INTERNATIONAL STANDARD

ISO 9962-1

First edition
1992-07-01

Manually operated draughting machines —

Part 1:
Definitions, classification and designation

Appareils à dessiner à commandes manuelles —

Partie 1: Définitions, classification et désignation

Reference number
ISO 9962-1:1992(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 9962-1 was prepared by Technical Committee ISO/TC 10, *Technical drawings, product definition and related documentation*, Sub-Committee SC 9, *Media and equipment for drawing and related documentation*.

ISO 9962 consists of the following parts, under the general title *Manually operated draughting machines*:

— *Part 1: Definitions, classification and designation*

— *Part 2: Characteristics, performance, inspection and marking*

— *Part 3: Dimensions of scale rule chuck plates*

International Organization for Standardization
Case Postale 56 • CH-1211 Genève 20 • Switzerland

Printed in Switzerland

Manually operated draughting machines —

Part 1:
Definitions, classification and designation

1 Scope

This part of ISO 9962 gives the definitions for, and specifies the classification and designation of, manually operated draughting machines.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this part of ISO 9962. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this part of ISO 9962 are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 5457:1980, *Technical drawings — Sizes and layout of drawing sheets*.

3 Definitions

For the purposes of ISO 9962, the following definitions apply.

NOTE 1 Terms printed in italics in the definitions are defined elsewhere in this clause.

3.1 manually operated draughting machine: Draughting machine with scale rules and indexing devices, operated manually by a parallel motion mechanism.

3.2 Types of manually operated draughting machine:

Two types of *manually operated draughting machine* are defined according to the parallel motion mechanism.

3.2.1 parallelogram-type draughting machine: *Manually operated draughting machine* which has a parallelogram-type parallel motion mechanism.

3.2.1.1 pulley-type draughting machine: *Parallelogram-type draughting machine* which has a pulley-type parallel motion mechanism (see figure 1).

3.2.1.2 link-type draughting machine: *Parallelogram-type draughting machine* which has a link-type parallel motion mechanism (see figure 2).

3.2.2 track-type draughting machine: *Manually operated draughting machine* which has a track-type parallel motion mechanism (see figures 3 and 4).

3.3 Main parts of manually operated draughting machine

3.3.1 head: Operating portion of a *manually operated draughting machine* for indexing, freewheeling, or locking of the *scale rule mounting plate*.

It comprises the parts defined in 3.3.1.1 to 3.3.1.10 (see figure 5).

3.3.1.1 knob: Grip used to move or rotate the *scale rule mounting plate* and the scale rules.

(See figure 5, item 1a.)

3.3.1.2 scale rule mounting plate: Plate on which the scale rules are mounted.

(See figure 5, item 1b.)

3.3.1.3 indexing lever: Lever to lock angles at every 15° interval or to make the *scale rule mounting plate* freewheeling.

(See figure 5, item 1c.)

3.3.1.4 angle lever: Lever to lock angles when the *indexing lever* is in the freewheeling position.

(See figure 5, item 1d.)

3.3.1.5 protractor: Main graduation plate for angle indication with two functions. The external graduation is for normal use and the internal one is for the reference line, or vice versa.

(See figure 5, item 1e.)

3.3.1.6 vernier for normal use: Vernier used for angle indication in normal draughting operations.

(See figure 5, item 1f.)

3.3.1.7 reference line lever: Lever to release and lock the angular position of the *head* with respect to the *reference line vernier*, which remains steady.

(See figure 5, item 1g.)

3.3.1.8 reference line vernier: Vernier used for the reference line.

(See figure 5, item 1h.)

3.3.1.9 indexing plate: Toothed plate which locks at regular intervals of 15°.

(See figure 5, item 1i.)

3.3.1.10 fine adjuster: Part for fine adjustment of the horizontal scale rule to a master direction.

NOTE 2 The master direction for a *track-type draughting machine* is defined by the horizontal rail.

(See figure 5, item 1j.)

3.3.2 Main parts of parallelogram-type draughting machines (see figures 1 and 2)

3.3.2.1 fixing bracket: Bracket to mount a *manually operated draughting machine* on a drawing board.

(See figures 1 and 2, item 3a.)

3.3.2.2 lifting hinge: Mechanism allowing a *manually operated draughting machine* to be lifted clear of the board surface.

(See figures 1 and 2, item 3b.)

3.3.2.3 contact adjusting screw: Screw to adjust the scale rule contact with the drawing board.

(See figures 1 and 2, item 3c.)

3.3.2.4 upper joint: Joint between the *fixing bracket* and the *upper parallelogram* system.

(See figures 1 and 2, item 3d.)

3.3.2.5 upper parallelogram: Parallelogram connected to the fixing bracket.

(See figures 1 and 2, item 3e.)

3.3.2.6 counterbalance system: System to keep the machine balanced when it is in the vertical position.

(See figures 1 and 2, item 3f.)

3.3.2.7 counterweight: Part of the *counterbalance system* that enables the position of the *manually operated draughting machine* to be maintained, without the use of a brake or locking system, whatever the inclination of the drawing board.

(See figures 1 and 2, item 3g.)

3.3.2.8 lower joint: Joint between the *upper parallelogram* and the *lower parallelogram*.

(See figures 1 and 2, item 3h.)

3.3.2.9 lower parallelogram: Parallelogram connected to the head.

(See figures 1 and 2, item 3i.)

3.3.3 Main parts of track-type draughting machines (see figures 3 and 4)

3.3.3.1 fixing bracket: Bracket to mount a *manually operated draughting machine* on a drawing board.

(See figures 3 and 4, item 4a.)

3.3.3.2 horizontal rail: Rail along which the *head* moves in the horizontal direction.

(See figures 3 and 4, item 4b.)

3.3.3.3 vertical rail: Rail along which the *head* moves in the vertical direction.

(See figures 3 and 4, item 4c.)

3.3.3.4 horizontal carriage: Carriage to move the *vertical rail* horizontally.

(See figures 3 and 4, item 4d.)

3.3.3.5 vertical carriage: Carriage to move the *head* vertically.

(See figures 3 and 4, item 4e.)

3.3.3.6 horizontal brake lever: Lever or button to lock the horizontal movement of the *head*.

(See figures 3 and 4, item 4f.)

3.3.3.7 vertical brake lever: Lever or button to lock the vertical movement of the *head*.

(See figures 3 and 4, item 4g.)

3.3.3.8 lifting hinge: Mechanism allowing the *head* to be lifted clear of the board surface.

(See figures 3 and 4, item 4h.)

3.3.3.9 counterweight: Weight in the *vertical rail* to balance the *head*.

(See figures 3 and 4, item 4i.)

3.3.3.10 board roller: Roller to support the *vertical rail*, running on the lower edge of the drawing board.

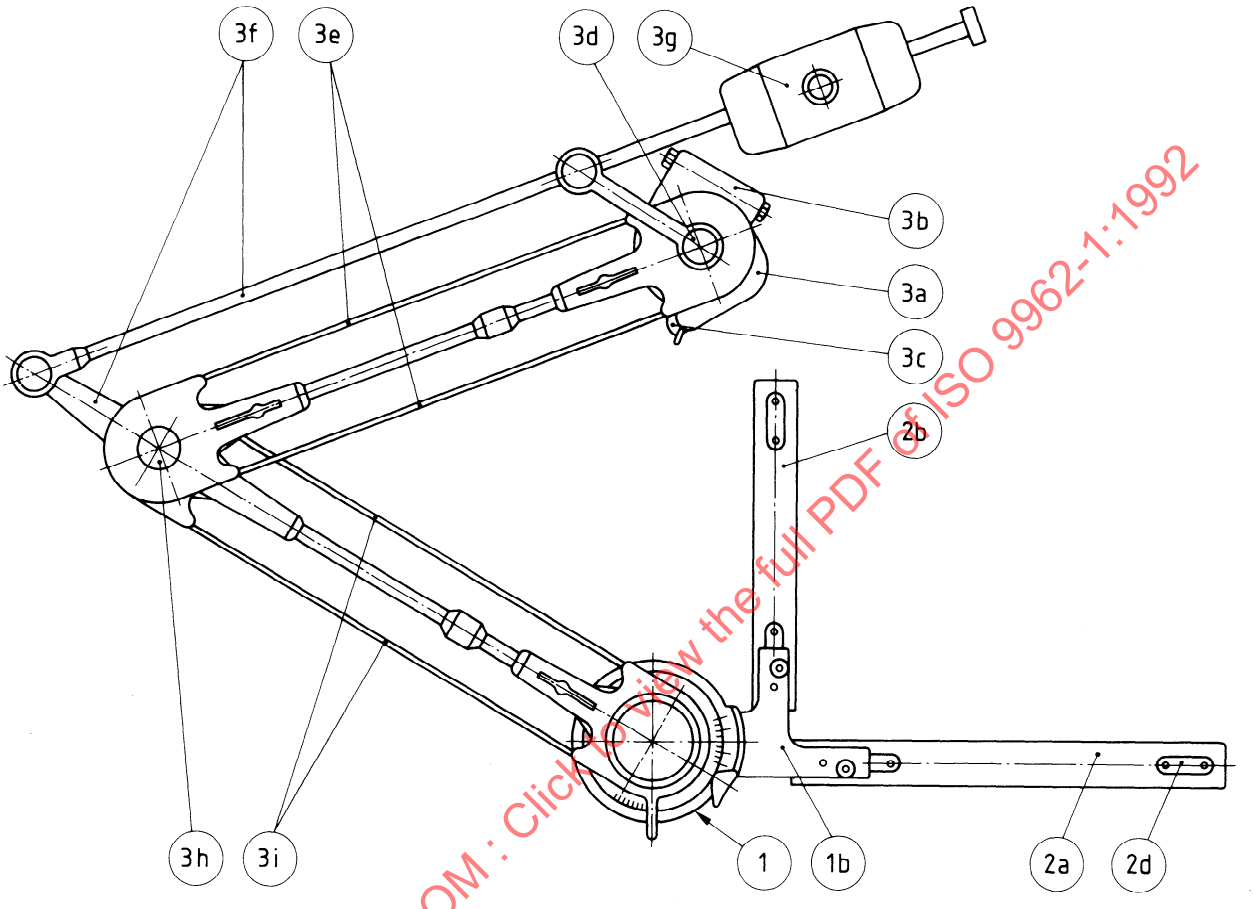
(See figures 3 and 4, item 4j.)

3.3.3.11 display: Digital readout of x and y coordinates and of angles.

(See figures 3 and 4, item 4k.)

3.3.3.12 keyboard: Keys for inputting commands and data.

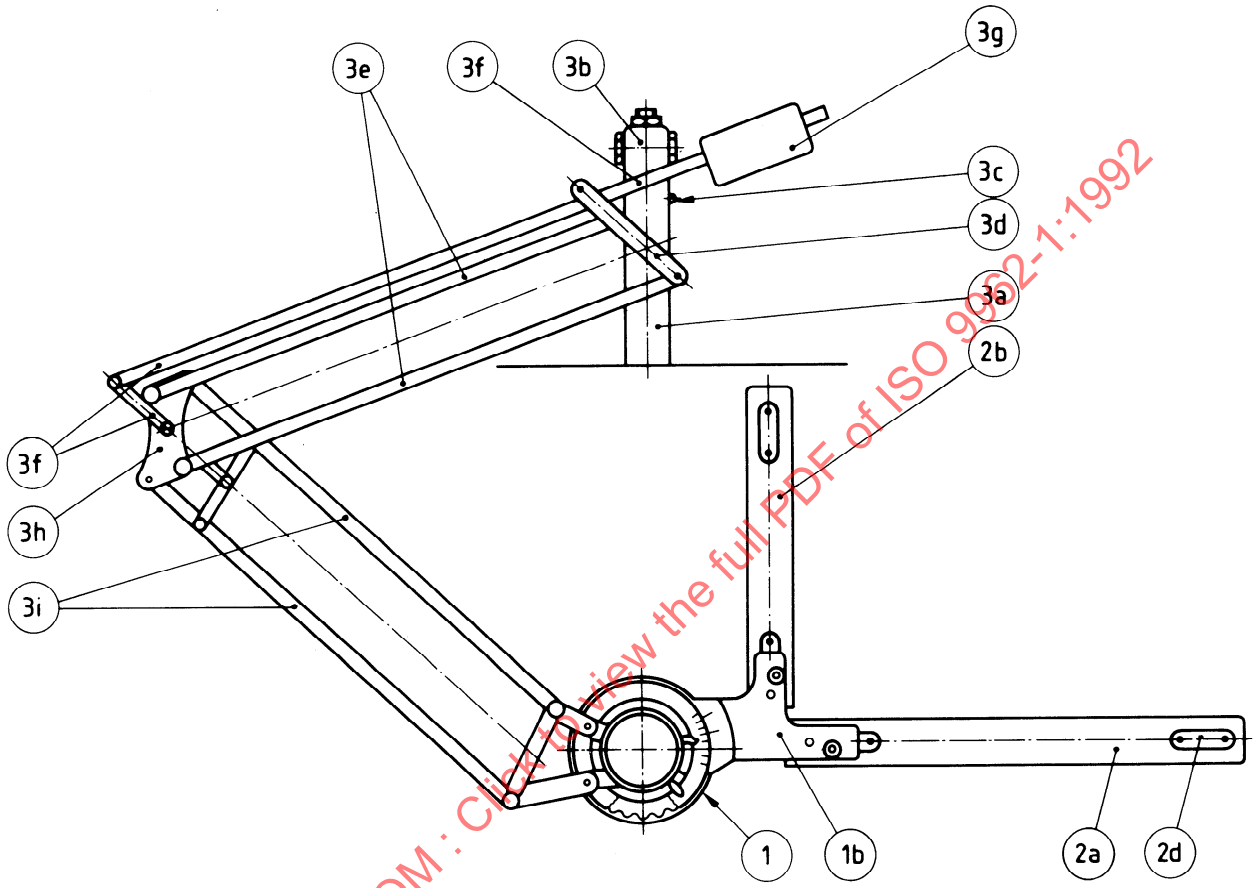
(See figures 3 and 4, item 4l.)



1	Head
1b	Scale rule mounting plate
2a	Horizontal scale rule
2b	Vertical scale rule
2d	Scale rule chuck plate
3a	Fixing bracket
3b	Lifting hinge
3c	Contact adjustment screw
3d	Upper joint
3e	Upper parallelogram
3f	Counterbalance system
3g	Counterweight
3h	Lower joint
3i	Lower parallelogram

NOTE — If the manually operated draughting machine is used only in the horizontal plane, the counterbalance system (3f) and the counterweight (3g) are not necessary.

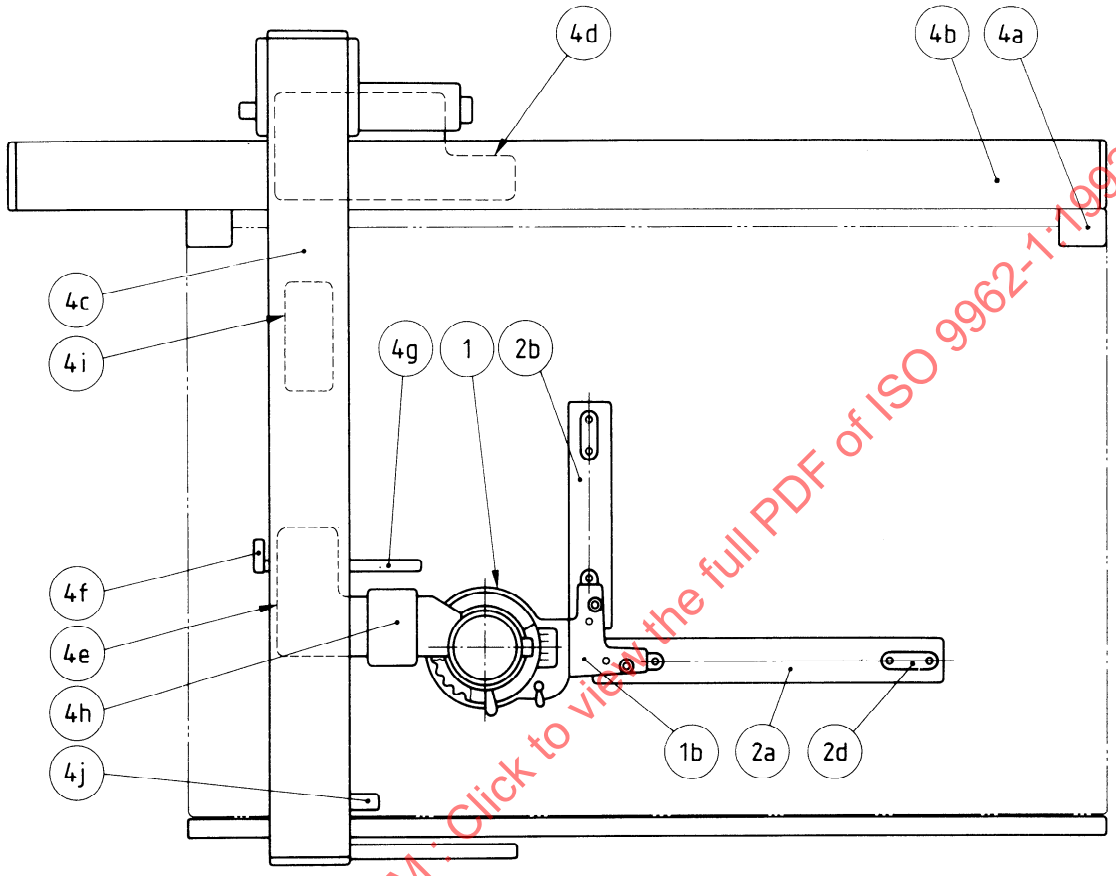
Figure 1 — Parallelogram pulley-type draughting machine



1	Head
1b	Scale rule mounting plate
2a	Horizontal scale rule
2b	Vertical scale rule
2d	Scale rule chuck plate
3a	Fixing bracket
3b	Lifting hinge
3c	Contact adjustment screw
3d	Upper joint
3e	Upper parallelogram
3f	Counterbalance system
3g	Counterweight
3h	Lower joint
3i	Lower parallelogram

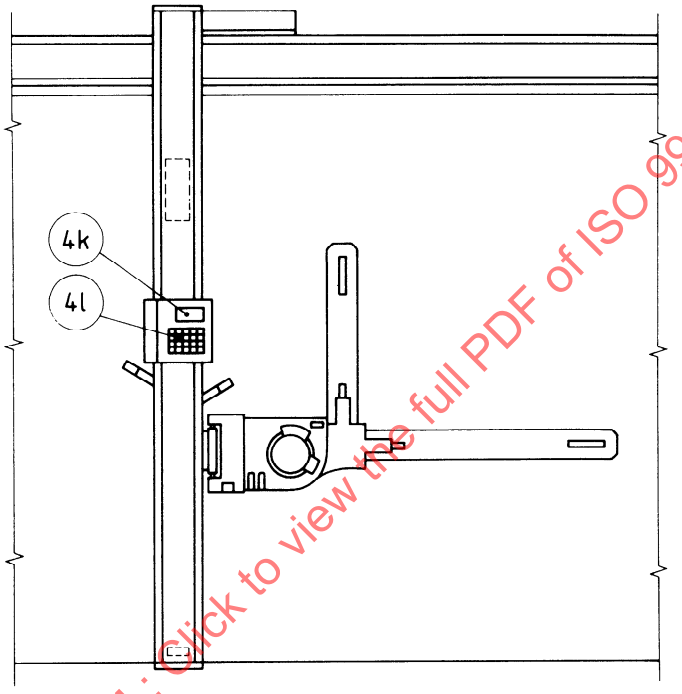
NOTE — If the manually operated draughting machine is used only in the horizontal plane, the counterbalance system (3f) and the counterweight (3g) are not necessary.

Figure 2 — Parallelogram link-type draughting machine



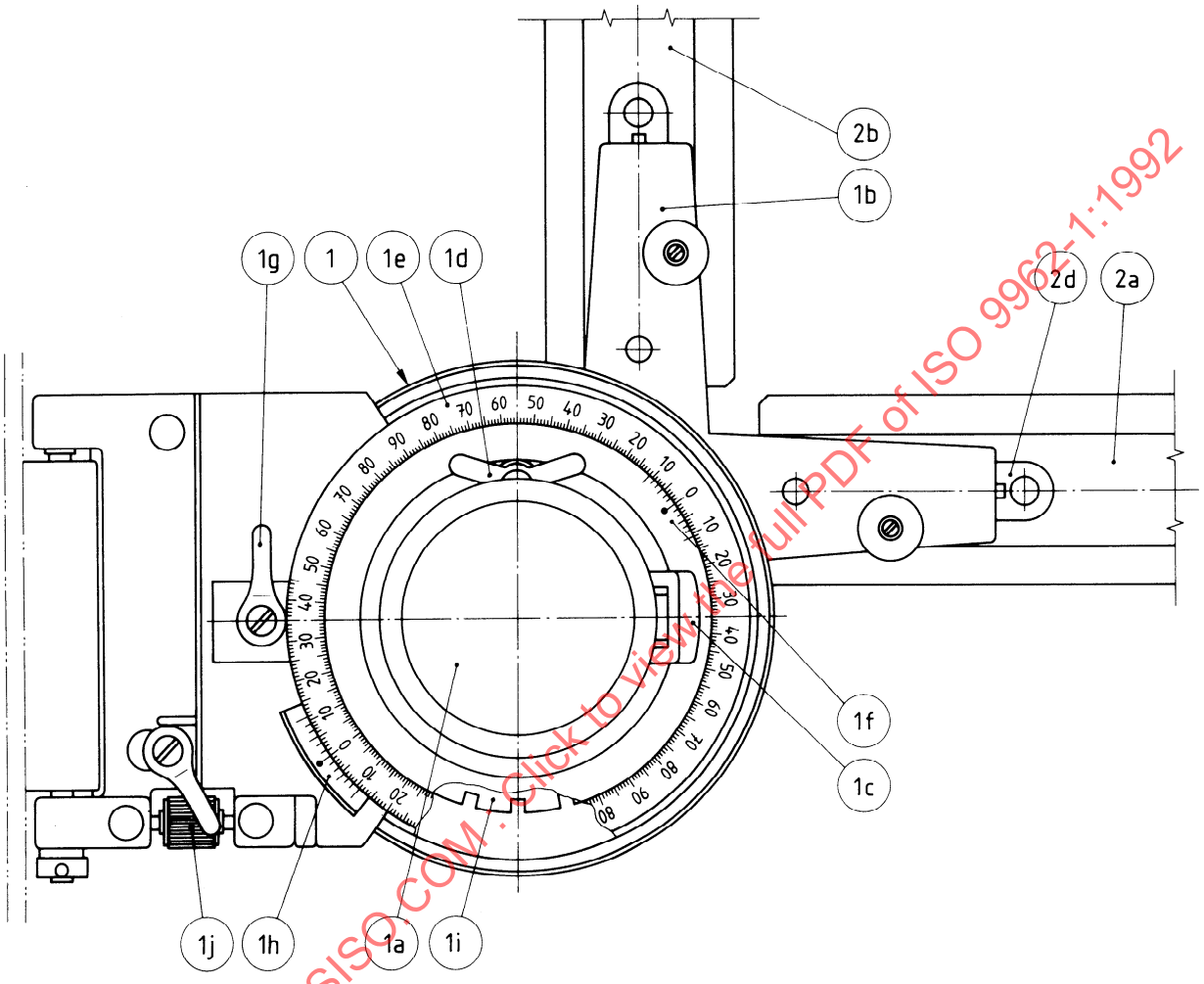
1	Head
1b	Scale rule mounting plate
2a	Horizontal scale rule
2b	Vertical scale rule
2d	Scale rule chuck plate
4a	Fixing bracket
4b	Horizontal rail
4c	Vertical rail
4d	Horizontal carriage
4e	Vertical carriage
4f	Horizontal brake lever
4g	Vertical brake lever
4h	Lifting hinge
4i	Counterweight
4j	Board roller

Figure 3 — Track-type draughting machine



4k Display (optional)
4l Keyboard (optional)

Figure 4 — Track-type draughting machine with digital display



1	Head
1a	Knob
1b	Scale rule mounting plate
1c	Indexing lever
1d	Angle lever
1e	Protractor
1f	Vernier for normal use
1g	Reference line lever
1h	Vernier for reference line
1i	Indexing plate
1j	Fine adjuster

Figure 5 — Enlarged view of a head

4 Classification

Manually operated draughting machines are classified according to four main headings:

— motion mechanism;

— inclination of the drawing board;

— usable area;

— scale rule chuck plate.

4.1 Designation according to the motion mechanism

The designation of manually operated draughting machines according to their motion mechanism is given in table 1.

4.2 Designation according to the inclination of the drawing board

The designation of manually operated draughting machines according to the inclination of the drawing board to which the draughting machine is to be attached is given in table 2.

4.3 Designation according to the usable area

The designation of manually operated draughting machines according to the usable area is given in table 3.

4.4 Designation according to the scale rule chuck plate

The designation of manually operated draughting machines according to the scale rule chuck plate type is either L (large type) or S (small type).

NOTE 3 Chuck plates form the subject of ISO 9962-3.

Table 1 — Designation according to the motion mechanism

Motion mechanism		Designation
Parallelogram type	pulley	P
	link	K
Track type		T

Table 2 — Designation according to the inclination of the drawing board to which the manually operated draughting machine is to be attached

Inclination of drawing board	Designation	Description
For horizontal plane use only	H	Drawing board is on or nearly on the horizontal plane. No counterweight is provided.
For horizontal up to vertical plane use	V	Drawing board may be from the horizontal up to the vertical plane. A counterweight is provided.

Table 3 — Designation according to the usable area

Minimum nominal usable area mm	Designation	For ISO 5457 sheet sizes	Motion mechanism
450 × 650	0406	A2	P, K, T
650 × 900	0609	A1	P, K, T
900 × 1 250	0912	A0	P, K, T
1 250 × 2 600	1226	A0 × 3	T

5 Designation

The designation of manually operated draughting machines shall include the following information in the order given:

a) the words "manually operated draughting machine";

b) reference to this part of ISO 9962, i.e. ISO 9962-1;

c) the designation of the motion mechanism;

d) the designation of the inclination of the drawing board to which the manually operated draughting machine is to be attached;

e) the designation of the usable area;

f) the designation of the scale rule chuck plate.

EXAMPLE

A track-type draughting machine (T), for a drawing board for horizontal up to vertical plane use (V), with a usable area of 900 mm × 1 250 mm (0912), and with a large scale rule chuck plate (L) is designated as follows:

Manually operated draughting machine ISO 9962-1 - T - V - 0912 - L