

TRIAC (ATC)

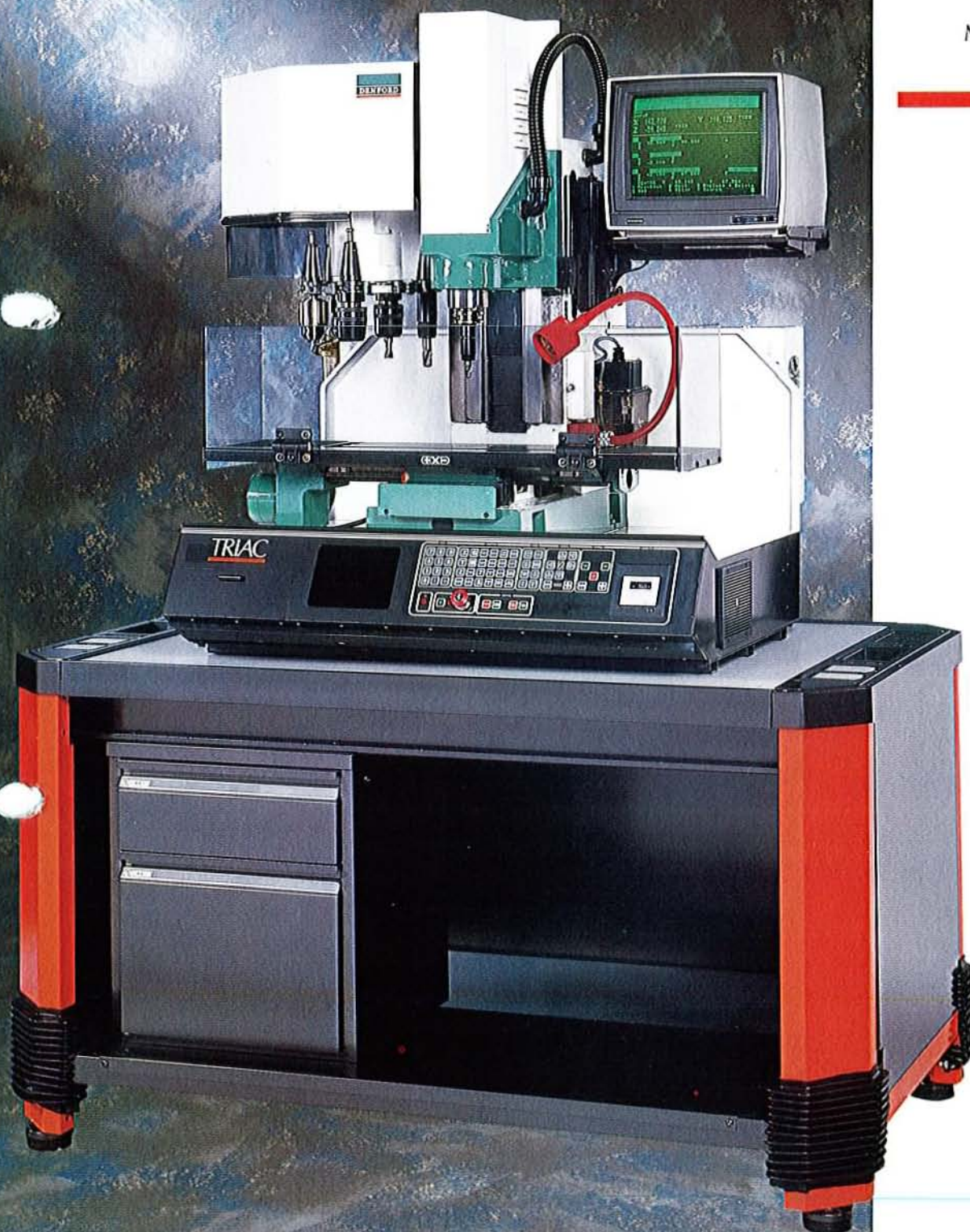
A

3 AXIS

C.N.C. BENCH

MILLING

MACHINE



DENFORD

COMPUTERISED MACHINES AND SYSTEMS

TRIAC (ATC)

TRIAC is programmed using the I.S.O. 'G' and 'M' Code format and incorporates 2 V.D.U.'s displaying programming information and Tool Path Graphics with an audio cassette deck instructing step by step programming. TRIAC has an RS232C giving compatibility to Denfords full range of off line programming software on BBC, Apple and IBM, together with CAD/CAM systems.

GENERAL SPECIFICATIONS

C.N.C. CONTROL SYSTEM

1. Self Contained Console.
2. Green on Black 7" V.D.U. with Anti-glare screen and outlet to external V.D.U. Monitor.
3. Continuous status display of Tool Number, Spindle Speed, Block Number, Run Number, Feedrate, Program No., X, Y and Z axis positions.
4. 12" V.D.U. situated above M/C duplicating programming sequences and showing Tool Path Graphics.
5. 5 Displays of cutter path available:- Plan, Plan & Isometric View showing Cutter Diameter, Side Elevation, Front View, Isometric View.
6. Alpha numeric keyboard allowing full Manual Data Input.
7. Mini Magnetic Cassette Unit for Multi Program Storage - up to 6000 blocks.
8. M.D.I. Single Step and Auto Selector for programs.
9. RS 232C Interface with 7 Din Pin connection to computers.
10. Parallel Printer Interface for obtaining hard copy of programs.
11. I.S.O. Format - allowing 'G' and 'M' Code Programming from DIN 66025 extract.
12. Full 'G' and 'M' code Listings on V.D.U. when required to assist programming.
13. Single Mode Selection Keys.
14. Axis Jog on All Axes with variable feedrate and 0.01 mm step.
15. Programmable Spindle Speed 150-2500 r.p.m. (forward and reverse).
16. 0-100% Spindle Speed Override.
17. Programmable Feedrate 0-1000 mm/min.
18. Feedrate override from 1 mm/min. to 750 mm/min.
19. Linear Interpolation on any 2 out of 3 axes with vectorially correcting feedrates. Circular interpolation on X-Y plane, X-Z plane or Y-Z plane enabled by the plane switching facility.
20. Absolute/Incremental, Inch/mm programming throughout program build-up with mixing.
21. Manual and Programmable Program Stops.
22. G81 repeat facility allowing build-up of subroutines and Do-Loops for drilling, pocket milling, slotting and pecking cycles. (Repeats available - 10').
23. Dedicated canned cycles for rectangular and circular pocket milling, drilling and pecking (G82, 83, 84).
24. Floating Datum Facility.
25. Memory capacity as standard is 750 blocks.
26. Tool length Offsets for up to 16 tools.
27. Tool diameter compensation for all tools.
28. Programmable Dwell from 0.1 to 9999.9 seconds.
29. 4 Auxiliary Outputs.
30. 4 Programmable Inputs.
31. Mirror Imaging on XY, XZ or YZ planes simultaneously.
32. Program Scaling and Component Scaling from 0.01% - 650%.
33. Program Offset allowing dry run facility.
34. System resolution 0.005 mm (0.0002").

SAFETY

Key Operated Emergency Stop Button, Power On Indicator, Membrane Keyboard, Axes Limit Switches - adjustable on Z Axis, Electronic Shear Key built into Spindle Controller, Diagnostic Fault Finder, Toolpath Graphics option to check programs prior to machining, Automatic tool retraction and spindle stop for toolchange.

MECHANICAL

Working Table Surface	500 mm x 160 mm (19 1/2" x 6 1/4")
Longitudinal Travel	290 mm (11 1/2")
Cross Travel	170 mm (7")
Head Travel	235 mm (9 1/4")
Spindle to Table	275 mm (11")
Spindle to Column	170 mm (6 3/4")
Spindle Taper (fitted with Quick Change Holder)	R8
Spindle Taper for ATC	BT 35
3 Tee Slots	10 mm width 31.5 mm centres
Z Axis Ballscrew	16 mm dia. x 5 mm Pitch
X Axis Ballscrew	16 mm dia. x 5 mm Pitch
Y Axis Ballscrew	16 mm dia. x 5 mm Pitch
Max. Machine Length	990 mm (39")
Max. Machine Width	710 mm (28")
Height	980 mm (38 1/2")
Weight (net)	240 kilos (528 lbs)
Machine resolution	0.01 mm (0.0004")

ELECTRICAL

Mains Supply
50/60Hz - 1 phase 220/240 Volts. 8 AMP
Spindle Motor:
Vari Speed 1H.P. A.C.
incorporating A.C. Frequency Changer
Axes Motors:
Stepper Motors - 200 steps/Rev D.C.

STANDARD EQUIPMENT

RS232C Link, 12" V.D.U., Audio Cassette Deck and Headphone Outlet, Audio Instruction Tape, Quick Change Master Holder, Installation-Maintenance and Instruction Manual, Spare Part List, Co-axial T.V. Socket for V.D.U., Maintenance Tools, Mini Cassette for program storage, Automatic Lubrication system, Table Guard, Woven Nylon Cover, Halogen Lo-Vo light.

EXTRA EQUIPMENT

6 station ATC and tooling.
Spray Mist Coolant, Quick Change Tooling, Printer, CAD/CAM and Off Line Computer Programming for Apple, BBC and IBM, link to Robot and Pneumatic Vice, interface with Denford F.M.S.

ATC

Triac can be ordered complete with 6 station automatic tool changer, and optional tooling packages. Tool to tool - approx 7 seconds.

CAD/CAM SOFTWARE

For IBM P.C. 100% compatibles and RM Nimbus P.C.
- Auto CAD, Auto CAM.

HAS BEEN
MANUFACTURED
SPECIFICALLY
FOR TECHNICAL
TRAINING
AND LIGHT
PRODUCTION

AUTOMATIC TOOL CHANGER AVAILABLE

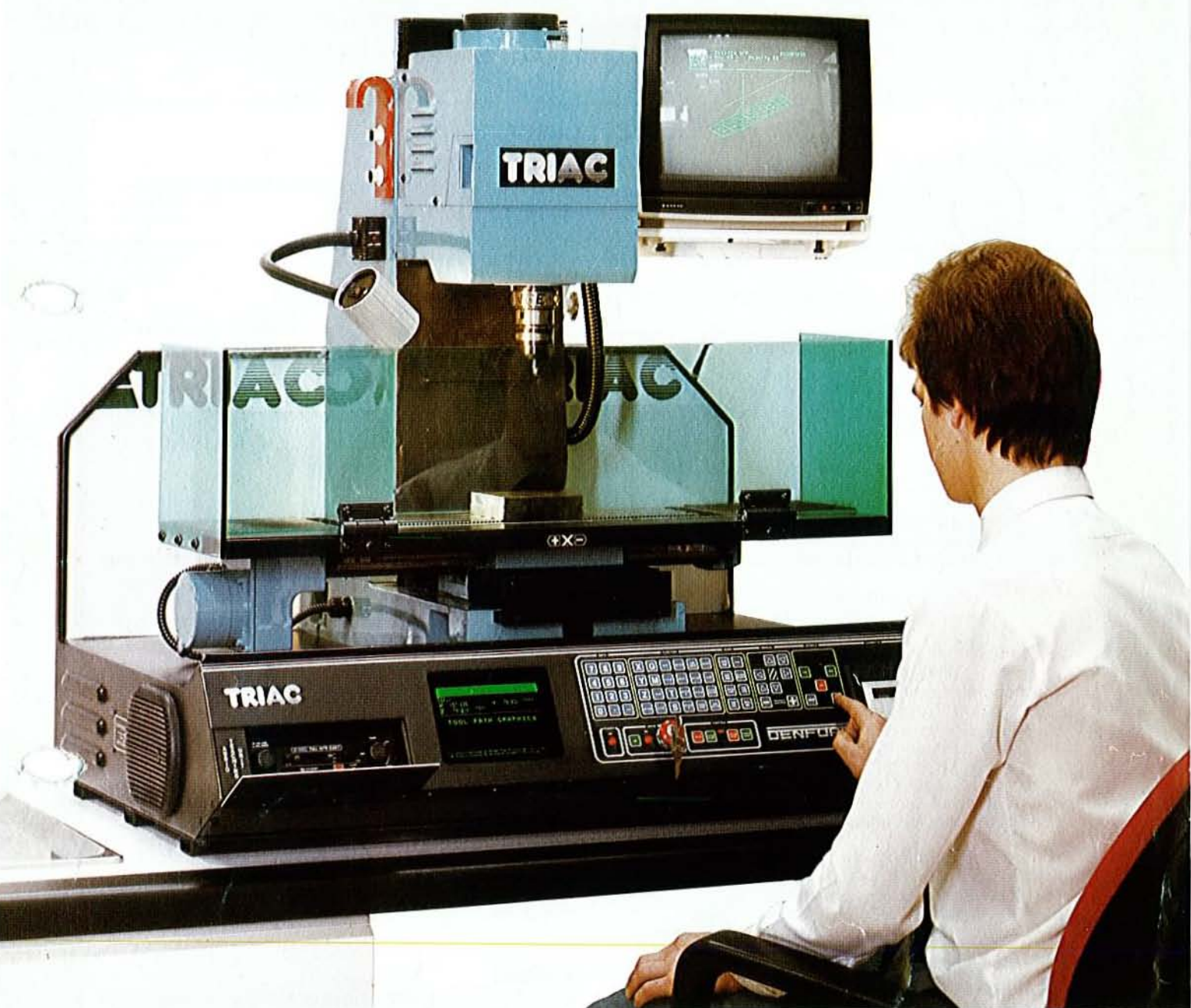


DENFORD MACHINE TOOLS LTD,
BIRDS ROYD, BRIGHOUSE
WEST YORKSHIRE, HD6 1NB
TELEPHONE: 0484 712264
TELEX: 517478 FAX: 0484 722160

DENFORD

COMPUTERISED MACHINES AND SYSTEMS

TRIAC



DENFORD MACHINE TOOLS

TRIAC

TRIAC is a 3 axis C.N.C. Bench Mill manufactured specifically for technical training and light production.

TRIAC incorporates 2 V.D.U's displaying programming information and Tool Path Graphics with an audio cassette deck instructing step by step programming. TRIAC has an RS232C giving compatibility to Denfords full range of CAD/CAM systems, computers and paper tape punch units.

GENERAL SPECIFICATIONS

CNC CONTROL SYSTEM

1. Self Contained Console.
2. Green on Black 7" V.D.U. with Anti-glare screen and outlet to external T.V. Monitor.
3. 12" V.D.U. situated above M/C duplicating programming sequences and showing Tool Path Graphics.
4. Alpha numeric keyboard allowing full Manual Data Input.
5. Mini Magnetic Cassette Unit for Multi Program Storage - up to 6000 blocks.
6. M.D.I. Single Step and Auto Selector for programs.
7. RS.232C Interface with 7 Din Pin connection to computers and paper tape punch units.
8. Parallel Printer Interface for obtaining hard copy of programs.
9. I.S.O. Format - allowing 'G' and 'M' Code Programming from DIN 66025 extract.
10. Full 'G' and 'M' Code Listings on V.D.U. when required to assist programming.
11. Single Mode Selection Keys.
12. Axis Jog on All Axes with variable feedrate and 0.01 mm step.
13. Feedrate over-ride from 1 mm/min. to 750 mm/min.
14. Programmable Spindle Speed 150-2500 r.p.m.
15. Programmable Feedrate 0-1000 mm/min.
16. Linear Interpolation on 3 axes with vectorially correcting feedrates.
17. Absolute/Incremental, Inch/mm programming throughout program build-up with mixing.
18. Manual and Programmable Program Stops.
19. G81 repeat facility allowing build-up of subroutines and Do-Loops for drilling, pocket milling, slotting and pecking cycles. (Repeats available - 10').
20. Dedicated canned cycles for rectangular and circular pocket milling, drilling, and pecking (G82, 83, 84).
21. Floating Datum Facility.
22. Memory capacity as standard is 750 blocks.
23. Tool length Offsets for up to 16 tools.
24. Tool diameter compensation for all tools.
25. Programmable Dwell from 0.1 to 9999.9 seconds.
26. 4 Auxiliary Outputs.
27. 6 Programmable Inputs.
28. Mirror Imaging on XY planes simultaneously.
29. Program Scaling and Component Scaling from 0.01%-650%.
30. Program Offset allowing dry run facility.
31. System resolution 0.01 mm (0.0004").
32. 5 Displays of cutter path available:- Plan, Plan & Isometric View showing Cutter Diameter, Side Elevation, Front View, Isometric View.

MECHANICAL

Working Table Surface	.500 mm x 160 mm (19 1/2" x 6 1/4")
Longitudinal Travel	300 mm (11 3/4")
Cross Travel	180 mm (7")
Head Travel	235 mm (9 1/4")
Spindle to Table	275 mm (11")
Spindle to Column	170 mm (6 3/4")
Spindle Taper	R8
Z Axis Ballscrew	16 mm dia. x 5 mm Pitch
X Axis Ballscrew	16 mm dia. x 5 mm Pitch
Y Axis Ballscrew	16 mm dia. x 5 mm Pitch
Max. Machine Length	990 mm (39")
Max. Machine Width	710 mm (28")
Height	980 mm (38 1/2")
Weight	240 kilos (528 lbs)
Mechanical Resolution	0.01 mm (0.0004")

ELECTRICAL

Vari Speed Machine

50 Hz/60 Hz - 1 phase 220 V.

Spindle Motor

Vari Speed 1/2 H.P. A.C. 0.371 kw 380 - 240 V 1.3 A incorporating AC Frequency Changer

Axes Motors

Stepper Motors 200 Steps/Rev, 3.1 Amps 2.9 V.

STANDARD EQUIPMENT

RS232C Link, 12" V.D.U., Audio Cassette Deck and Headphone Outlet, Audio Instruction Tape, Quick Change Master Holder, Installation-Maintenance and Instruction Manual, Spare Part List, Co-axial T.V. Socket for V.D.U., Maintenance Tools, Mini Cassette for program storage, Automatic Lubrication system, Table Guard, Halogen Lo-Vo light, 2 days operator training.

EXTRA EQUIPMENT

Spray Mist Coolant, Quick Change Tooling, Printer, CAD/CAM and Off Line Computer Programming for Apple, BBC and IBM, Desk Top Programmer, Robot with F.M.S., Pneumatic Vice.

SAFETY

Key Operated Isolator Switch, Membrane Keyboard, Table Guard, Axes Limit Switches, Electronic Shear Key built into Spindle Controller, Diagnostic Fault Finder.



*Controlling
the
future*

TRIAC

PARTS ILLUSTRATIONS

MILLING HEAD	TR.1/100
MILLING HEAD KNOCK OFF	TR.1/100A
BASE & CROSS SLIDE DRIVE	TR.1/200
COLUMN & HEAD DRIVE	TR.1/300
TABLE & CROSS SLIDE	TR.1/400
X AXIS LIMIT SWITCH & SENSOR	
BRACKET ASSEMBLY	TR.1/400A
TABLE GUARD ASSEMBLY	TR.1/400B
CABINET	TR.1/500
LUBRICATION SYSTEM	TR.1/600

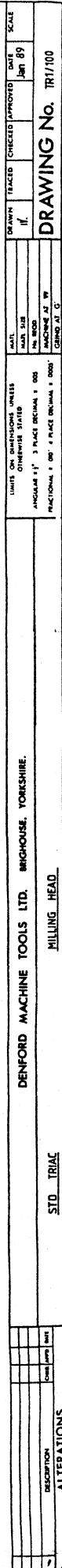
PART No.	DESCRIPTION	QTY
TR.1/102	SPINDLE	1
104	DRAWBAR CAP	1
106	VERTICAL HEAD JIB STRIP	1
107	JIB STRIP SCREW	1
108B	HEAD COVER	1
110	JIB STRIP LOCK	1
111	SPINDLE NOSE CAP	1
112	SPINDLE GREASE COLLAR	1
114	MOTOR PULLEY	1
115	SPINDLE RPM SENSOR BRACKET	
116	HEAD KNOCK OFF BLOCK	1
117	" " " ROD	1
118	" " " PAD	1
119	" " " MICRO SWITCH BOX	1
120	" " " BUSH	1
121A	TERMINAL BRACKET	1
122	COVER PLATE	1
123	HEAD COVER PLATE	1
TR.2/101	SPINDLE PULLEY	1
TR.3/101	MILLING HEAD	1
RM.1/108	RPM SENSOR TRIP	1
CH.338Z	AXIS DIRECTION PLATE	1
CH.438B	NAMEPLATE "DENFORD"	1

DESCRIPTION	MANUFACTURER & REF	COMPUTER No.	QTY
DRIVE MOTOR	SEM:MT30X2-44L	BI 00306F	1
TIMING PULLEY	FENNER:14L100(TR1/114)	BI 00643	1
TIMING PULLEY	FENNER:22L100(TR2/101)	BI 00643D	1
TIMING BELT	FENNER:150L100	BI 00646A	1
BEARING	FAG : 7208 B	BI 00102D	2
LOCKNUT	FAG : KM 8	BI 00186H	1
WASHER	FAG : MB 8	BI 00186I	1
SENSOR	BALLUFF : NJ 58 GN	BI 00401A	1
MICRO SWITCH	BURGESS : 4CRQR	BI 00381C	1
BRG SEAL	NYLOS RINGS : 6208 AV	BI 00113C	1
R8 TOOLHOLDER	EASICHANGE : ECR8	BI 00855	1
DIE CAST BOX	RS 509-939 (TR1/119)	RS 509-939	1

<u>PART No.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
TR.1/101	MILLING HEAD	1
102	SPINDLE	1
103A	SPINDLE PULLEY	1
104 ✓	DRAWBAR CAP	1
105	SPINDLE MOTOR PLATE	1
106	VERTICAL HEAD JIB STRIP	1
107 ✓	JIB STRIP SCREW	1
108	HEAD COVER	1
109	DRAWBAR COVER	1
110 ✓	JIB STRIP LOCK	1
111	SPINDLE NOSE CAP	1
112	SPINDLE GREASE COLLAR	1
113A	SPINDLE COVER	1
114A	MOTOR PULLEY	1
115 ✓	SPINDLE RPM SENSOR BRACKET	1
116 ✓	HEAD KNOCK OFF BLOCK	1
117 ✓	HEAD KNOCK OFF ROD	1
118 ✓	HEAD KNOCK OFF PAD	1
119 ✓	HEAD KNOCK OFF MICRO SWITCH BOX	1
120 ✓	HEAD KNOCK OFF BUSH	1
CH.338Z	AXIS DIRECTION PLATE	1
CH,438B	NAMPLATE "DENFORD"	1

<u>DESCRIPTION</u>	<u>MANUFACTURER & REF</u>	<u>COMPUTER No.</u>	<u>QTY</u>
DRIVE MOTOR	ASEA : MT.71B14F 130-4	55500306A	1
TIMING PULLEY	FENNER: 15L100 (TR,1/114A)	55500643B	1
TIMING PULLEY	FENNER: 18L100 (TR,1/103A)	55500643C	1
TIMING BELT	FENNER: 124L100	55500636C	1
BEARING	FAG : 7208 B	55500102D	2
LOCKNUT	FAG : KM 8	55500186H	1
TAB WASHER	FAG : MB 8	55500186I	1
SENSOR	BALLUFF : NJ 58 GN	55500401A	1
MICRO SWITCH	BURGESS 4CRQR	55500381C	1
BRG SEAL	NYLOS RINGS: 6208 AV	55500113C	1
R8 TOOLHOLDER	EASICHANGE: ECR8	55500855	1
DIE CAST BOX	R.S. 509 939 (TR.1/119)	509 939	1

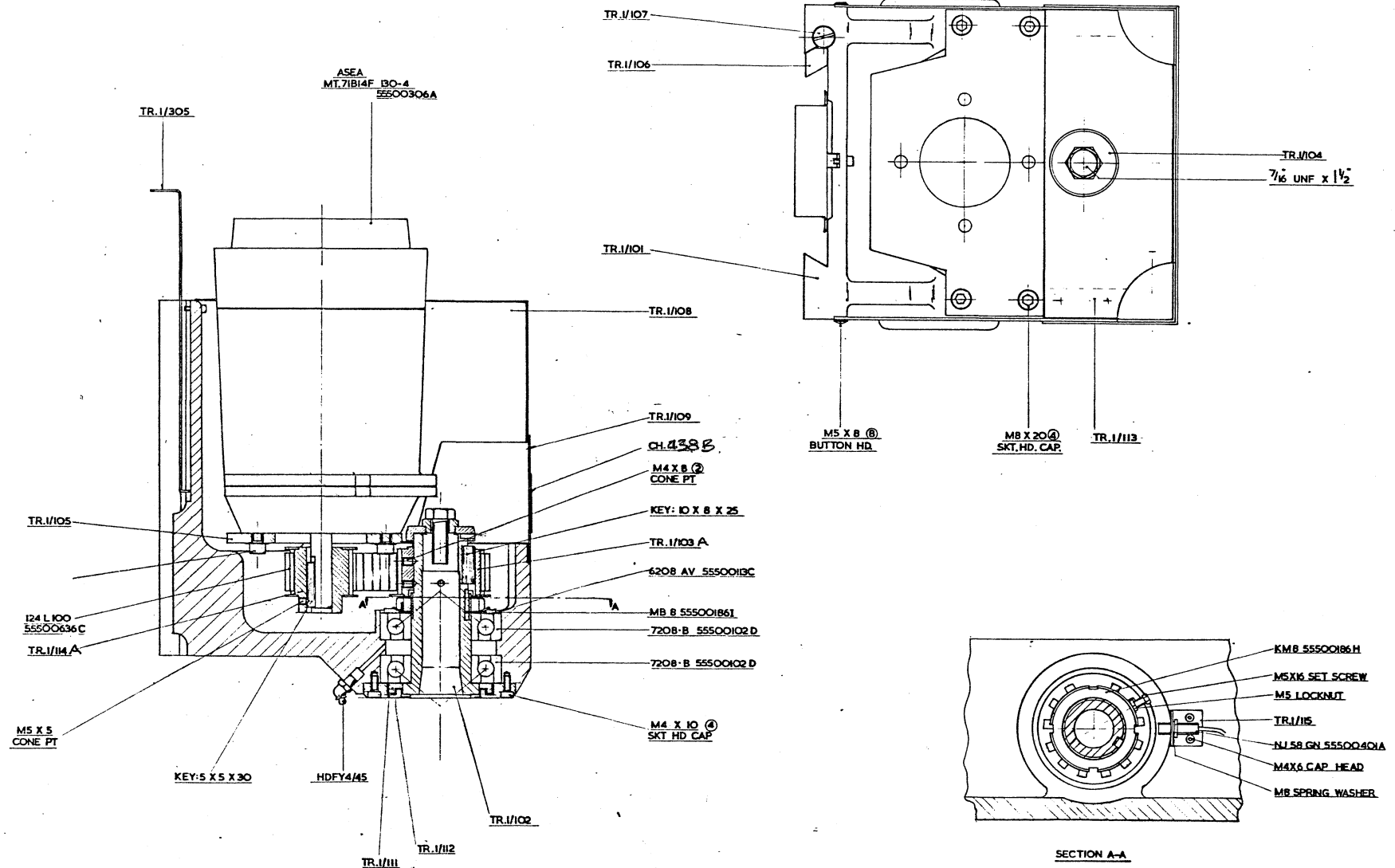
DRG. No.

ALTERATIONS
DESCRIPTION

IF IN DOUBT ASK.

PLAN VIEW WITHOUT THE MOTOR

DRG. No.



DESCRIPTION	CHG	APPRO	DATE
ALTERATIONS			

DENFORD MACHINE TOOLS LTD. BRIGHOUSE, YORKSHIRE.

TRAC MILLER

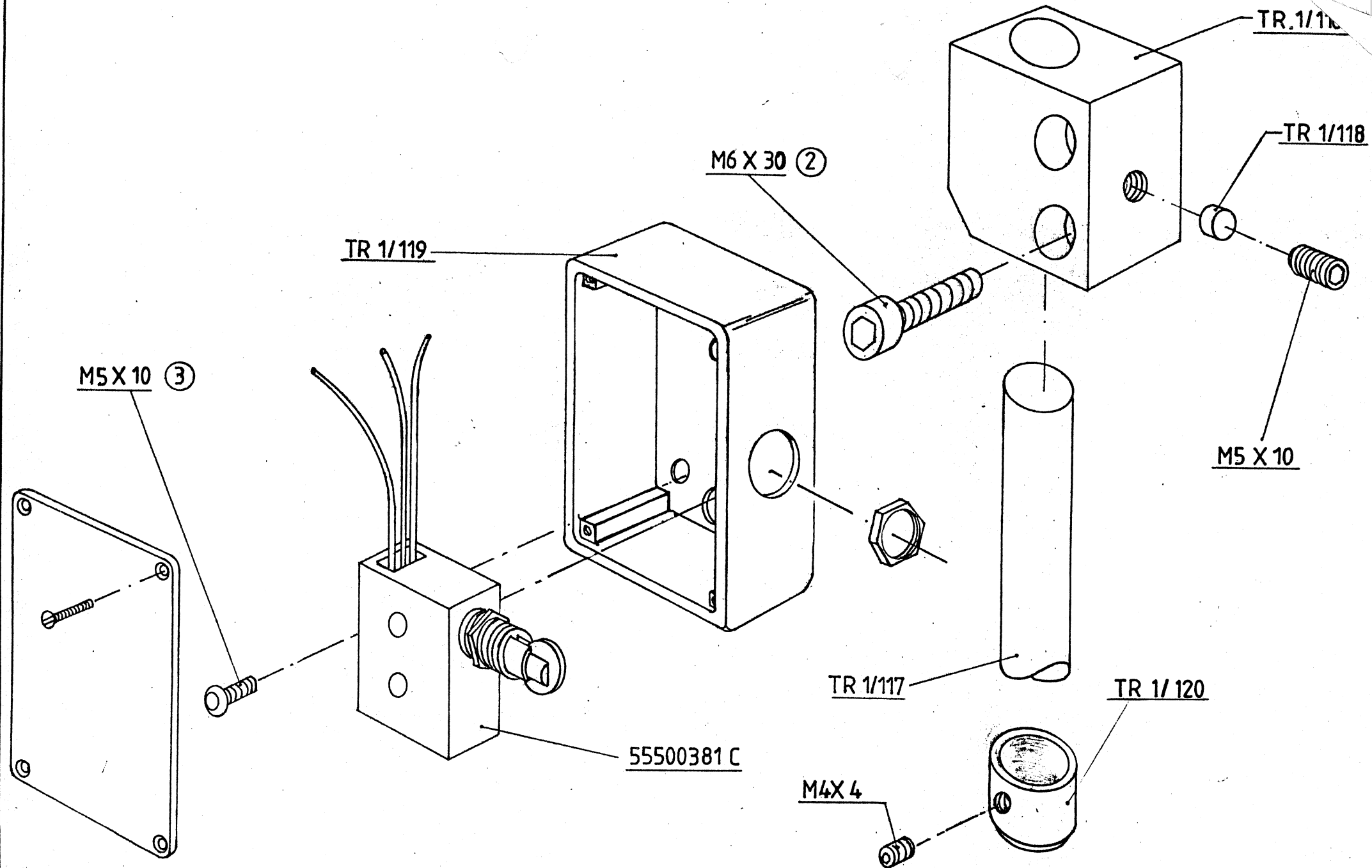
MILLING HEAD

LIMITS ON DIMENSIONS UNLESS OTHERWISE STATED
ANGULAR 1/8" 3 PLACE DECIMAL 1/100"
FRACTIONAL 1/8" 4 PLACE DECIMAL 1/1000"

MATL. SIZE
FIN. RECD.
MACHINE AT 100
CHECKED AT 100

DRAWN	TRACED	CHECKED	APPROVED	DATE	SCALE

DRAWING No. TR.1/100

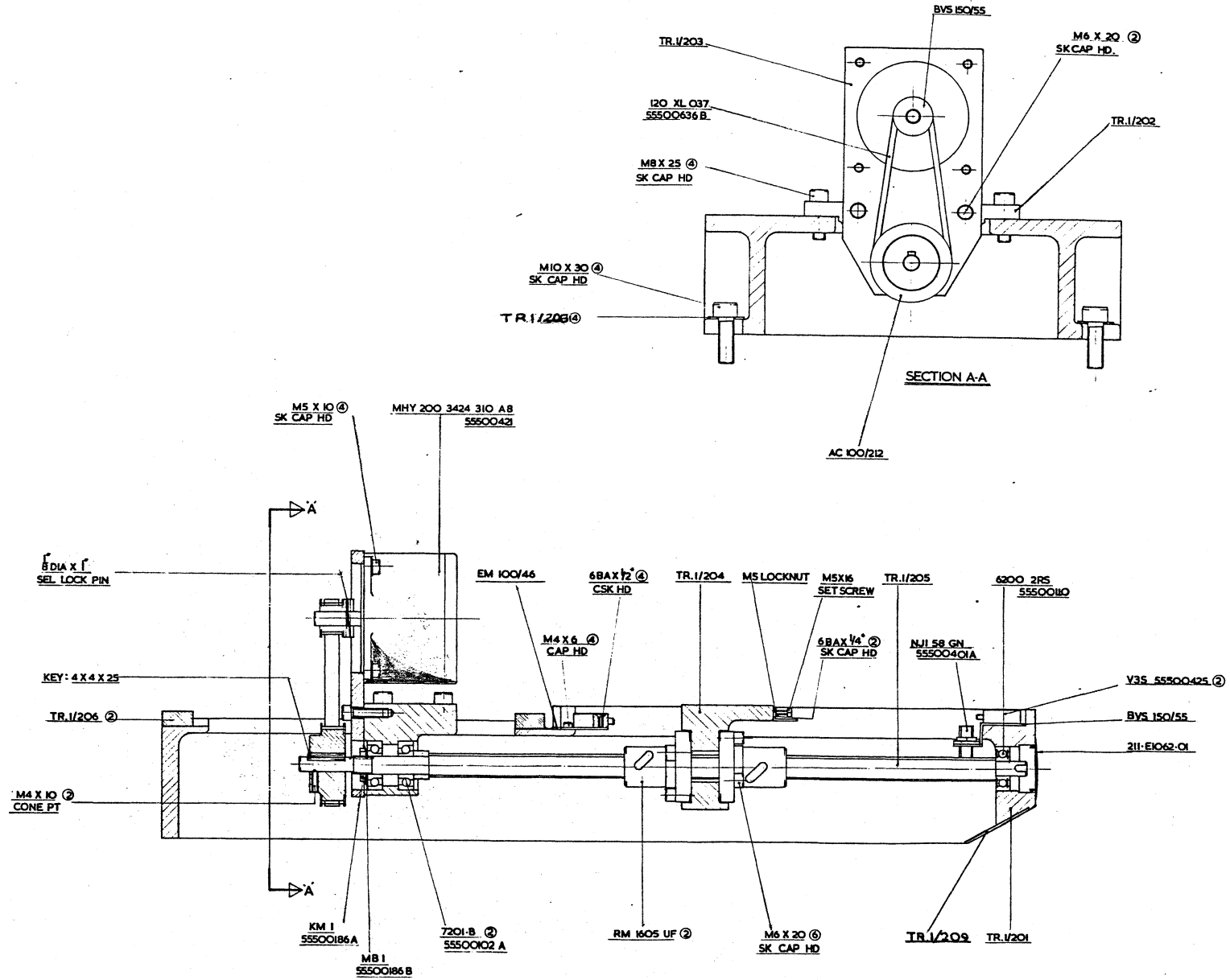


TRIAC MILLER HEAD KNOCK OFF ASSEMBLY

DRAWING No. TR 1 / 100 A

IF IN DOUBT ASK.

DRG. No.



DESCRIPTION			CHG. APPRO. DATE			LIMITS ON DIMENSIONS UNLESS OTHERWISE STATED			MATERIAL			DRAWN			TRACED			CHECKED			APPROVED			DATE			SCALE		
ALTERATIONS						ANGULAR ± 1° 3 PLACE DECIMAL ± .005°			MATERIAL			V												25.5-4					
						FRACTIONAL ± .005" 4 PLACE DECIMAL ± .0005"			MATERIAL SIZE																				
									MATERIAL																				
									MATERIAL																				

DENFORD MACHINE TOOLS LTD. BRIGHOUSE, YORKSHIRE.

TRIAC MILLER

BASE & CROSS SLIDE DRIVE

DRAWING No. TR.1/200

TRIAC BASE & CROSS SLIDE DRIVETR.1/200.

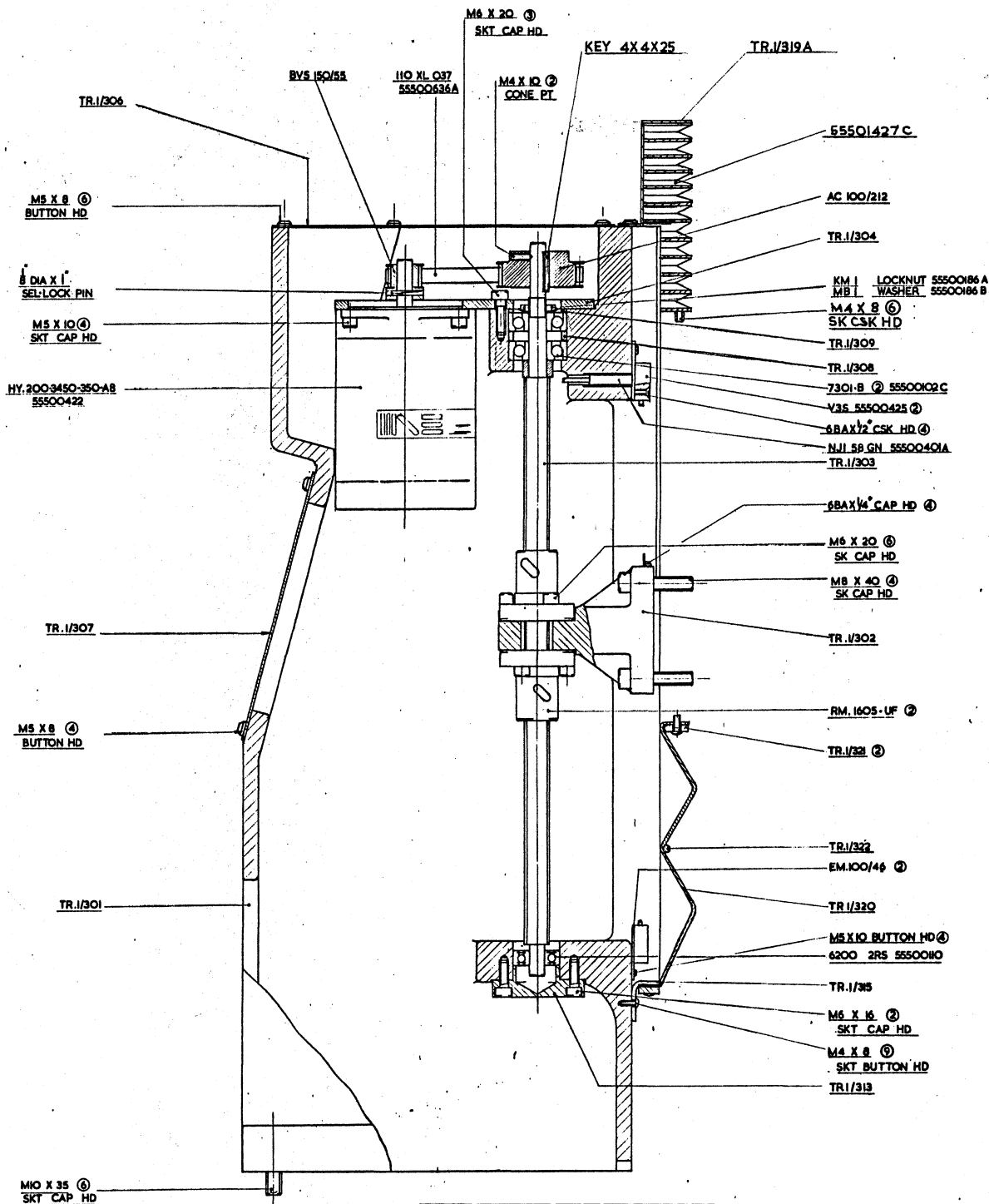
<u>PART No.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
TR.1/201	BASE	1
202	CROSS SLIDE DRIVE HOUSING	1
203	MOTOR PLATE	1
204	CROSS SLIDE BALLNUT BRACKET	1
205	CROSS SLIDE BALLSCREW	1
206	TENON	2
207B	FRONT BELLOW SUPPORT PLATE	1
208	BASE WASHER	4
209	BASE FILLER PLATE	1
210	FRONT BELLOW HINGE PLATE	2

EM.100/46	MICRO-SWITCH MOUNTING PLATE	1
BVS.180/35	SENSOR & SWITCH BRACKET	1
CH.338Y	AXIS DIRECTION PLATE	1
BVS.150/55	12 T PULLEY	1
AC.100/212	30 T PULLEY	1

<u>DESCRIPTION</u>	<u>MANUFACTURER & REF</u>	<u>COMPUTER No.</u>	<u>QTY</u>
STEPPING MOTOR	ELECTRICAL DYNAMICS LTD. LHY200 3424 310 A8	55500421	1
TIMING PULLEY	FENNER:12XL037(BVS150/55)	55500640	1
TIMING PULLEY	FENNER:30XL037(AC100/212)	55500639	1
TIMING BELT	FENNER:120xL037	55500636B	1
BEARING	FAG : 7201 B	55500102A	2
BEARING	FAG : 6200 2RS	55500110	1
LOCKNUT	FAG : KM 1	55500186A	1
TABWASHER	FAG : MB 1	55500186B	1
SENSOR	BALLUFF : NJ1 58 GN	55500401A	1
MICRO SWITCH	BURGESS : V3S	55500425	2
HOLE PLUG	HARMSWORTH TOWNSLEY 211-E1062-01		1
HINGE	SOUTHC0 : E6-10-301-20	55501220A	2

DRG. No.

IF IN DOUBT ASK.

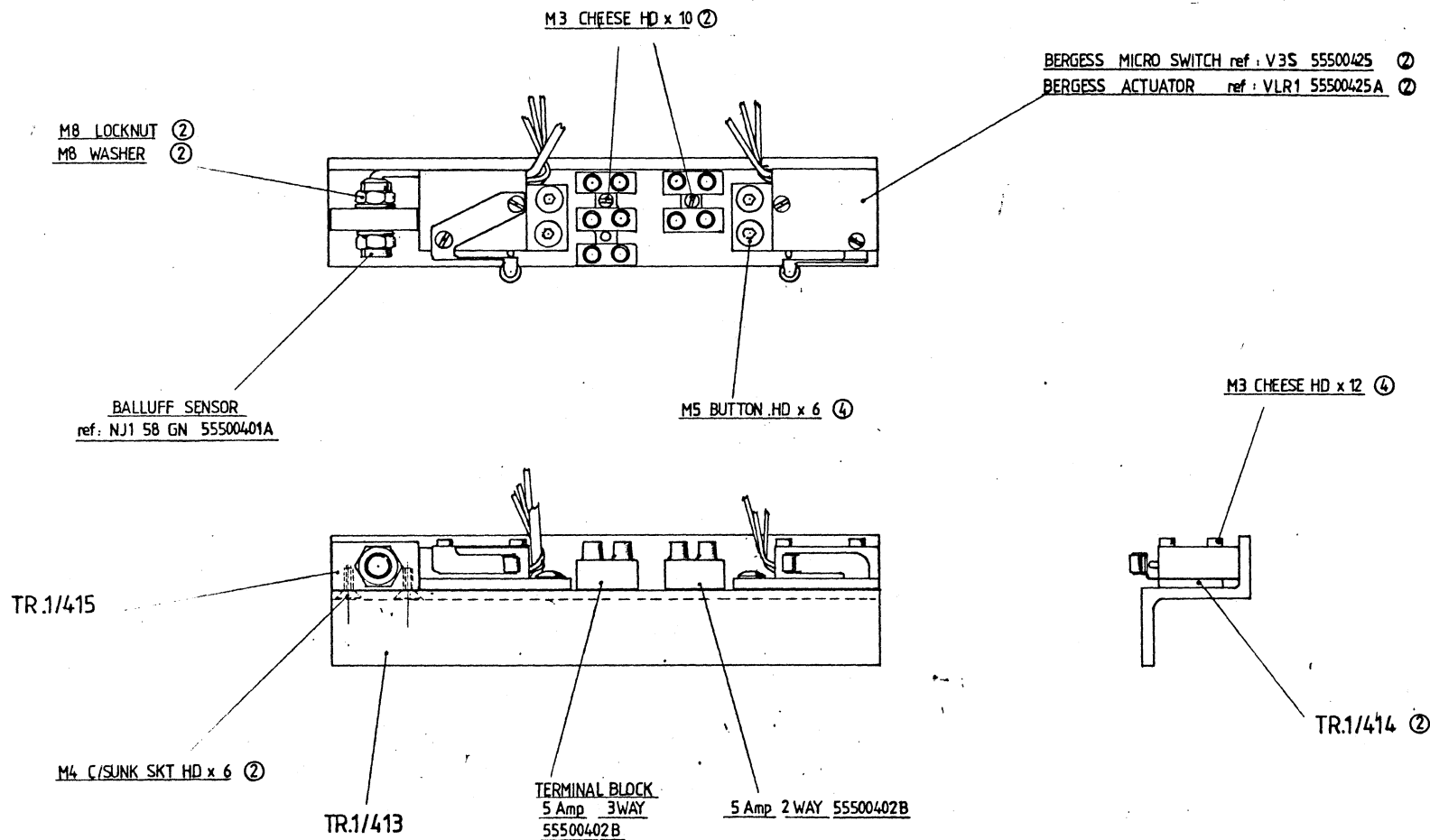


DATE	APPROVED	DATE	SCALE
DRAWN	TRACED	CHECKED	DATE
UNIT OF MEASUREMENT	UNIT OF MEASUREMENT	UNIT OF MEASUREMENT	UNIT OF MEASUREMENT
LINE SIZE	LINE SIZE	LINE SIZE	LINE SIZE
ANGLER 1" = 1" 3 PLACES	ANGLER 1" = 1" 3 PLACES	ANGLER 1" = 1" 3 PLACES	ANGLER 1" = 1" 3 PLACES
FRACTIONAL 1" = 1" 4 PLACES	FRACTIONAL 1" = 1" 4 PLACES	FRACTIONAL 1" = 1" 4 PLACES	FRACTIONAL 1" = 1" 4 PLACES
DRAWING No. TR.1/300			
DENFORD MACHINE TOOLS LTD. BRIGHOUSE, YORKSHIRE.			
TRIAC MILLER COLUMN & HEAD DRIVE			
ALTERATIONS			

<u>PART No.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
TR.1/301	COLUMN	1
302	HEAD BALLNUT BRACKET	1
303	HEAD BALLSCREW	1
304	MOTOR PLATE	1
305		
306	COLUMN TOP COVER	1
307	REAR COVER PLATE	1
308	BEARING SPACER	1
309	PRE LOAD RING	1
313	BEARING CAP	1
314		
315	COLUMN BELLOW BRACKET	1
316		
317	MONITOR SCREW	2
318	LO VO LIGHT MOUNTING BOX	1
319A	VERTICAL BELLOW TOP SUPPORT	1
320	SLIDE COVER	1
321	SLIDE COVER CLAMP	2
322	SLIDE COVER GUIDE	1
323		
324	MONITOR CLAMP	1
325	MOTOR PULLEY COUNTERWEIGHT	1
326	PENDANT ARM BRACKET	1
327	MONITOR FIXING BLOCK	2
329	CHOKE BRACKET	1

AC100/212	30T PULLEY	1
BVS.150/55	12T PULLEY	1
BVS.160/80	LIFTING BRACKET	2
EM.100/46	MICRO SWITCH MOUNTING PLATE	1
SK.773	VERTICAL COLUMN BELLOW	1
H.359	LOW LUB PLATE	1

<u>DESCRIPTION</u>	<u>MANUFACTURER & REF</u>	<u>COMPUTER No.</u>	<u>QTY</u>
STEPPING MOTOR	ELECTRONIC DYNAMIC		
	HY.200-3450-350-A8	55500422	1
BEARING	FAG 7301-B	55500102C	2
BEARING	FAG 6200 2RS	55500110	1
TIMING PULLEY	(AC100/212) 30XL037	55500639	1
TIMING PULLEY	(BVS150/55) 12XL037	55500640	1
TIMING BELT	FENNER 110XL037	55500639A 5A	1
LOCK NUT	FAG KM1	55500186A	1
TAB WASHER	FAG MB1	55500186B	1
SENSOR	BALLUFF NJ1 58GN	55500401A	1
MICRO SWITCH	BURGESS V3S	55500425	1
BELLOW	(SK.773)	55501427C	1
LO -VO LIGHT	SUNNEX	55500370	1
LOW-LUBE LIGHT	R.S. 587-080	587-080	1
CIRCLIP	ANDERTON 1300/30		1
TV BRACKET	AVF LITTLE TWISTER	55501449A	1



No.	DESCRIPTION	CHK'D	APP'D	DATE
	ALTERATIONS			

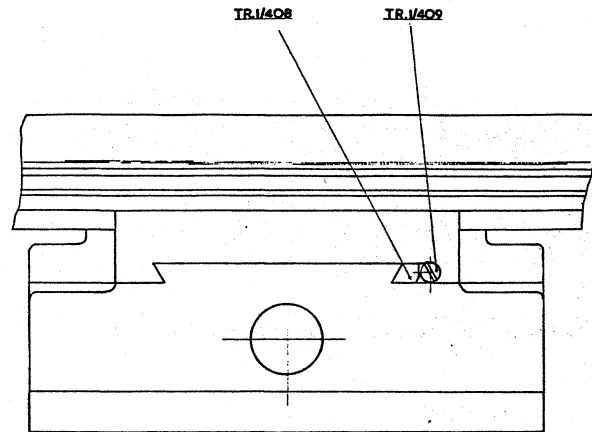
TRIAC CNC MILLER
X AXIS LIMIT SWITCH & SENSOR BRACKET
ASSEMBLY

DRAWN IV.	TRACED	CHECKED	APPROVED	DATE 16-1-85	SCALE 1:1
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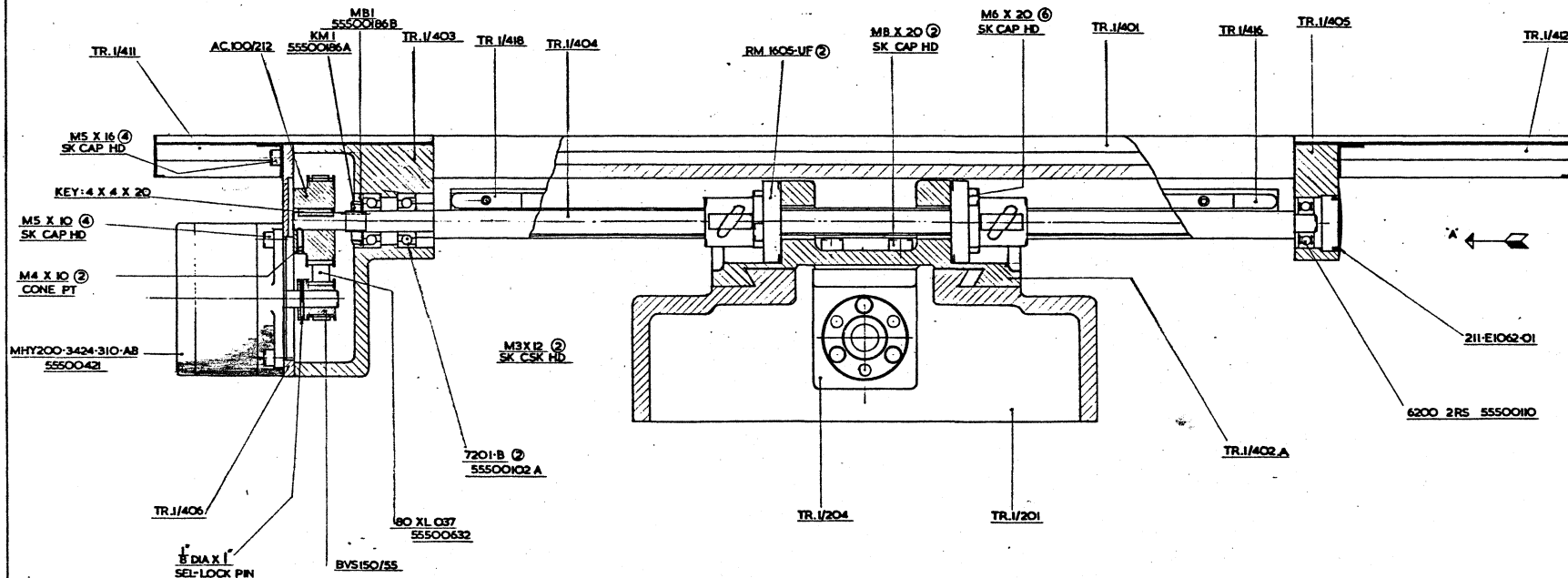
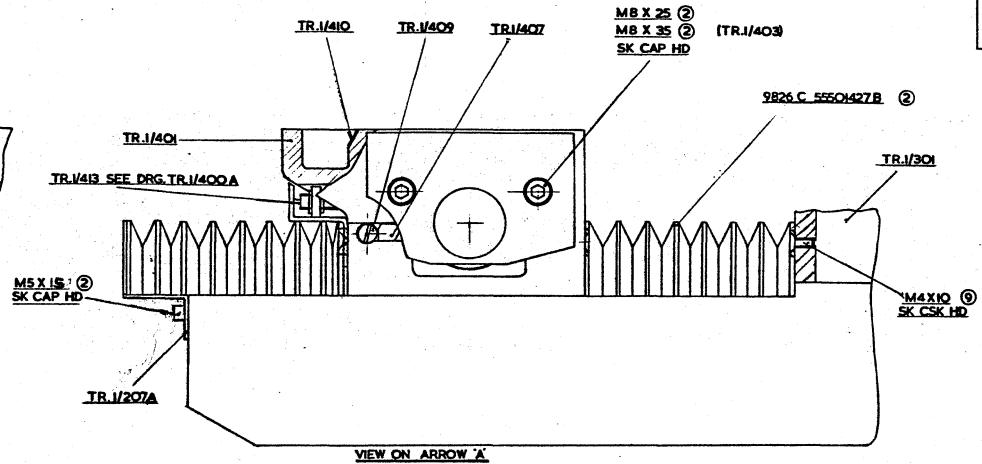
DRAWING No. TR.1/400 A

IF IN DOUBT ASK.

DRG. No.



FRONT VIEW
TR.I/413, TR.I/207A BELLOW OMITTED



DENFORD MACHINE TOOLS LTD. BRIGHOUSE, YORKSHIRE.

TRIAC MILLER

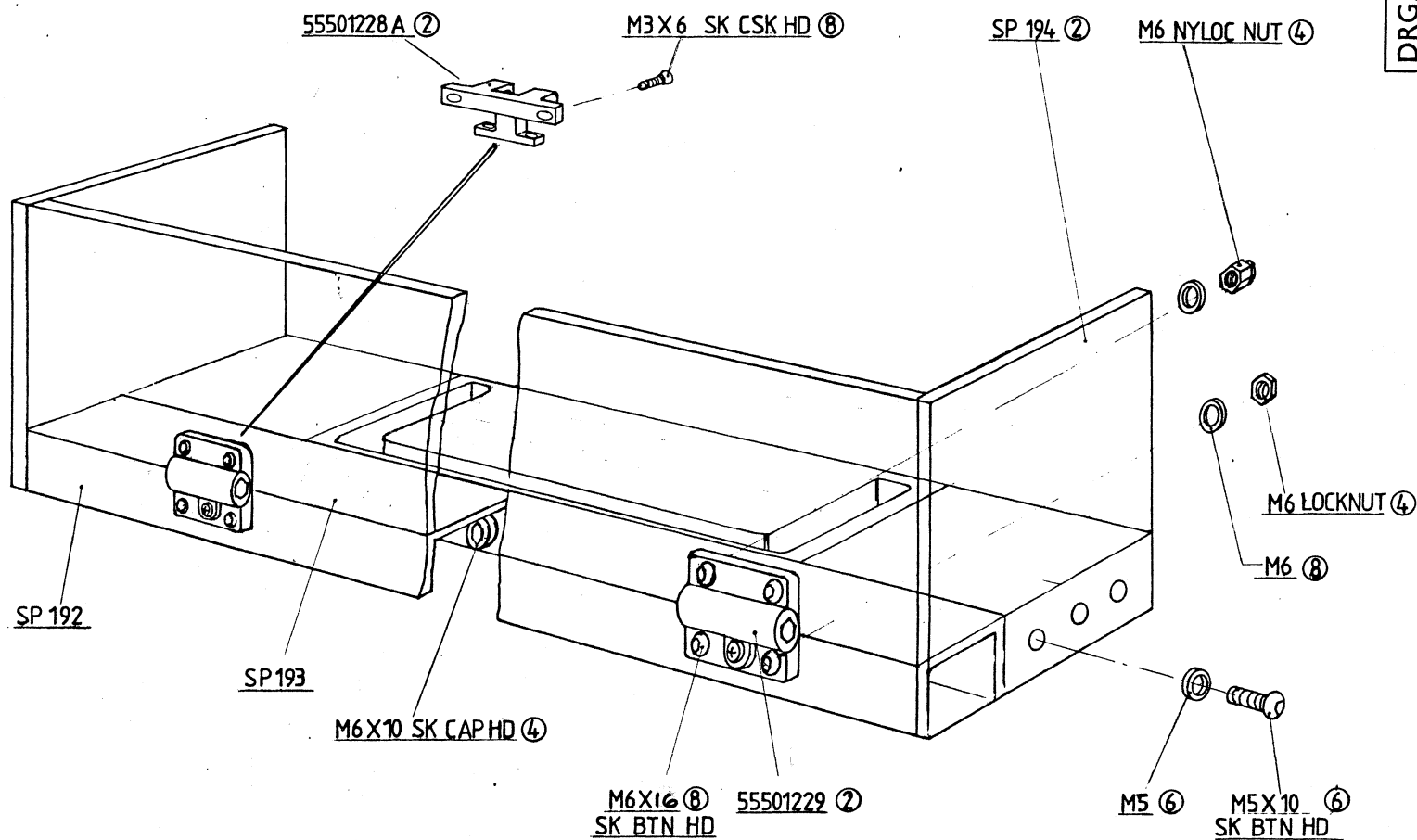
TABLE & CROSS SLIDE

UNITS ON DIMENSIONS UNLESS
OTHERWISE STATED.
ANGULAR ± 1° 3 PLACE DECIMAL ± .005°
FRACTIONS ± .005" 4 PLACE DECIMAL ± .0005"

MATL.
MATERIAL SIZE
MATERIAL
MACHINE AT 1V
DRIND AT 1C

DRAWN TRACED CHECKED APPROVED DATE SCALE
DRAWING No. TR.I/400

DESCRIPTION
ALTERATIONS



No.	DESCRIPTION	CHK'D	APP'D	DATE
	ALTERATIONS			

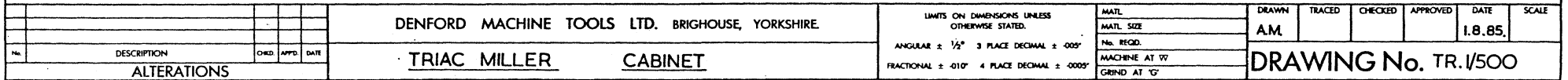
TRIAC CNC MILLER
TABLE GUARD ASSEMBLY

DRAWN A.M.	TRACED	CHECKED	APPROVED	DATE 29.7.85.	SCALE
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DRAWING No. TR:1/400 B

PART No.	DESCRIPTION	QTY
TR.1/401	TABLE	1
402A	CROSS SLIDE	1
403	TABLE DRIVE HOUSING	1
404	TABLE BALLSCREW	1
405	TABLE BEARING HOUSING	1
406	MOTOR PLATE	1
407	TABLE JIB STRIP	1
408	CROSS SLIDE/BASE JIB STRIP	1
409	JIB STRIP SCREW	2
410	TABLE SETTING RULE	1
411	TABLE END COVER LH	1
412	TABLE END COVER RH	1
413	SENSOR BRACKET	1
414	SWITCH PLATE	2
415	SENSOR SUPPORT	1
416	DATUM & LIMIT TRIP	1
417A	'X' MOTOR CONNECTION BOX	1
418	LIMIT TRIP	1
419	GUARD KNOCK OFF BRACKET	1
420	TEE NUT (M8)	
421	GUARD KNOCK OFF CAM	1
422	CROSS SLIDE JIB STRIP LOCK	2
SP 192A	SUPPORT CHANNEL	1
193A	FRONT PLATE	1
194A	SIDE PLATE	2
CE.338X	AXIS DIRECTION PLATE	1
BVS.150/55	12 T PULLEY	1
AC.100/212	30 T PULLEY	1

DESCRIPTION	MANUFACTURER & REF	COMPUTER No.	QTY
STEPPING MOTOR	ELECTRONIC DYNAMICS LTD		
	MHY200-3424 310 A8	55500421	1
TIMING PULLEY	FENNER:12XL037(BVS150/55)	55500640	1
TIMING PULLEY	FENNER:30XL037(AC100/212)	55500639	1
TIMING BELT	FENNER:80XL037	55500632	1
LOCKNUT	FAG : KM 1	55500186A	1
TABWASHER	FAG : MB 1	55500186B	1
BEARING	FAG : 7201 B	55500102A	2
BEARING	FAG : 6200 2RS	55500110	1
SENSOR	BALLUFF : NJ1 58 GN	55500401A	1
MICRO SWITCH	BERGESS : V3S	55500425	2
ACTUATOR	BERGESS : VIR 1	55500425A	2
BELLOWS	SEVEN VALLEY : 9826.C	55501427B	2
HOLE PLUG	HARMSWORTH TOWNSLEY		
	211-E1062-01		1
BALL CATCH	HOMEPAK 78	55501228A	2
HINGE	SOUTHC0 E6-10-501-20	55501229	2

DRG. No.

TRIAC CABINET

TR.1/500

<u>PART No.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
TR.1/501	CABINET	1
502	REAR DOOR	1
503A	INTERNAL SUPPORT	1
504	50mm GROMMET	1
505	LEVELLING SCREW	4
506	CHASSIS SUPPORT BLOCK	2
TR.1/307	REAR COVER PLATE	1
CH.304A	EARPHONE PLATE	1
CH.342	TRIAC GUARD EMBLEM	2
CH.357	LUBRICATION PLATE	1
CH.265	ELECTRIC SYMBOL	1
CH.267B	SPECIFICATION PLATE	1
CH.269	ELECTRIC WARNING LABEL	1

<u>DESCRIPTION</u>	<u>MANUFACTURER & REF.</u>	<u>COMPUTER No.</u>	<u>QTY</u>
SPEAKER GRILLES	UNICARS 1-05.071	55501432	2
TRACK	WIDNEY 2012 FN	55501431	2
PLASTIC RIVETS	HARMWORTH TOWNLEY 201-03-2409-00		4

TRIACTOOL CABINETTR.1/550

<u>PART No.</u>	<u>DESCRIPTION</u>	<u>QTY.</u>
TR.1/551	BASE	1
552	TOP	1
553	TOP DOORS (WITH CUTOUTS)	2
554	TOP DOORS	2
555	DOOR PIVOT BLOCKS	2
556	DOOR PIVOT BLOCKS	2
557	WINDOWS	2
558	INSPECTION PLATE	1
ST.3/661	SLIDING DOORS	2

<u>DESCRIPTION</u>	<u>MANUFACTURER & REF</u>	<u>COMPUTER No.</u>	<u>QTY.</u>
HINGE	SOUTHC0 E6-10-501-20	55501229	8
SLIDING TRACK	AL. SECTION TOP MM01H BOTTOM MM01G		
CAM FOLLOWER	NADELLA GC 16 EE	55500175	4
HANDLES			4
LIGHT	LAB CRAFT GL16		
WINDOW RUBBER	BAINES L.R.S. 736 W.S.		
TRACK	WIDNEY 2012 FN	55501431	2
SPEAKER GRILLES	UNICAR 1-05.071	55501432	2
Hinge		55501203	4

TRIAC PARTS LIST

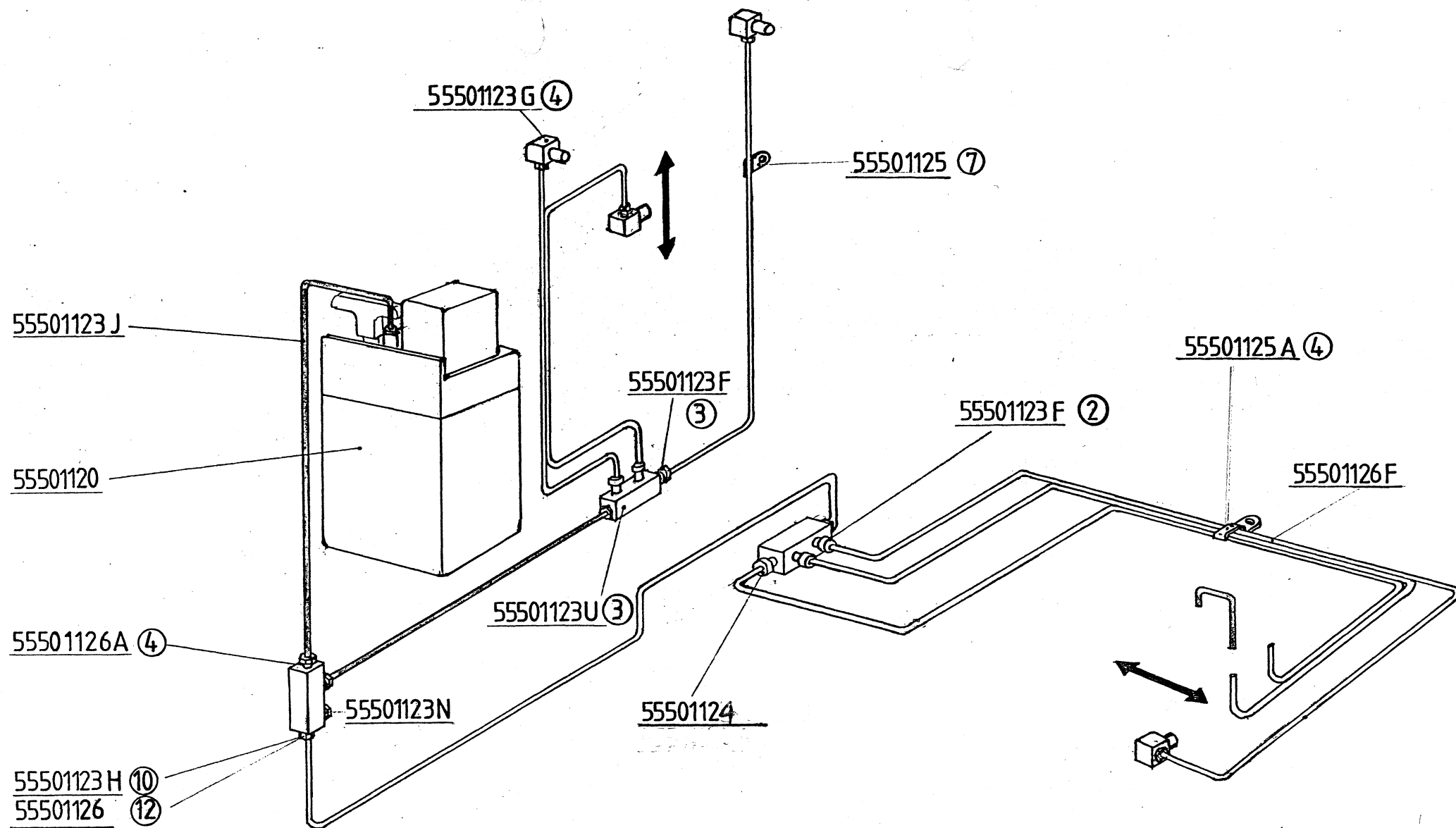
TR.1/600

LUBRICATION SYSTEM

<u>DESCRIPTION</u>	<u>MANUFACTURER & REF.</u>	<u>COMPUTER No.</u>	<u>QTY</u>
OIL PUMP	BIJUR C-2894	55501120	1
METER UNIT	" " FJB 3/0 B-6548	55501123F	5
COMPRESSION BUSH	" " B-1371	55501123H	10
4 WAY JUNCTION	" " B-3262	55501123U	3
* METER UNIT	" " FJB 0 B-2495	55501124	1
COMPRESSION NUT	" " B-1095	55501124A	6
" " " " " SLEEVE	" " B-8272 (NYLON)	55501126	12
" " " " " " " "	" " B-1061	55501126A	20
ELBOW ADAPTOR	" " A-3080	55501123G	4
PLUG	" " B-3714	55501123N	1
PIPE CLIP	ENOTS 34-0218-02	55501125	7
3 WAY PIPE CLIP	" " 34-0220-02	55501125A	4
COPPER CLIP	B.I.C.C. RC 34		4
" " " " "	" " " " RC 54		4
COPPER PIPE	YORKSHIRE IMPERIAL		
	4mm O/D x 0.6 WALL	55501123J	1M
NYLON PIPE	ENOTS 5N25	55501126F	5M

See Drg. TR.1/600 Lubrication system

* Initially issued by forman



DENFORD MACHINE TOOLS LTD.
BRIGHOUSE, WEST YORKSHIRE, ENGLAND.

TRIAC CNC MILLER
LUBRICATION SYSTEM

DRAWN A.M.

DATE 14. 3. 86.

DRAWING NO.

TR 1/600

TRIAC BAR MILLING FIXTURETR.1/800

<u>PART No.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
SK.871/1	BASE PLATE	1
2	FIXED JAW	1
3	MOVING JAW	1
4	CYLINDER SUPPORT	1
6	JAW BACKPLATE	1

<u>DESCRIPTION</u>	<u>MANUFACTURER & No.</u>	<u>COMPUTER No.</u>	<u>QTY</u>
CLAMPING UNIT	BRAUER 489	55500845D	1
TUBE FITTING	ENOTS 97-1505 04	55501451E	5
FILTER/REGULATOR	SCHRADER B06-101-A2 KD	55501451	1
PRESSURE GAUGE	" " " 18-013-989	55501451A	1
BRACKET	" " " 18-001-053	55501451B	1
SOLENOID VALVE	MARTONAIR DM 2401B	55500050C	1
ADAPTOR	ENOTS 97-1505-10	55501451G	1
ELBOW	3/8" BSP. CHROME		1
NYLON TUBE	6 DIA x 4 BORE	55501110C	
NON RETURN VALVE	ENOTS 04-0355-00-000	55501128W	1
BULKHEAD CONNECTOR	ENOTS 97-1508-04	55501451I	2
LOCKNUT	ENOTS 36-0520-03	55501451J	2

ELECTRICAL PARTS.

<u>DESCRIPTION</u>	<u>MANUFACTURER & REF</u>	<u>COMPUTER No.</u>	<u>QTY.</u>
BOX	SAREL 8015	55500420B	1
MOUNTING PLATE	" " 5215	55500420C	1
MAIN ISOLATOR	STROMBERG OETL 40D2	55500366A	1
HANDLE MECH.	" " " OETL ZS37	55500368B	1
" " " " "	" " " OETL ZX45	" " " " "	1
PUSHBUTTON			
OPERATOR	BBC CAT No 1.30040001/15		1
CONTACT BLOCK	" " " " " 1.20116.002		2
KEY SWITCH			
OPERATOR	" " " " " 1.30045.016		1
RELAY BASES		55500362A	2
RELAYS	240V 50HZ	55500362B	2
FUSE FITTING		R.S.412-021	1
FUSE	1A	R.S.413-585	1
TERMINAL			
BLOCK	KLIPPON	55500402	1

TRIAC

TR.1/800 A

PNEUMATIC VICE (MANUAL).

TRIAC NAMEPLATES

TR 1 / 2000

CH	338	X	AXIS DIRECTION PLATE	1	✓
		Y	" " " " " " "	1	✓
		Z	" " " " " " "	1	✓
	438	B	DENFORD NAMEPLATE	1	✓
	359		LOW LUB PLATE	1	✓
	304A		EAR PHONE PLATE	1	✓
	357		LUBRICATION PLATE	1	✓
	265		ELECTRIC SYMBOL	+	
	267D		SPECIFICATION PLATE	1	✓
	269		ELECTRIC WARNING LABEL	2	✓
	437		DELAY & VOLTAGE WARNING PLATE	1	✓

TRIAC(ATC)

A
3 AXIS
C.N.C. BENCH
MILLING
MACHINE



DENFORD

COMPUTERISED MACHINES AND SYSTEMS

TRIAC 3 A.T.C.MILLING HEADTR.3/100

<u>PART No.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
TR.3/101	MILLING HEAD	1
102	BASE PLATE	1
103	SPINDLE No.35 INT	1
104	SPINDLE TENON (SHORT)	1
105	DRAW BAR COLLET	1
106	SPINDLE TENON (LONG)	1
107	SPINDLE MOTOR PLATE	1
108 A	HEAD COVER	1
109	SENSOR BRACKET	1
110	PRE LOAD NUT	1
111	SPINDLE END CAP	1
112	SPINDLE SUPPORT BUSH	1
113	LIMIT NUT	1
114	HEAD COVER PLATE	1
115	MOTOR PULLEY	1
TR.1/103A	SPINDLE PULLEY	1
106	VERTICAL HEAD JIB STRIP	1
107	JIB STRIP SCREW	1
110	JIB STRIP LOCK	1
111	SPINDLE NOSE CAP	1
112	SPINDLE GREASE COLLAR	1
116	HEAD KNOCK OFF BLOCK	1
117	HEAD KNOCK OFF ROD	1
118	HEAD KNOCK OFF PAD	1
119	HEAD KNOCK OFF MICRO SWITCH BOX	1
120	HEAD KNOCK OFF BUSH	1
121A	MOTOR TERMINAL BRACKET	1
CH.338 Z	AXIS DIRECTION PLATE	1

<u>DESCRIPTION</u>	<u>MANUFACTURER & REF</u>	<u>COMPUTER No.</u>	<u>QTY.</u>
DRIVE MOTOR	SEM FDPM 30x2 (4000 r.p.m.)	55500306F	1
BEARING	KEMO 43.610.33.025.	55500102D	2
BEARING	FAG 7208 B	55500109A	1
BEARING SEAL	FAG 6007 2RS	55500113C	1
LOCKNUT	NYLOS RINGS 6208 AV	55500186H	1
TAB WASHER	FAG KM 8	55500186I	1
MICRO SWITCH	FAG MB 8	55500186I	1
SENSOR	BURGESS 4CRQR	55500381C	1
TIMING PULLEY	BALLUFF NJ 58 GN	55500401A	1
TIMING BELT	FENNER 18L100 (TR.1/103A & TR.3/115).	55500643C	2
	FENNER 150L100	55500646A	1
WIPER	A2 x 50mm long	55501425	1
DIE CAST BOX	R.S. 509-939 (TR.1/119)	509-939	1
DISC SPRING	ANDERTON 28.0x14.2x1.25	55500196E	52

PART No.	DESCRIPTION	QTY
TR.1/301	COLUMN	1
302	HEAD BALLNUT BRACKET	1
303	HEAD BALLSCREW	1
304	MOTOR PLATE	1
305		
306	COLUMN TOP COVER	1
307	REAR COVER PLATE	1
308	BEARING SPACER	1
309	PRE LOAD RING	1
313	BEARING CAP	1
314		
315	COLUMN BELLOW BRACKET	1
316		
317	MONITOR SCREW	2
318	LO VO LIGHT MOUNTING BOX	1
319A	VERTICAL BELLOW TOP SUPPORT	1
320	SLIDE COVER	1
321	SLIDE COVER CLAMP	2
322	SLIDE COVER GUIDE	1
323		
324	MONITOR CLAMP	1
325	MOTOR PULLEY COUNTERWEIGHT	1
326	PENDANT ARM BRACKET	1
327	MONITOR FIXING BLOCK	2
329	CHOKE BRACKET	1
TR.3/724A	COLUMN FILLER PLATE	1
725A	COLUMN WIPER PLATE	1
738	COLUMN COVER	1
739	COLUMN COVER	1
740	COLUMN COVER GUIDE	1
741	COLUMN COVER STOP	1

AC100/212

30T PULLEY

1

BVS.150/55

12T PULLEY

1

BVS.160/80

LIFTING BRACKET

2

EM.100/46

MICRO SWITCH MOUNTING PLATE

1

~~173~~~~VERTICAL COLUMN BELLOW~~

1

CH.359

LOW LUB PLATE

1

DESCRIPTIONMANUFACTURER & REFCOMPUTER No.QTY

STEPPING MOTOR

ELECTRONIC DYNAMIC

55500422

1

BEARING

HY.200-3450-350-A8

55500102C

2

BEARING

FAG 7301-B

55500110

1

TIMING PULLEY

FAG 6200 2RS

55500639

1

TIMING PULLEY

(AC100/212) 30XL037

55500640

1

TIMING BELT

(BVS150/55) 12XL037

55500632A 5A

1

LOCK NUT

FENNER 110XL037

55500186A

1

TAB WASHER

FAG KM1

55500186B

1

SENSOR

FAG MB1

55500401A

1

MICRO SWITCH

BALLUFF NJ1 58GN

55500425

1

~~BELLOW~~

BURGESS V3S

~~55501427C~~~~1~~

(SK.773)

SUNNEX

55500370

1

LO -VO LIGHT

R.S. 587-080

587-080

1

LOW-LUBE LIGHT

ANDERTON 1300/30

1

CIRCLIP

AVF LITTLE TWISTER

55501449A

1

TV BRACKET

TRIAC A.T.C.

TOOL CHANGER

TR.3/700A

<u>PART No.</u>	<u>DESCRIPTION</u>	<u>QTY.</u>
TR.3/701	PISTON FLANGE	1
702	MOUNTING PILLARS	4
703	DRAW BAR	1
704A	SUPPORT BRACKET	1
705	HORIZONTAL SLIDE	1
706		
707	MICRO SWITCH PLATE	4
708A	STOP ROD	1
709A	TURRET BEARING HOUSING	1
710A	VERTICAL SUPPORT	1
712	VERTICAL SLIDE	1
714A	TURRET	1
715	TOOL HOLDER	6
717A	TURRET SPINDLE	1
719	TRIAC A.T.C. COVER	1
721A	SENSOR BRACKET	1
722A	PISTON VEE BLOCK	1
723	GUIDE COLLAR	1
724A	COLUMN FILLER PLATE	1
725A	COLUMN WIPER PLATE	1
726A	CYLINDER BRACKET	1
728	TOOL HOLDER SPRING	6
729	TOOL HOLDER ROLLER	12
730	TOOL HOLDER TENON	6
731	A.T.C. COVER BACKPLATE	1
732	MICRO SWITCH BLOCK	2
737	PERSPEX GUARD	1
738	COLUMN COVER	1
739	COLUMN COVER	1
740	COLUMNCOVER GUIDE	2
741	COLUMN COVER STOP	1
742	STOP ROD BUSH	1
743	STOP ROD PLATE	1
744A	SHOCK ABSORBER BRACKET	1
745	TOP TRIP	1
746	BOTTOM TRIP	1
747	LOCKNUT	1
748	PULL STUD (BT 35-type U2)	6
750	INDEX PLATE	1
751	INDEX DISC	1
752	INDEX ROLLER	1
753	COLUMN BACK COVER	1
754	DRIVE COVER	1
755	FILLING PLATE	1
756		
757	A.T.C. COVER SUPPORT	1
758	HINGED FLAP	1
CH.438B	NAMEPLATE "DENFORD"	1
442	NUMBERS	2 sets
363	AIR PRESSURE PLATE	1

TRIAC 3 A.T.C.

TOOL CHANGER

TR.3/700A

Cont.

<u>DESCRIPTION</u>	<u>MANUFACTURER & REF</u>	<u>COMPUTER NO.</u>	<u>QTY.</u>
OILITE BUSH	MANG. BRONZE 6x10x10	55500195G	1
" " " "	" " " " " 12x16x20	55500195D	1
" " " "	" " " " " 7/8"x1"x1"	55500194J	2
BEARING	FAG 6002 2RS	55500106A	1
" " "	" " 7201B	55500102A	1
LOCKNUT	" " KM 1	55500186A	1
TABWASHER	" " MB 1	55500186B	1
SENSOR	R.S. 633 442 BALLUFF	633 442 55500401A	1
MICRO SWITCH	BURGESS V3S	55500425	4
ACTUATOR	" " " VLR 1	55500425A	4
THRUST BEARING	TORRINGTON NTA 815	55500145	1
THRUST PLATE	" " " TRA 815	55500146	2
SLIDE WHEEL	HEPCO W2X	55501461	4
SLIDE TRACK	" " " T2 260mm	55501461A	2
ADJUSTABLE	" " " BMX2	55501461B	2
STATIONARY BUSH	" " " BM2	55501461C	2
MOTOR	ORIENTAL 2RK5GK	55500306J	1
GEAR BOX	" " " CE/2GK25K	55500306K	1
SPRING	DON SP. L2288F (TR.3/728)		6
EDGING STRIP	BAINS; TITANFAST CODE 102	55501435A	

ATC PNEUMATICS

TR3/700A PNEU

CLAMP CYCLINDER	BRAUER 489	55500845D	1
TUBING	6 DIA NYLON	55501110C	
TUBING SLEEVE 4 DIA	ENOTS 36-0500-02	55501123I	84
TUBING NUT 4 DIA	ENOTS 36-0501-02	55501123R	84
TUBING	4 DIA NYLON	55501126F	
LUBRICATOR	ENOTS L07-100-MFQD	55501127A	1
SOLENOID VALVE	ENOTS 14-1135-50-240*	55501128G	1
CYLINDER 25 DIA.	ENOTS 60-202-00-160	55501128I	1
CYLINDER 25 DIA.	ENOTS 60-202-00-100	55501128J	1
CYLINDER NUT	ENOTS 48-0127-06	55501128K	2
REDUCER	1/4" - 1/8" BSP M.B145148	55501128M	+
PUSH IN ADAPTOR	ENOTS 971505-02	55501128N	+5
PLASTIC SILENCER	1/8" BSP S/S 1x10	55501128T	6
1/8" BSP NIPPLED CON	ENOTS 36-0633-01	55501128U	87
SOLENOID VALVE	ENOTS X4-1155-50-240*	55501128V	2
NON RETURN VALVE	ENOTS 04-0355-00-000	55501128W	2
FLOW VALVE 1/8" BSP	ENOTS 04-0351-00-000	55501128X	4
COMPRESSION TEE	ENOTS 36-0514-04	55501128Y	1
NIPPLED ADAPTOR	ENOTS 36-0556-04	55501128Z	1
STRAIGHT MALE ADPT.			
6 DIA.	ENOTS 36-0530-04	55501129D	2
ELBOW ADAPTOR	ENOTS 36-0005-02	55501129E	6
STRAIGHT MALE ADPT.			
4 DIA.	ENOTS 36-0530-02	55501129G	24
PUSH IN ELBOW	ENOTS 97-1114-04	55501129H	23
FILTER REGULATOR	ENOTS B06-101-AZKS	55501451	1
PRESSURE GAUGE	ENOTS 07-0131-16	55501451A	2
BRACKET	ENOTS 18-001-053	55501451B	2

TRIAC 3 A.T.C

TOOLCHANGER

TR3/700A PNEU

Cont.

DESCRIPTION	MANUFACTURER & REF	COMPUTER NO.	QUANTITY
PUSH IN ADAPTOR	ENOTS 97-1505-04	55501451C	9
PUSH IN ELBOW	ENOTS 97-1005-10	55501451D	1
PUSH IN TEECON	ENOTS 97-1514-04	55501451L	4
TUBING NUT	ENOTS 36-0500-04	55501451P	4
TUBING SLEEVE	ENOTS 36-0501-04	55501451Q	4
HOSE ADAPTOR	$\frac{1}{8}$ " BSP SCHRADER 8051-11	55501451S	1
SHOCK ABSORBERS	MARTONAIR M/59614/AX	55501129F	4
ENCLOSURES	SAREL 8002	55500420	1
ENCLOSURE PLATE	SAREL 5202	55500420A	1
AIR VALVE	ENOTS 03-0401-00	55501129L	1
AIR VALVE	ENOTS 03-0413-00	55501129M	1
REGULATOR	ENOTS R06-100-RNKD	55501451U	1
PLUG	$\frac{1}{8}$" B.S.P.		1
PUSH IN TEE CON	ENOTS 97-1514-02	55501128D	1
$\frac{1}{8}$ CHROME ELBOW			1

TRIAC NAMEPLATES

TR3 / 2000

CH	338	X	AXIS DIRECTION PLATE	1
		Y	" " " " " " "	1
		Z	" " " " " " "	1
	438	B	DENFORD NAMEPLATE	1
	359		LOW LUB PLATE	1
	304A		EAR PHONE PLATE	1
	357		LUBRICATION PLATE	1
	265		ELECTRIC SYMBOL	+
	267D		SPECIFICATION PLATE	1
	269		ELECTRIC WARNING LABEL	2
	437		DELAY & VOLTAGE WARNING PLATE	1
	442		NUMBERS	1 set
	363		AIR PRESSURE LABEL	1

TRIAC 3 ATCELECTRICAL COMPONENTS

DESCRIPTION	MANUFACTURER & REFERENCE	COMPUTER No	QUANTITY
TRIAC ATC CHASSIS	NORTH EAST ELECTRONICS	55500436C	1
CONTROL UNIT	NORTH EAST ELECTRONICS	55500436B	1
DC SPINDLE DRIVE	ANYSPEED LYNX 8	55500432Y	1
TRANSFORMER		55500378	1
FUSE HOLDER	PHONIX USIS	55500402E	1
FUSE BRIDGE	PHONIX STSI	55500402F	1
END STOPS	PHONIX E-UK	55500402D	2
12v DC RELAY	12v DC RELAY 4 C/O TS 348-942	348-942	1
24v AC RELAY	24v AC RELAY 8 PIN	55500362	1
240v AC RELAY	240v AC RELAY 8 PIN	55500362B	1
8 PIN RELAY BASE	8 PIN RELAY BASE	55500362A	2
SPRING RETURN KEYSWITCH	G.D.HARRISON I30045001		
ELECTRICAL BOX	SAREL 8002	55500420	1
BACK PLATE	SAREL 5202	55500420A	1