



**ST1500**

**SEMI AUTO TWIN  
STAIR TRENCHING  
MACHINE**

SERIAL No.

**ALL ENQUIRIES FOR SPARES, TOOLING  
AND SERVICE SHOULD BE FORWARDED TO :-**

Wadkin UltraCare Ltd.

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## STAIR TRENCHER TOOLING

| PRODUCT CODE      | DESCRIPTION                                  |
|-------------------|--|
| RVB-HSSI16PCLH    | 16 DIA.LH HSS PARALLEL CUTTER                |
| RVB-HSS16PCRH     | 16 DIA.RH HSS PARALLEL CUTTER                |
| RVB-HSS22PCLH     | 22 DIA.LH HSS PARALLEL CUTTER                |
| RVB-HSS22PCRH     | 22 DIA.RH HSS PARALLEL CUTTER                |
| RVB-HSS19BCLH     | 19 DIA.LH HSS BEVEL CUTTER                   |
| RVB-HSS19BCRH     | 19 DIA.RH HSS BEVEL CUTTER                   |
| RVB-HSS22BCLH     | 22 DIA.LH HSS BEVEL CUTTER                   |
| RVB-HSS22BCRH     | 22 DIA.RH HSS BEVEL CUTTER                   |
| RVB-HSS25BCLH     | 25 DIA.LH HSS BEVEL CUTTER                   |
| RVB-HSS25BCRH     | 25 DIA.RH HSS BEVEL CUTTER                   |
| RVB-TCT16DISPPCLH | 16 DIA.LH TCT DISPOSABLE TIP PARALLEL CUTTER |
| RVB-TCT16DISPPCRH | 16 DIA.RH TCT DISPOSABLE TIP PARALLEL CUTTER |
| RVB-TCT22DISPBCLH | 22 DIA.LH TCT DISPOSABLE TIP BEVEL CUTTER    |
| RVB-TCT22DISPBCRH | 22 DIA.RH TCT DISPOSABLE TIP BEVEL CUTTER    |

OTHER SIZES AVAILABLE UPON REQUEST

## **CONTENTS**

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- SAFETY RULES
- OPERATING INSTRUCTIONS
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- SETTING THE TEMPLATE FOR OPEN STAIRS
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- PNEUMATICS DIAGRAMS
- PNEUMATICS PARTS LIST

## **UN-PACKING INSTRUCTIONS**

### **MOVING YOUR STAIR TRENCHER**

To use a Fork Truck:-

- Slide forks under 2 off base cross members, avoiding electrical box support bar

To use Crane:-

- Sling round either side of bridge (2 Slings) and 1 sling on base back cross member. On receipt of machine these areas will be wrapped with corrugated paper.

### **IMPORTANT ON INSTALLATION**

- Remove all anti-rust from bright parts and lightly oil.
- Remove Transit Bracket (Painted Yellow on top of swinging arm)
- Two M10 Socket HD Cap Screws in swinging arm.
- Two M12 Socket HD Cap Screws in Template.
- Replace in Template with two M12 x 35lg Socket HD Cap Screw Supplied

**THIS MACHINE OPERATES USING 220/380 VOLTS  
3 PHASE SUPPLY AND A WORKING AIR PRESSURE OF  
BETWEEN 70 & 80 PSI**

## **SAFETY RULES**

The safe operation of Woodworking Machinery requires alertness and close attention to the work in hand at all times.

For you own safety, PLEASE read instruction manual before operation machine.

**DO NOT OPERATE WITHOUT ALL GUARDS AND COVERS IN POSITION.**

Be sure machine is electrically earthed – grounded.

**Remove** or fasten loose articles of clothing such as neckties etc. Confine long hair.

**Remove** jewellery such as finger rings, watches etc.

**Use safety face shield, goggles or glasses** to protect eyes and other personal safety equipment as required.

**ALWAYS STOP THE MACHINE** before making adjustments or cleaning chips from work area.

**Never use blunt cutters** as they are inefficient. Take time to re-sharpen or replace blades when necessary, as ineffective cutters, not only increases the risk of accidents, but also lowers the standard of work.

Keep the floor around the machine clean from pieces of wood, sawdust, oil or grease to minimise the danger of slipping.

## **OPERATING INSTRUCTIONS**

- Connect air & electricity supply.
- Switch on – press reset on main panel  
The machine will set itself to sequence start.
- Position the timber to the beginning of the first string.
- Table clamps on.
- Cutter plunge in (ensuring that the cutters are clear of the wood).
- Set the depth of cut using adjusters on right hand side of heads.
- Cutter plunge out. When heads retract, set lever in centre (Neutral position).
- Insert correct nosing plate (see sheet 'Changing Nosing Plate').
- Set Template (See sheets – 'Setting the Template') for standard and open plan stairs.
- Table clamps on.
- Start Heads.
- Cut first string.
- Travers Clamps On.
- Table Clamps Off.
- Traverse Wood.
- Table Clamps On.
- Traverse Clamps Off.
- Reverse Traverse.
- Repeat
- Cut second string (repeat above).
- When staircase complete, press stop button to retract clamps etc.

## **SETTING THE TEMPLATE FOR STANDARD WEDGE STAIRS**

(REFER TO FIGURE 1, 2 & 3)

1. Set Stops A & B to give desired length of Tread (A) Riser (B).
2. Set the zero point on Rule Bar (C) to Tread Stop 'A'.
3. Slacken the bolts D & E.
4. Adjust the template so that stops A & B are both against the Rule Bar.  
Tighten bolts D & E.

The dimension read against Riser Stop (B) is the pitch and this should be set accordingly on the back bar. See Figure 2.

i.e. A 9" tread with an 8" rise should give a pitch of 12 1/32".

5. To set the step position on the timber (X) – see Figure 3, slacken bolts F & G (as Figure 1), and slide the Template to give the desired dimension.

## **SETTING THE TEMPLATE FOR OPEN PLAN STAIRS**

(REFER TO FIGURE 1, 2, 3, 4 & 5)

Set template as for wedge stairs – item 1, 2, 3, 4 & 5

- Fit Nosing Plate supplied to suite, tread thickness and projection
- Fit Tread Spacer Stop Block supplied using M6 socket cap screws
- Set and fix both stop blocks – see Figure 4
- Fit Wedge Plates to stop blocks as sketch
- Use 5/8” pin Cutter and Roller

Template with riser looking from underside – Figure 4

Template without Riser looking from underneath – Figure 5

- Fit Stop Off Nosing Plate

## **CHANGING NOSING PLATES**

(REFER TO FIGURE 4 or 5)

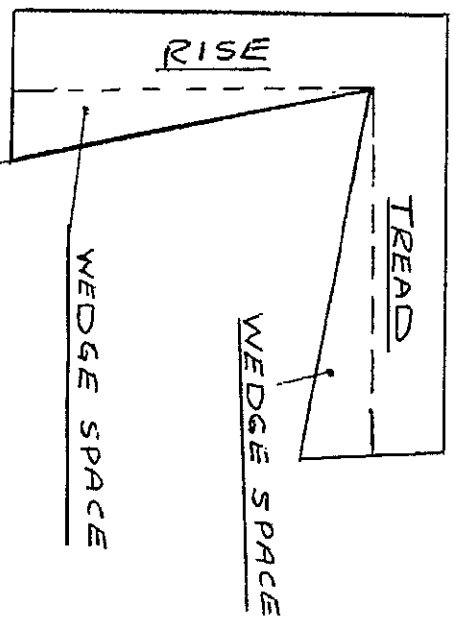
1. Release nosing plate lock screw (P) and insert nosing plate beneath template. Once located, tighten in place.

**The nose of the tread is now absolutely in line with the tread slot.**

2. Two nosing plates with  $1\frac{3}{4}$ " and  $1\frac{1}{16}$ " slots are supplied with the machine. Additional nosing plates may be made to order. Nosing plates govern both the depth of the tread slot and the amount of overhang.
3. Also additional nosing plate. Stop off (open plan stairs) is provided.
4. Three sizes of guide roller and roller bearing,  $\frac{5}{8}$ " ,  $\frac{3}{4}$ " and  $\frac{7}{8}$ " are supplied with each machine.

## TO SET FOR WEDGE SPACE

The best way is to make a wooden template from  $\frac{1}{2}$ " thick plywood as sketch.

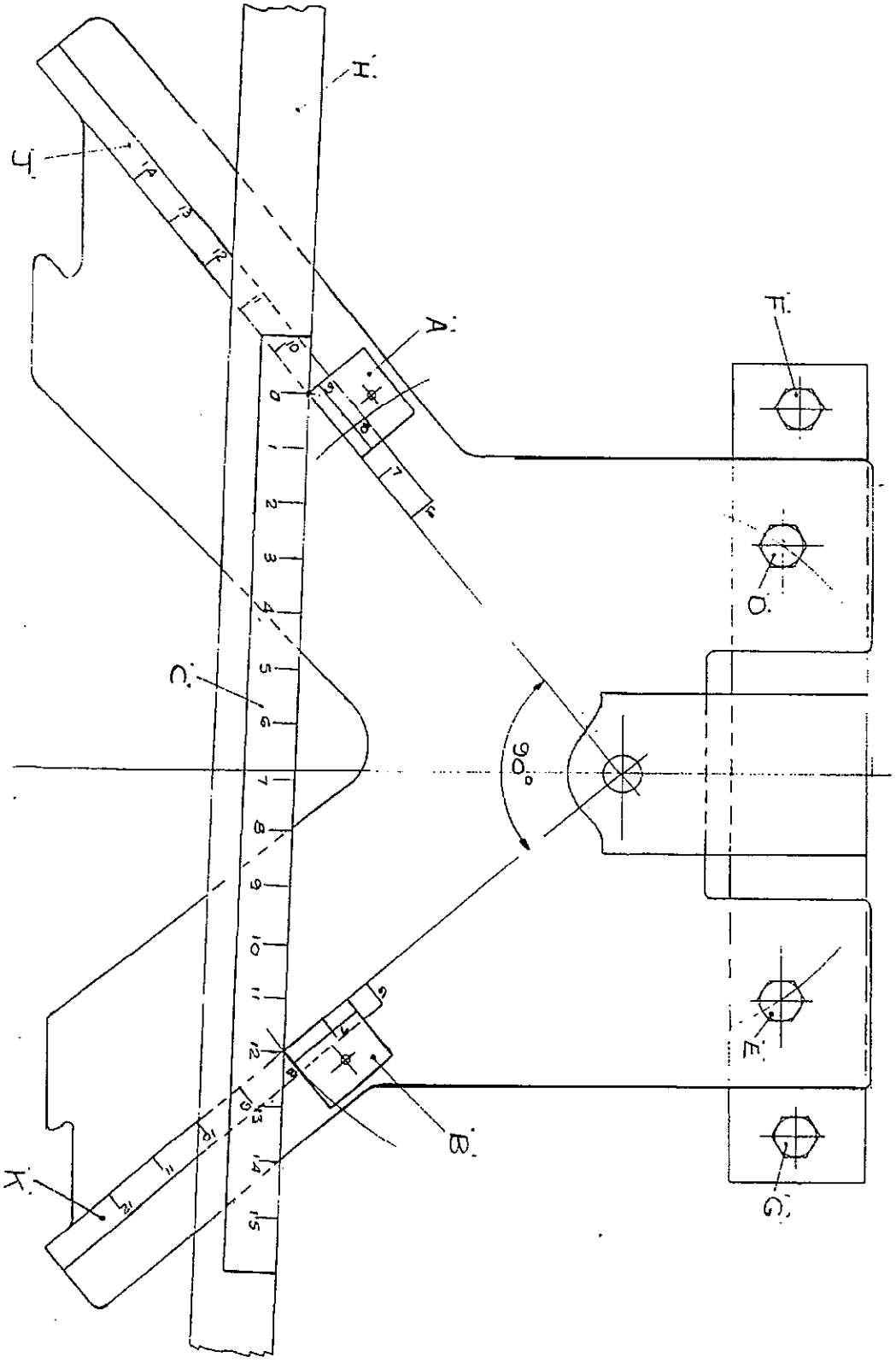


Slacken wedge spacing nuts and adjust the two slotted and angled wedge spacing plates up to the wooden template. (It may be necessary to turn the nosing plates around to fix at the apex.

Fit nosing plate as supplied to suite your tread thickness and projection.

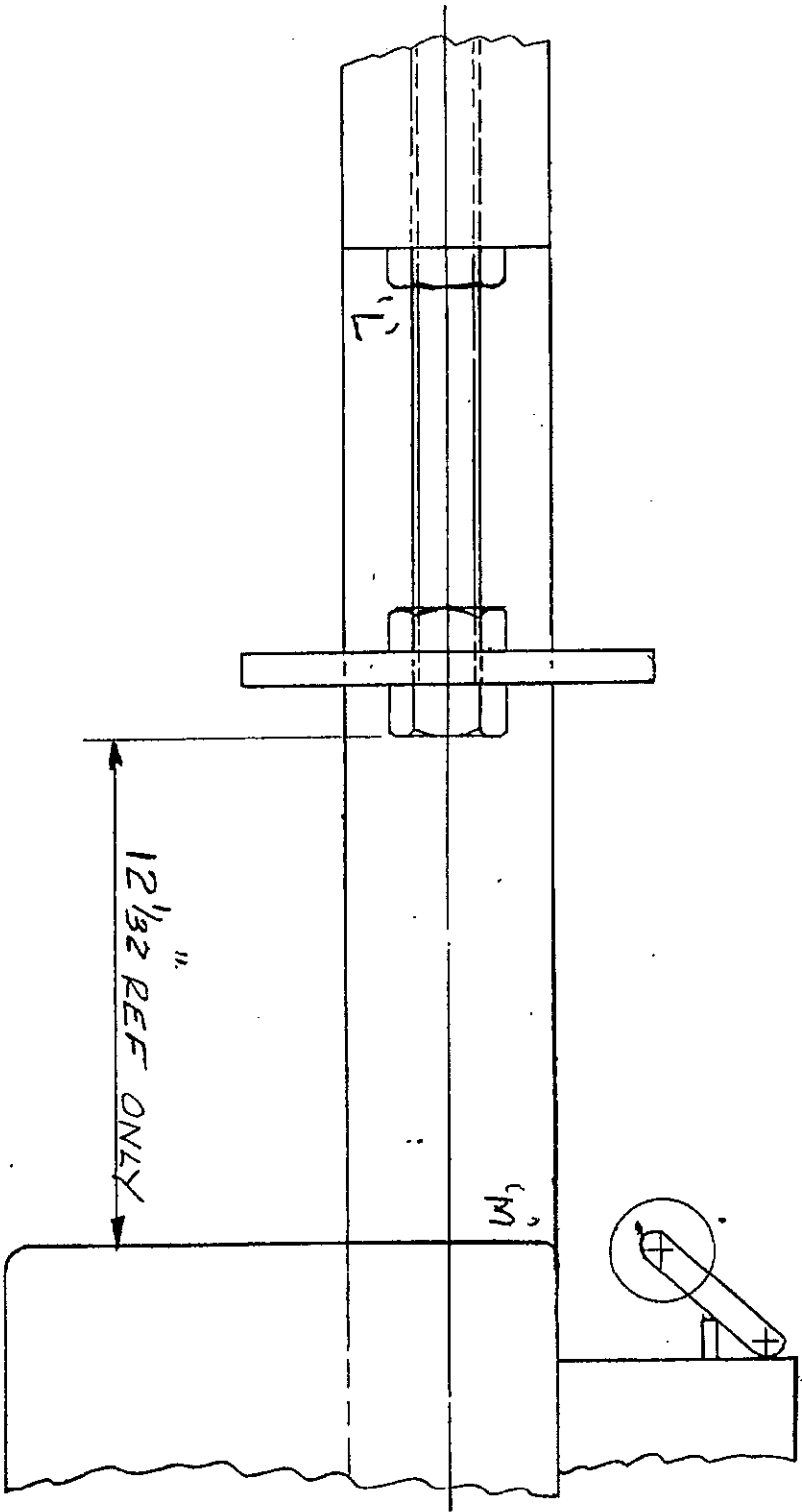
**KEY – FIGURE 1-5**

- A** Adjustable Tread Stop
- B** Adjustable Riser Stop
- C** Pitch Bar Rule (metric & Imperial)
- D** Left Hand Template Setting Screw
- E** Right Hand Template Setting Screw.
- F/G** Bolts to Adjust Template – forward and backwards once set.
- H** Pitch Setting Bar
- J** Tread Rule (Metric & Imperial)
- K** Riser Rule (Metric & Imperial)
- L** Adjustable Not-Inward Feed
- M** Side Frame Datum for Inward Feed Arm
- P** Nosing Piece locking screw
- R** Adjustable Tread Height Guide Bar
- S** Adjustable Riser Height Guide Bar

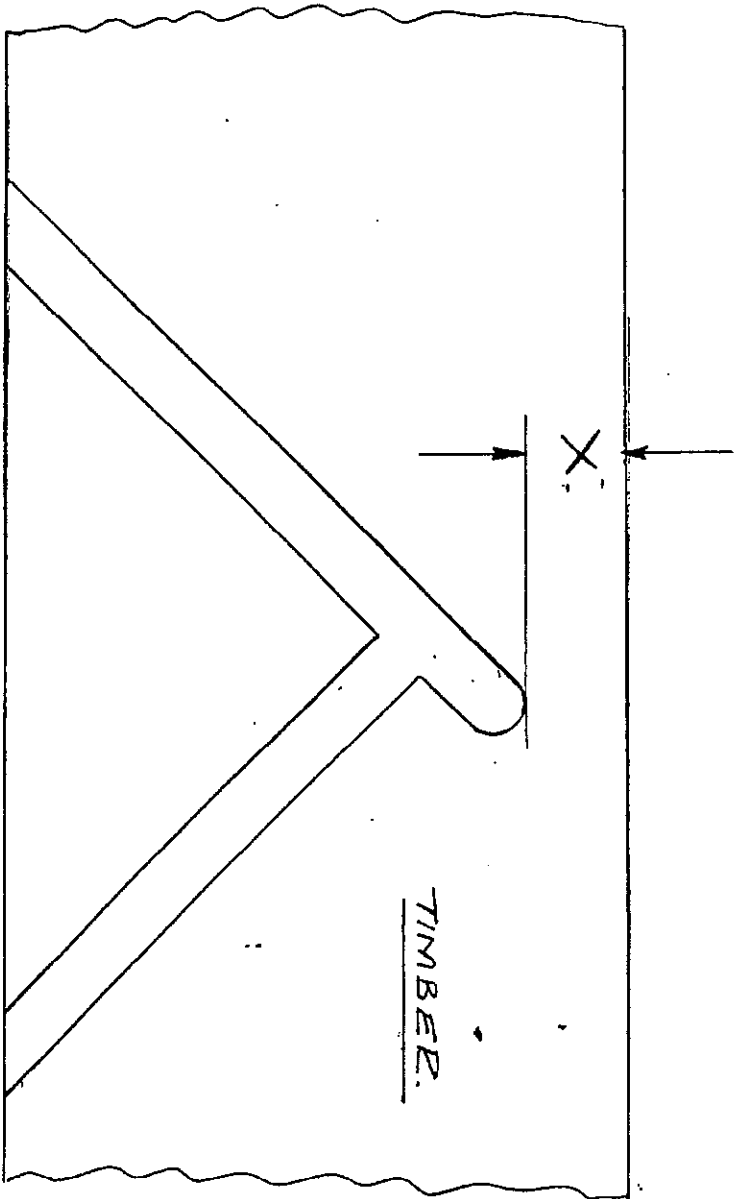


TEMPLATE SETTINGS

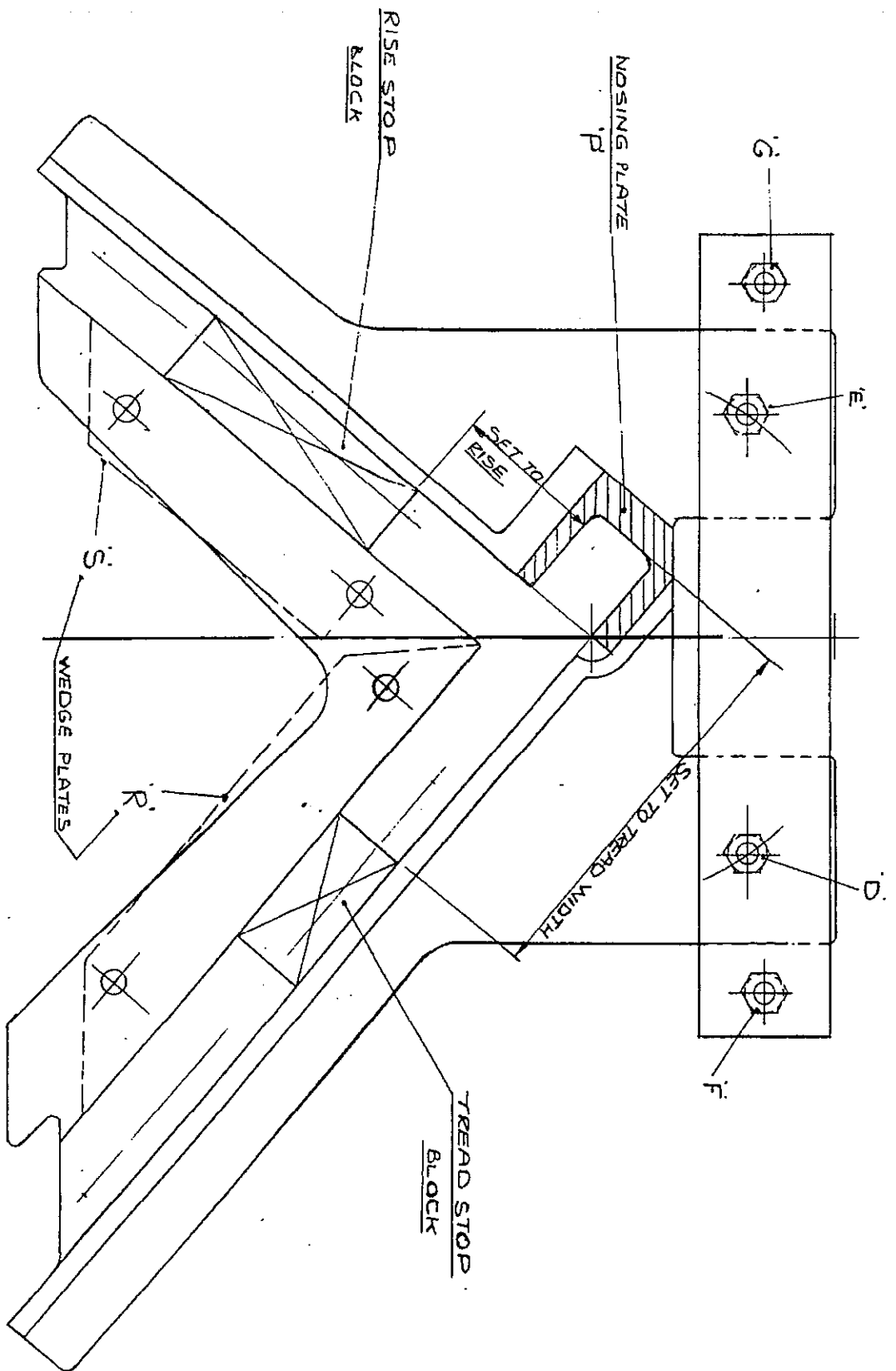
FIG 1



BACK BAR SETTING FIG 2.

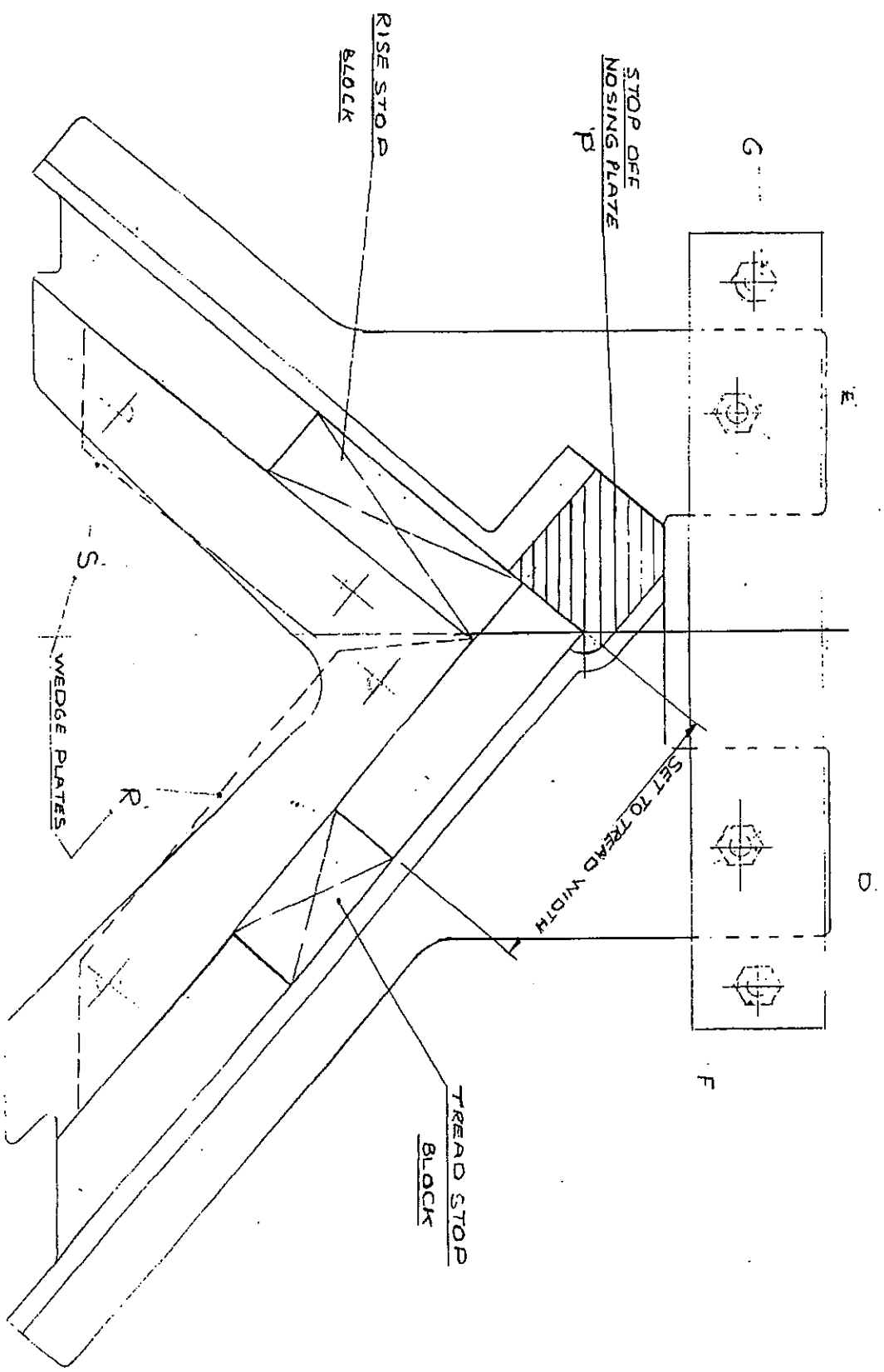


TIMBER STEP POSITION FIG 3



VIEW ON UNDERSIDE TEMPLATE

WITH RISER FIG 4



VIEW ON UNDERSIDE TEMPLATE

WITHOUT RISER FIG. 5

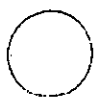
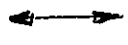
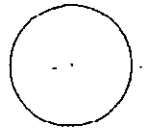
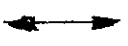
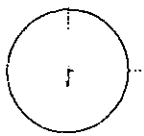
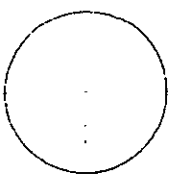
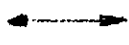
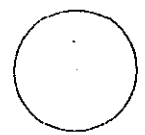
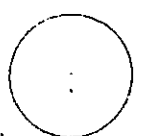


TABLE CLIMPS

CUTTER RANGE

START CUTTER



STRING TRAVEL

TRUSS CLAMP

STOP CUTTER

EQUIPMENT FOR THE WOODWORKER

## **TOOL KIT & ACCESSORIES**

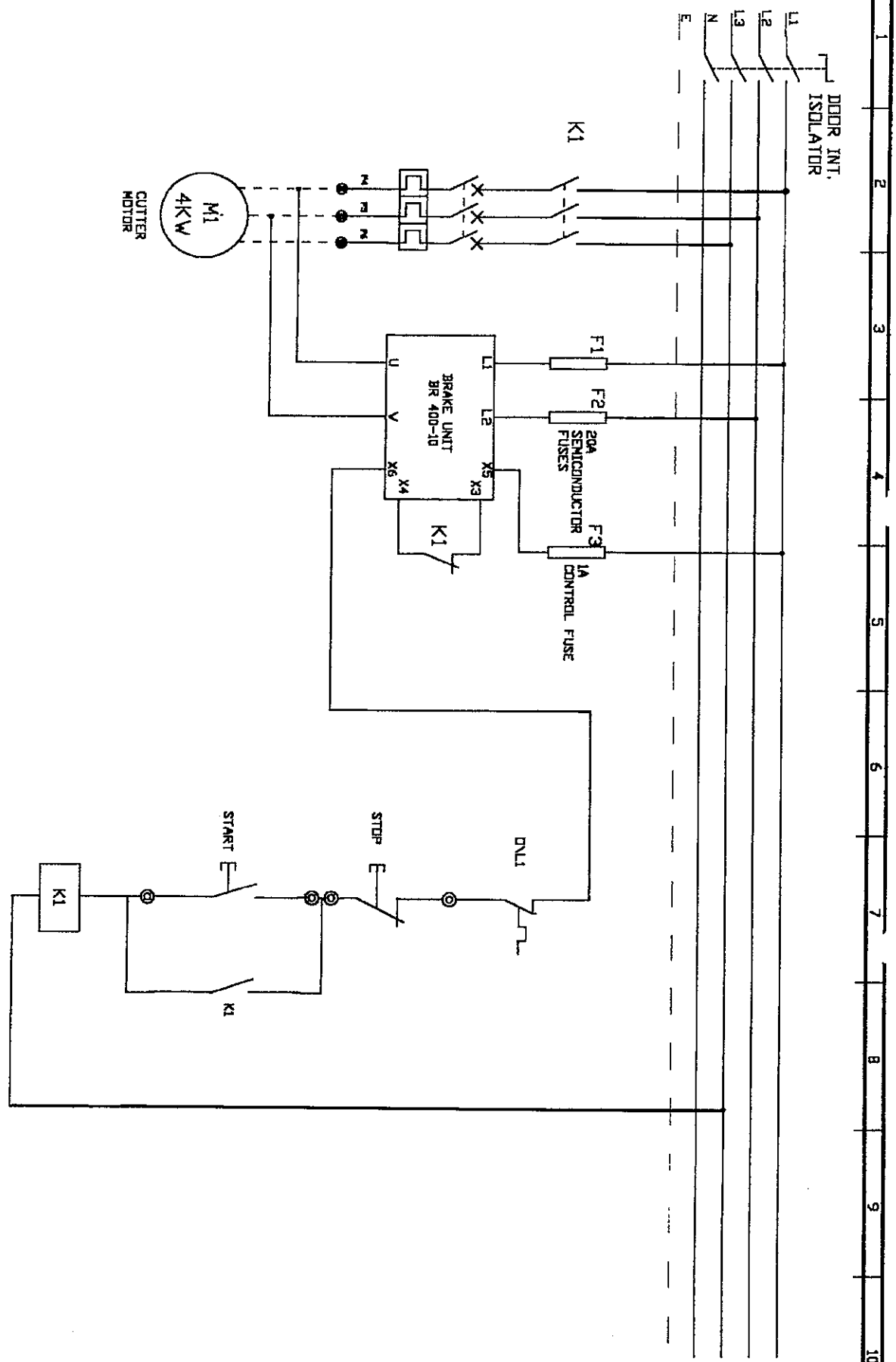
- 1 off 8mm Allen Key
- 1 off 3mm Allen Key
- 1 off 10mm Allen Key
- 1 off 5/32" Allen Key
- 1 off 19mm, 17mm Double Ended Spanner
- 1 off 24mm Open Ended Spanner

### **Your Stair Trencher also comes with:-**

- 2 off adjustable roller stands
- 1 – Nosing Plate Open Plan Stairs
- 1 – Nosing Plate Wedge Stair for Tread
- 1 – Nosing Plate. Stop Off. Open Plan Stairs
- 1 – Tread Stop Block
- 1 – Riser Stop Block
- 2 - Cutters

## **MAINTENANCE INSTRUCTIONS**

1. Ensure sufficient dust extraction is available to clear the machine of dust and shavings.
2. Clean the machine daily.
3. Oil the machine weekly at the following points:-
  - Top and bottom plunging heads slides
  - Back Bar (2 Places)
4. Drain the air filter/regulator daily.
5. Ensure there is sufficient oil in the air lubricator.
6. Grease the middle pivot joints top & bottom every 6 months.

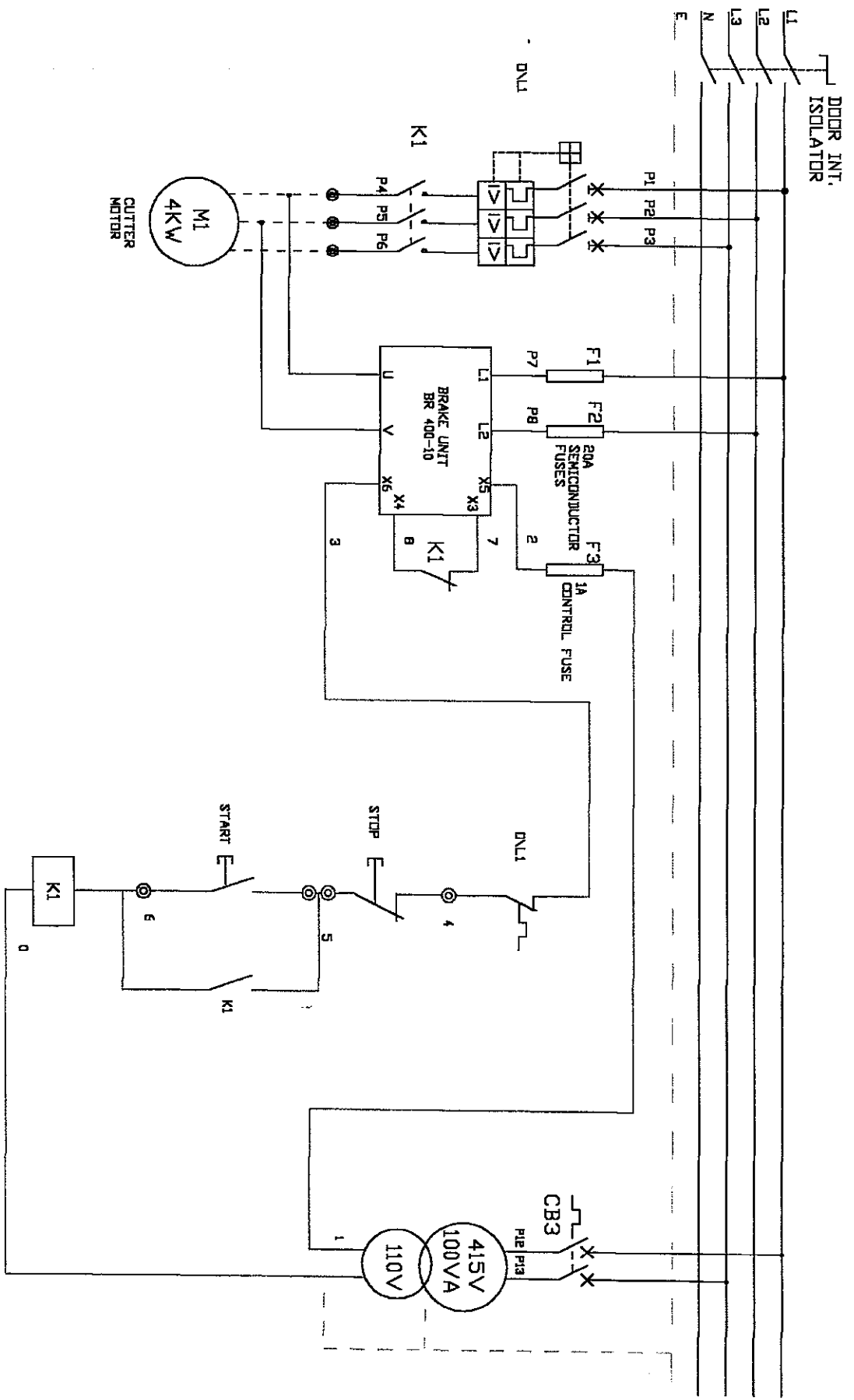


STANDARD WIRE COLOURS: A.C CONTROL - RED; D.C CONTROL - BLUE; POWER CIRCUITS (ACDC) - BLACK; CIRCUITS FED FROM EXTERNAL SUPPLY - ORANGE; NEUTRAL CONDUCTOR - BLACK; PROTECTIVE CONDUCTOR - GREEN/YELLOW

# O & ME ELECTRICAL SERVICES

PROVIDENCE WORKS, QUEENS ROAD, HALLIFAX, HX1 3NS.  
 TELEPHONE : 01422 343670 FAX : 01422 347735  
 E-MAIL : [technical@omelectricals.net](mailto:technical@omelectricals.net) [omelectricals.net](http://omelectricals.net) [omelectrical.co.uk](http://omelectrical.co.uk)

|               |                           |           |          |             |        |
|---------------|---------------------------|-----------|----------|-------------|--------|
| CUSTOMER      | COBLEY ENGINEERING        | DATE      | 24-09-03 | SERIAL NO.  | 2268   |
| DRAWING TITLE | MANUAL STAIRCASE TRENCHER | REV.      | A        | DRAWING NO. | 2268-1 |
| DRAWN BY      | IAN PORTER                | DESIGN BY | IP       | SHEET       | 1 OF 1 |



STANDARD WIRE COLOURS: A.C. CONTROL - RED; D.C. CONTROL - BLUE; POWER CIRCUITS (AC/DC) - BLACK; CIRCUITS FED FROM EXTERNAL SUPPLY - ORANGE; NEUTRAL CONDUCTOR - BLACK; PROTECTIVE CONDUCTOR - GREEN/YELLOW

# O & M ELECTRICAL SERVICES

PROVIDENCE WORKS, QUEENS ROAD, HALIFAX, HX1 3NS.  
 TELEPHONE : 01422 343570 FAX : 01422 347735  
 E-MAIL : technical@omelectrical.fsnet.co.uk

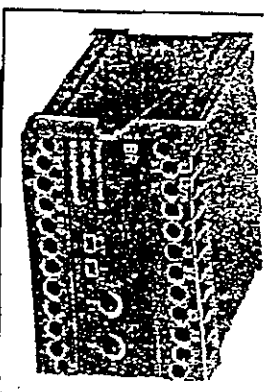
|               |                                     |           |          |             |        |
|---------------|-------------------------------------|-----------|----------|-------------|--------|
| CUSTOMER      | COPLEY ENGINEERING                  | DATE      | 16-12-03 | SERIAL NO.  | 2273   |
| DRAWING TITLE | MANUAL STAIRCASE TRENCHER (REMOTED) | REV.      | A        | DRAWING NO. | 2273-1 |
| DRAWN BY      | IAN PORTER                          | DESIGN BY | IP       | SHEET       | 1 OF 1 |

# RAISPEED

MOTOR CONTROL SYSTEMS

## Features:

- DC braking with one-way rectification
- suitable for all asynchronous motors
- easy mounting, also for retrofitting into existing plants
- wear-resistant and maintenance-free
- special voltages up to 690V (20A-devices)
- special voltages up to 690V (20A-devices)
- integrated braking contactor (devices from 40A on)
- for snap-mounting onto 35mm top-hat-rail (devices up to 20A)
- degree of protection IP 20 (BR 230/400 - 10 ... 20)
- degree of protection IP 00 (BR 230/400 - 40 ... 400)



Braking Devices  
 BR 230-10 ... 400  
 BR 400-10 ... 400

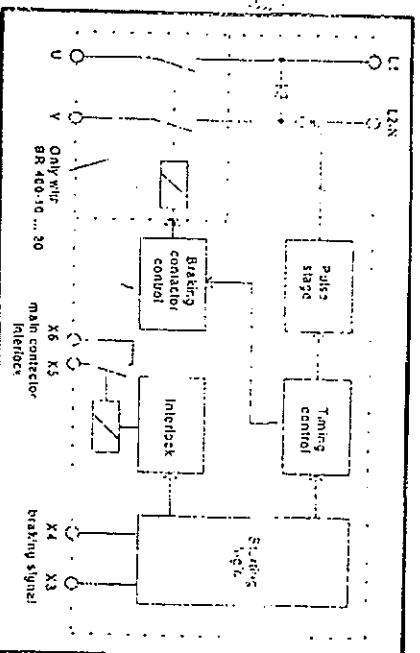
CE

**Typical Applications:**

- sawing machines
- centrifuges
- wood working machines
- textile machines
- conveying systems

## Function:

- DC braking
- control via motor contactor
- 2. separately adjustable parameters  
braking current, braking time
- potential-free output for motor contactor interlocking during braking
- loadable with 250V/8A
- potential-free output for braking contactor:  
(devices from 40A on)
- loadable with 250V



| Type designation BR                           | 230-10<br>400-10   | 230-20<br>400-20               | 230-40<br>400-40   | 230-50<br>400-50   | 230-100<br>400-100 | 230-200<br>400-200 | 230-400<br>400-400 |
|---|--|--------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Rated voltage                                 | BR 230 ...<br>BR 400 ...   | 220/240V ±10%<br>330/415V ±10% | 50/60Hz<br>50/60Hz | 50/60Hz<br>50/60Hz | 50/60Hz<br>50/60Hz | 50/60Hz<br>50/60Hz | 50/60Hz<br>50/60Hz |
| Power draw of the electronics                 | 6 VA   |                                |                    |                    |                    |                    |                    |
| Motor rating                                  | at 220/240V<br>at 330/415V   | 1.1kW<br>2.2kW                 | 3kW<br>5.5kW       | 5.5kW<br>7.5kW     | 15kW<br>22kW       | 30kW<br>55kW       | 60kW<br>110kW      |
| Rated device current                          | 10A  | 20A                            | 40A                | 60A                | 100A               | 200A               | 400A               |
| c.d.f. at max. braking current                | 20%  | 20%                            | 15%                | 15%                | 15%                | 15%                | 15%                |
| Back-up (use high-speed)                      | 10A  | 20A                            | 40A                | 60A                | 100A               | 200A               | 400A               |
| Braking voltage                               | 0 ... 130VDC at 220/240V<br>0 ... 220VDC at 330/415V                                     |                                |                    |                    |                    |                    |                    |
| Braking time                                  | 2 ... 15sec. (other times upon request)  |                                |                    |                    |                    |                    |                    |
| Contact rating                                | relay contact for motor contactor = 6A/230V~<br>contact for braking contactor = 6A/250V~ |                                |                    |                    |                    |                    |                    |
| Delay time for reduction of residual c.m.l.   | 250ms  | 250ms                          | 600ms              | 600ms              | 1500ms             | 1500ms             | 1500ms             |
| min. cross-sectional area of connection cable | 1.5mm²   | 1.5mm²                         | 2.5mm²             | 4mm²               | 10mm²              | 25mm²              | 50mm²              |
| Ambient / Storage temperature                 | 0°C ... 45°C / -25°C ... 75°C  |                                |                    |                    |                    |                    |                    |
| Weight  | 0.5kg  | 0.55kg                         | 2.4kg              | 2.4kg              | 2.55kg             | 3.55kg             | 7.6kg              |
| Order number                                  | BR 230-...<br>BR 400-...   | 21600.<br>22010                | 21600.<br>22040    | 21600.<br>22040    | 21600.<br>22100    | 21600.<br>22200    | 21600.<br>22400    |
|   |  | 21600.<br>38010                | 21600.<br>38040    | 21600.<br>38040    | 21600.<br>38100    | 21600.<br>38200    | 21600.<br>38400    |



as per 1/05 11500.10001

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These commissioning instructions were made with great care. Nevertheless, the PETER electronic GmbH & Co. KG does not assume liability for damage resulting from mistakes possibly contained in this manual. Technical changes that serve to improve the product are subject to change without notice.

### 1. Safety notes

The described devices are electrical equipment for the application in industrial electrical power installations. An impermissible removal of the covers during operation can cause serious damage to your health, since these devices contain live parts with high voltages.

Adjustment work may only be performed by trained staff observing the safety regulations. Assembly and mounting work may only be carried out with the equipment de-energized.

Make sure that all the drive components are properly earthed.

Read these commissioning instructions carefully before putting the electronic braking device into operation.

Besides, the user must ensure that the devices and associated components are fitted and connected in accordance with the applicable local, legal and technical regulations. The VDE-regulations VDE 0100, VDE 0110, VDE 0150 and VDE 0113, plus the appropriate regulations of the TÜV (Technical Inspectorate) and the employers' liability insurance associations apply in Germany.

The user must make sure that the drive assumes a safe operating state following a device failure, in the event of maloperation, or if the control unit has failed etc..

The control terminals X3 and X4 carry mains potential. If a switch or contactor contact is connected to these terminals, it must sustain a test voltage of 2,5 kV.

Even if the motor is at rest, it is not physically separated from the mains.

### 2. Declaration of conformity

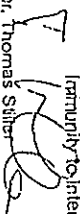
In industrial linguistic usage the electronic brakes of the type BR... are called "devices", however, in the sense of the "device-safety-law", the "EMC-law" or the "EC-guideline for machinery" they are not devices or machines ready for use or connection but they are components. It is only possible to define their final function, when these components are integrated into the design and construction of the user.

The user takes the responsibility to ensure that the user's design and construction comply with the applicable legal provisions.

The commissioning is strictly forbidden as long as the conformity of the final product with the guideline 89/392/EC (machinery guideline) is not proved.

The devices of the BR-series are electrical equipment that is used in industrial electrical power installations. They are designed for the application in machines. In order to slow down rotating masses on drives with three-phase motors. With due regard to the installation guidelines they meet the following requirements:

Emitted interference: Continuous duty EN 50081-1  
 Brakes EN 50947-4-2, IEC 947-4-2  
 Immunity to interference: EN 50082-2 1995

  
 Dr. Thomas Silber  
 Managing Director

CE

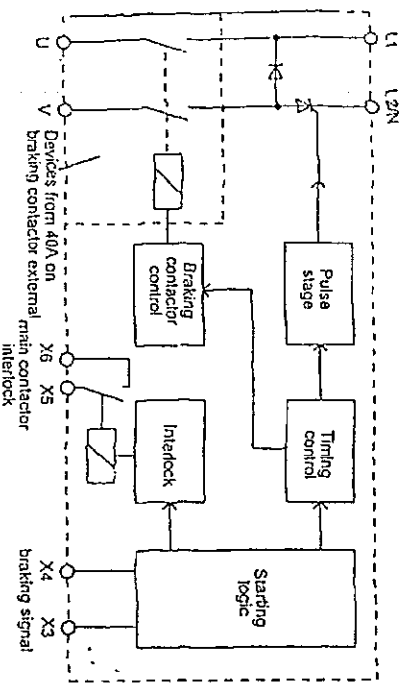
3. General description

The electronic braking devices of the BR...-type enable a non-wearing braking of three-phase asynchronous motors and A.C. motors. The braking devices are used for drives that due to safety or functional reasons have to be reliably slowed down.

**Special features**  
 non-wearing and maintenance-free  
 retrofitting in existing systems possible  
 also available for special voltages  
 for all asynchronous motors

**Typical applications**  
 sawing machines  
 centrifuges  
 wood working machines  
 textile machinery  
 conveying machines

4. Block diagram



5. Functional description (see connection diagram)

After switching on the operating voltage on L1 and L2 the main contactor interlock (terminal X5,X6) closes. The motor can be started.  
 A starting logic makes sure that braking is not yet initiated when the plant is switched on with the master switch while the motor is still switched off.  
 The fully automatic run of the braking interval starts with the switch-off of the motor contactor which at the same time closes the contact (terminal X3,X4). During braking the main contactor is interlocked via the contact (terminal X5,X6). After a delay time in which the remaining voltage of the motor decays to a value that is harmless for the power semiconductors (0.25sec. for small-size braking devices, up to 1.5sec. for the 400A-version), the braking contactor pulse in. Afterwards an adjustable d.c. voltage is applied to the motor winding. The resulting magnetic field has a braking effect on the still rotating rotor. The d.c. voltage is generated by a thyristor generalized phase control. Special circuits protect the power semiconductors against overvoltage. With the potentiometer "1" the braking torque can be adjusted in wide ranges. Experience shows that a braking current amounting to double rated motor current has a good braking effect. When commissioning the device, the braking current, for safety reasons, has to be checked with a moving-iron instrument. Multimeters and clamp-on probes give wrong measurements and must not be used for this purpose. Value-adjustments higher than the rated device current are not allowed. If, due to heavy rotating masses to be slowed down, the braking time at rated device current is still too long, the next larger braking device is to be used.  
 With the potentiometer "1" the braking time can be adjusted from 2 to 14sec.. At the end of the adjusted braking time the braking voltage is switched off and the braking contactor drops out with delay. Thereupon the contact (terminal X5,X6) recloses, so that the motor can be started anew.

5.1 LED Indicators

|             |                          |
|-------------|--------------------------|
| LED - green | mains voltage is applied |
| LED - red   | braking current flows    |

6. Technical data

|  |  |                      |                    |                    |                             |                   |                   |      |
|--|--|----------------------|--------------------|--------------------|-----------------------------|-------------------|-------------------|------|
| Type designation BR                          | 230-10   | 230-20               | 230-40             | 230-60             | 230-100                     | 230-200           | 230-400           |      |
| Normal voltage                               | 400-10   | 400-20               | 400-40             | 400-60             | 400-100                     | 400-200           | 400-400           |      |
| Power draw of the electronics                | BR 230 ...<br>BR 400 ...   | 220/240V<br>380/415V | 10%<br>10%         | 50/60Hz<br>50/60Hz | other voltages upon request |                   |                   | 6 VA |
| Factor rating at 380/415V                    | 1.1kW<br>2.2kW   | 3kW<br>5.5kW         | 5.5kW<br>7.5kW     | 7.5kW<br>15kW      | 15kW<br>22kW                | 30kW<br>55kW      | 60kW<br>110kW     |      |
| Rated device current at max. braking current | 10A<br>20%   | 20A<br>20%           | 40A<br>15%         | 60A<br>15%         | 100A<br>15%                 | 200A<br>15%       | 400A<br>15%       |      |
| Back-up fuse high-speed                      | 10A  | 20A                  | 40A                | 60A                | 100A                        | 200A              | 400A              |      |
| Adjustment range of braking voltage          | 0 ... 130VDC at 220/240V<br>0 ... 220VDC at 380/415V                                     |                      |                    |                    |                             |                   |                   |      |
| Adjustment range of braking time             | 2 ... 14sec. (other times upon request)  |                      |                    |                    |                             |                   |                   |      |
| Contact rating                               | relay contact for motor contactor = 6A/250V-<br>contact for braking contactor = 6A/250V- |                      |                    |                    |                             |                   |                   |      |
| Delay time for reduction of residual e.m.f.  | 250ms  | 250ms                | 600ms              | 600ms              | 1500ms                      | 1500ms            | 1500ms            |      |
| min. Cross-sectional area of connect cable   | 1.5mm <sup>2</sup>   | 1.5mm <sup>2</sup>   | 2.5mm <sup>2</sup> | 4mm <sup>2</sup>   | 10mm <sup>2</sup>           | 25mm <sup>2</sup> | 50mm <sup>2</sup> |      |
| Storage temperature                          | -25 ... 75°C   |                      |                    |                    |                             |                   |                   |      |
| Operating temp.                              | 0 ... 45°C   |                      |                    |                    |                             |                   |                   |      |
| Protection class                             | IP 20  |                      |                    |                    |                             |                   |                   |      |

6.1 Ambient conditions

7. Connection

- The braking device has to be connected according to the attached connection diagram. For other connections refer to the factory.  
Prior to putting the motor brake into operation the wiring has to be checked.  
To ensure a reliable operation it is important to keep to the interlocking conditions:
- In order to initiate braking, a potential-free break-contact of the main contactor is necessary, i.e., when the motor contactor is dropped out the terminals X3, X4 of the braking device are connected.  
The interlocking contact of the braking unit (terminal X5, X6) has to be looped into the control circuit of the motor contactor, so that the motor contactor cannot pull in during braking.
  - When using braking devices with separate braking contactors (devices with rated currents exceeding 20A), braking contactor and motor contactor have to be interlocked against each other.  
(Electrical interlock with break contact)

8. Commissioning

Sequence of commissioning:

- Disconnect plant from supply mains
- Connect current measuring instrument to the supply line from the braking device to the motor. The adjustment of the braking current (r.m.s. value) requires a moving-tor instrument. Do not use clamp-on probes or moving-coil instruments.
- Turn potentiometer "r" to right stop (maximum).
- Turn potentiometer "l" to left stop (minimum).
- Switch on the plant
- Initiate braking by switching the motor contactor ON/OFF.

8.1 Adjusting the braking current

Adjust the braking current as small as possible. In order to avoid unnecessary heating of the power semiconductors and the motor. This is especially important in the case of frequent operation. We recommend to limit the maximum braking current to double rated motor current.  
The required braking torque is to be adjusted with the potentiometer "r". It is important that the braking current does not exceed the rated device current that is indicated on the nameplate of the device.  
If the braking current is adjusted to a too high value, the braking devices will be switched off immediately.

8.2 Adjusting the braking time

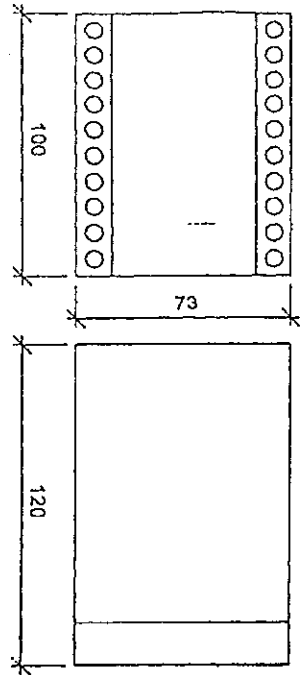
The time, in which the braking current flows, is to be adjusted with the potentiometer "r". It should be so long that, as soon as the motor has come to rest, the braking current is switched off.  
When the motor has reached operating temperature, check the settings and, if necessary, readjust them.

Attention:

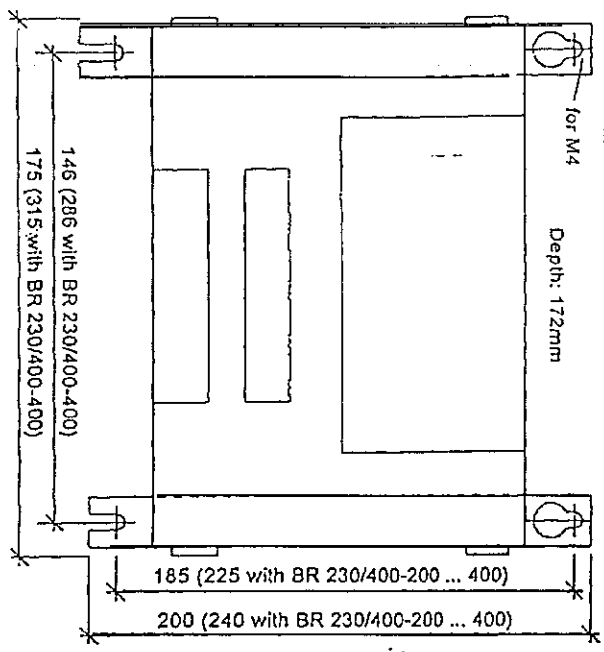
The devices BR 230-10 to BR 400-20 feature overcurrent cut-off.  
If the rated device current is exceeded, the braking current will be switched off.  
If the braking current is adjusted to a too high value, the braking current will be cut off after approx. 0.5s.  
In the event, adjust the braking current "r" downwards so that the required braking time is reached again.  
If, with the maximum braking time, the motor does not come to a rest, a braking device of the next higher performance category or a device with an extended braking time (special device) has to be used.

9. Dimensional drawings

BR 230-10 ... 20  
BR 400-10 ... 20



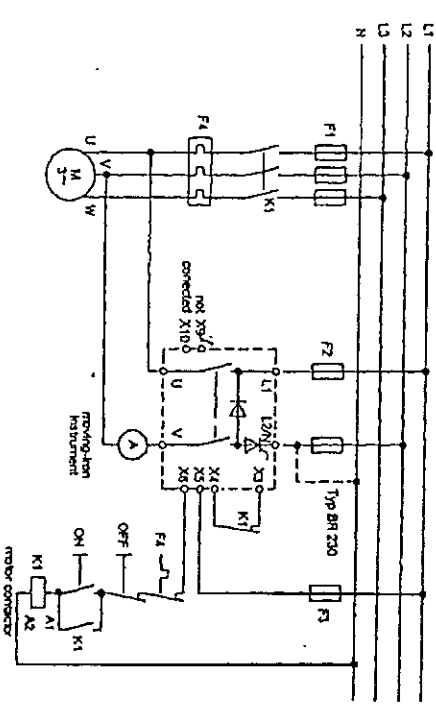
BR 230-40 ... 400  
BR 400-40 ... 400



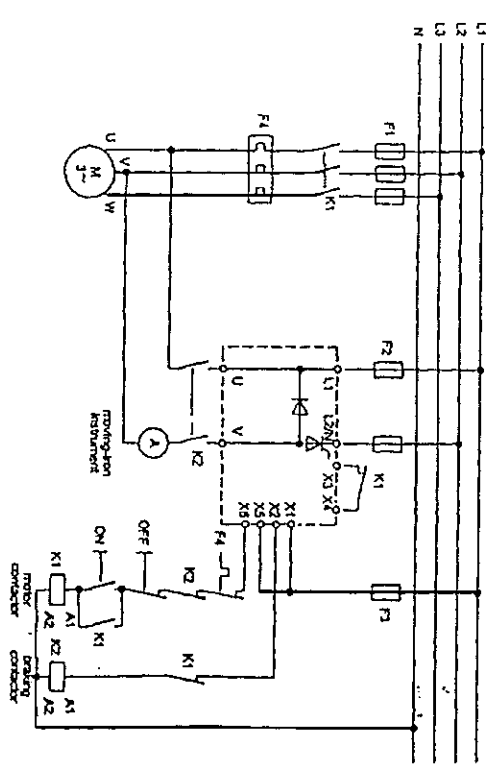
All Dimensions in mm!

10. Connection diagram

BR 230-10 ... 20  
BR 400-10 ... 20



BR 230-40 ... 400  
BR 400-40 ... 400



## Zubehör für Schaltblöcke K1 - K9 / V02 - V6 Accessories for Contact Blocks K1 - K9 / V02 - V6 Accessoires pour blocs de contacts K1 - K9 / V02 - V6

**ACHTUNG** .....  
Gefährliche Spannungen können zu Stromschlägen oder Verbrennungen führen. Vor dem Abheben am Gerät Spannung abschalten! Vor dem Wiedereinschalten vergewissern, daß das Gehäuse fest verschlossen ist. Siehe Katalog bzgl. technischer Angaben.

**WARNING** .....  
Hazardous voltage can shock or burn. Turn off all power supplying this equipment before working on it. Be sure enclosure is closed securely before reapplying power. See catalog for technical application data.

**AVERTISSEMENT** .....  
Haute tension peut provoquer chocs ou brûlures. Couper l'alim courant fourni à cet équipement avant d'y travailler. S'assurer que le coffret soit bien fermé avant de rétablir le courant. Voir catalogue pour informations techniques.

Schnellbelastigung  
Clip-On Mounting Plate  
Plaque de montage rapide

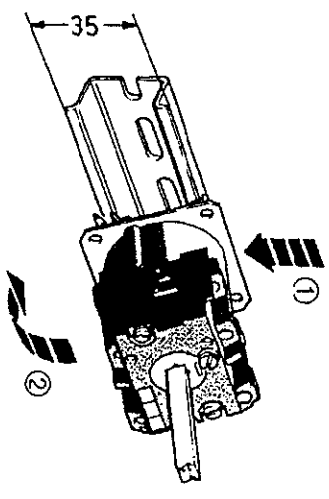
für  
pour

K1 - K9

KZ 3:



Tragschiene  
Rail Mounting  
Montage sur rail



Türverriegelungsplatte  
Door Interlock  
Plaque de verrouillage

KZ 32

für  
pour

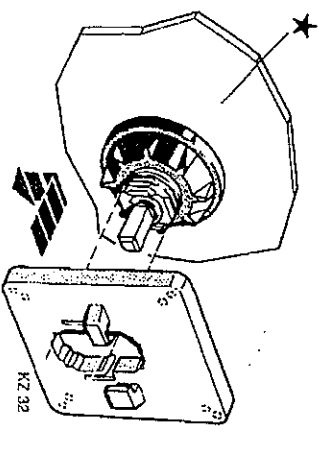
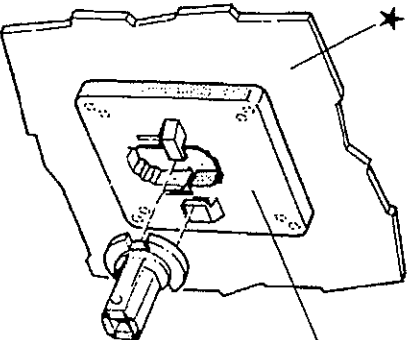
K1 - K9,  
V02 - V2

Achskuppung  
Shaft Coupling  
Axe de couplage

KZ 50 l = 60 mm  
KZ 52 l = 26 mm

für  
pour

K1 - K9,  
V02 - V2

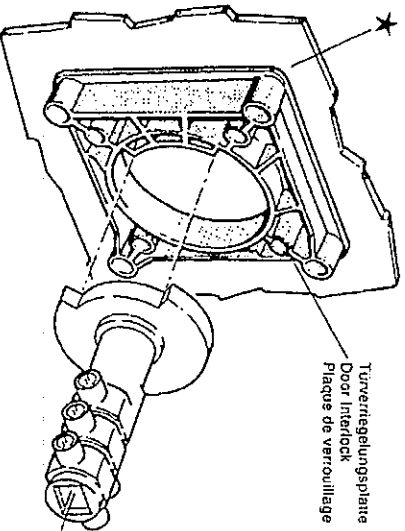


Türverriegelungsplatte  
Door Interlock  
Plaque de verrouillage

KZ 74

für  
pour

K4 - K9,  
V3 - V6

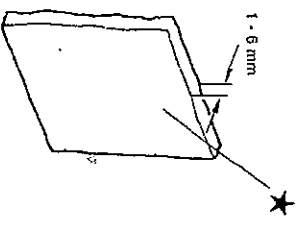


Achskuppung  
Shaft Coupling  
Axe de couplage

KZ 51 l = 60 mm

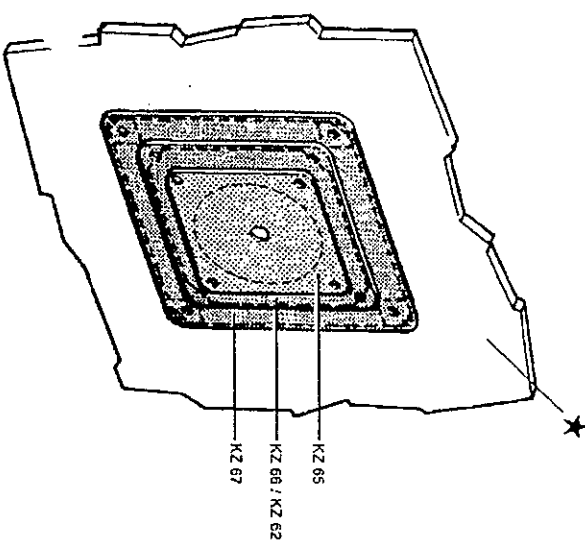
für  
pour

K4 - K9,  
V3 - V6



Gummidichtung  
Rubber Seal  
Joint caoutchouc

- KZ 62 60x60 mm / ( ) 8 mm
- KZ 65 45x45 mm / ( ) 8 mm
- KZ 66 60x60 mm / ( ) 9 mm
- KZ 67 90x90 mm / ( ) 8 mm



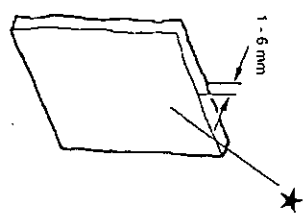
KZ 65  
KZ 66 / KZ 62  
KZ 67

KZ 55 für K1-K3  
für V02-V2  
pour

KZ 62 für K4-K6,  
für V3-V4  
pour

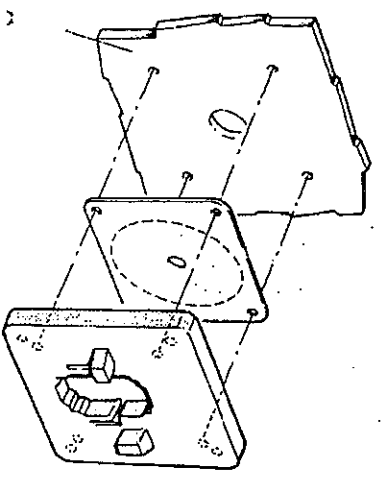
KZ 66 für K1...X -- K3...X,  
für V02-V2  
pour

KZ 67 für K7-K9,  
für K4...X -- K6...X,  
für V3-V6  
pour

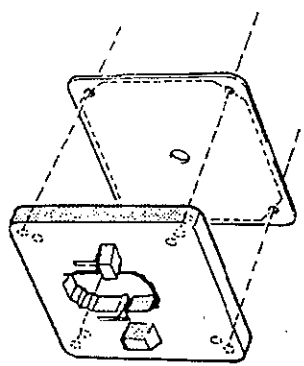


Druckplatte mit Gummidichtung  
Push Plate with Rubber Seal  
Plaque de maintien avec joint caoutchouc

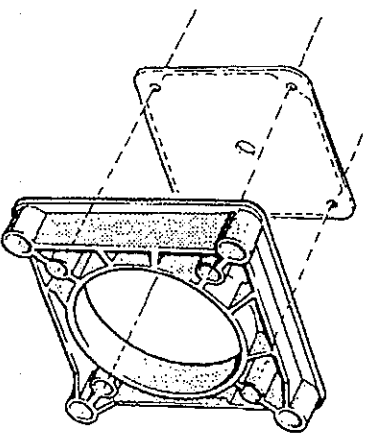
- KZ 80
- KZ 81
- KZ 82
- KZ 83



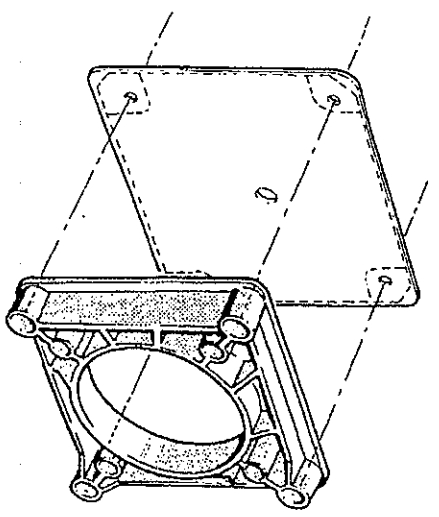
KZ 80 für K1-K3,  
für V02-V2  
pour



KZ 83 für K1-K3,  
für V02-V2  
pour



KZ 81 für K4-K6,  
für V3-V6  
pour



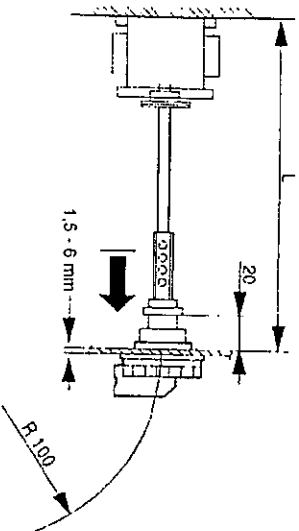
KZ 82 für K7-K9,  
für V3-V6  
pour

Achsverlängerung  
Shaft extension piece  
Prolongateur d'axe

VZ 17  
VZ 30

V01, V02, V0, V1, V2

VZ17 L = 300 - 330 mm  
VZ30 L = 400 - 430 mm

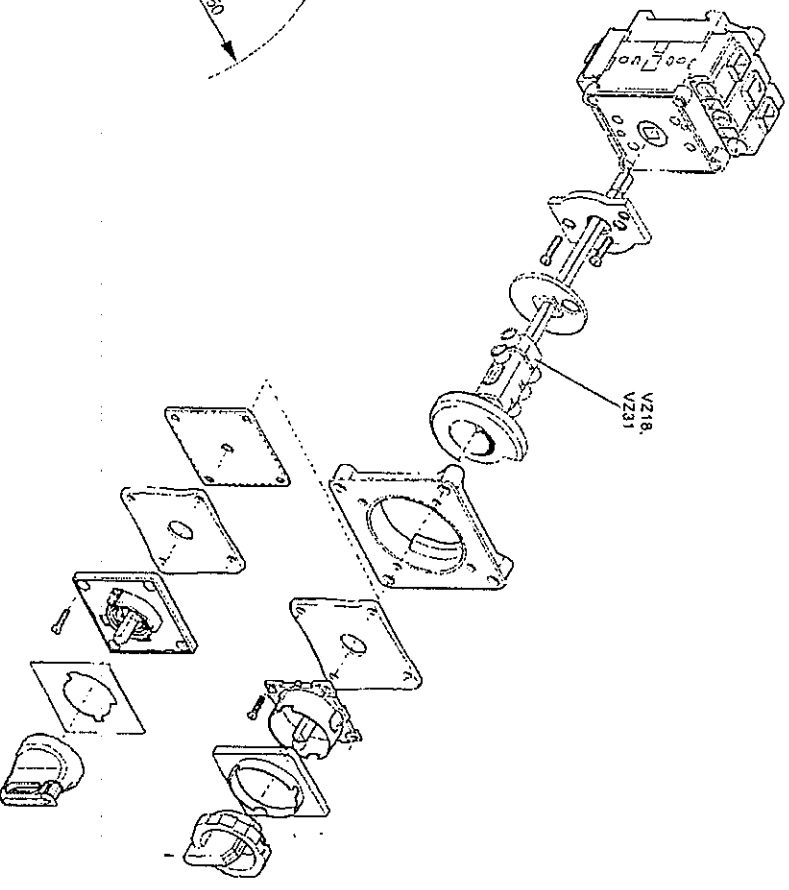
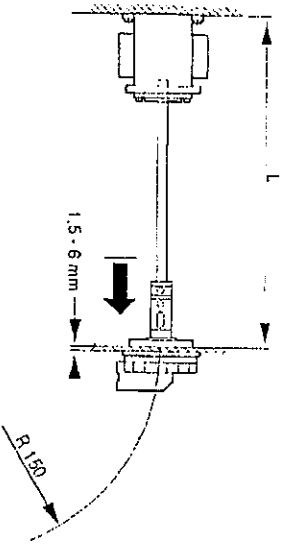


Achsverlängerung  
Shaft extension piece  
Prolongateur d'axe

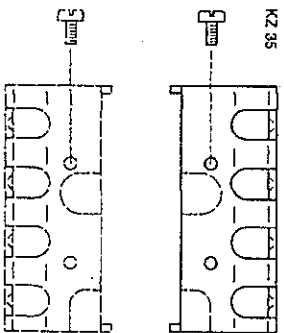
VZ 18  
VZ 31

V3, V4, V5, V6

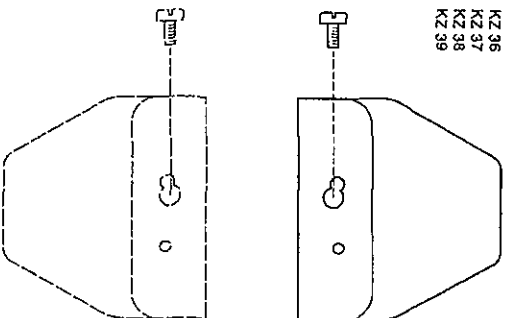
VZ18 L = 330 - 320 mm  
VZ31 L = 430 - 423 mm



Klemmenabdeckungen für Schaltblöcke K1 - K9  
 Terminal Shields for Contact blocks K1 - K9  
 Protecteurs bornier pour blocs de contacts K1 - K9

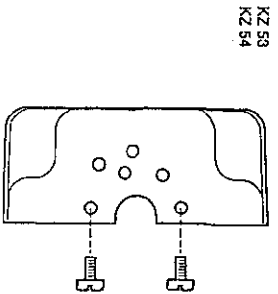


KZ 35



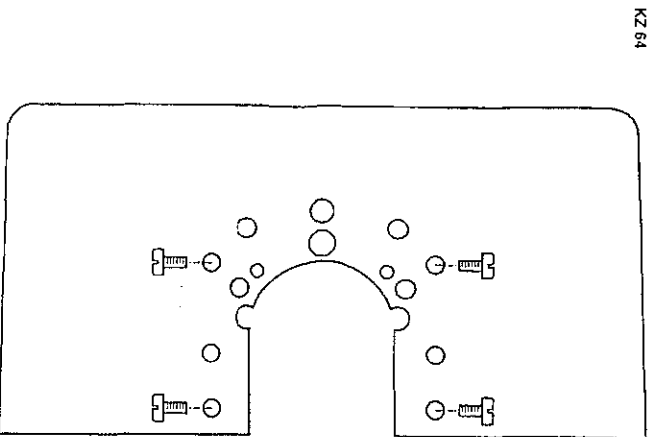
KZ 36  
 KZ 37  
 KZ 38  
 KZ 39

| Schaltblock<br>Contact Block<br>Bloc de contacts | bis ... Kontakte<br>up to ... Contacts<br>Jusqu' à ... contacts | Klemmenabdeckung<br>Terminal Shield<br>Protecteur bornier |
|--|---|---|
| K1, K2   | 4   | KZ 35   |
|  | 8   | KZ 36   |
|  | 12  | KZ 37   |
|  | 16  | KZ 38   |
| K3   | 20  | KZ 39   |
|  | 4   | KZ 53   |
| K4, K5   | 8   | KZ 54   |
|  | 4   | KZ 58   |
| K6   | 6   | KZ 59   |
|  | 4   | KZ 59   |
| K7   | 6   | KZ 75   |
|  | 4   | KZ 60   |
| K8   | 6   | KZ 61   |
|  | 4   | KZ 61   |
| K9   | 6   | KZ 63   |
|  | 4   | KZ 64   |

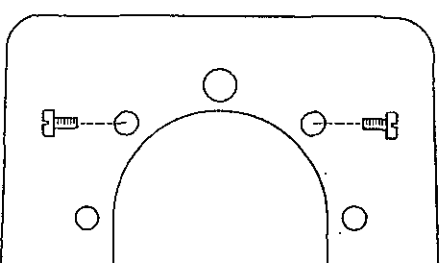


KZ 53  
 KZ 54

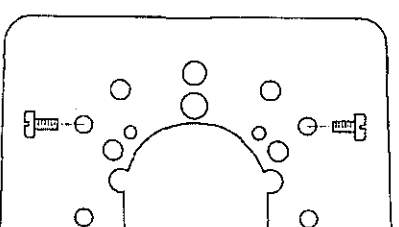
KZ 58  
 KZ 59  
 KZ 75

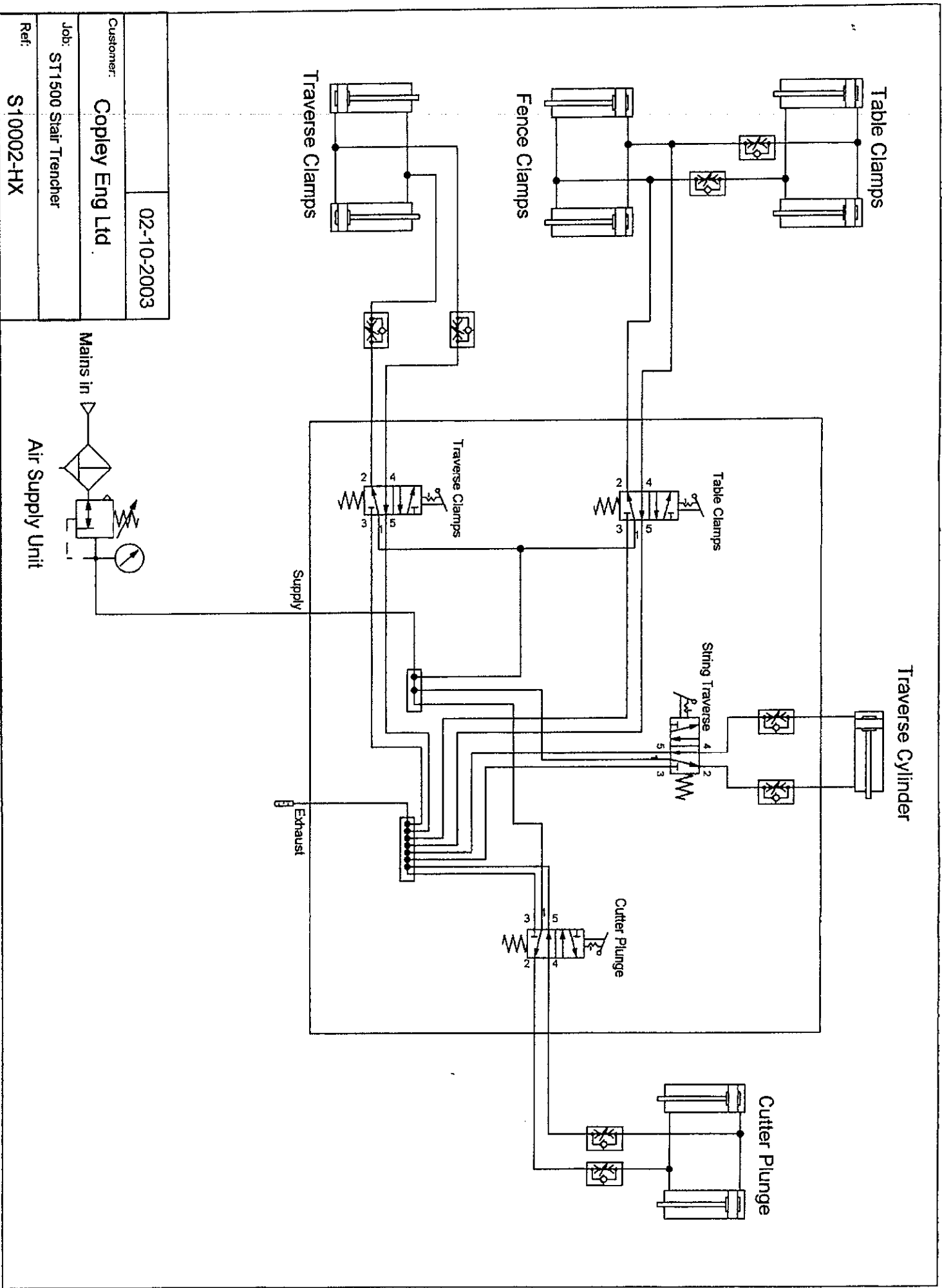


KZ 64



KZ 60  
 KZ 61  
 KZ 63





02-10-2003

Customer: Copley Eng Ltd

Job: ST1500 Stair Trencher

Ref: S10002-HX