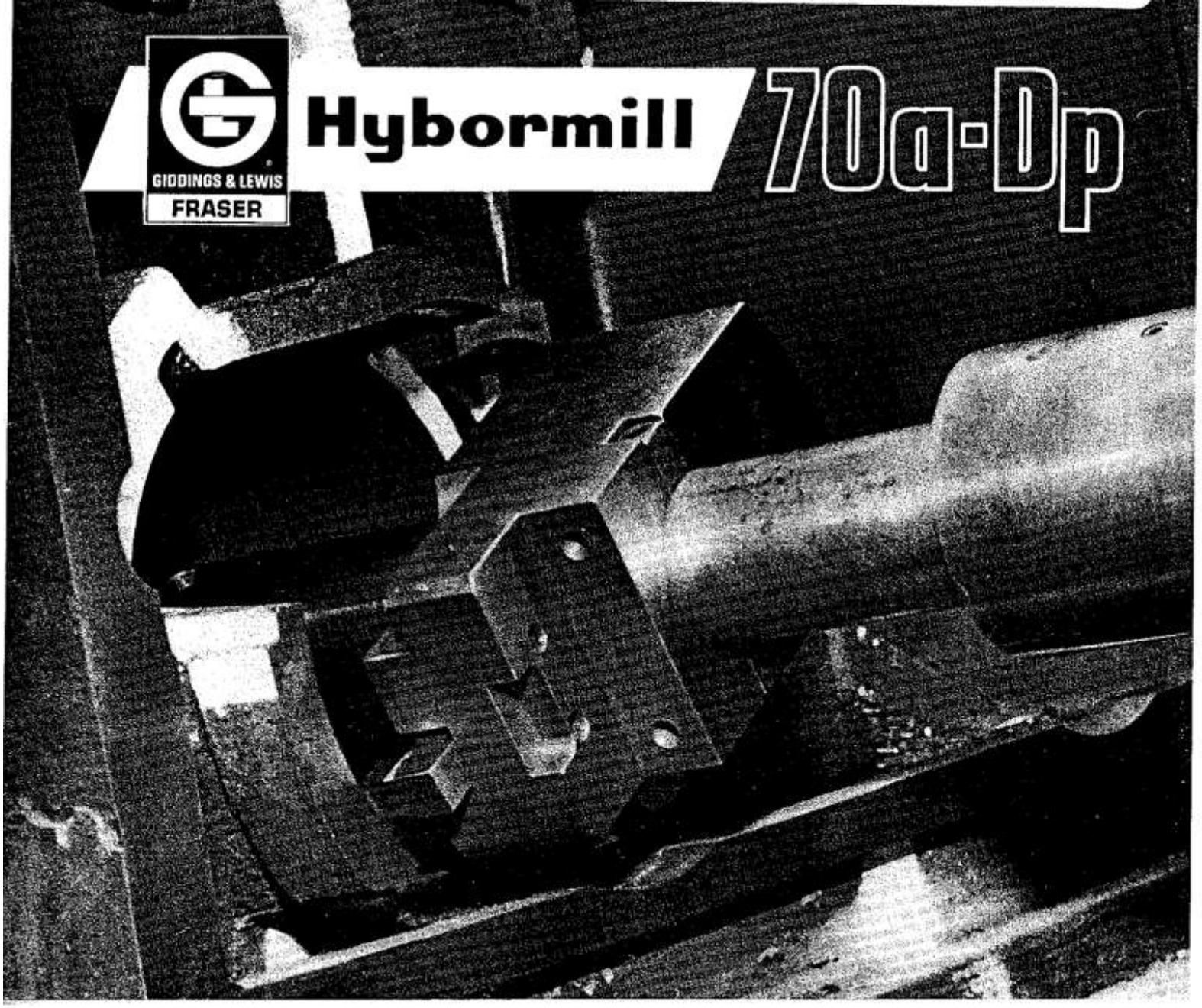


Horizontal Boring, Milling and Drilling Machines

MASS OVER TABLE.

1966
THE QUEEN'S AWARD TO INDUSTRY

Cat HBM/11

standard features for strength, power and production

major castings

All major components are cast in a close-grained Meehanite iron – a metal which, combined with scientific component design, ensures maximum strength and rigidity with minimum weight.

bed

1

Proportioned for maximum rigidity to provide a stable foundation for the whole machine. The surface hardening technique employed produces an extremely hard case and tough core structure to the guiding edges of the precision ground bedways. These bedways are virtually indestructible to ensure sustained machining accuracy and freedom from scoring throughout the life of the machine.

table and saddle

2

Both the Table and Saddle castings are of box-type, fully ribbed construction. The Saddle is designed to provide maximum support for table loads with minimum deflection at the extremes of table cross travel. Extra-length saddles, with double supports, are available giving even greater rigidity. Surface hardened and precision ground saddle ways ensure maintenance of accuracy throughout the life of the machine.
The Table working surface is precision machined and is provided with accurately machined 'T' slots. Cross slots can be provided when required.

column

3

This is a massively proportioned casting designed to absorb vibrations set-up during heavy milling cuts. The wide spread of the ways, coupled with the eight bearing surfaces that these provide for the headstock, ensure minimisation of vibration under maximum loading conditions.

headstock

4

The result of continuous development and experience over many years of horizontal borer manufacture. The exclusive, ultra-precision, sleeve-driven spindle is manufactured in nitralloy. A special feature of Hybormill headstocks is the closeness of the spindle axis to the column ways, permitting greater than usual metal removal rates without increasing vibration. Each size of spindle, 4 in. or 5 in., is built into a headstock casting designed and proportioned for the particular spindle size.

extended saddle with supports

5

This is a standard feature on all machines. This additional support of the saddle minimises deflection and assists in the maintenance of precision table alignments.

pendant

6

This compact control centre gives the operator control of headstock, table and saddle motion, milling feed-rate selection and an indication of power consumption from anywhere within the work area.

independent milling feeds

7

Separate constant mesh transmission allows maximum metal-removal rates to be used.
While still in the cut, the operator can watch the pendant load meter and increase the feed rate until maximum power is being utilized.

self-sustaining auto-clamping

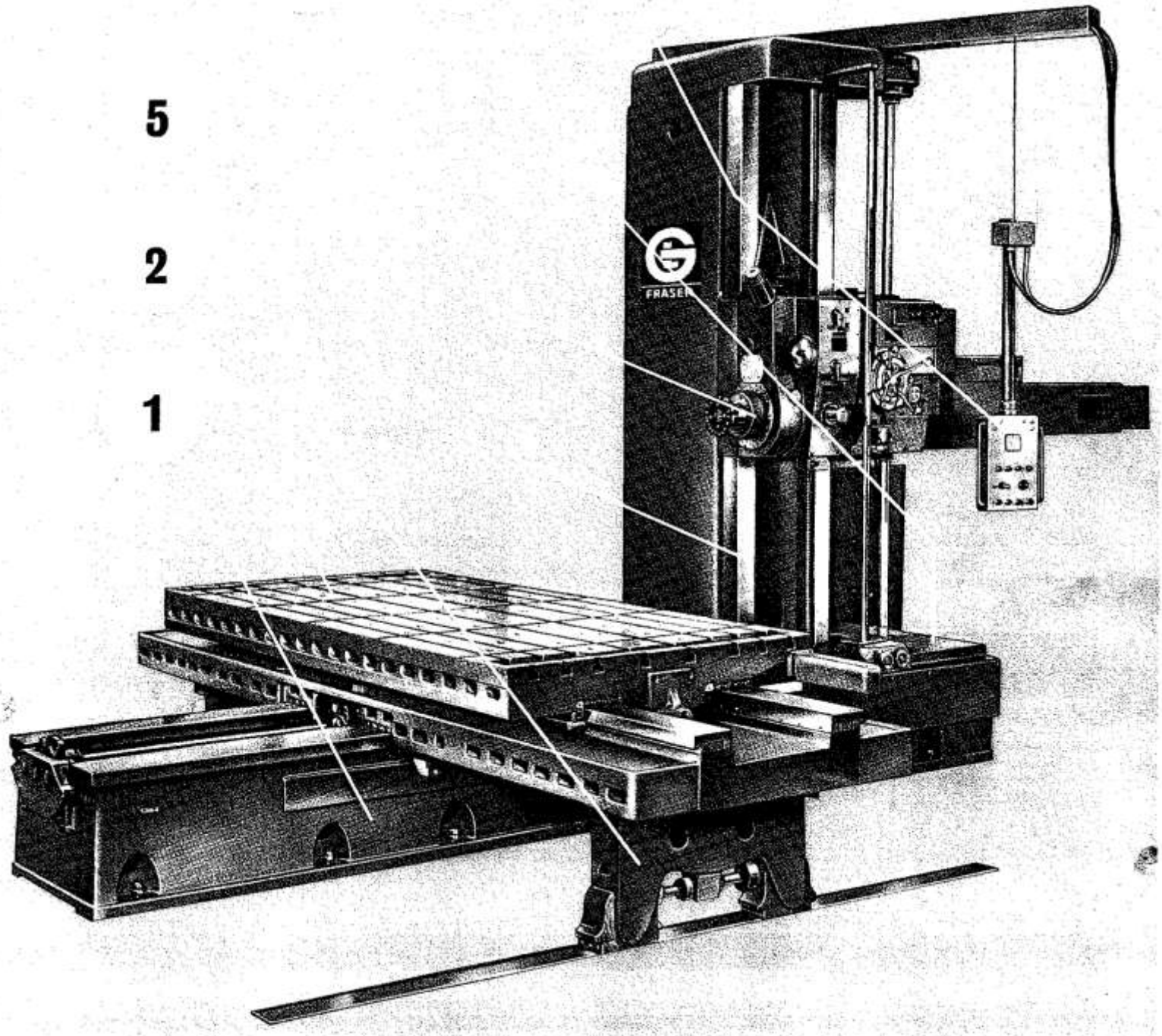
The electro-hydraulic clamping system is fully automatic and guarantees positive clamping to table, saddle and headstock without the operator touching a button. Only when movement to these units is initiated are the clamps released, instantly re-clamping when motion ceases.

end support (optional)

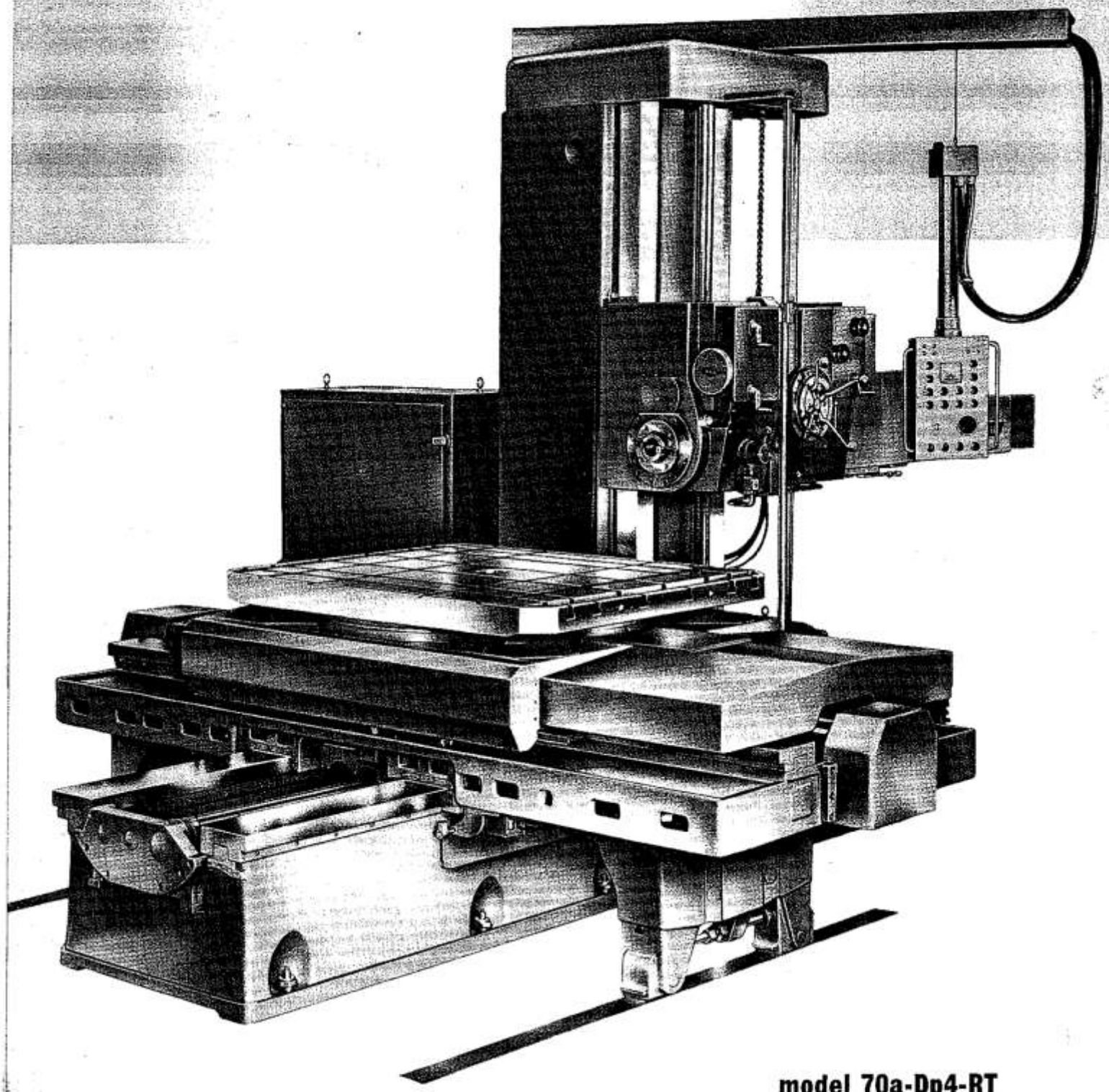
This provides perfect alignment for long boring bars, the vertical motion being synchronised with the headstock. Removal of the end support gives 20½ in. of additional saddle travel along the bedways.

scales end verniers

These are provided as standard equipment for table, saddle, headstock and end support. Adjustable verniers read to .001 in. Alternative measuring systems are described within the brochure.


3
4
7
6
5
2
1
FRASER

built-in rotary table model for precise, positive



model 70a-Dp4-RT

indexing . . . . under power

These machines retain all the inherent features of plain table machines for Precision with Power in boring and milling plus rotary indexing.

outstanding design features

- ☐ **PRECISE INDEXING UNDER POWER**
- ☐ **POSITIVE AUTOMATIC CLAMPING**
- ☐ **LARGE LOAD-CARRYING CAPACITY**
- ☐ **ANTI-FRICTION BEARINGS THROUGHOUT**

Four index positions are supplied as standard and accuracy is controlled to within ± 3 seconds of arc. Positive indexing and clamping is initiated from a single push button on the pendant. The table rotates rapidly to slightly beyond the selected position, is then smoothly reversed against hardened locators and automatically securely locked by means of electro-hydraulic wedge-type clamps. Continuous rotation of the table is obtained by means of a separate selector switch.

table design

The heavy metal section and scientific ribbing of the high grade Meehanite castings gives these tables the rugged strength required for Hybormill standards of Precision with Power.
The tables can withstand full power boring and milling cuts and are able to support the heaviest components due to the arrangement whereby all vertical thrust is carried by precision steel balls running in large diameter hardened tracks; all radial thrust is taken by a single precision Timken tapered roller bearing which is also used to pre-load the ball track.

fully automatic clamping

Headstock, Table, Saddle and Rotary Table motions are provided with positive automatic clamps, which remain securely locked during machining and are only released when a movement is initiated.

basic machine specification

	70a-Dp4-T	70a-Dp5-T	70a-Dp4-RT	70a-Dp5-RT
SPINDLE				
Diameter	4 102	5 127	4 102	5 127
*Morse Taper	No. 5	No. 6	No. 5	No. 6
Extension	30 762	36 914	30 762	36 914
Vertical Travel – above Table	36 914	48 1219	29 737	41 1041
– below Table	4½ 114	4¾ 121	11½ 292	11¾ 298
TABLE				
Work Surface	36×72 914×1828	48×72 914×1828	40×40 1016×1016	40×40 1016×1016
Cross Travel	60 1524	60 1524	58 1473	58 1473
SADDLE				
Longitudinal Travel – without End Support	50 749	40 494	47 674	71 1283
– with End Support	29½ 1270	19½ 1016	26½ 1194	50½ 1803
SPEED AND FEED DATA				
No. of Spindle Speeds	45	45	45	45
Range – (2 built-in) – r.p.m.	10–1300	7·5–975	10–1300	7·5–975
No. of Spindle Feeds in each Range	18	18	18	18
Range – in./rev.	·002–·250	·002–·250	·002–·250	·002–·250
– mm/rev.	·05–6·0	·05–6·0	·05–6·0	·05–6·0
No. of Feeds to Headstock, Table and Saddle	24	24	24	24
Range – in./min.	·039–120	·039–120	·039–120	·039–120
– mm/min.	1·05–3200	1·05–3200	1·05–3200	1·05–3200
Fast Traverse to all Motions – in./min.	120	120	120	120
– mm/min.	3200	3200	3200	3200
MOTORS				
1500 r.p.m., 220/240 V., 3 ph., 50 c.p.s. – h.p. or 1800 r.p.m., 220/240 V., 3 ph., 60 c.p.s.	20	25	20	25
CONSTRUCTION				
Top of Bed to Top of Table	15 381	16 406	21 5/16 541	21 5/16 541
Width across Bed Ways	36 914	36 914	36 914	36 914
Width of Bed Way	8 203	8 203	8 203	8 203
Width across Column Ways	22 559	26 660	22 559	26 660
Width of Column Way	4 102	4¼ 108	4 102	4¼ 108
Width and Depth of Column	30×32 762×813	36½×40 927×1016	30×32 762×813	36½×40 927×1016
Width across Saddle Ways	†22 559	33 838	‡22 559	‡22 559
Width of Saddle Ways	5 127	7 178	5 127	7 178
Approx. Nett Weight – lb.	30400	37400	33000	40000
– Kilo	13789	16964	15000	18180
ROTARY TABLE				
No. of Power Feeds			22	22
No. of Power Indexes			4	4

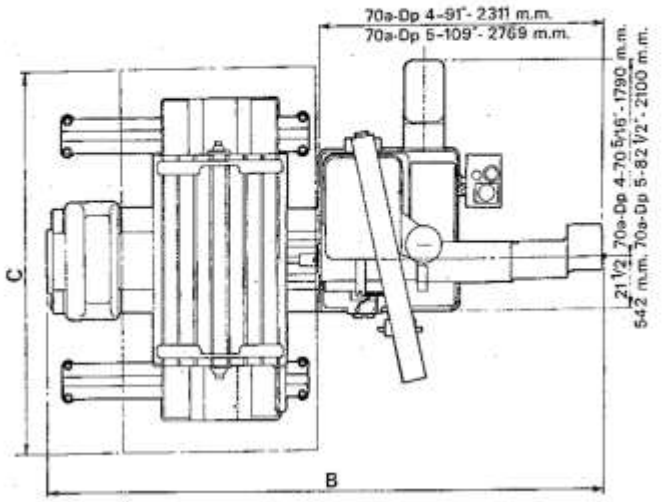
*No. 50 International Taper when Power Operated Drawbolt is supplied.

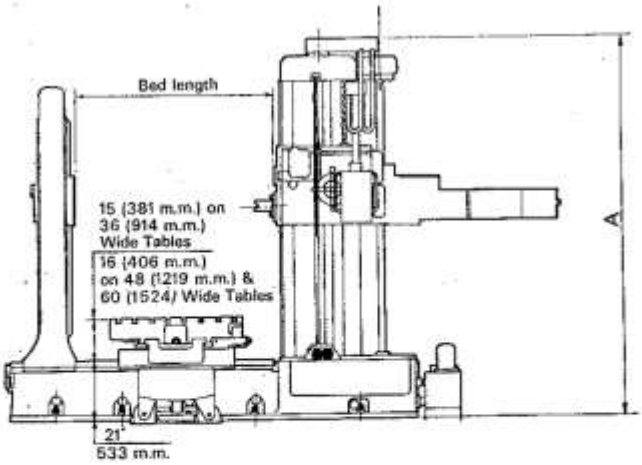
† 22 (559) on 36×72 (914×1828), 36×96 (914×2440) and 48×72 (1219×1828) Tables. 33 (838) for all other table sizes

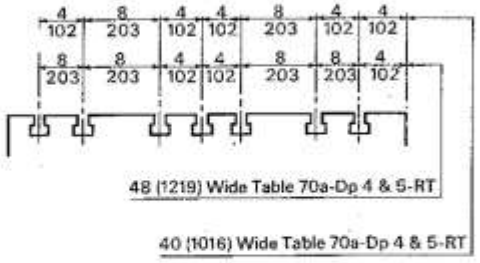
‡ 33 (838) on 60×60 (1524×1524) Tables.

Metric dimensions are in colour

model 70a-Dp4 & 5-T

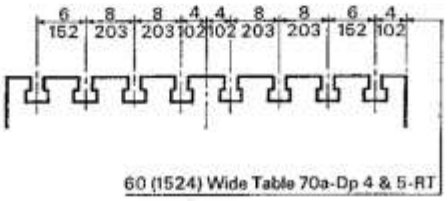




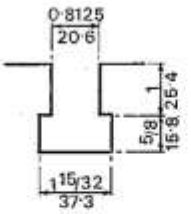


48 (1219) Wide Table 70a-Dp 4 & 5-RT

40 (1016) Wide Table 70a-Dp 4 & 5-RT



60 (1524) Wide Table 70a-Dp 4 & 5-RT



Models 70a-Dp 4 & 5-RT 40 (1016), 48 (1219) & 60 (1524) Wide Tables

overall machine dimensions

length

Bed Length		Dimension 'B' Models 70a-Dp4-T & RT		Models 70a-Dp5-T & RT	
72	1828	182	4623	—	—
96	2438	206	5232	230	5842
120	3048	230	5842	254	6452
144	3658	254	6452	278	7061
168	4267	278	7061	302	7671

width

Models 70a-Dp4 & 5-T Table Cross Travel		Dimension 'C'		Models 70a-Dp4 & 5-RT Table Cross Travel		N Dimensions	P
60	1524	143	3632	48	1219	80 2032	66 1676
72	1828	167	4242	56	1422	84 2134	66 1676
84	2134	191	4851	60	1524	96 2438	80 2032
108	2743	239	6071	72	1828	100 2540	80 2032
120	3048	263	6660	84	2134	112 2845	96 2438
132	3352	287	7290				

height

Spindle Vertical Travel		Dimension 'A' Model 70a-Dp4-T		Model 70a-Dp5-T		Model 70a-Dp4-RT		Model 70a-Dp5-RT	
29	737	—	—	—	—	106	2692	—	—
36	914	106	2692	—	—	—	—	—	—
41	1041	—	—	—	—	118	2997	122	3099
48	1219	118	1219	122	3099	—	—	—	—
53	1346	—	—	—	—	130	3302	134	3404
60	1524	130	1524	134	3404	—	—	—	—
65	1651	—	—	—	—	142	3607	146	3708
72	1828	142	1828	146	3708	—	—	—	—
77	1956	—	—	—	—	—	—	158	4013
84	2134	—	—	158	4013	—	—	—	—
89	2261	—	—	—	—	—	—	170	4318
96	2438	—	—	170	4318	—	—	—	—

Metric dimensions are in colour