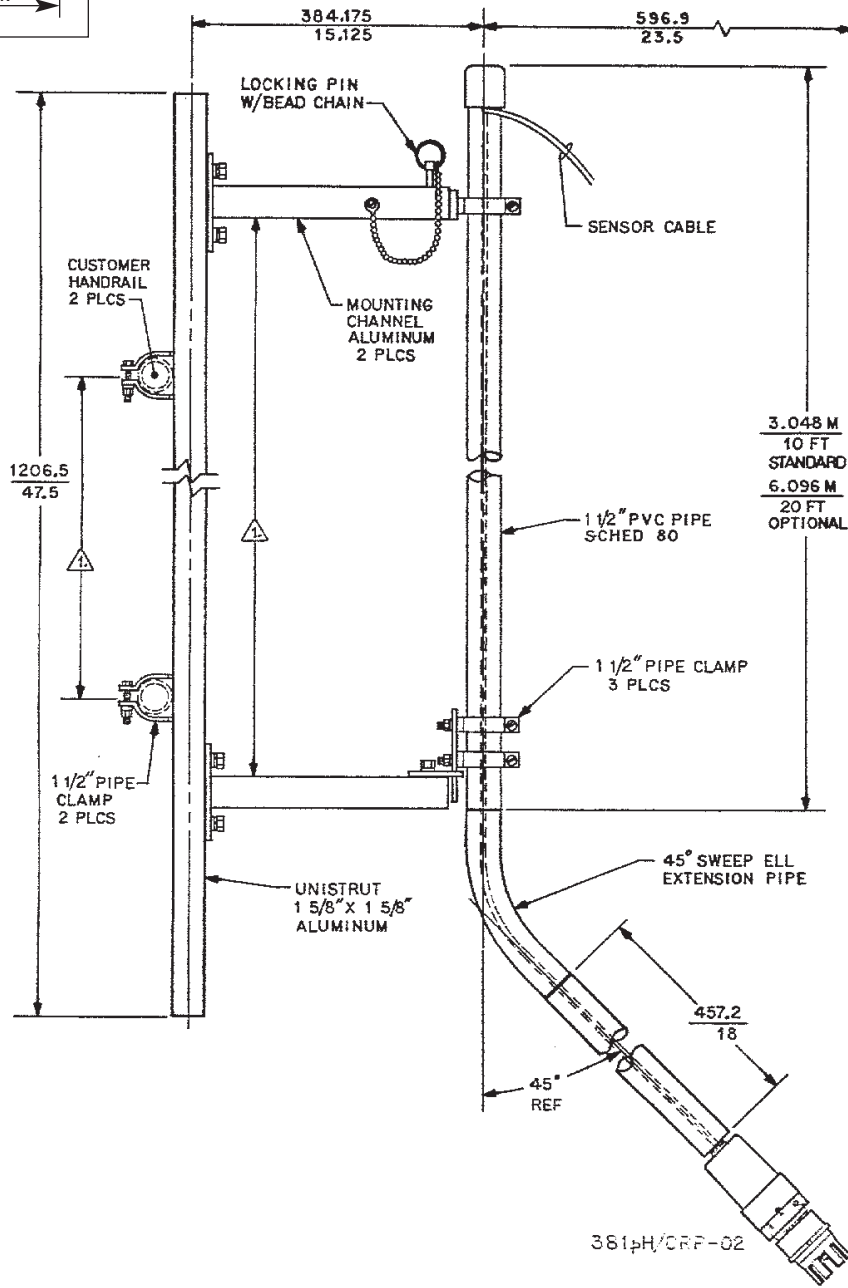
INSERTION AND FLOW THROUGH INSTALLATION





SUBMERSION INSTALLATION: HANDRAIL MOUNTING ACCESSORY (P/N 1000857)

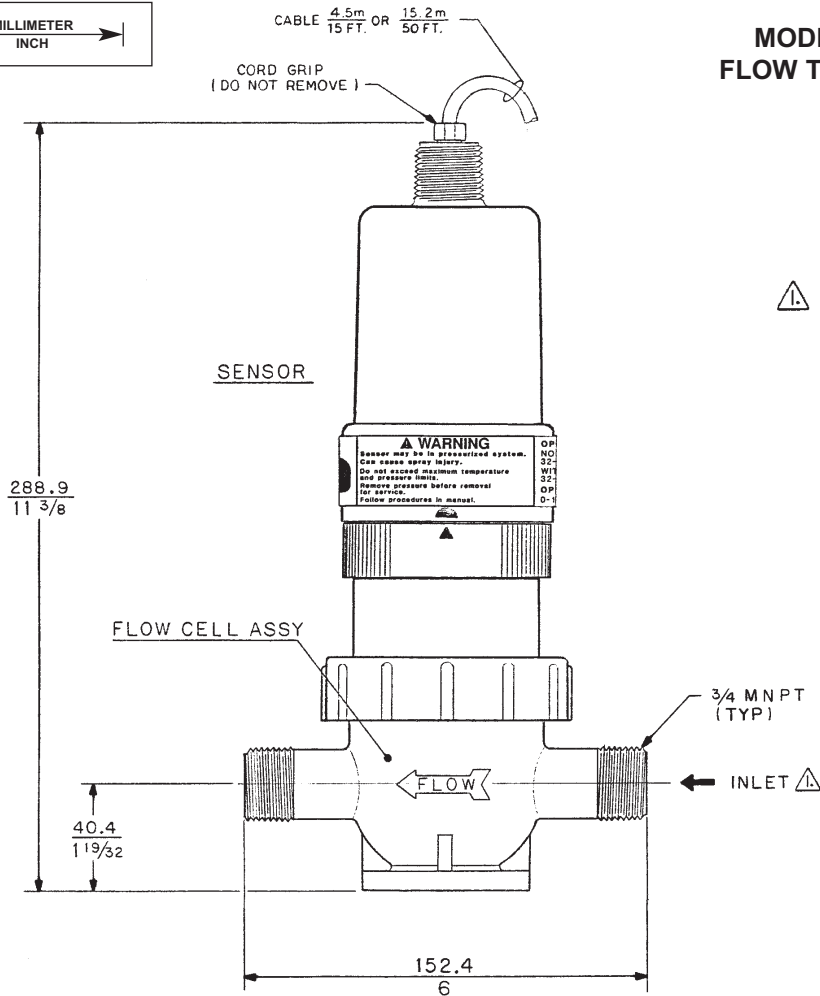
MILLIMETER
INCH



SUBMERSION INSTALLATION: HANDRAIL MOUNTING ACCESSORY (P/N 11275-00)

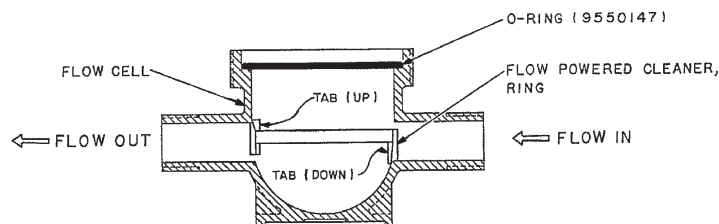
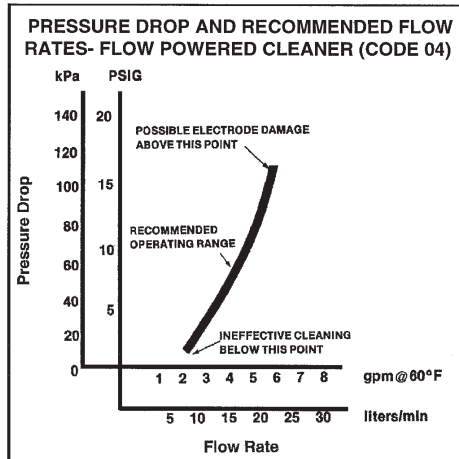
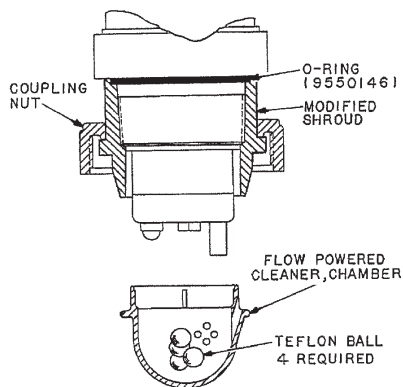


MODEL 381 SENSOR IN FLOW THROUGH ASSEMBLY



⚠ MODEL 381 SENSOR WITH FLOW POWERED CLEANER, MINIMUM FLOW RATE REQUIRED IS 2 gpm; DO NOT EXCEED 6 gpm AS THIS COULD CAUSE ELECTRODE DAMAGE.

381 FLOW POWERED CLEANER



ORDERING INFORMATION

Model 381 pH/ORP Sensor is housed in a PES body suitable for insertion, submersion, or flow through installation. The sensor is offered with an integral preamplifier, measuring electrode, double-junction gel-filled reference cell, automatic temperature compensation for pH, and a choice of two cable lengths of either 15 ft or 50 ft (4.5 or 15.2 m).

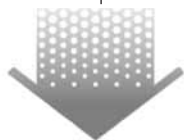
MODEL 381		INSERTION, SUBMERSION, FLOW THROUGH SENSOR
Level 0	FUNCTION	
pH	pH assembly for Models 1003, 1023, 1050, 1060, and 1181pH; requires Code 30	
PE	pH or ORP assembly for Models 1054, 1054A, 1054B, 2054, and 2081; requires Code 31	
+	pH or ORP assembly for Models 54/54e, 1055, 81, 3081, 4081, 5081-P, Xmt-P; requires Code 31	
OR	ORP assembly for Models 1003, 1023, 1050, 1060, and 1181ORP; requires Code 32	
Level 1	TEMPERATURE COMPENSATOR	
31	Automatic TC, 100 ohm RTD	
Level 2	CABLE	
40	15 ft (4.5 m) cable for integral sensor preamp (see below for preamp choices)	
41	15 ft (4.5 m) coax cable w/BNC connector for remote sensor preamp and integral analyzer preamp (Models 1054A-54, 1054B-54, 2054-54 and 54e, 1055, 81, 3081, 4081, 5081-P, and Xmt-P)	
43	50 ft (15.2 m) cable for integral sensor preamp (see below for preamp choices)	
Level 3	MEASURING ELECTRODE	
10	General purpose pH, GPHT (0-14), not available with Code OR	
11	High pH Electrode, requires Code 21. For sodium concentrations greater than 1 or continuous measurement above 11 pH; not available with Code OR	
12	Ruggedized pH Electrode. For abrasive solutions, not available with Code OR	
13	Platinum ORP Electrode, not available with Code pH	
14	Gold ORP Electrode, not available with Code pH	
15	HF pH Electrode. For HF concentrations less than 300 ppm, not available with Code OR	
Level 4	LIQUID JUNCTION	
20	Wood/Kynar Liquid Junction	
21	Ceramic/Kynar Liquid Junction	
Level 5	PREAMPLIFIER	
52	Preamp NOT REQUIRED	
55	Preamp for Models 54/e, 81, 3081, 4081, 5081-P, and Xmt-P (for Code+ only)	
Level 6	INSTALLATION	
	No Selection	
02	Submersion	
03	Flow Through	
04	Flow Through with Flow Powered Cleaner	
Level 7	SPECIAL	
	No Selection	
99	Special (consult factory)	

ACCESSORIES

PART #	DESCRIPTION
23550-00	Junction Box, with extension board 54, 81, 3081, and 4081 compatible
23555-00	Remote junction box with preamp for 54/e, 5081-P, and Xmt-P compatible
23557-00	Preamplifier for junction box, 54/e, 5081-P, and Xmt-P compatible
9210012	Buffer Solution, pH 4.01, 16 oz.
9210013	Buffer Solution, pH 6.86, 16 oz.

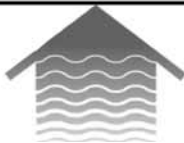
SPARE PARTS

PART #	DESCRIPTION
2000734	Liquid Junction, KYNAR/wood
2000735	Liquid Junction, KYNAR/Ceramic
22694-00	Electrode, pH, GP
22694-01	Electrode, High pH
22694-02	Electrode, pH, Rugged
22694-03	Electrode, pH, HF Resistant
22697-00	Electrode, Combination pH
22697-01	Electrode, High pH, Combination
22723-00	Flow Powered Cleaner Balls (quantity 9)
22731-00	ORP Electrode, Platinum
22751-00	O-ring Kit (quantity 5), Upper Body
22751-01	O-ring Kit (quantity 5), Lower Body
22811-01	Flow Powered Cleaner - Retrofit Kit, code -00, -02
22892-00	Flow powered cleaner retrofit kit (for use with Option -03 sensors)
23018-00	Reference element (formerly 22688-00)
23551-00	Sensor Body, complete, Pt-100
23552-00	Sensor Cover with 15' Cable
23552-01	Sensor Cover with 15' Coax Cable
23552-02	Sensor Cover with 50' Cable
32602-00	Flow Cell, PES
32605-00	Electrode, Shroud, Protective
32606-00	Flow Cell Coupling Nut, PES
32793-00	Flow Powered Cleaner, Ring



*The right people,
the right answers,
right now.*

**ROSEMOUNT ANALYTICAL
CUSTOMER SUPPORT CENTER
1-800-854-8257**



Emerson Process Management

2400 Barranca Parkway
Irvine, CA 92606 USA
Tel: (949) 757-8500
Fax: (949) 474-7250

<http://www.raihome.com>

© Rosemount Analytical Inc. 2010

ON-LINE ORDERING NOW AVAILABLE ON OUR WEB SITE
<http://www.raihome.com>

Specifications subject to change without notice.



Credit Cards for U.S. Purchases Only.

