

Thermo Ramsey

PRO-LINE

**Tilt Switches
Model 20-39**

with

**Control Unit
Model 20-35U**

INSTRUCTION MANUAL

Chapter 1

Tilt Switch Probe

1.1 Introduction

The Tilt Switch Probe actuates when it is tilted 12 - 15 degrees or more from its vertical position. The Mercury Switch is precisely positioned so that regardless of direction of Tilt the normally closed contact will open.

1.2 Specifications

(1)	Contact:	Normally closed Mercury Switch
(2)	Contact Rating:	1 Amp at 24 VDC None inductive
(3)	Temperature Ratings:	
	Standard - Model 20-39 :	30 - +80°C
	HI Temp - Model 20-39HT:	20 - +200°C
(4)	Housing:	Ductile Iron
(5)	Finish:	Cadmium Plated
(6)	Dimensions:	See Figure 1-1
(7)	Tilt Angle:	12° - 15°

Chapter 2

Tilt Switch Control

2.1 Introduction

The Control Unit is housed in an enclosure with large green ("Normal") and red ("Alarm") indicating lights on the front cover. A 0-5 second adjustable time delay circuit in the control unit prevents momentary tilting of the switch from causing a false or premature contact transfer. Two normally-open and two normally closed output contacts are available for connection to external alarms and/or controls. Interruption of line power causes a relay transfer.

2.2 Specifications

(1) Power Requirements:

- (A) Voltage : 110 / 220 VAC " 10 %
- (B) Frequency : 50 Hz
- (C) Consumption : 5.5 Watts

(2) Outputs:

- One (1) DPDT contacts : Rated at 2 Amp at 250 VAC

(3) Time Delay:

- Adjustable : 0-5 Seconds

(4) Input Resistance (resistance probe):

- 0.1 - 20 MOhm

(5) Selectable operation switch:

- Permits reverse operation for either the tilt switch or the resistance probe.

(6) Enclosure:

- Model 20-35U, IP 55
- Model 20-35U pcba, none

(6) Dimensions - See Drawing PL 00 2035U ED 01

Chapter 3

Inspection and Installation

3.1 Inspection

Inspect the packages for external damage before opening as normally the carrier can be held responsible for shipping damages. After unpacking, inspect the unit for broken components, etc.

3.2 Installation - Tilt Switch Probe

- (1) Refer to Figure 1-1 for Dimensional Data
- (2) Refer to Figure 3-1 for Installation Methods

3.3 Installation - Tilt Switch Control

- (1) Refer to Figure 2-1 for Dimension Data
- (2) The Control Unit should be mounted in a vibration free area. Where the ambient temperature does not exceed 55EC.

3.4 Installation - Electrical

- (1) The control unit enclosure is supplied with two holes in the bottom for PG13,5 Conduit.
- (2) Use separate Conduit for probe and power circuits.
- (3) Refer to Drawing PL 00 2035U ED 02 for wiring data.

Chapter 4

Set-Up and Adjustment

4.1 Tilt Switch Set-Up

Put the left dip-switch in the position – TILT –.

When the Tilt Switch System is used as a no flow detector the normal position of the probe is tilted and when used as a level detector the normal position is vertical (not tilted). Because these uses are opposite each other, the right dip-switch must be checked before applying power.

Refer to Drawing PL 00 2035U ED 02 for the location of the dip-switches.

Select from operational chart on the pcba the desired mode of operation, change the position of the dip-switches if necessary.

4.2 Resistance Probe Set-Up

Put the left dip-switch in the position – RESIS –.

Select from operational chart on the pcba the desired mode of operation, change the position of the dip-switches if necessary.

Fill the vessel up to the desired limit level and adjust the potentiometer – SENS – (see drawing No.: PL 00 2035U ED 02) until the ALARM situation is monitored, or just not monitored, depending on how critical this level is.

4.3 Delay Adjustment

This adjustment (potentiometer – DELAY –) will prevent relay output contacts from transferring when probe is momentarily or falsely tripped.

The range of adjustment is 0-5 Seconds, because the actual delay time is application dependent it must be adjusted at the time of installation.

When setting this adjustment begin at the full C.C.W. pot (– DELAY –) position and increase until false tripping is a minimum. A typical delay time is 3 seconds.

Chapter 5

Troubleshooting

5.1 General

The Tilt Switch control system has been designed to operate under normal Industrial environments. The majority of failures encountered have been the result of excessive vibration, misapplication of the probe or switching excessive currents of voltages.

the operation of the Control unit may be checked by following the procedure.

Caution: when following the procedure, remember that if the unit is controlling other equipment, the equipment concerned will either be shut down or started up, depending on the application.

5.2 Troubleshooting Procedure

- (1) Check supply voltage. The proper voltage must be applied to Terminals 1 and 2 (110VAC) or 1 and 3 (220VAC).
- (2) Disconnect probe wires at Terminals 5 and 6.
- (3) Turn time delay control (– DELAY –) completely CCW. (Remember where it was set so that it may be returned to the same setting).
- (4) Short across Terminals 5 and 6 (in tilt switch mode only). (There are no hazardous voltages at these terminals). If the unit is operating properly, the following will occur:

The relay will reverse its state.

The light that was illuminated will be de-energized and the one that was de-energized will be illuminated.

Relay operation may also be checked by disconnecting wires at Terminals 7, 8 and 9 or 10, 11 and 12, and connecting an ohm-meter at the terminals.

- (5) Turn the time delay control slightly CW and repeat Step 4. The action as previously observed should be repeated, however, the relay de-energized action will be preceded by the delay period as set.

If the unit functions as described, the problem most likely is in the probe, its cable, or field wiring between the probe and the control unit. (This device may be checked with an ohmmeter for proper operation). If the unit does not function as described, see the Maintenance chapter.

Chapter 7

Maintenance, Spares and Repair

7.1 General

Except for the parts replacements mentioned below, Ramsey recommends that repairs not be attempted on this unit.

Unauthorized repairs during the warranty period will void the warranty.

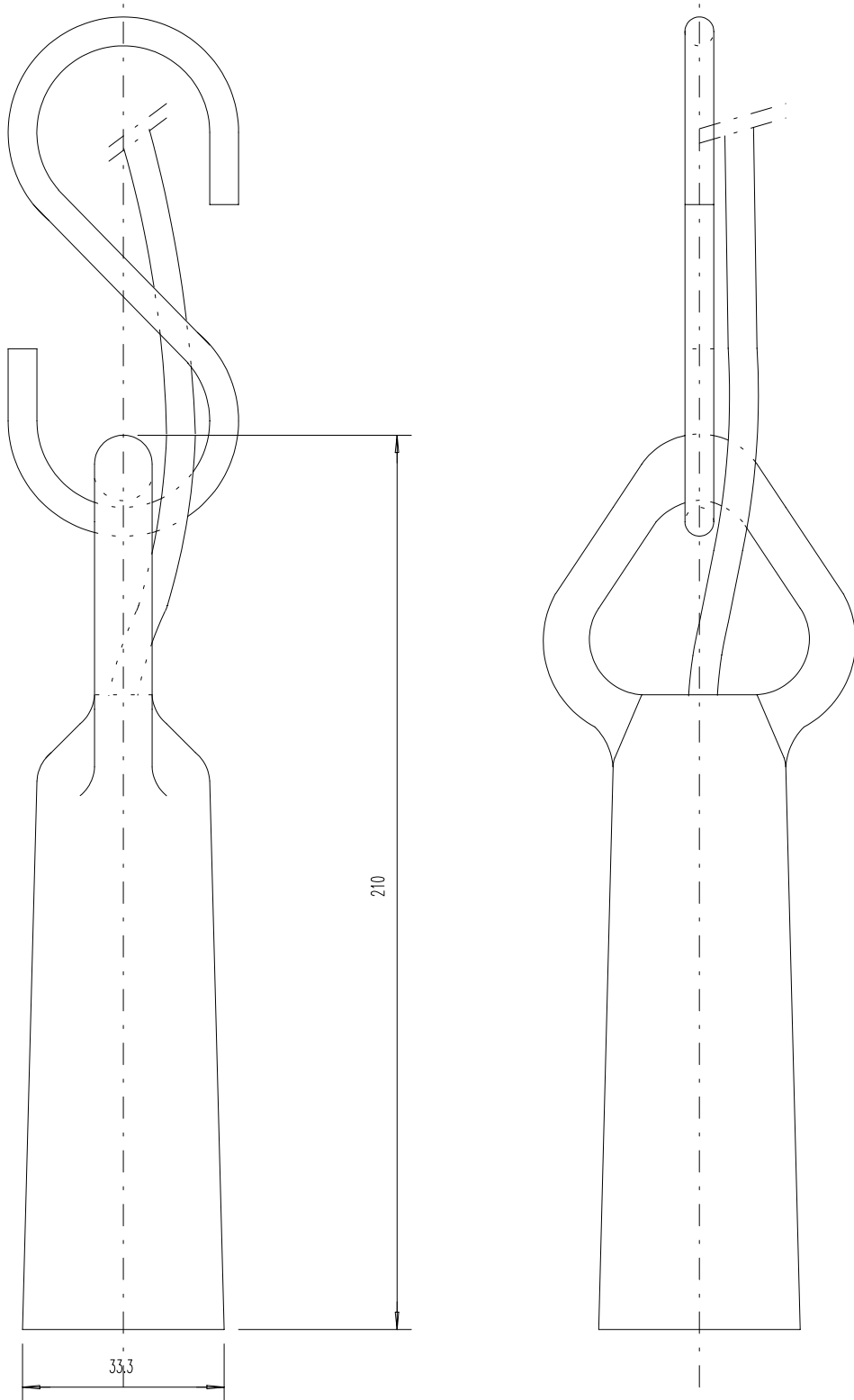
7.2 Suggest: Recommended Spares

(1) (1) Ramsey Model 20-35U pcba
(Complete Control less enclosure and Control Lights)

(2) (2) Lamps

7.3 Repair

Upon notification, Ramsey will repair and return within two (2) weeks after receipt of equipment. Charges for repairing are based on time, material and handling.



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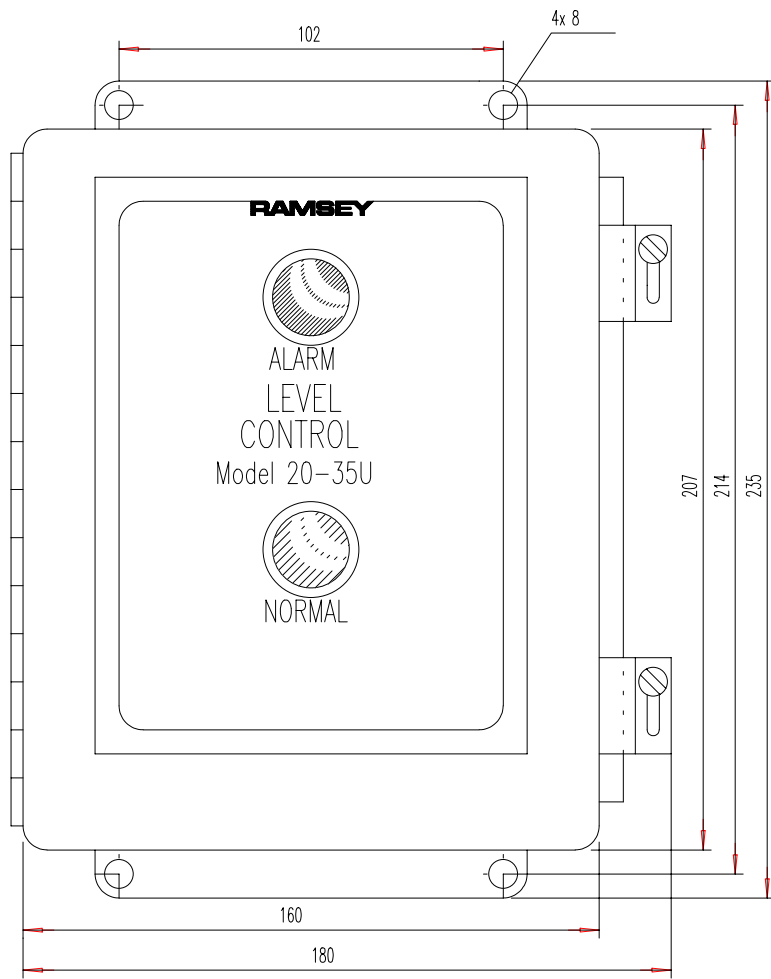
Title:

TILT SWITCH PROBE
Model 20-39

Figure 1-1

Drawn: APD Dep.

Date: march 20, 1995



TITLE: DIMENSIONS
TILT SWITCH CONTROL BOX
MODEL 20-35U

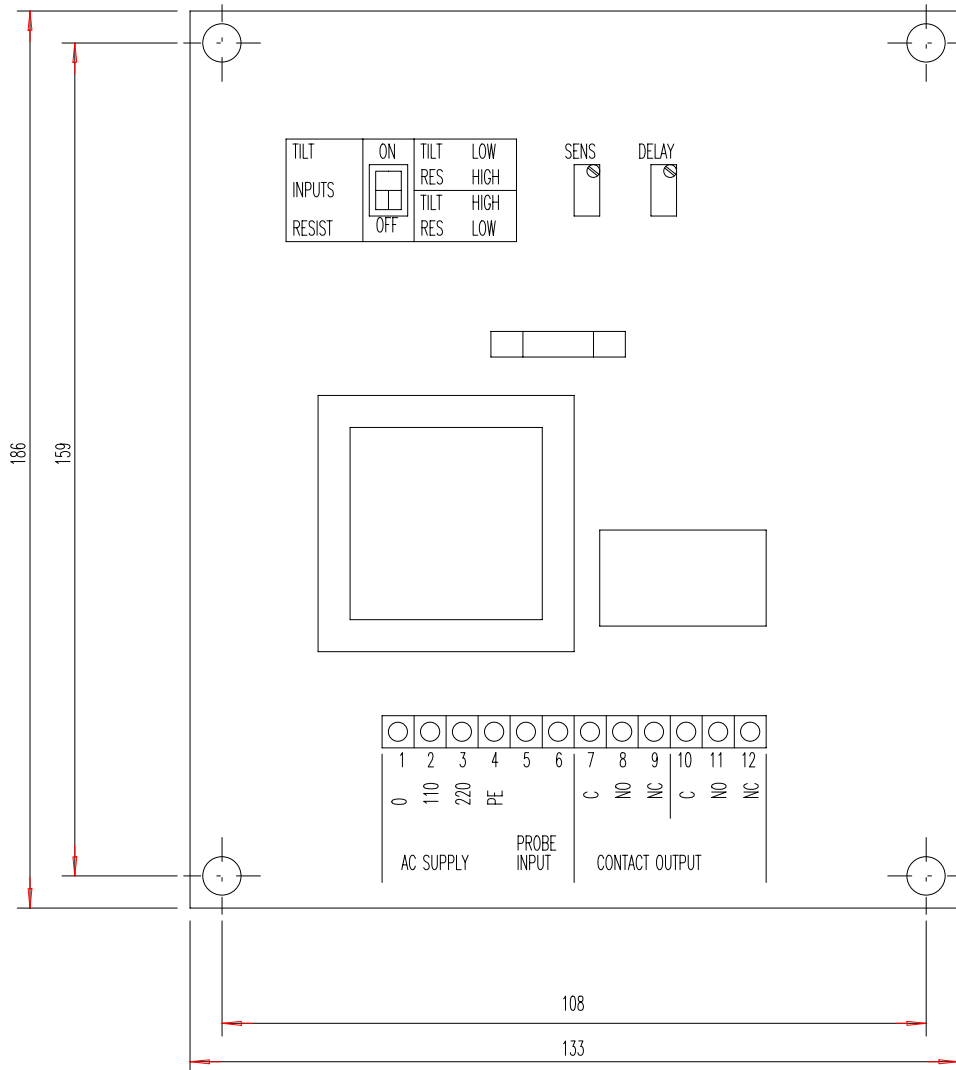
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PL 00 2035U ED 01
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2035-E01

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Product series: PROLINE		



PROJECT:

Rev.	Revision	Date	Name
-	Initiation	22.11.96	JG



TITLE: INNER LAYOUT
TILT SWITCH CONTROL BOX
MODEL 20-35U

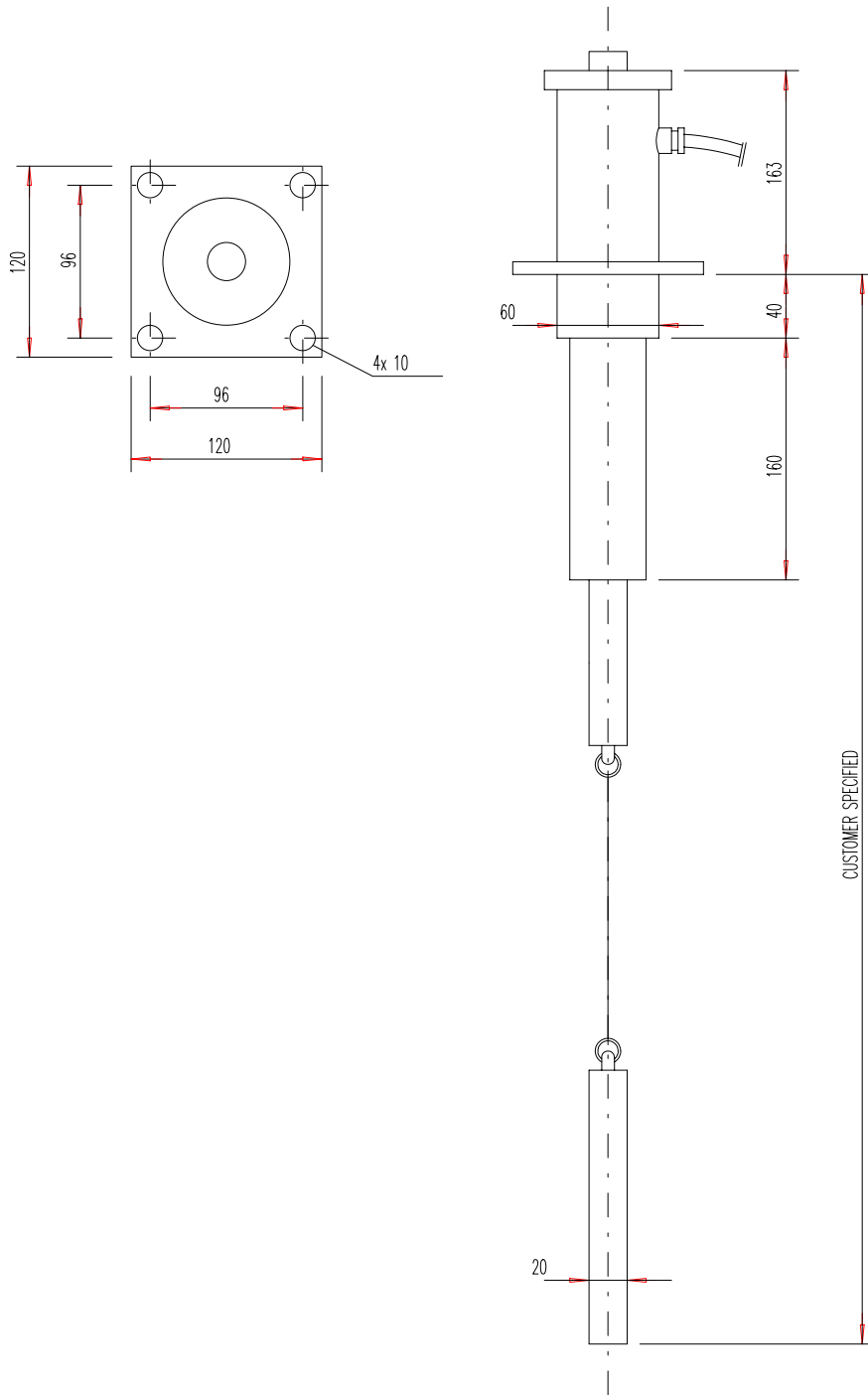
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Product series: PROLINE		



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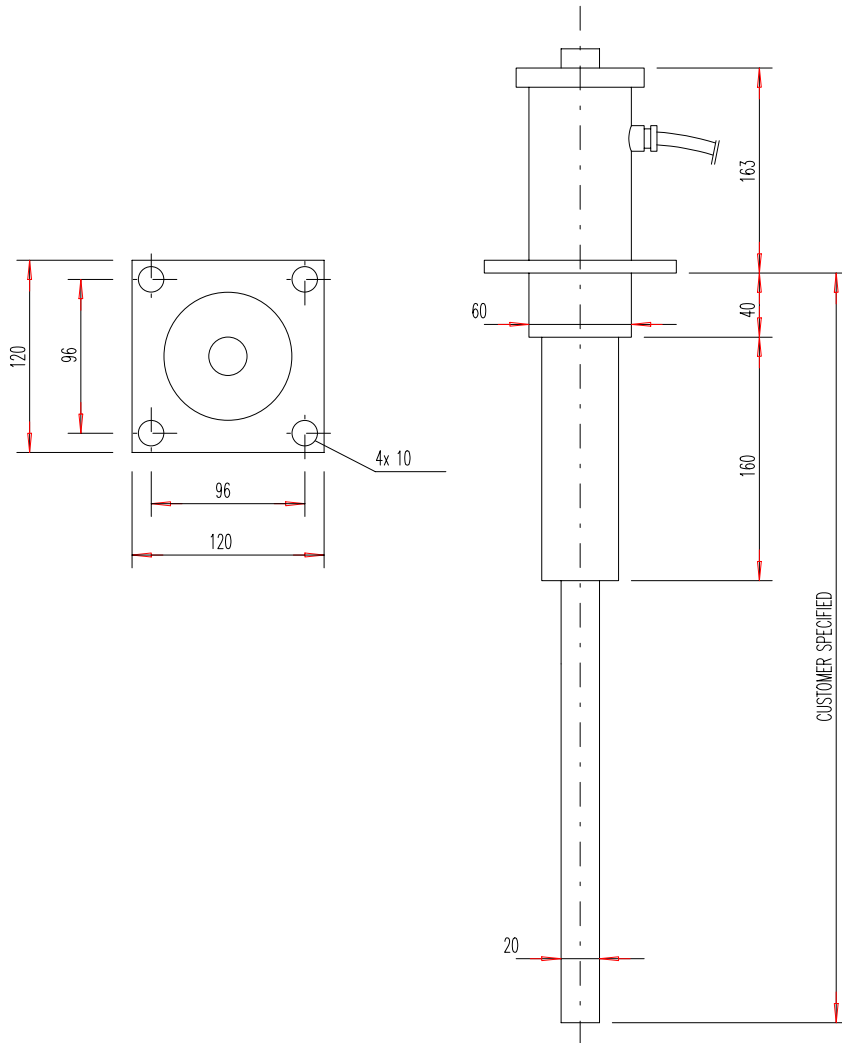
Rev.	Modification	Date	Name
-	Initiation	22.11.96	JG



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Title:
RESISTANCE PROBE
MODEL 20-82

Figure 1-2
Drawn: JG/APD Dept.
Date: November 20, 1996



Title:
RESISTANCE PROBE
MODEL 20-84

Figure: 1-3
Drawn: JG/APD Dept.
Date: November 20, 1996