Wadkin

DUPLEX 2000

Tenoning & Profiling Workcentre

INSTRUCTION MANUAL

GB

1.0 GENERAL INSTRUCTIONS

2.0 INSTALLATION

3.0 OPERATION

4.0 MAINTENANCE

1.0 GENERAL INSTRUCTIONS

1.1 SCOPE

This instruction manual contains important information for your safety. The instructions are for the following machines.

DUPLEX 2000
Tenoning and profiling work centre

MANUFACTURER:-
Wadkin Durham
Fencehouses
Houghton-le-Spring
Tyne and Wear
England

Tel 091 3852385
Fax 091 3853311

1.0 GENERAL INSTRUCTIONS

1.1 SCOPE

The machine is used for cutting solid timber typically for window and door frames.

Type of work which may be carried out:-

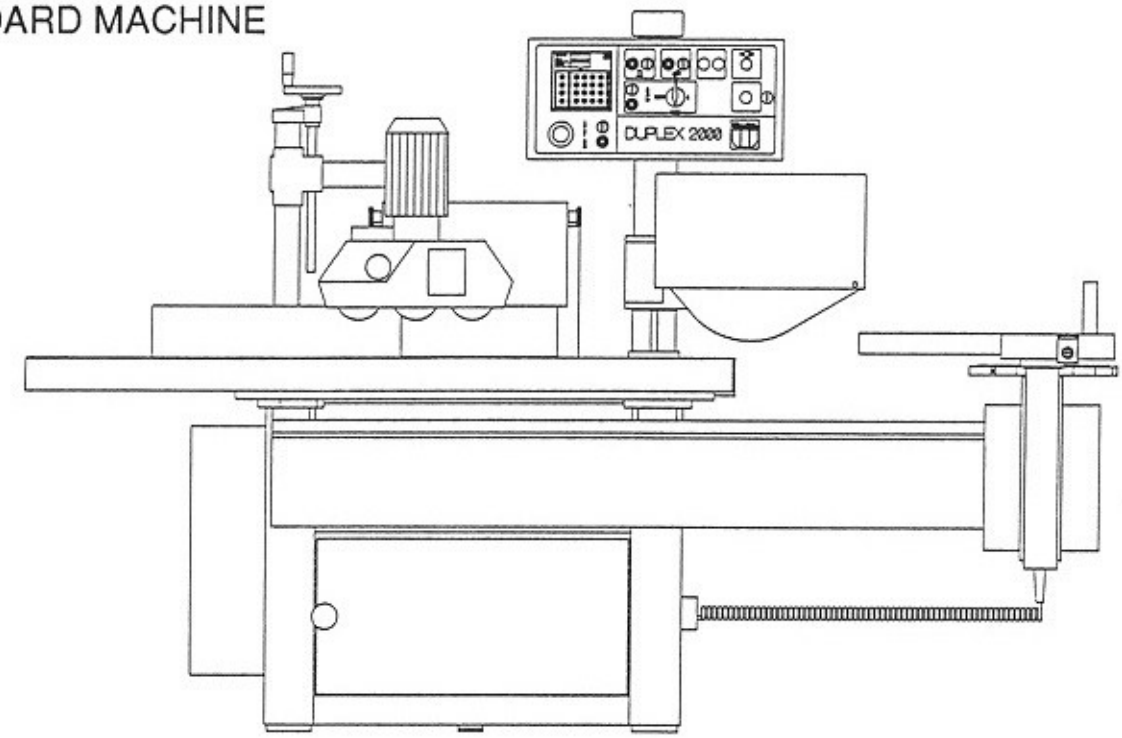
a. length profiling or moulding

b. cutting to length with cut off saw using sliding table

c. tenoning using sliding table

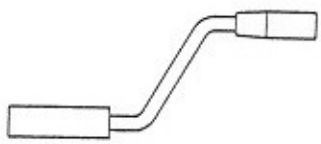
d. angled tenons and other end grain moulding.

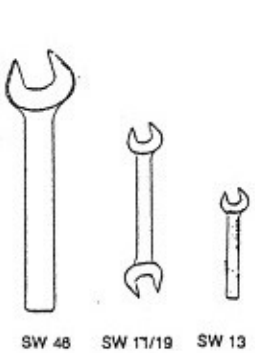
1.2 STANDARD MACHINE

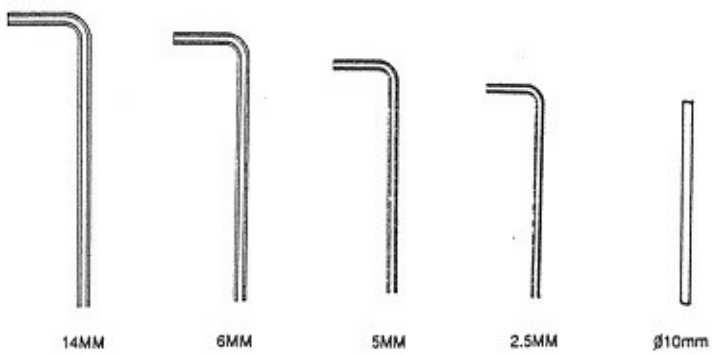


Standard items despatched with machine

Grease Gun







1.3 OPTIONAL EXTRAS

digital readout to turnover stop
digital readout to angle indication
spare quick change backing pieces

1.4 TECHNICAL SPECIFICATION

MAIN MACHINE

Main table size	2145 x 864 (mm)
Table height	900 (mm)
table openings	80-355 (mm)
spindle rise and fall	210 (mm)
spindle diameter options (must be specified with machine)	50/40 (mm)
spindle length	300/210 (mm)
Maximum dia of tooling	322 (mm)
spindle speeds	3000/6000
main motor power (2 speed auto braking)	6.5kw/8.1kw

CUT OFF SAW

Laterial movement of saw unit	120 (mm)
Saw diameter	350(mm)
Bore of saw	30 (mm)
Saw spindle speed	3000 rpm
Saw motor power (auto braking)	2.2kw

SLIDING TABLE

Sliding table size	200 x 1000 (mm)
Fence capacity	2000/2800 (mm)
Sliding table stroke	1700 (mm)
Angle adjustment	$\pm$ 45 °

1.5 SAFETY

Attention

GENERAL SAFETY INSTRUCTIONS

1. Before installing machine please read instruction manual
2. Only suitably qualified personnel should operate this machine
3. Before carrying out maintenance always ensure machine is electrically isolated
4. Always adjust gaurds to cover as much of the cutters as practicable
5. Use safety attachments and fixtures where possible
6. Always keep a safe distance from rotating cutters - use push sticks whenever possible.
7. Keep hands and fingers clear of feed rollers etc.
8. Never wear gloves or loose fitting clothes - remove jewellery etc.
9. Always wear safety glasses
10. Make sure tools have been perfectly sharpened, balanced and correctly tightened.
11. Do not stand in line with workpieces when loading/unloading machine
12. Keep area around machine clean and free from obstacles
13. Always work with full concentration
14. These instructions are for your safety, please observe them carefully

1.6 NOISE

Work place noise emissions according to DIN 45635

	1	2
Machine idling	77.7dB(A)	75.8dB(A)
Machine cutting	88.2dB(A)	86.6dB(A)

NOISE LEVELS

This machine, under certain conditions, will emit noise in excess of 85dB(a)

Noise levels will be affected by the environment in which the machine operates, the timber being machined, tooling, machine setting and dust extraction.

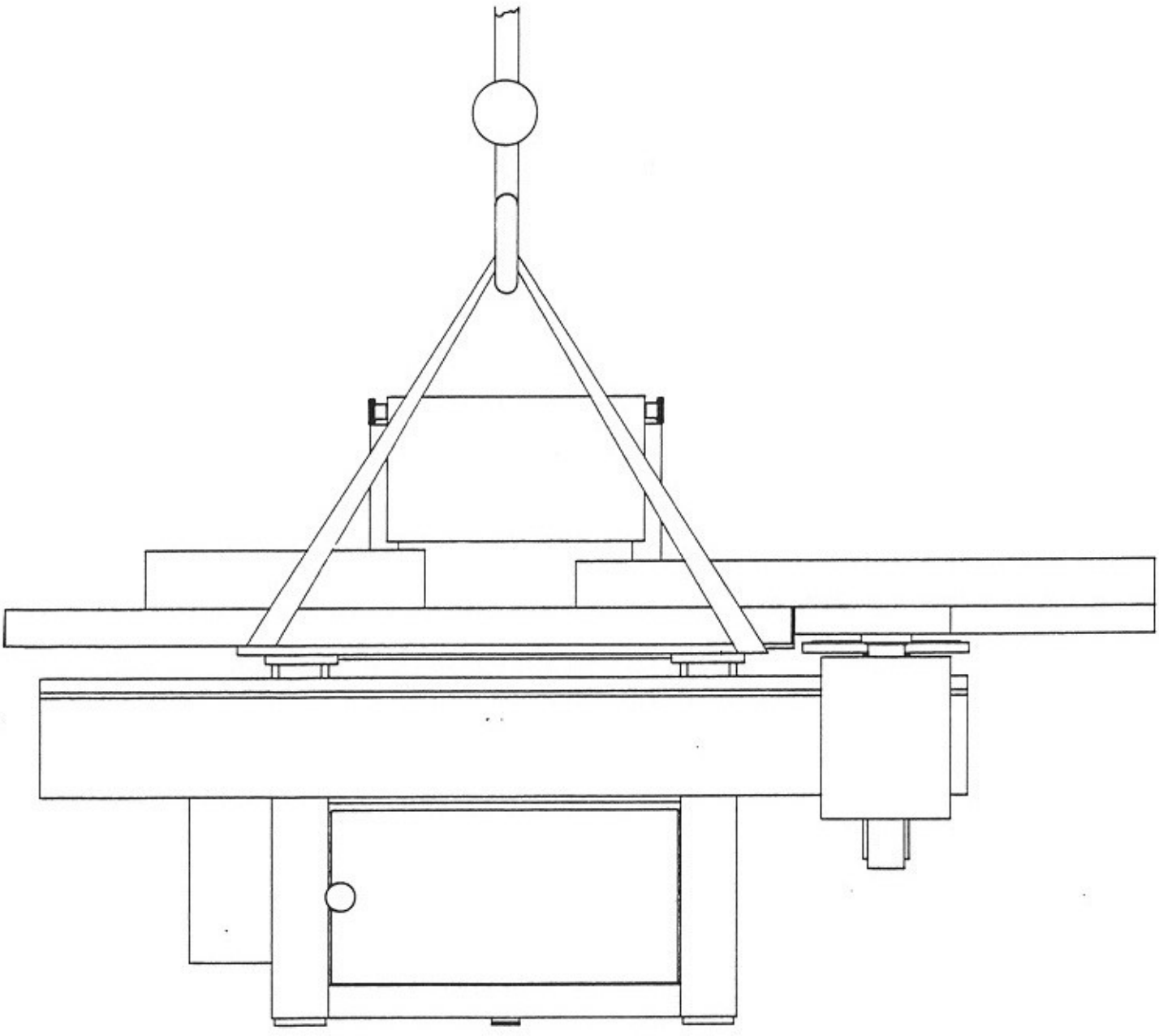
Further information available from Wadkin (at the above address) on request.

''As a manufacturer it is Wadkin's policy to reduce the noise level as far as is predictable.

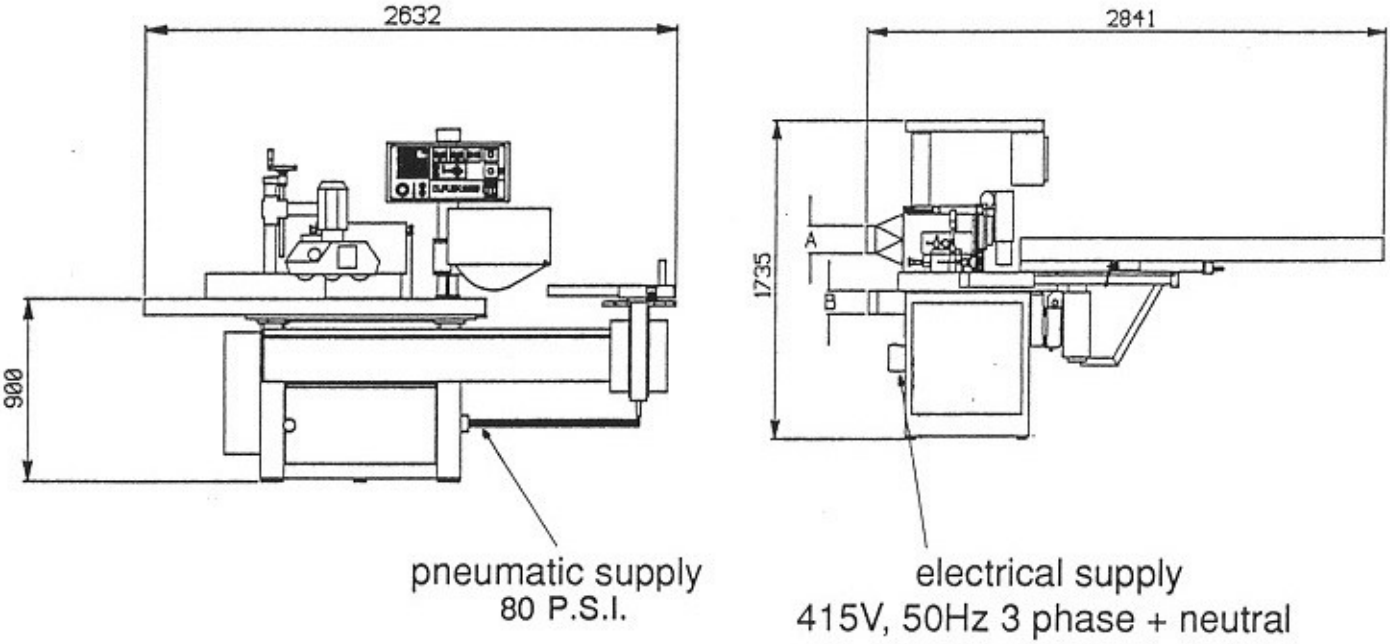
2.1 SLINGING

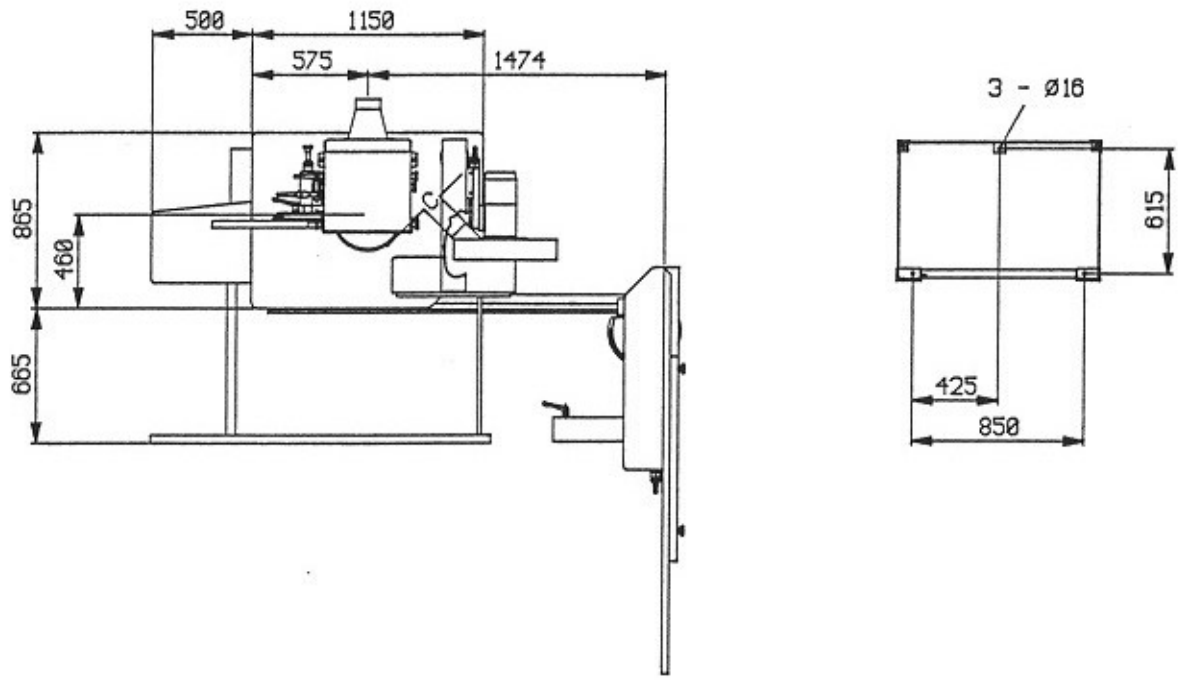
Nett weight 1070 kg

IMPORTANT
Always use slings within the safe working load of the machine weight.
Never work or stand under machine during slinging operation.



2.2 RE-ASSEMBLY OF MACHINE/FOUNDATION PLAN (mm)



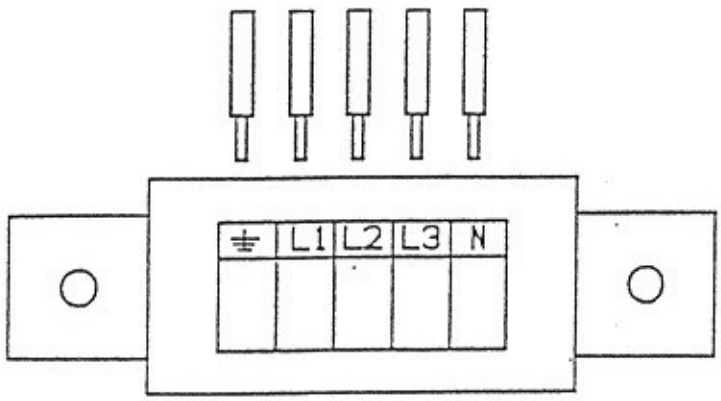


2.3 ELECTRICAL CONNECTION

380/415V 3 Phase 50Hz

Motor Power	KW	4	5.5	6	7	7.5	8	10	12.5	20	25
Fuse	mm2	2.5	2.5	2.5	4	4	4	6	6	10	10
Wire Size	Amp	10	16	16	18	18	18	20	32	40	50

IMPORTANT
Electrical installation must be carried out by a qualified electrician

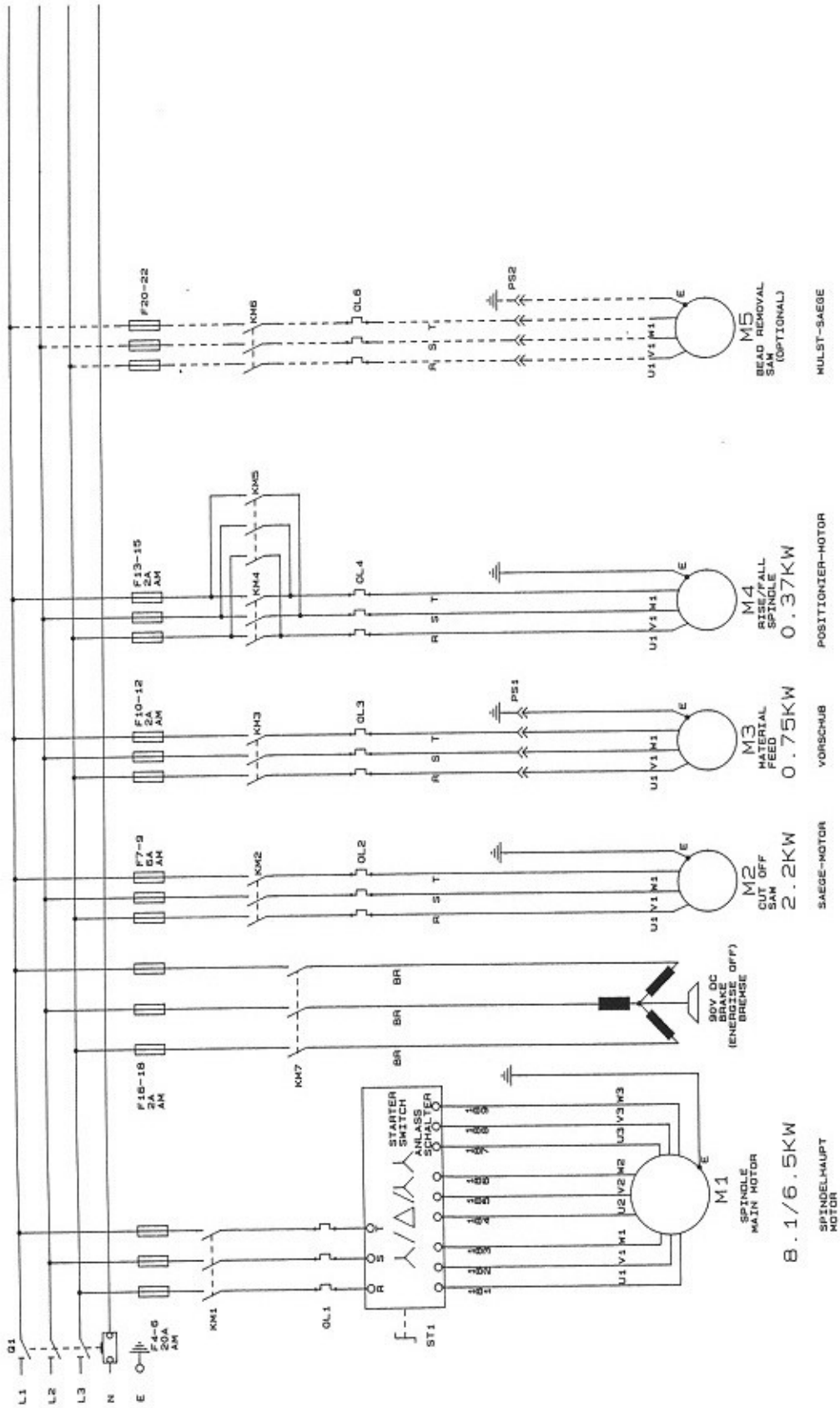


1. Check the voltage, phase and frequency correspond to those on the motor plate.

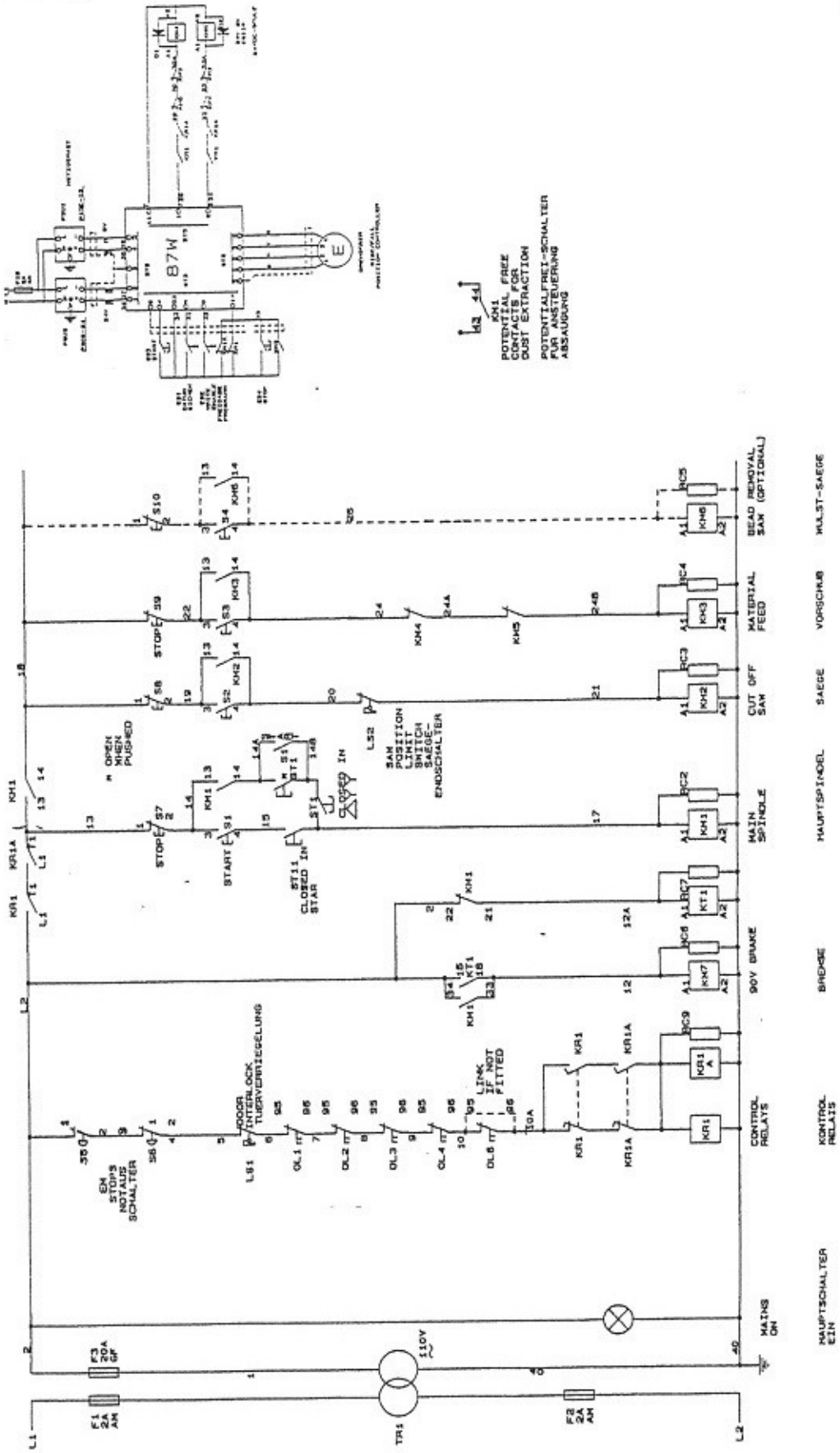
2. Connect the line leads to the appropriate terminals in the isolating switch

3. Check direction of both motors. If these are incorrect, reverse any two of the incoming line leads.

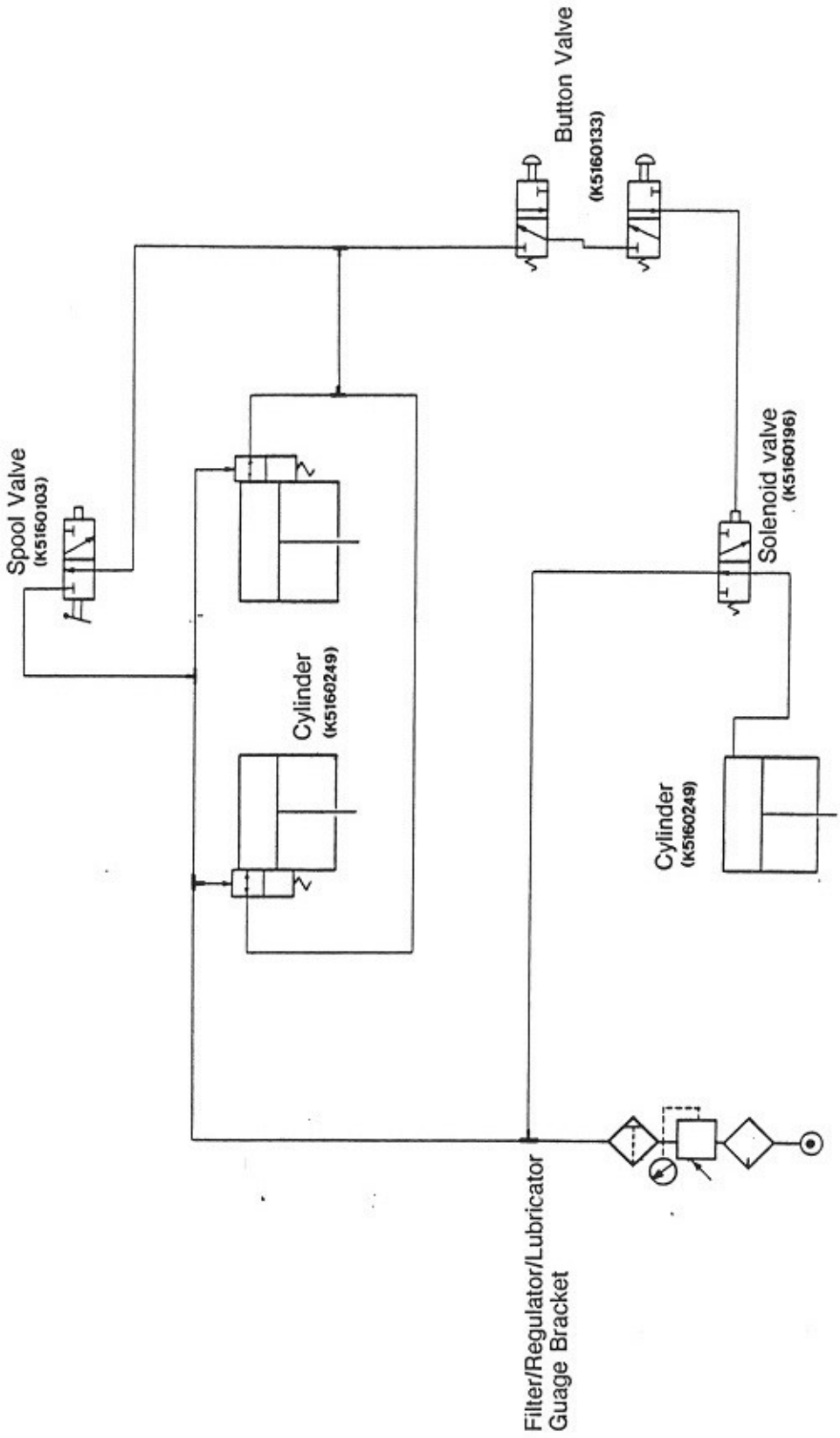
WIRING DIAGRAM



WIRING DIAGRAM



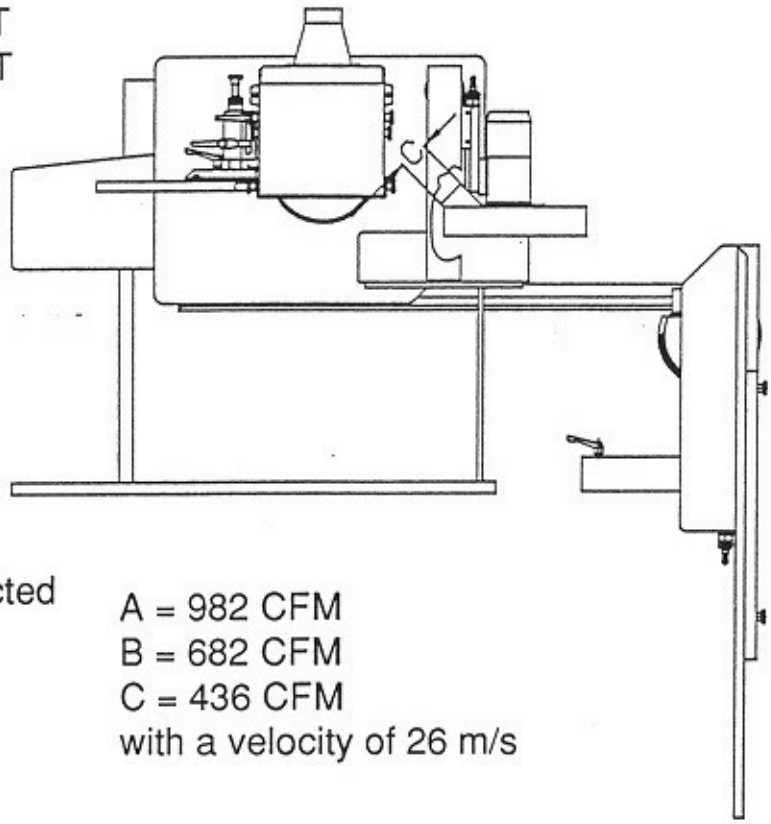
2.4 PNEUMATIC DIAGRAM



2.4 DUST EXTRACTION

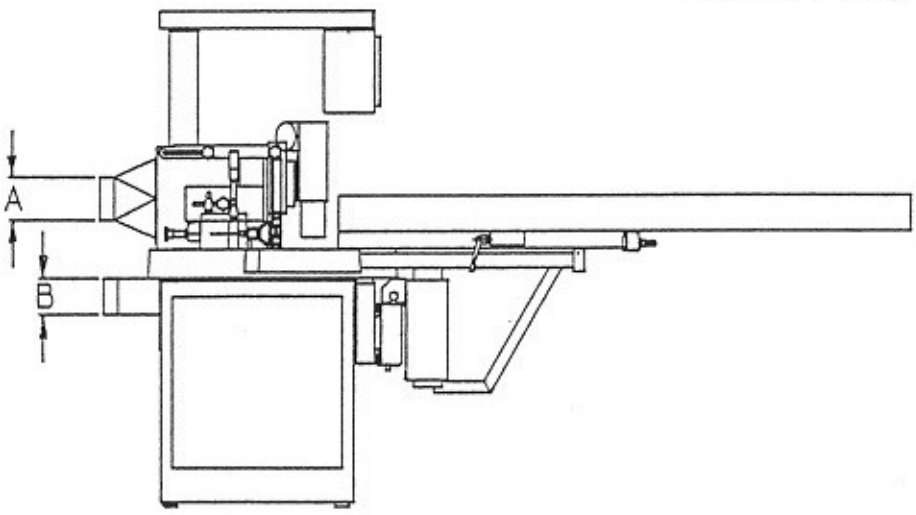
The machine is supplied with three dust extraction outlets.

A = 150 mm DIAMETER OUTLET
B = 120 mm DIAMETER OUTLET
C = 100 mm DIAMETER OUTLET



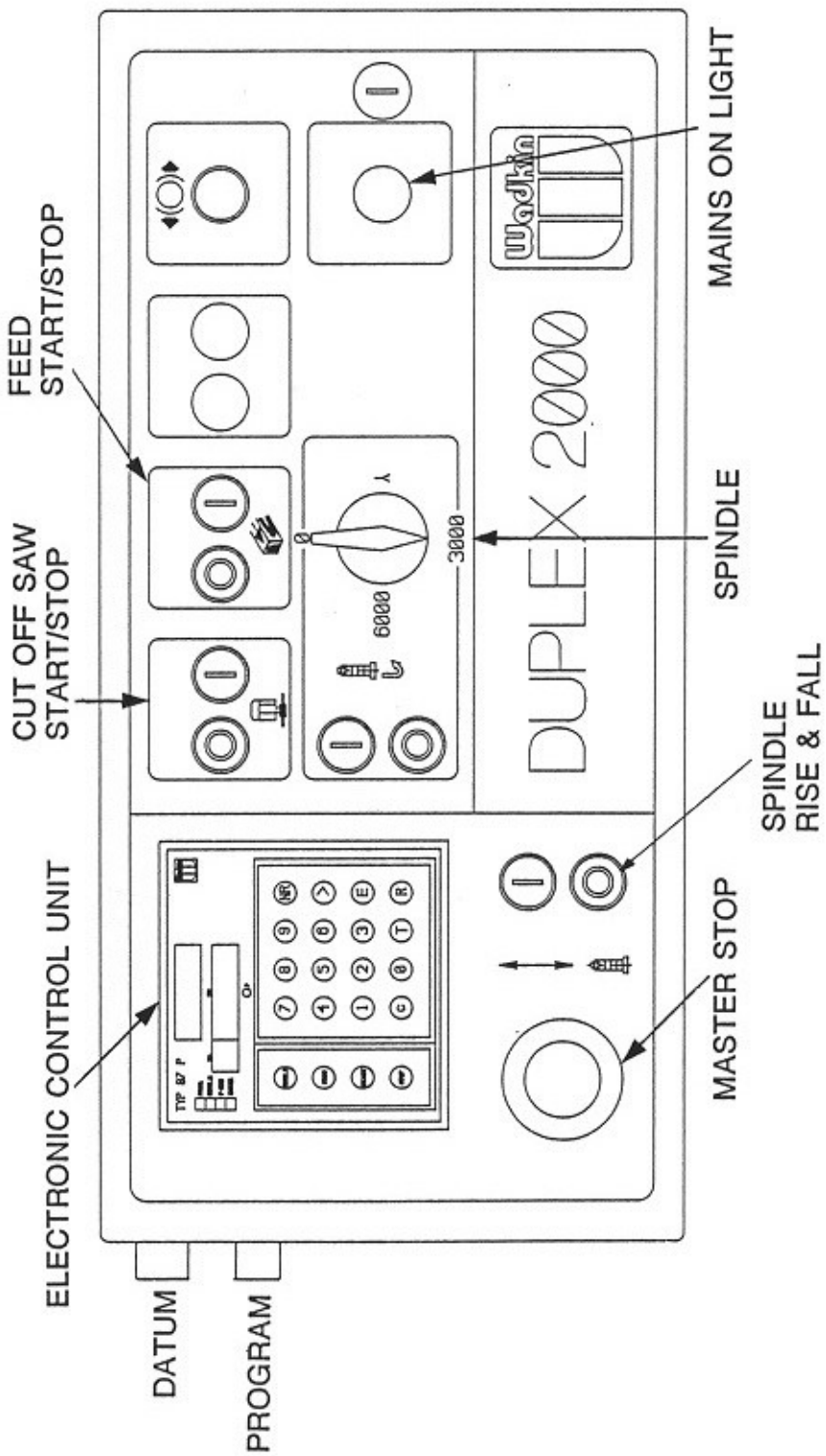
Volume of air to be extracted

A = 982 CFM
B = 682 CFM
C = 436 CFM
with a velocity of 26 m/s



WARNING
Contactor KMI may be live even when the machine is isolated.

3.1 ELECTRICAL CONTROLS

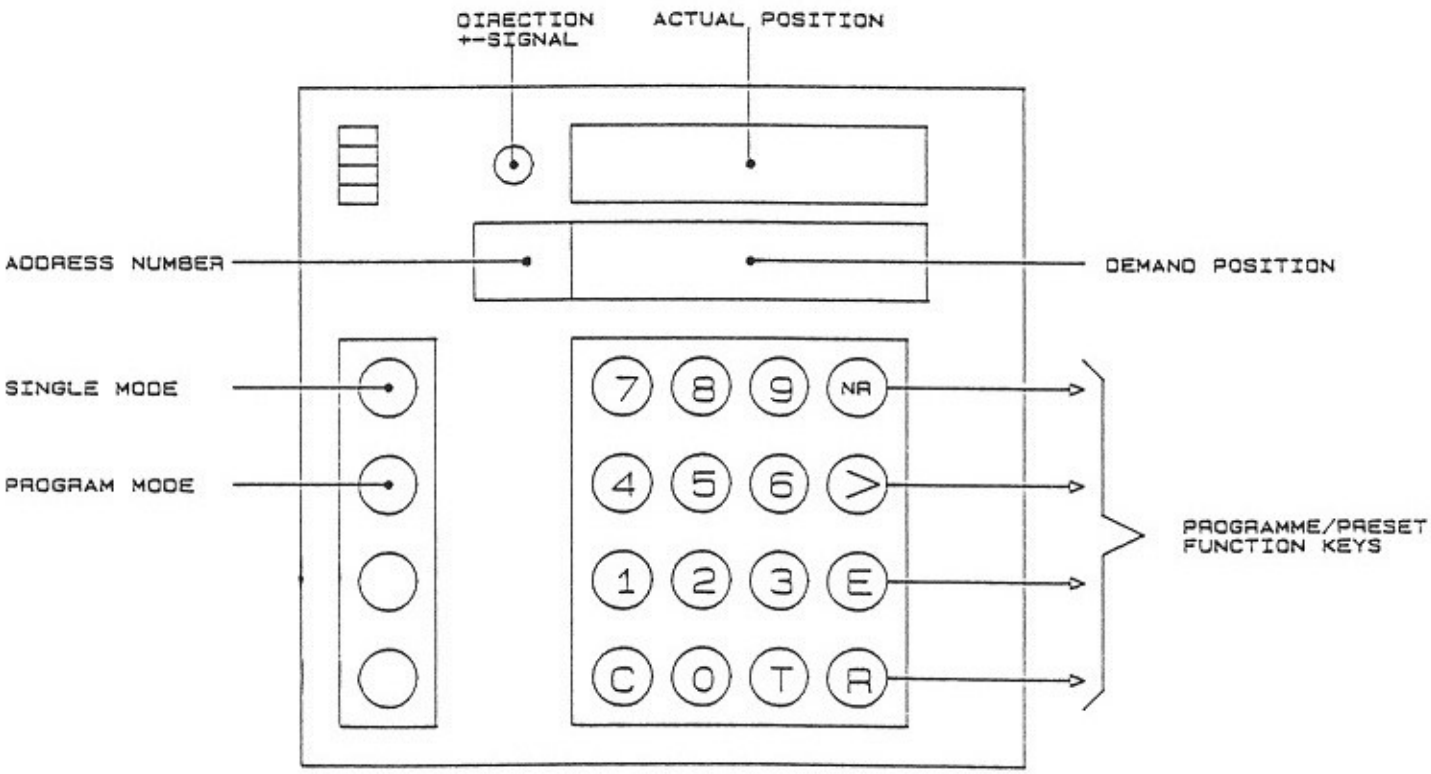


3.2 DUPLEX 2000/87W Control Manual

Introduction

The 87W control will position the Spindle Tool to a preset absolute position.

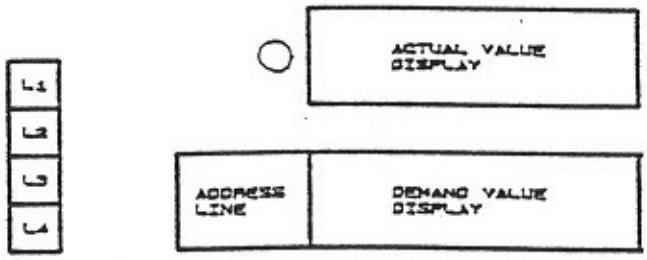
Actual Position is monitored by means of a incremental Encoder which feeds back the information for display in the Top Window of the 87W.



3.2 DUPLEX 2000/87W Control Manual

Controller in Operation

1. Description of Front Panel



Pushbuttons

Prog - Resets the Controller. (Resets to beginning), Also selects programme run mode.

T - Reset the programme to beginning, also used to finish editing.

NR - Selects direct address.

> - Cursor (steps through, line by line)

E - Ends Programming.

R - Select Register (see Set up and Configuration)

SINGLE- Selects Single Run Mode.

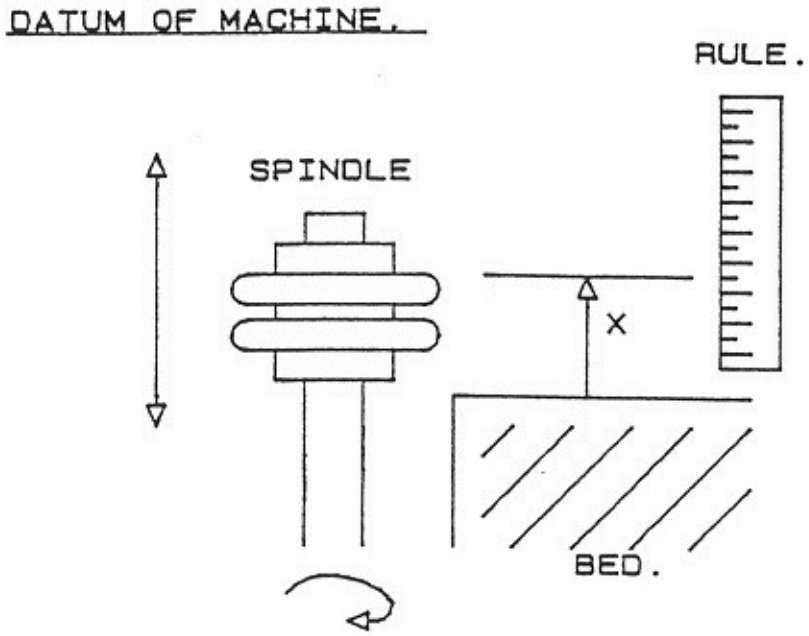
LED's

L1	Prog	illuminated when programme run selected
L2	Single	illuminated when single run selected.
L3	P-End	illuminated whilst motion is taking place.
L4	Error	Fault Lamp

3.2 DUPLEX 2000/87W Control Manual

Datum of Machine

Datuming is required upon delivery of the machine or if the vertical position of the spindle is manually adjusted during any power down conditions.



1. Manually position spindle to preset point.

2. Measure value X - Datum Point.

3 Press SINGLE

4. Enter Datum Value X

5. Close Datum Switch and Release (Top Key Switch).

6. The Demand and Actual Position will now both be identical.

3.2 DUPLEX 2000/87W Control Manual

Programming

Introduction - There are 99 directly addressable lines in the 87W control

Programming - Each programme address comprises
A. Address Number
B. Dimension.

To Programme Turn bottom key switch (Write Enable) ON.

Press PROG	00 Flashes
Press NR	Enter 01 in Address Window
Press >	Cursor LED below dimension is displayed
Press C	Clear Value

Enter dimensional data.

Pressing cursor again, moves the programming to the next line, ie Address Number will increment to 02 and the second line can be programmed.

When the desired numberof lines have been programmed, press E (for End) then turn Write Enable to off.

3.2 DUPLEX 2000/87W Control Manual

Editing a Programme

Write Enable on.
If any line is to be edited, select this line by using NR.
Press C to delete value.
Enter new value.
Press >
The new value is now stored.
Press T to reset programme to beginning.
Write Enable off.

Operation of the Programme

Press "PROG"
All displays set to zero.
To select Address, press "NR"
Enter required address
Press >
Press Start to move spindle to position.

Single Operation

Press "SINGLE"
Cursor LED illuminates in dimension display.

The Operator can now enter any desired dimensions and press start.

3.2 DUPLEX 2000/87W Control Manual

Viewing Registers

Write Enable on
Press PROG
Press R
Enter demand Register eg 6
Press >
Value of Register is displayed
Press E to exit
Write Enable off

Changing of Register Values

All registers are write protected by a security code.
Please contact your distributor or consult the main manual for set-up parameter changing.

Fault-Diagnostics

Fault	Problem
1. No Spindle Movement	Check machine interlocks/limits on machine instructions and emergency stop buttons.
2. Keypad does not respond	Keypad/Enable/Disable incorrect.
3. Error and Demand LED's flash and no spindle movement.	No Encoder signal caused by:- A. Stalled Motor B. Controller Failure C. Cable Failure D. Encoder Failure
4. Demand LED flashes and no spindle movement	Software limits exceeded.

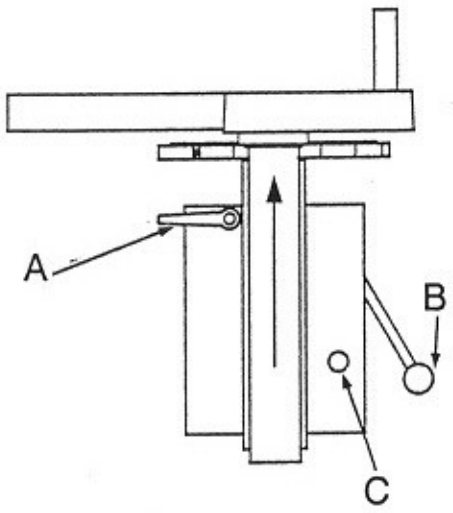
3.2 Duplex 2000 - Set-up

Each 87W Control has a standard set of parameters (Registers) which determines the way that the unit will operate. Each machine has a unique but variable set of registers.

Duplex 2000 - Actual Settings

Register	Value	Description
1	0	No Fast Speed
2	0	-
3	5	0.5mm Stop Offset
4	25	2.5mm Backlash Overrun
5	25	2.5mm Retract Distance
6	0	Saw width zero
7	500	Datum value 50.0mm (not used)
8	311101	System Parameter 1
8/1	3	Programming enabled by external switch Start/Stop permanently disabled
8/2	1	Position field only enabled
8/3	1	Datum value accessed from single
8/4	1	One place of decimals
8/5	0	Forward and reverse relay output
8/6	1	Negative backlash compensation
9	5	In position pulse 0.5 sec
10	5	Backlash dwell 0.5 sec
11	5	Quantity reached pulse 0.5 sec
12	1	Tolerance Window 0.1 mm
13	5	Software limit negative 0.5 mm
14	2200	Software limit positive 220.0mm
18	000000	System Parameter 2
18/1	0	-
18/2	0	Retract a distance set in R5
18/3	0	Absolute setting of single mode
18/4	0	Absolute positioning in programme mode (Register inactive)
18/5	0	No incremental error compensation
18/6	0	Automatic quantity counting
91	050000	Multiplication set a 0.50000
40	0	1st programme block selected
41	4	Direct 99 mode
60	5	Time delay 0.5 sec
61	5	Programme end pulse 0.5 sec
62	5	Encoder pulse monitoring interval set to 0.5 sec
63	1	Self calibration and no retrys

3.3 TABLE POSITION FOR TENONING



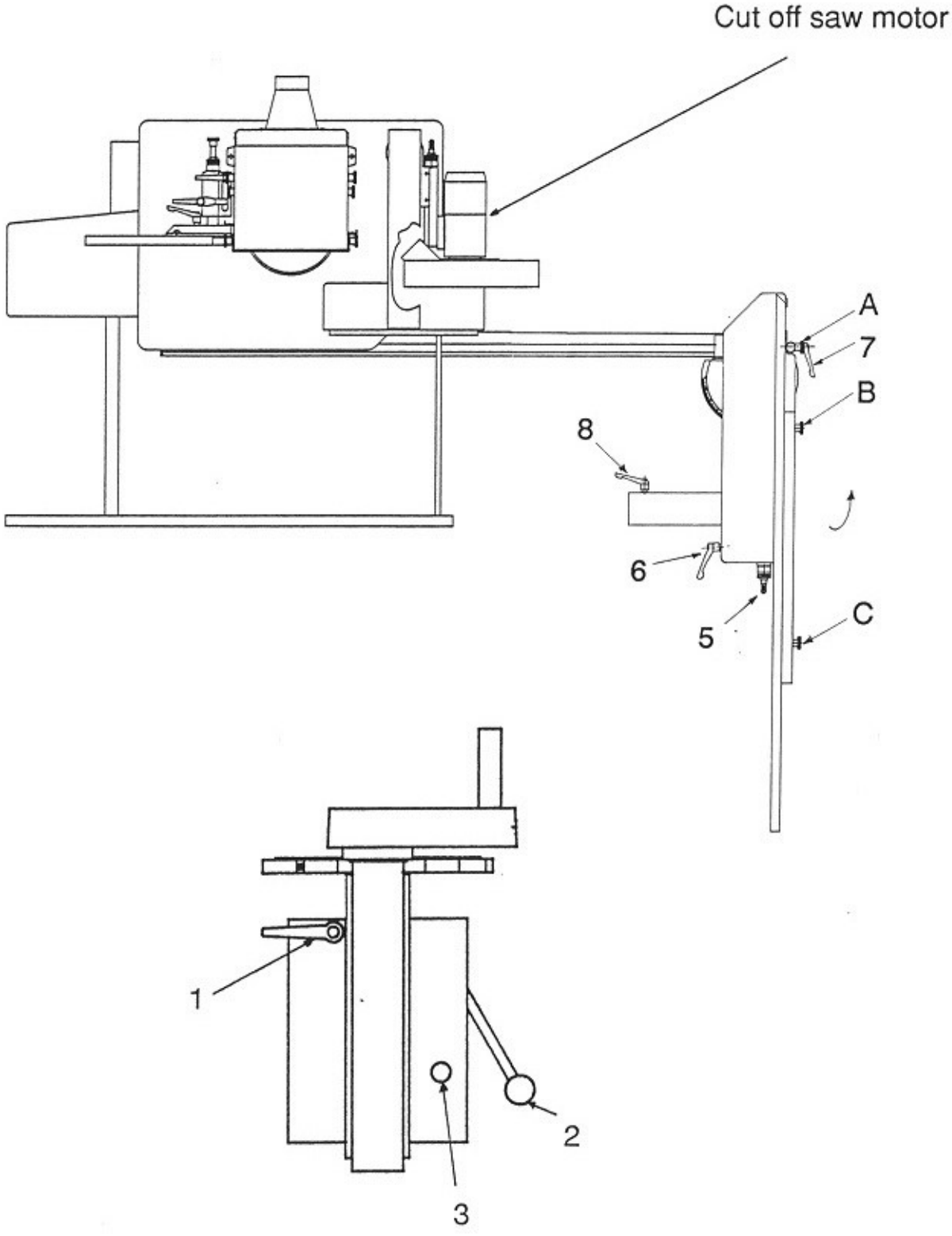
To lift table release handle (A) press down handle (B) which will lift the table and automatically engage height lock (C) re-lock handle (A)

OPERATION OF SLIDING TABLE

To allow movement of Sliding Table:-

1. Clamps must be activated into clamping position.
2. Buttons on the rear of the clamp bracket and fence, **must be depressed simultaneously** to allow movement
3. The release of either button automatically prevents movement of sliding table.

Convert from Tenoning to Profiling Position.



To Convert From Tenoning to Profiling Position.

1. Swing cut off motor to the back of the machine.

2. Move sliding table to the end of the beam.

3. Release locking handle (1) and swing table anti-clockwise through 180°

4. Take weight of table with handle (2) and release lever (3). Slowly lower table with handle (2) to bottom position.

5. Release handwheels (A), (B) and (C) and slide fence back until the front end of the fence is free from the locking shoe on the clamp post.

6. Swing fence clockwise through 90° up to the stop and lock in position with handle (8).

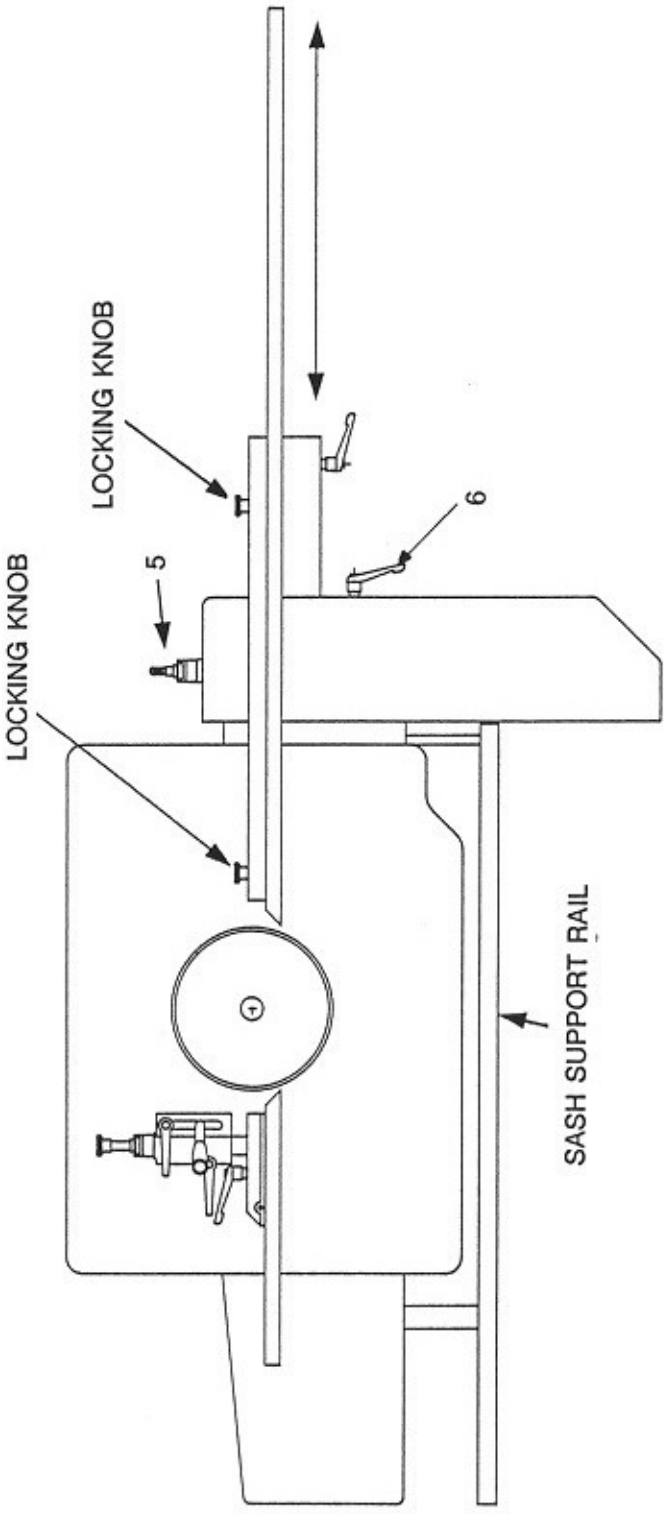
7. Move sliding table up flush to main table and lock in position with handle (6).

8. Remove clamp and post assembly by unscrewing handle (7). Hang assembly on hook provided on carriage below.

9. Fit front deflection guard to infeed fence.

MOULDING POSITION

Adjustments to infeed fence

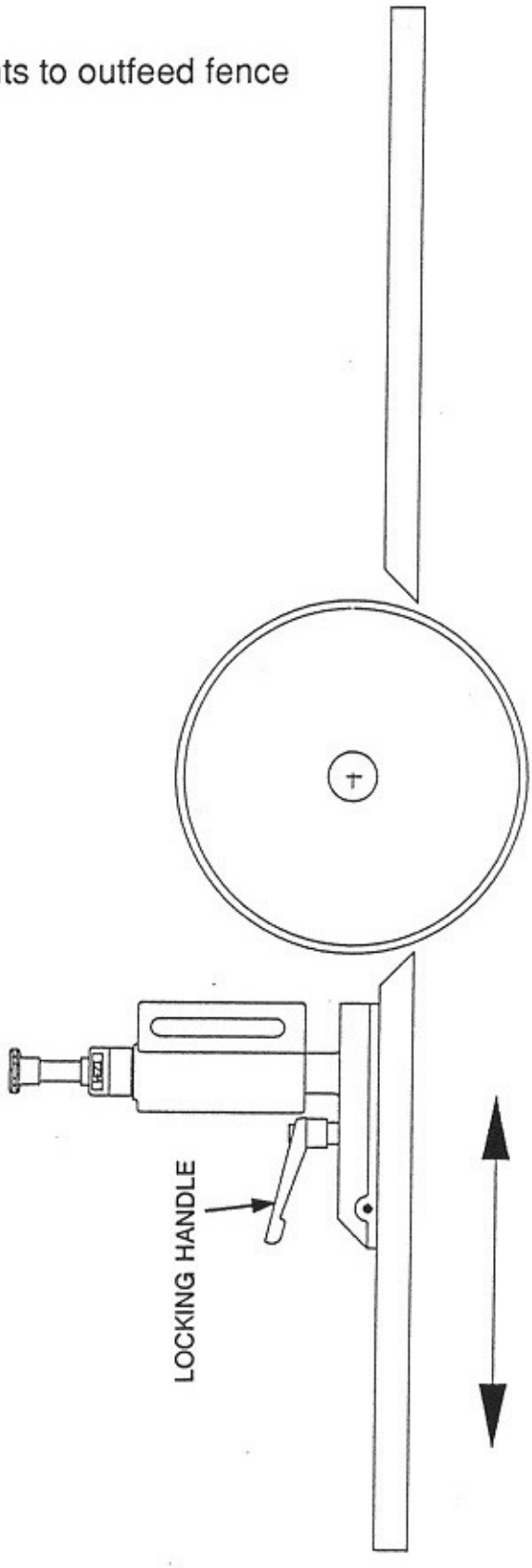


1. For lateral adustment loosen locking knobs. Re-lock after adjustment

2. For in-out adjustment release locking handle (6) and adjust position with handle (5). Re-lock handle (6).

3.4 MOULDING POSITION

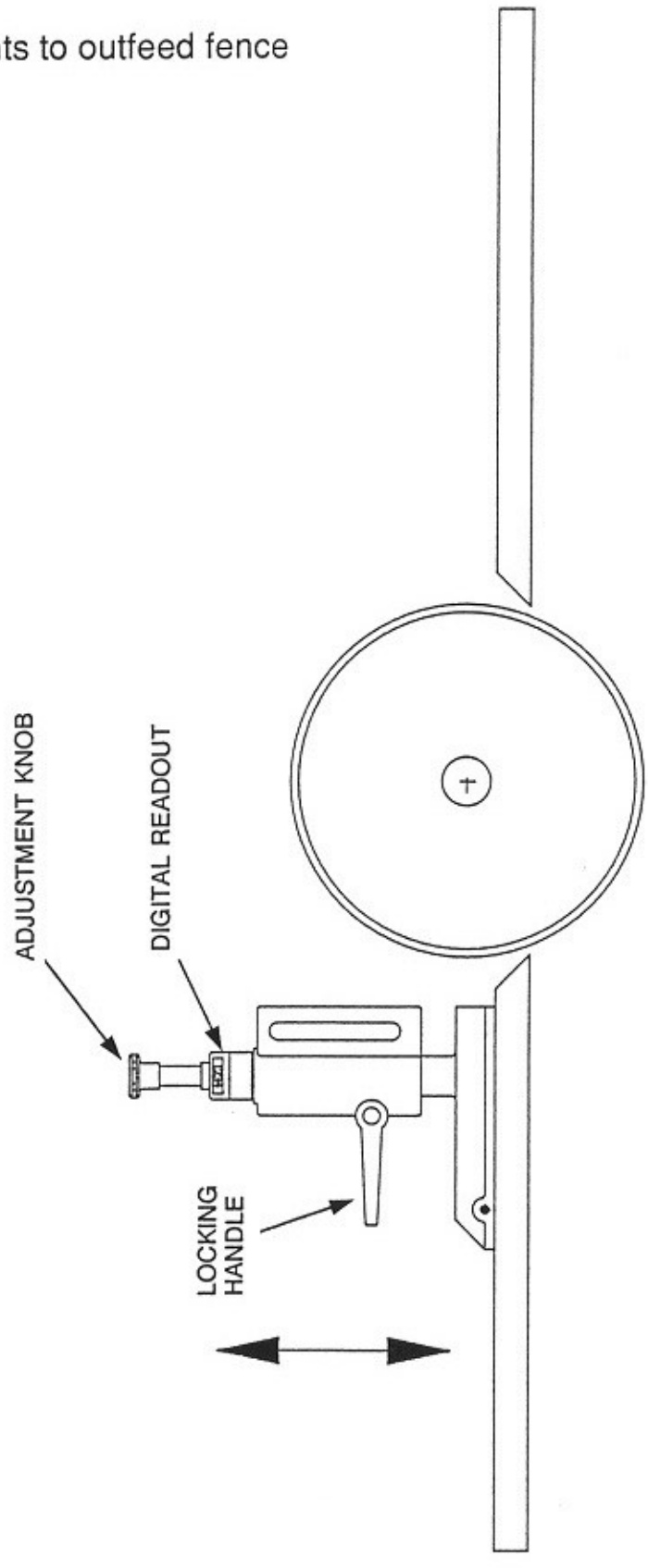
Adjustments to outfeed fence



For lateral adustment loosen locking handle. Re-lock after adjustment

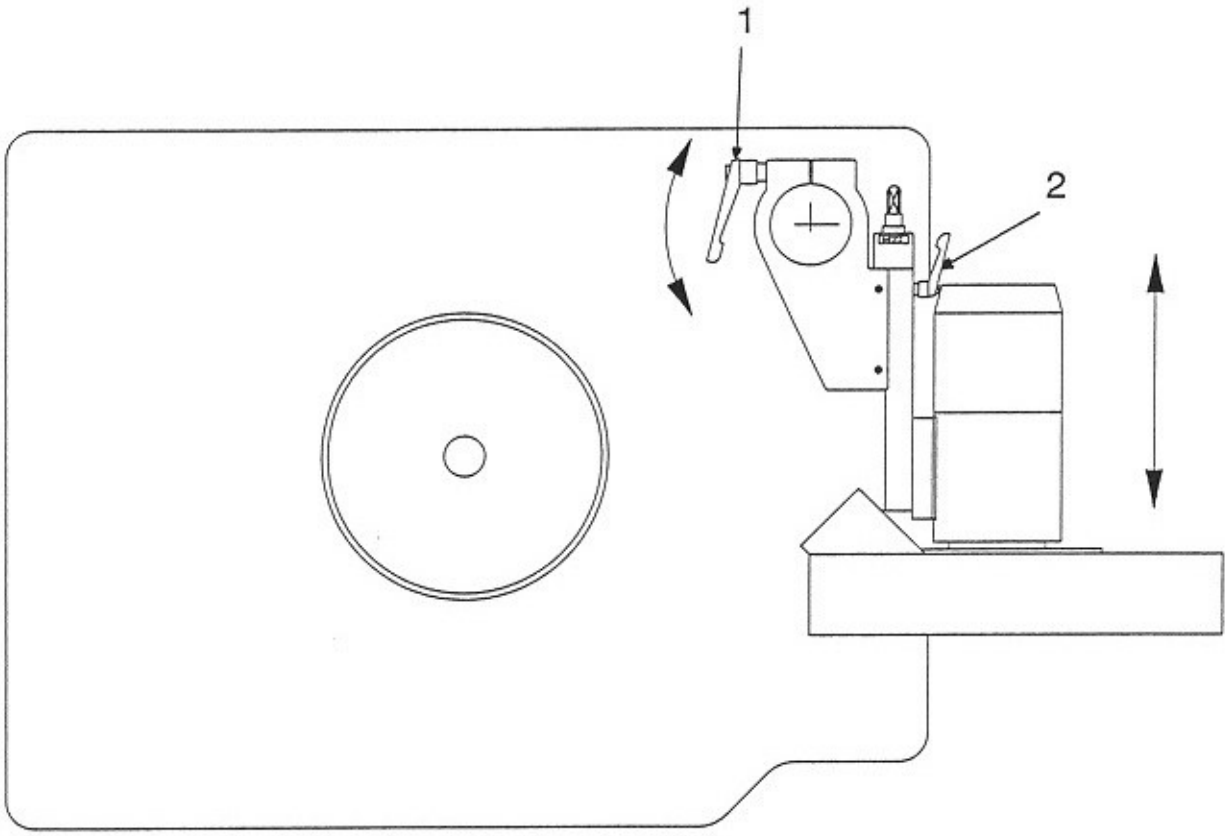
MOULDING POSITION

Adjustments to outfeed fence



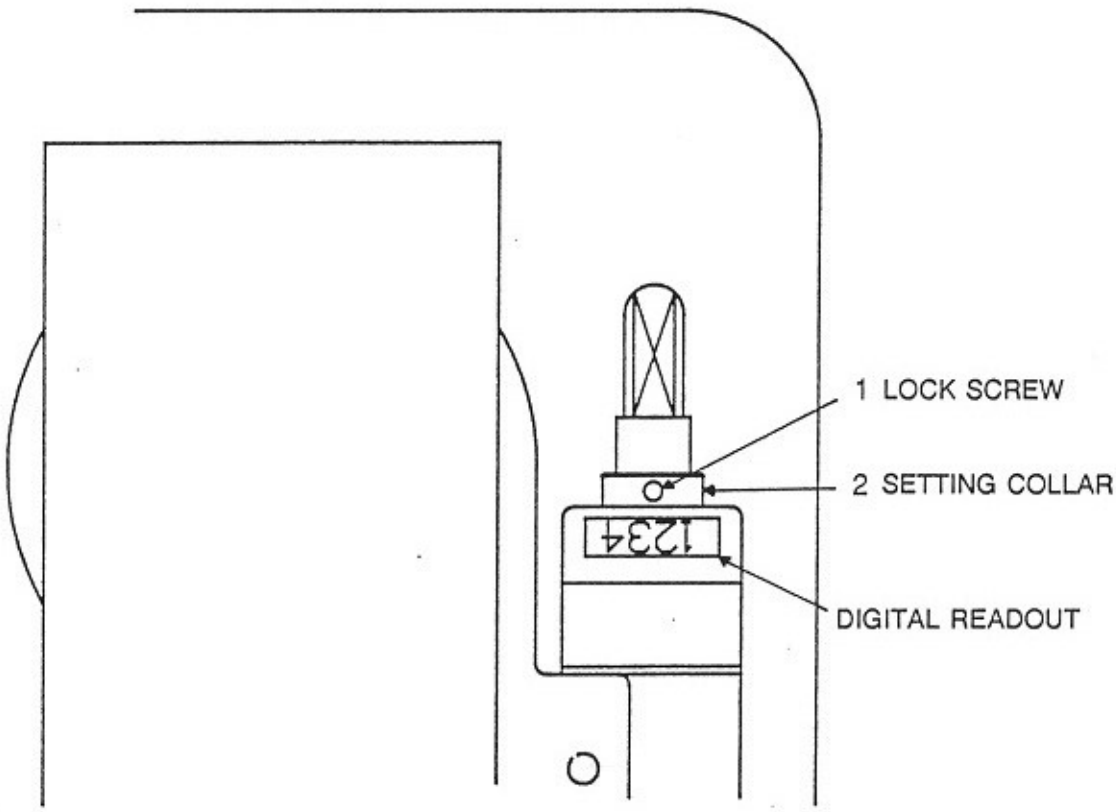
For in-out adustment loosen locking handle and turn adusting knob.
Re-lock after adjustment

3.5 CUT OFF SAW

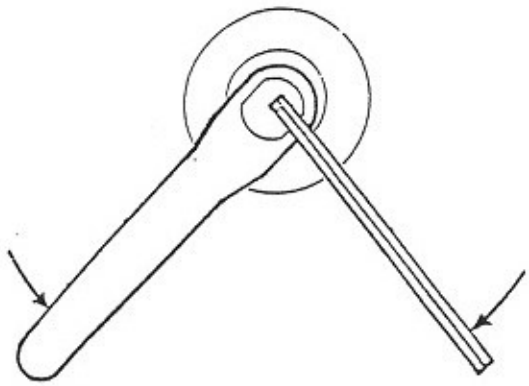


Cut off saw adjustments.

1. Loosen locking handle (1) . Swing assembly to the back of machine and re-lock handle (1).
2. For in-out adjustment loosen locking handle (2) adjust to position and re-lock handle (2).

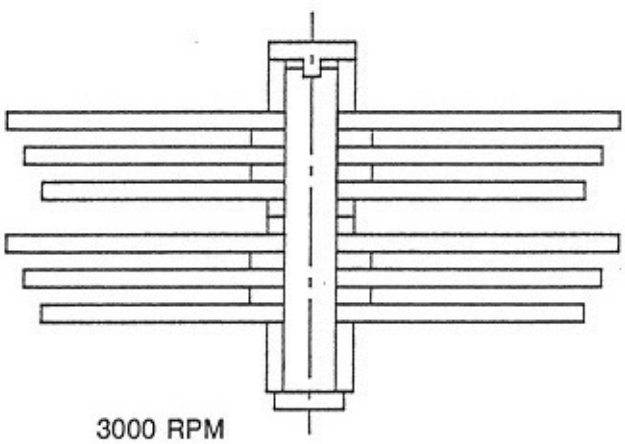

1 LOCK SCREW
2 SETTING COLLAR
1234
DIGITAL READOUT

3.6 TOOL CHANGING



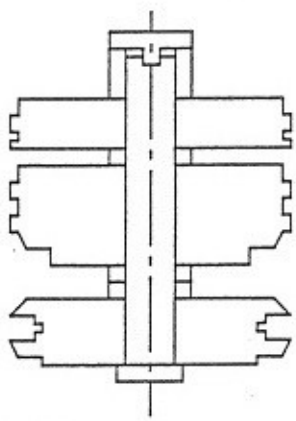
TIGHTEN

TOOLING FOR TENONING



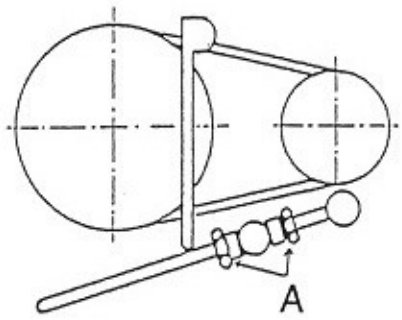
3000 RPM

TOOLING FOR MOULDING



6000 RPM

4.1 BELT TENSION

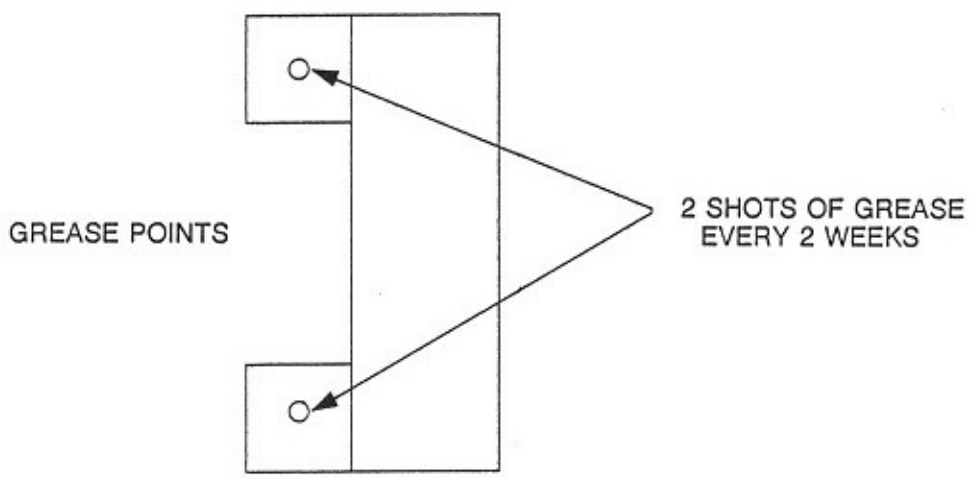


Tension can be altered by adjusting nuts (A).
The correct tension is achieved when there is between 8-10 mm deflection between belt centres.

4.2 LUBRICATION AND CLEANING

The majority of machine working parts are designed to require no lubrication. All that is required is the following:-

1. Top up pneumatic lubricator bottle to level shown by indicator mark on the side of the bottle.
2. 4 shots of grease every 2-3 weeks through 2 grease nipples on carriage (as shown below). It is advisable to keep all bright parts covered with a thin film of oil to prevent rusting.



Application	APPROVED LUBRICANTS					
	Castrol	B.P.	Shell	Esso	Texaco	Century
Worm Boxes	Alpha SP220	Energol XP220	Omala 220	Spartan EP220	Meropa 220	F76
General Lubrication	Magna 68	Maccurat 68	Tonna T68	Febis K68	Way Lube 68	WLC
Pneumatic Lubricators	Hyspin AWS32	Energol HL32	Tellus 37	Nuto H32	Rando Oil HD32	AF32
Grease	Spheerol AP3	Energrease L53	Alvania R3	Beacon 3	Multifak EP3	Lupas A3
Brake Cables	Brake Cable Grease	Energrease L21M	Alvania R3	Multi-purpose Grease		Molycent MP

76141 11D

This range of Single Disc Electro-Magnetic Brakes are spring applied electrically released units which provide Fail-to-Safe operating characteristics, such that on interruption, or failure of power supply, the brake will engage and arrest the load.
If required, brakes can be supplied with, or be fitted with, Manual Release facility. (see Accessories leaflet)

Units are manufactured and tested to VDE 0580 and conform to CENELEC Memorandum No. 3. Part. 3. Para. 2.3 E. E. C. Equipment Safety Regulations.

For application information, refer to «Technical Informations 7» and «Operating Instructions 76 14 . E»

Brake Units fitted with Standard Silicon Rectifier attachment.
Units are available with built-on Silicon Rectifier suitable for direct A.C. mains connections of 220, 380 or 415 Volts single phase. Brake operating coils are wound for 98, 168 and 186 Volts D.C. respectively.

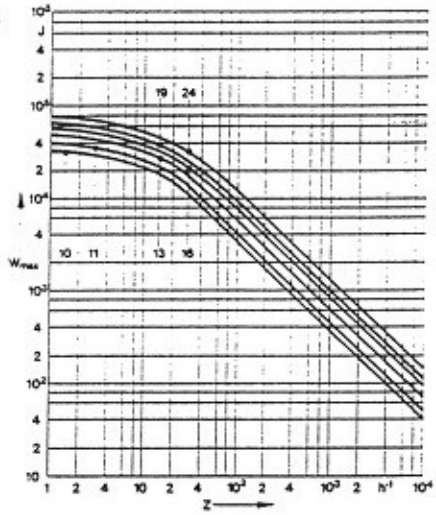
Brake Units fitted with Force Voltage Silicon Rectifier attachment.
This rectifier unit is a special force voltage type, which for a limited period supplies the brake with twice its nominal D.C. operating voltage, this reduces the normal brake release time t_1 by ca. 40 %.
Units are suitable for A.C. mains connections of 220, 380, or 415 Volts single phase. Brake operating coils are wound for 98, 168 and 186 Volts D.C. respectively.

Standard Voltages
Brake without Rectifier: 24, 98, 168 and 186 Volts D.C. Brake with Rectifier: 220, 380 and 415 Volts A.C., 40 to 60 Hz.

Protection to DIN 40 050
Units are available with increased protection and corrosion-proofing on enquiry.

Insulation Class: F

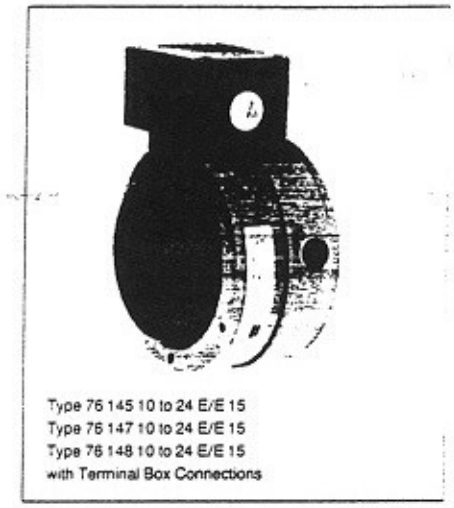
Permissible Frictional Work per engagement W_{max} in relationship to number of Braking operations per hour Z



Accessories: Fixing Screws, Hand Release facility, Torque adjusting Key, Rectifier Equipment.

Subject to alteration

Please take note of ordering data!

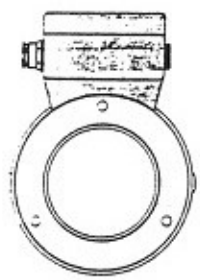


Type 76 145 10 to 24 E/E 15
Type 76 147 10 to 24 E/E 15
Type 76 148 10 to 24 E/E 15
with Terminal Box Connections

D. C. Spring engaged Single Disc Brakes Type 76 14 . . . E 15
for application as a holding brake (no duty rating) with considerably torque M_1.
It is possible to carry out occasional emergency stops with this brake.

Type 76 141 10 to 24 E/E 15
with Flying Leads
Protection
Brake Body IP 43

Type 76 143 10 to 24 E/E 15
with Terminal Block
Protection
Brake Body IP 43
Connection IP 20



Type 76 145 10 to 24 E/E 15
with Terminal Box
Protection
Brake Body IP 43
Connection IP 54

Type 76 147 10 to 24 E/E 15
with Standard Silicon Rectifier
Protection
Brake Body IP 43
Connection IP 54

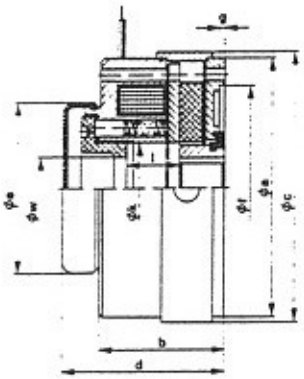
Type 76 148 10 to 24 E/E 15
with Force Voltage
Silicon Rectifier
Protection
Brake Body IP 43
Connection IP 54

Technical Data

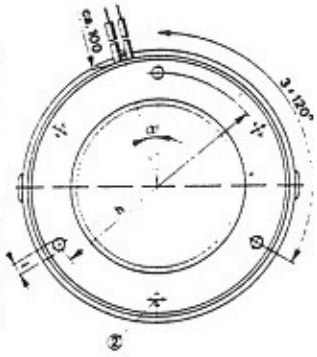
The Response Times listed relate to D.C. controlled brake units operating at normal working temperature and nominally rated voltage. If brakes are A.C. controlled, the listed t_2 values increase by nominally 6 times. The t_1 ("ON") and t_2 ("OFF") values refer to current ON and OFF conditions, i.e. t_1 represents the release time of the brake from the moment of applying current, to the brake torque falling to 10% of its rated value (M_{2N}). t_2 represents the engagement time of the brake from the moment of interrupting current supply, to the brake delivering its rated braking torque (M_{2N}).

The Thermal Capacity P_N is the amount of energy (work) which the brake can dissipate hourly. The Permissible Friction Work W per engagement is the max. amount of energy which the brake can absorb per stop, relative to number of stops per hour. See diagram (values are for fan cooled motor brakes).
All listed values are valid for units operating horizontally. For vertical applications please refer to supplier.
Brake torque can be varied by a screwed adjustment ring at the rear of the brake body. Torque settings must not be increased by more than 10 % above, or reduced more than 30% below the brake's Rated Torque Value (M_{2N}).

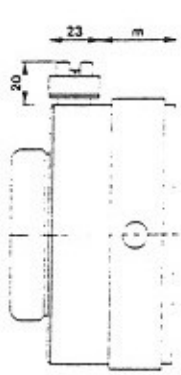
Size	Rated Torque $M_1 = M_{2N}$		Max. Speed	Thermal Capacity		Input Power			Response Time		Inertia	Weight
	Type E	Type E 15		Machine Brake	Motor Brake	Type E		Type E 15	ON	OFF	Brake Hub & Friction Disc	
	M_{2N}	M_{2N}	n_{max}	P_N	P_N	P_{20}	P_{20}	P_{20}	t_1	t_2	J	m
	Nm	Nm	min^{-1}	kJ/h	kJ/h	W	VA	W	ms	ms	$kgcm^2$	kg
10	8	15	5400	250	350	21	43	63	68	15	1,22	2
11	14	25	5000	320	480	24	52	73	90	40	1,75	3,15
13	32	50	4000	460	720	35	63	120	130	30	5	5
16	60	100	3500	570	930	55	88	143	163	70	14	9,5
19	130	200	3000	640	1090	70	112	210	285	80	37,5	13
24	240	360	3000	700	1190	100	178	154	195	180	87	28



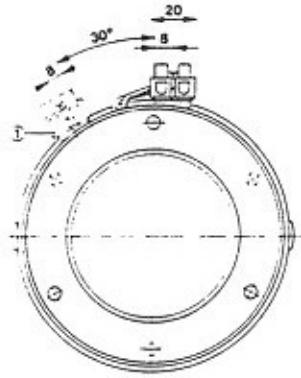
Type 76 141 10 to 24 E/E 15
with Flying Leads



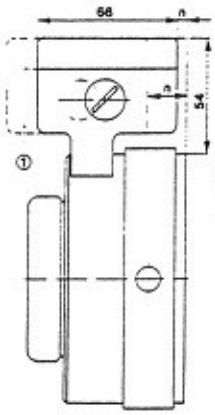
② 6 Holes Size 13 and above



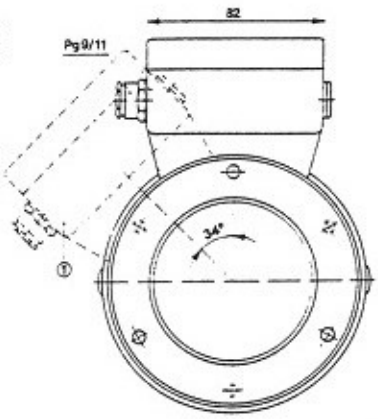
Type 76 143 10 to 24 E/E 15
with Terminal Block Arrgt.



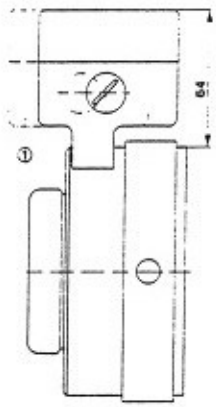
① Size 10



Type 76 145 10 to 24 E/E 15
with Terminal Box Arrgt.
Type 76 147 10 to 24 E/E 15
with Terminal Box
with Silicon Rectifier

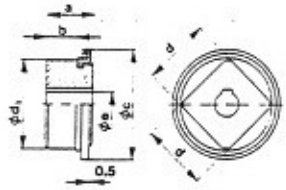


① Size 10



Type 76 148 10 to 24 E/E 15
with Terminal Box
with Force Voltage
Silicon Rectifier

Brake Hub
Type 76 141 10 to 24 D00 900



Keyways normal according to DIN 6885 Sheet 1, Tolerance JS9. See Leaflet Bores and Keyways. The hub minimum bore e_{min} is based on a shaft diameter of materail U.T.S. 500 N/mm², equivalent to the Brake Torque. In special cases, the hub can be supplied with smaller bores. See table sizes e_G.

Brake-Dimensions (mm)

Sz.	a	b	c	d	e	f⊕	g	h	i	k	l	m	n	w	α
10	100	50	105	66	74	75	2,5	88	5,5	39,8	14	28	13	0...30	15°
11	115	58,5	120	74,5	76	90	2,5	100	5,5	39,8	22,5	36	8,5	0...30	15°
13	135	72,5	140	88,5	102	110	2,5	120	5,5	65,8	31	50	22,5	0...54	15°
16	165	87,8	175	106	135	140	2,5	150	6,6	79,2	39,5	66	38,5	0...67	15°
19	190	98,5	200	116	155	160	3	170	6,6	92,2	47	76	48,5	0...79	15°
24	240	117,5	248	140,5	185	200	3	220	9	113	48	84	57,5	0...90	7°

Hub-Dimensions (mm)

Sz.	a	b	c	d	d_1	e_G	e_{min}	e_{max}
10	20,5	13,5	48,9	30	39	9,5	12	22
11	20,5	13,5	48,9	30	39	9,5	12	22
13	24	15	76	45	59	11	12	35
16	26,5	17,5	88	52	68	14	20	45
19	30	20,5	107	62	82	19	25	55
24	45	30	124,5	80	106	19	30	70

Fixing Screws

Brake Sz.	Screw Size	Quantity	Mat. No.
10	M 5 x 60	3	304 028
11	M 5 x 65	3	304 029
13	M 5 x 85	6	304 035
16	M 6 x 100	6	304 060
19	M 6 x 110	6	304 061
24	M 8 x 130	6	304 088

Ordering Data
Single Disc (Fail-Safe) Brake
Type: 76 14 . Size: .. E/E 15
Nominal Voltage: ... Volts D.C. or A.C.
Rated Torque: ... Nm
Brake Hub
Type: 76 141 Size: .. D00 900
Bore e: Ø ... mm H7
Keyway: ... mm JS9
Accessories

Ordering Example
Single Disc (Fail-Safe) Brake
Type 76 147 13 E
Nominal Voltage 220 Volts A.C.
Rated Torque 32 Nm
Brake Hub
Type 76 141 13 D00 900
Bore e Ø 30 mm H7
Keyway 8 mm JS9
Fixing Screws M 5 x 85

76131 11A

This Electro-Magnetic Disc Brake is a spring applied, electrically released unit, which provides Fail-to Safe operating characteristics, such that on interruption, or failure of power supply, the brake will engage and arrest the load.
The brake unit comprises of a stationary coil body with captive spring actuated armature. The body has a centralising recess at the rear for location and three equally spaced holes for securing same to a motor end shield, or machine frame. The arrester element is a combination Friction Disc/Fan, which is fitted onto the motor/machine shaft. Two alternative forms of fixing are available, i. e. either bore and keyway, or Tolerance Ring.
The arrester element can be supplied in either Fan form as illustrated, or Boss form, for the adaption of a pinion, or belt pulley etc ...

Unit are manufactured and tested to VDE 0580 and conform to CENELEC Memorandum Part. 3. para. 2.3 E. E. C. Equipment Safety Regulations.

For application information refer to Application Instructions 7, also Operating and Maintenance Instructions 76 131 11 A.

Standard Voltage: 98 Volts D. C. for operation from Half-Wave Rectified 220/230 Volts 50 Hz Single Phase supply.
(Rectification network must employ both a Line Diode and Freewheel Diode).
Alternative voltages max. 196 Volts D. C. are available at extra cost.

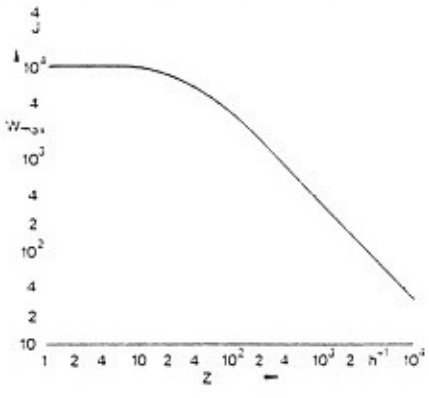
Protection to DIN 40 050: IP 00

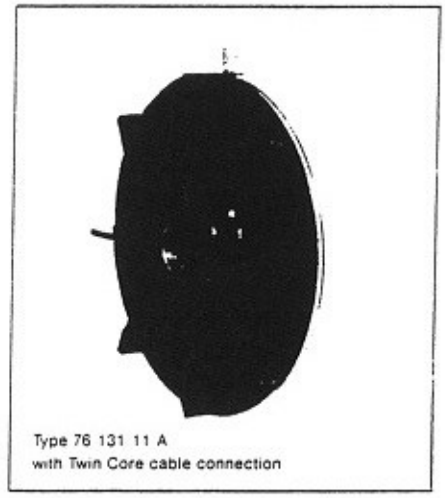
Insulation class: F

Subject to alteration.

Please take note of ordering data!

Permissible Frictional Work per engagement W_{-2s} in relationship to number of Braking operations per hour Z





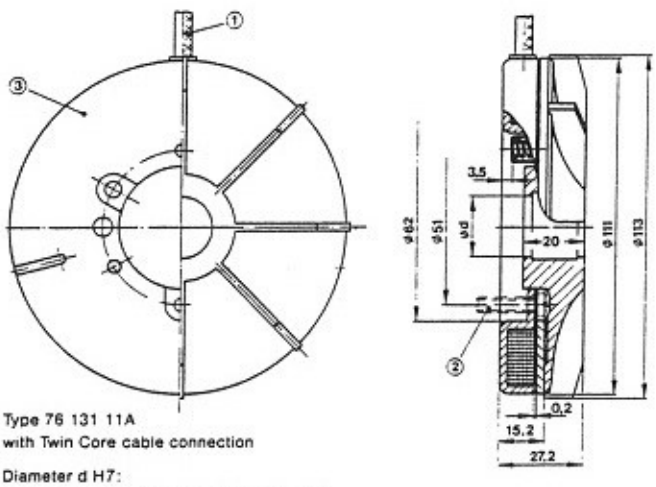
Type 76 131 11 A
with Twin Core cable connection

Technical Data

The Response Times t_1 ON and t_2 OFF refer to current ON and OFF conditions i. e. t_1 represents the release time, from the moment of applying current, to the brake torque falling to 10% of its Rated Torque M_{2N}.
The t_2 value represents the engagement time, from the moment of interrupting current supply, to the brake delivering 90% of its Rated Torque M_{2N}. Values listed relate to the brake being separately switched. When brake is switched in parallel with a Single or Three Phase motor t_2 value is extended.
The Thermal Capacity P_N is the amount of energy (work) which the brake can dissipate hourly. Listed value applies for either a motor or machine application.
All data relates to an operational speed of 3000 r. p. m.

Size	Rated Torque $M_1 = M_{2N}$ M_{2N} Nm	Max. Speed n_{max} min^{-1}	Thermal Capacity Motor Brake P_N kJ/h	Input Power P_{20} W	Response Time ON t_1 ms	Response Time OFF t_2 ms	Inertia (Fan Combination) J $kgcm^2$	Weight m kg
11	4	3000	330	33	35	90	1,5	0,7

Dimensions (mm)



Type 76 131 11A
with Twin Core cable connection

Diameter d H7:
Bore range for Friction Disc/Fan fixing with Bore and Keyway: 8 mm dia. min., 17 mm dia. max.

Normal Keyway to DIN 6885 Sh. 1, JS9 tolerance (ISO R773)

Bore range for Friction Disc/Fan fixing with Tolerance Ring: 14 mm dia. min., 20 mm dia. max.: Shaft tolerance to h9

① Cable Connection 230 mm long (Twin Core 2 x 0,75 mm^2)

② M5 Skt. Hd. Cap Screws (Shallow Head DIN 6912) or DIN 84 supplied only on request

③ View with Fan removed

Ordering Data
D. C. (Fail-Safe) Single-Disc Brake
Type: 76 131 Size: 11 A
Nom. Voltage: ... Volts D. C.
Friction Disc
Keyway Fixing
Bore d: ø ... mm H 7
Keyway: ... mm JS9
Tolerance Ring Fixing
Shaft: ø ... h9

Ordering Example
D. C. (Fail-Safe) Single-Disc Brake
Type 76 131 11 A
Nom. Voltage 98 Volts D. C.
Friction Disc ø 15 mm H7
Keyway 5 mm JS9

4.4 TABLE OF BELTS AND BEARINGS

Belt	No. Off 2 SPZ 1112
Spindle Bearings	No. Off 2 6010 2Z EP5 KLUBER No. Off 1 6307 2Z
Linear Bearings	No. Off 2 LBCT 30 2LS

4.5 LIST OF ELECTRICAL COMPONENTS

Code No.	Supplier	Description	No. Off	Part Number
OL4	Square D	Overload Relay TD 0.54	1	K51.16.555
TR1	H.T.E.	100va Transformer type HTE 100 440 110	1	K51.18.448
PSV1	Elco	P30E-24-N 24v Power Supply Unit	1	K51.18.217
PSV2	Elco	P15E-12-N 12v Power Supply Unit	1	K51.18.219
ES1,ES2 ESS3,ES4	Telemecanique	Key Switches type ZB2-BG2	2	K51.18.220
S2,S3, S5,S7	Telemecanique	Contact Block type ZB2 BE 101	6	K51.17.316
S8,S9	Telemecanique	Contact Block type ZB2 BE 102	4	K51.17.317
S1	Telemecanique	Contact Block type ZB2 BE 103	1	K51.18.228
LP1	Telemecanique	Lens type ZB2 BV6	1	K51.18.940
LP1	Telemecanique	Lamp Holder type ZB2 BV6	1	K51.18.941
LP1	Telemecanique	BLVB Bulb	1	K51.18.942
ST1	Kraus Naimer	Star/Delta 2 Speed Switchtype GBC 929	1	K51.18.229
S1,S2 S3,ES3, ES4,S9	Telemecanique	Start Button type ZB2 BA331	4	K51.18.929
S7,S8	Telemecanique	Stop Button type ZB2 BA432	4	K51.18.988
S5	Telemecanique	Master Stop Button type ZB2 B554	1	K51.19.930
S6	Schrader Bellows	Pressure Switch 43018	1	K51.18.290
LS1	Telemecanique	Limit Switch XCMB 5022	1	K51.18.289

CODE NO	SUPPLIER	DESCRIPTION	No OFF	PARTN No
Q1	Kraus Naimer	Isolator type K964 C51341	1	K51.18.916
F1,F2,F3, F7,F8,F9 F10,F11, F12,F13, F15,F16, F17,F18, F19,F20	Telemecanique	20amp fuse Carriers type DF6 AB08	6	K51.18.260
F1,F2 F10,F11, F12,F13, F14,F15, F16,F17, F18,F19, F20	Ferraz	2amp AM DFZ BA0200 Fuses	13	K51.18.980
F3	Ferraz	2amp GF DFZ BN0200 Fuses	1	K51.18.981
F4,F5,F6	Ferraz	20amp AM DFZ CA20	3	K51.18.198
F7,F8,F9	Ferraz	6amp AM DFZ BA0600	3	K51.18.196
F4,F5,F6	Telemecanique	32A Fuse Carriers type DF6 AB10	3	K51.18.986
KM1,KM2 KM3	Klockner Moeller	DILOM 110v Contactor	3	K51.16.416
KM1	Klockner Moeller	DIL31M Aux. Contact Block	1	K51.16.708
KM1	Klockner Moeller	5 DIL Side Aux. Contact Block	1	K51.16.706
KM2	Klockner Moeller	DIL11M Aux. Contact Block	1	K51.16.704
KM3, KR1	Klockner Moeller	DIL22M Aux. Contact Block	2	K51.16.703
KR1,KM7	Klockner Moeller	DIL00 AM 110v Contactor	2	K51.16.435
KT1	Klockner Moeller	TE11-10 Timer Relay	1	K51.18.199
KM4,KM5	Square D	24v DC Contactors type PCD3.10E	2	K51.18.214
KM4,KM5	Square D	Aux.Contact Blocks type PN22	2	K51.18.215
KM4,KM5	Square D	Mechanical Interlock type PHY	1	K51.18.987
RC1,RC2, RC3,RC4, RC7,RC8	Murrelektronik	Suppressors RC-A022/220 110v-220v	6	K51.18.216
OL1	Klockner Moeller	Z00 24 Overload Relay	1	K51.16.562
OL2	Klockner Moeller	Z00 6 Overload Relay	1	K51.16.555
OL3	Klockner Moeller	Z00 4 Overload Relay	1	K51.16.554

4.6 FAULT FINDING

1. FAULT
"The Machine does not start"

CAUSE	REMEDY
Master stop button depressed	Release master stop button
In line fuses blown	Replace blown fuses
No incoming supply to machine	Check supply to all three phases

2. FAULT
"The Machine stops during working"

CAUSE	REMEDY
Thermal overloads tripped out	Wait until thermal overloads cool down (check setting of thermal over loads)
Interruption to incoming supply	Check supply to all three phases
In line fuses blown	Replace blown fuses

ATTENTION:-
use only original spares supplied by the manufacturer or authorised dealer.
Only suitably qualified personnel should carry out repairs or maintenance.
Failure to observe these instructions may invalidate the guarantee.