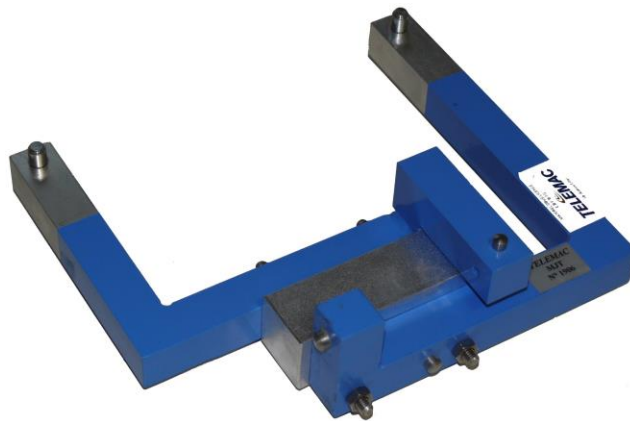


Nature of the document :
<i>INSTRUCTION MANUAL</i>

Reference : Vinchon-2008.doc	Original date : May 1997	Page : 1/5
------------------------------	-----------------------------	------------

**INSTRUCTION MANUAL**  
**TRIAXIAL FISSUROMETER**  
**Model VINCHON**



C					
B	P.VAILLANT	R.BUDIN	P.BERNARD	Update	August 2008
A	N.CHERON	C.LIETARD	R.TETART	Update	May 1997
Ind	Typing	Verification	Approval	State	Date

This document is the property of TELEMAC and can't be reproduced or distributed without its acceptance

Reference: Vinchon-2008
Folio total number of the document : 5

Date: August 2008

Reference:

OF:

## TABLE OF CONTENTS

<b>1. AIM</b> .....	<b>3</b>
<b>2. PRINCIPLE</b> .....	<b>3</b>
<b>3. DESCRIPTION</b> .....	<b>3</b>
<b>4 SPECIFICATION</b> .....	<b>3</b>
<b>5. INSTALLATION</b> .....	<b>4</b>
<b>6. MEASUREMENTS</b> .....	<b>5</b>
<b>7. RESULTS</b> .....	<b>5</b>
<b>8. PROTECTION</b> .....	<b>5</b>

### 1. AIM

The fissurometer allows to measure crack and joint widening evolution at accessible locations in dams or all civil exceptional works.

### 2. PRINCIPLE

Widening between two fixing points is determined by three manual measurements according to three orthogonal axis (x, y, z).

### 3. DESCRIPTION

The VINCHON three dimensional jointmeter is made of two mating elbow-shaped brackets (see figure n°2) with three 20 mm square section arms on each. Each bracket is fitted with three reference studs (1 and 1', 2 and 2', 3 and 3').

One arm C is used to anchor the bracket at the location of the measurement point. The other two arms support three spherical tipped precision reference studs mounted in three orthogonal directions (see figure n°1).

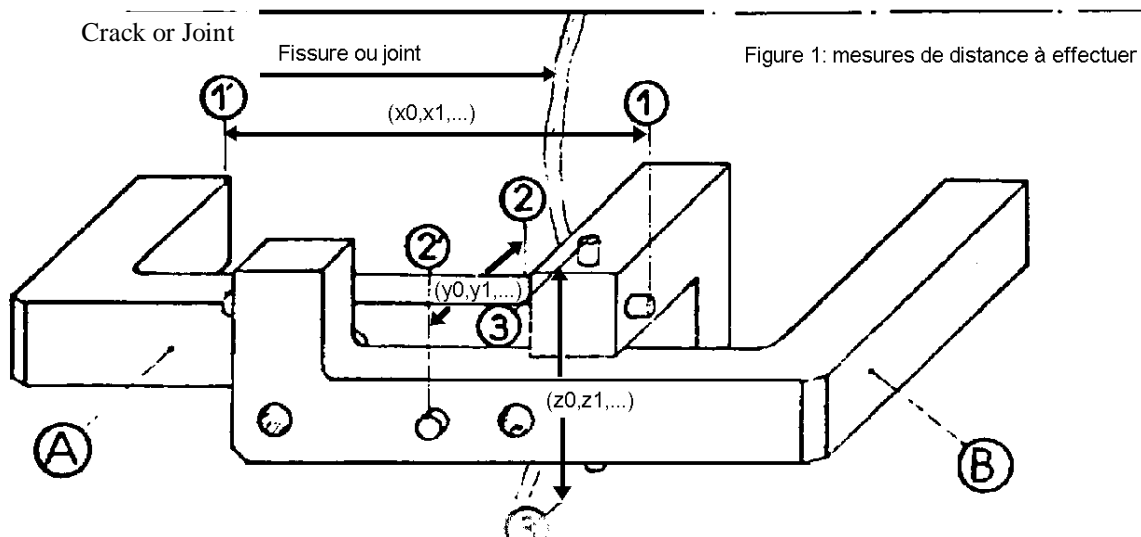


Figure 1 : Distance measurement to be made

### 4. SPECIFICATION

Distance between the two anchors is 190mm. The biggest section of each anchor is 41mm.

Accuracy on reading of little displacement with caliper is:

- with digital caliper : <0.02mm
- with vernier caliper : <0.04mm,

Date: August 2008

Reference:

OF:

Maximum relative displacement:

X axis (convergence/Divergence)	50/40 mm
Y axis (convergence/Divergence)	30/∞ mm
Z axis (convergence/Divergence)	10/∞ mm

Dimensions: 210 x 180 x 60 mm      Weight: 2.9kg

Note : For important movements (between 5 to 10 mm), the accuracy depends on the precaution taken during the readings.

## 5. INSTALLATION

The two jointmeter anchoring arms are installed 190mm apart and grouted astride the discontinuity approximately 60mm deep into the structure being monitored. The brackets are configured so that when installed using the provided template, three sets of coplanar reference studs located in three orthogonal directions are set up. The template is removed once grout has set. The arms are set orthogonally to the crack or joint as per figure n°2.

If several sensors are to be installed, they all must be grouted in the same position with arm A bearing stud n°3 above arm B as per figure 2.

- Wait for grout to set

- Un-mount and definitely remove arm C and fixing screws.

Initial reading can hence be done.

Figure 2 : Schéma d'implantation

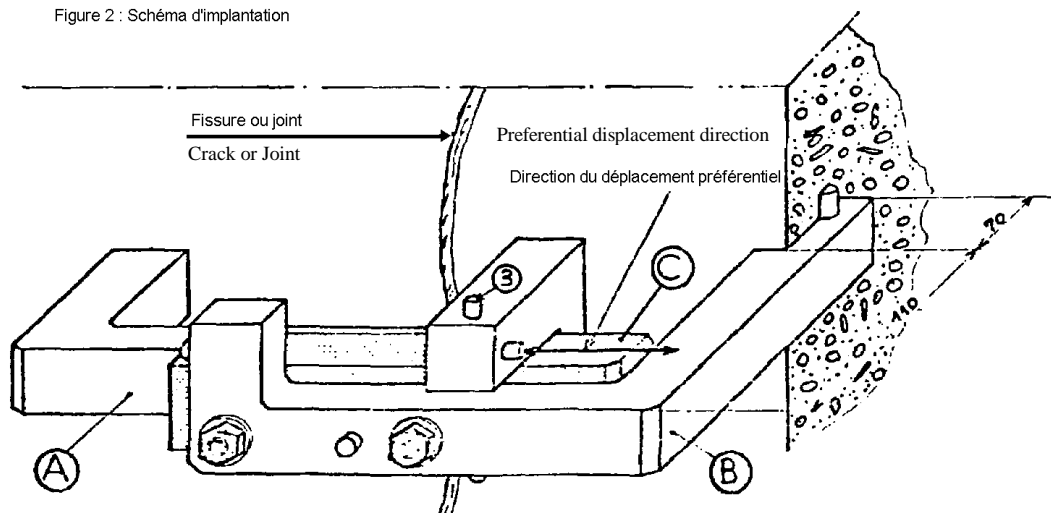


Figure 2 : Setting diagram

Date: August 2008

Reference:

OF:

## 6. MEASUREMENTS

The joint meter being installed, initial measurement is taken by distance measurement  $x_o$ ,  $y_o$ ,  $z_o$  between each reference stud pairs (1 & 1', 2 & 2', 3 & 3').

To take a reading, the calliper jaws are positioned perpendicular to the axis containing a pair of studs and closed until contact with the apex of the pair of reference studs is made. The vernier is rotated 90° from the initial position and another reading is taken.

Repeat the operation until the difference between two consecutive readings is within the instrument accuracy (usually three times).

By construction close values are:

- $x_o \cong 100\text{mm}$
- $y_o \cong 80\text{mm}$
- $z_o \cong 60\text{mm}$

The next readings  $x$ ,  $y$ ,  $z$  taken with same condition will permit to control the relative movement.

## 7. RESULTS

On the DTG papers for automatic treatment, write the value of each reading in the thick squares made for.

Examples:

Caliper at 1/10°	reading 99 mm and 2/20°	0	9	9	2	0
Caliper at 1/20°	reading 78 mm and 12/20°	0	7	8	1	2
If measures aren't done or impossible		9	9	9	9	9

For all other treatments and notation, it is important to write the distance and the variation in the distance (taking as reference the initial reading for interpretation).

## 8. PROTECTION

A surface treated steel sheet protective cover can be provided as an option to protect the jointmeter against chocks. The cover must be removed between each measurement and replace after it.

