

HQ400/3A • HQ400/3L

MULTI - PURPOSE MACHINE

OPERATING MANUAL

1. TECHNICAL DATA

TURNING

Swing over bed	420mm
Distance between centers	400mm.500mm
Longitudinal travel	380mm. (HQ400/3L:480mm)
Cross travel	120mm
Spindle bore	20mm
Spindle taper	M.T.3
Tailstock barrel taper	M.T.3
Range of spindle speed	7 speeds 160~1360r.P.m
Thread can be cut	metric:18steps0.2~3mm Imperial:27 steps 8~120T.P.I
Amount of power feed	8 steps 0.050~0.175mm/r 0.002~0.007"/r

DRILLING AND MILLING

Max. Drilling diameter	φ 15mm
Max. End milling cutter diameter	φ 20mm
Max. Face milling cutter diameter	φ 63mm
Spindle taper	M.T.3
Spindle travel	85mm
Range of spindle speed	14 speeds 177~1300r.p.m
Table size(L×W)	200×150mm ²

OTHERS

Motor capacity	0.55kw
Voltage. Frequency	As customer's requirement
Overall dimension(L×W×H)	970×580×965mm ³ , (HQ400/3L: 1070×580×890mm ³)
Net weight	180kg (HQ400/3L:185kg)

2. ACCESSORIES

STANDARD ACCESSORIES

Serial No.	Specification		Quantity	Remark
1	Tree-jaw chuck	100mm	1	
2	Centers	M.T.3	2	
3	Drill chuck	B16(1.5~13mm)	1	
4	Tie rod		1	
5	Tie rod washer		1	
6	Drill stock		1	
7	Toolpost wrench		1	
8	Open end wrench	13mm-16mm	1	
9	Wedge		1	
10	Allen wrench	4mm	1	
		5mm	1	
		6mm	1	
		8mm	1	ForHQ400/3A
11	Change gear	24T	1	For metric and imperial leadscrew
		27T	1	
		30T	1	
		33T	1	
		36T	1	
		42T	1	
		48T	1	
		60T	1	
		120T	1	
		39T	1	For imperial
		72T	1	Leadscrew
		25T	1	For metric
		75T	1	leadscrew
12	Duplex gear	60T/120T	1	For metric
		125T/127T	1	Leadscrew
		60T/127T	1	For imperial
		120T/127T	1	Leadscrew

SPECIAL ACCESSORIES

Serial No.	Specification	Quantity
1	Lathe tool	1 set
2	Multi-purpose machine vice	1 set
3	Milling force cutting cutter chuck	1 set
4	Reversible thread tapping tools	1 set

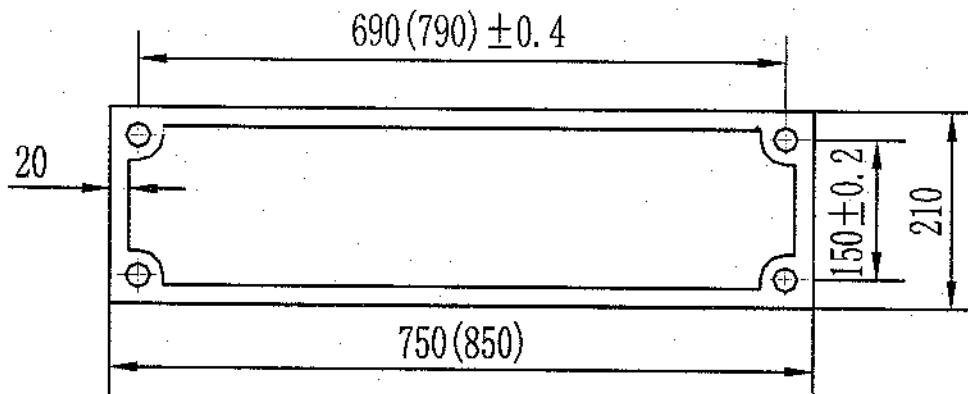
3. INSTALLATION

There are four shafts on the two sides of the bed for lifting. Pulling out the shafts and tying up the ones with rope, the machine be lifted and carried.

CAUTION : protecting the controls and the painted surface.

A rigid base as shown in fig.1 is given by yourself. Place the machine on it and fixed the machine with bolts. Level the surface of the table with admissible error 0.1mm in 1000mmm.

Fig.1.Plan of the base



4. CONSTRUCTION AND CONTROLS

The machine consists of the bed, the headstock, the drilling-milling unit, the table, the rotation base, the electrical motor, etc. the milling-drilling unit can be swiveled 360° on the base(headstock). The height of the unit of model HQ400/3A can be adjusted.

Loose the screw(19), rotate the lever(5) (see fig.2), the drilling-milling unit of HQ400/3A can be adjusted up or down. After adjusted the height of the unit at the suitable position, lock the screw(19).

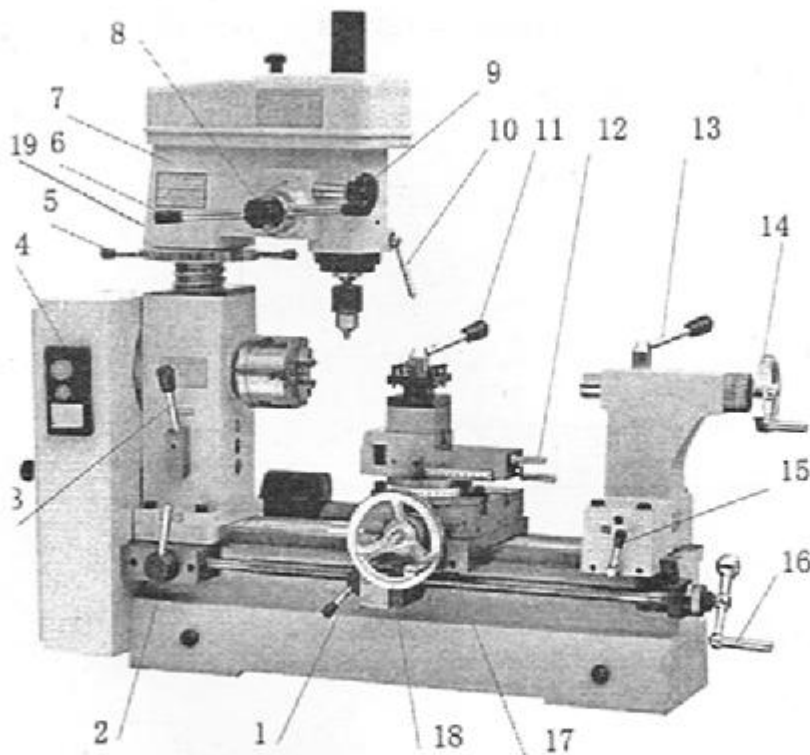


Fig.2 (HQ400/3A)

1. Half nut handle 2. Lead screw clutch handle 3. Speed change handle
 4. Magnetic switch 5. Up and down adjusting lever 6. Feed lever 7. Drilling
 And milling unit 8. Clutch handle 9. Micro feed handle 10. Clamp handle
 11. Tool post lock handle 12. Vice handle 13. Tailstock barrel clamp handle
 14. Tailstock barrel handwheel 15. Tailstock lock handle 16. Longitudinal feed
 handle 17. Carriage lock handle 18. Cross feed handwheel 19. Drilling and
 milling unit lock screw

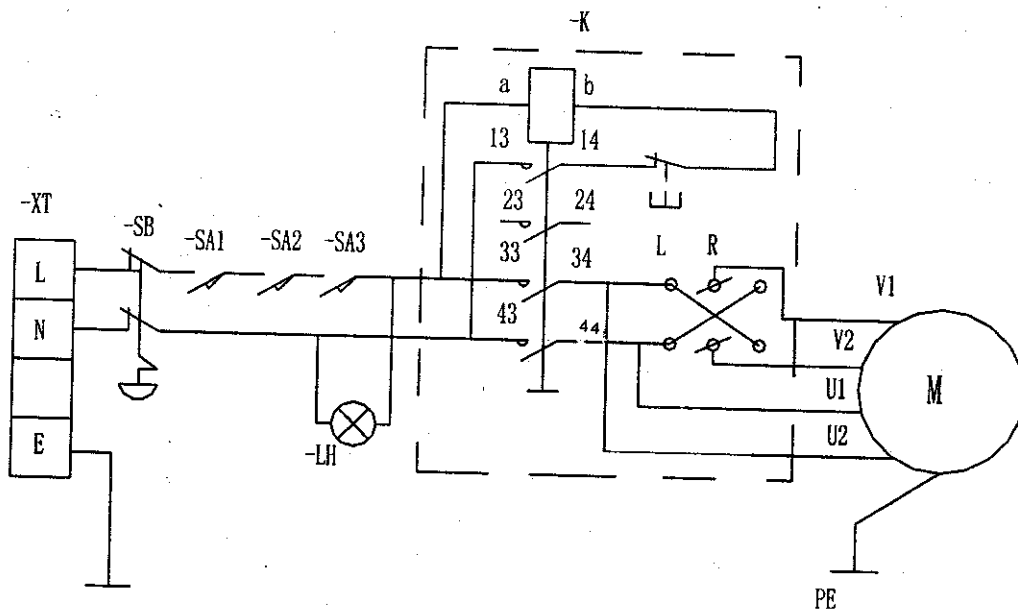
6. ELECTRICAL SYSTEM

The standard machine is wired for 220V.50Hz.1Ph

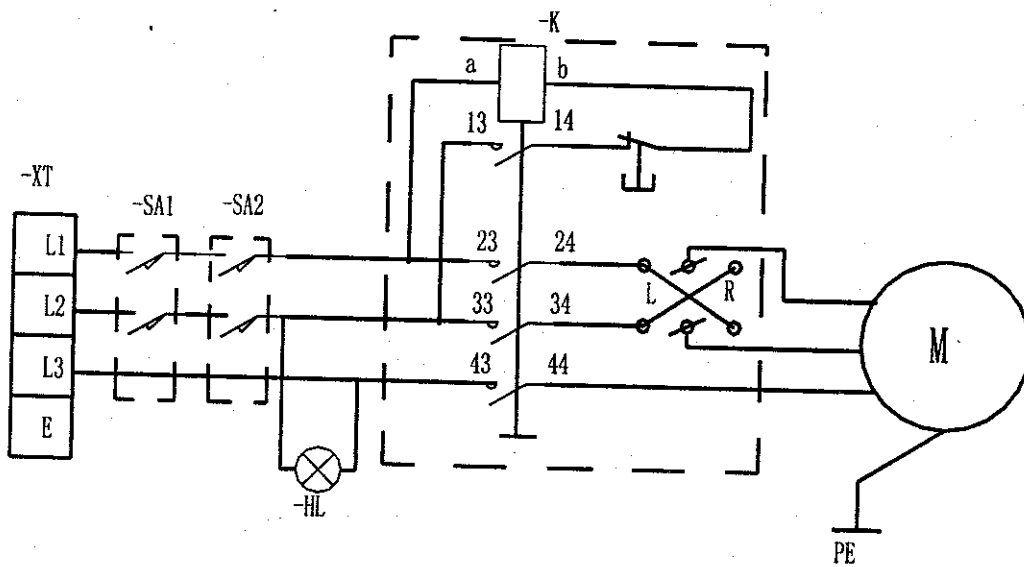
On special order, some machines are wired for 110V/380V/440V. 50Hz/60Hz.
 1Ph/3Ph, The yellow-green wire spaced on the housing is grounding.

M	Motor	YL7144	HL	Power indicator light AD11
K	Magnetic switch	KJD	SA1,SA2, SA3	Limiting switch LX5-11N
SB	Emergency switch	LAY3	XT	Terminal block

**Fig.3 Wiring diagram
Single phase (CE)**



Three phase (CE)



ATTENTION: Fig.3 is designed specially as CE standard. For universal products, SA1,SA2, SA3 switch don't assemble. If you have some special requirement, we will design as it.

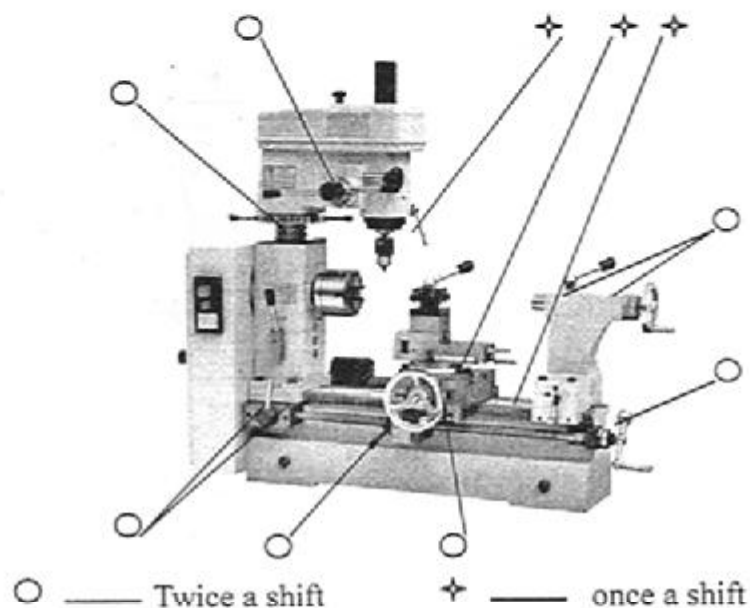
6. LUBRICATION

All oil sites on the machine should be oiled with the regulations mentioned in fig.3.

The leadscrew, the slide, and the drilling-milling quill should be oiled with engine oil to the operating condition of the machine. All bearing should be greased periodically and cleaned once a year.

The oil in the headstock should be changed periodically.

Fig.4.Lubrication chart



7. OPERATION

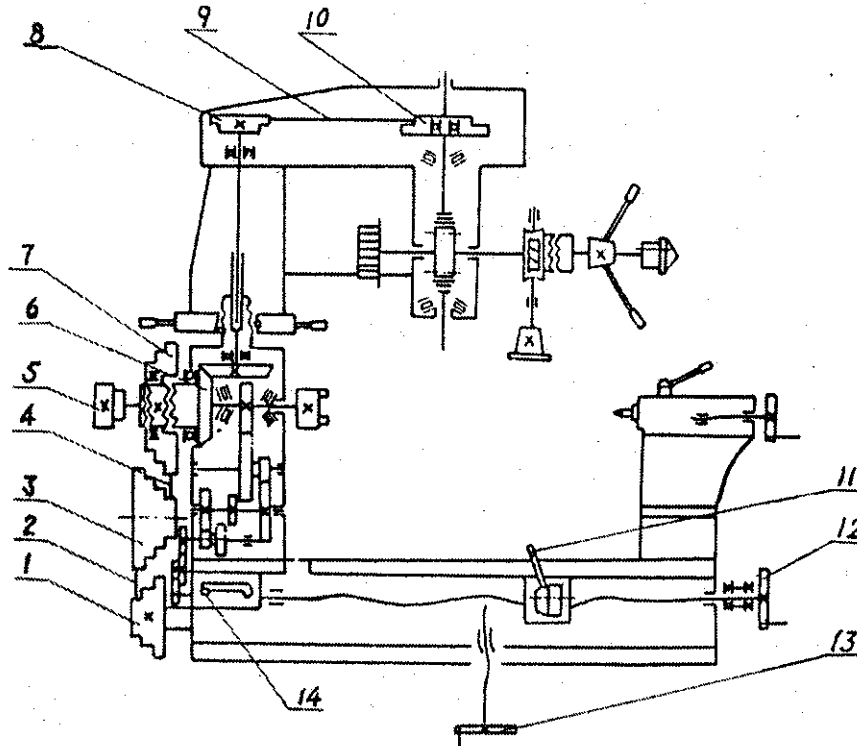
Before operating the machine, you should read the OPERATING MANUAL carefully to acquaint the construction of the machine, the functions of the control system, and the demand of lubrication. And loose the slide lock lever, the drilling-milling quill clamp lever, etc., clean the machine with uncorrosion kerosene, then clean the machine with dry cotton goods, oil the machine slide with lubricating-oil.

Loose the screw (19), rotate the lever (5), the drilling-milling unit of HQ400/3A can be adjusted up or down. After adjusted the height of the unit at the suitable position, tie the screw (19). (see fig.2)

Draw out the handle (8) , turn the lever (6) to feed spindle directly. Push on the handle (8), Turn the handle (9) to micro feed spindle. (see fig.2)

8. DRIVE SYSTEM

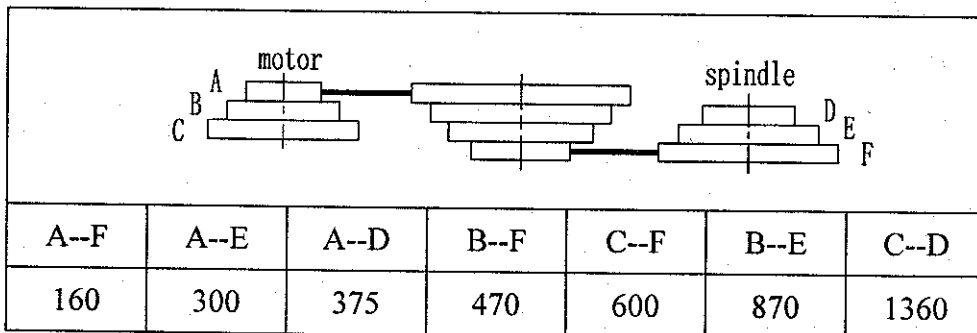
Fig.5 Transmission system



SPINDLE DRIVE

Change the position of belts on the pulleys, 7 different speeds as shown in fig.6 may be obtained for the spindle.

Fig.6 Turning Spindle speeds(r.p.m)



DRILLING- MILLING DRIVE

Change the position of the belts on the pulleys, 14 different speeds as shown in fig.7 may be obtained for the drilling-milling spindle.

Fig.7 Drilling-milling spindle speeds (r.p.m)

Spindle Unit Drilling-Milling Unit									
		A--F	A--E	A--D	B--F	C--F	B--E	C--D	
G	H	K-G	150	290	360	450	575	836	1300
K	L	L-H	117	220	276	345	440	640	1000

FEED MOTION (see fig.5)

Place the handle (14) on the right to take off the leadscrew from the driven system, move the handle (11) to engage the half-nut, move the handwheel (12), the toolpost movement by hand is provided by leadscrew- nut mechanism.

Place the lever(14) on the left, move lever(11) to engage the half-nuts, the spindle movement drives the gear mechanism, the toolpost obtains power feed movement.

If the machine with longitudinal leadscrew guard, it has not the half-nut.

Change the gear A, 8 different amounts of power feed may be obtained.

AT	A	24	30	36	42
120T	I	0.1	0.125	0.15	0.175
60T	II	0.05	0.063	0.075	0.088
120T	I	0.0039	0.0049	0.0059	0.0069
	II	0.002	0.0025	0.003	0.0035

For metric leadscrew (4mm)

AT	A	24	30	36	42
127T	I	0.1	0.125	0.15	0.175
60T	II	0.05	0.063	0.075	0.088
120T	I	0.004	0.005	0.006	0.007
	II	0.002	0.0025	0.003	0.0035

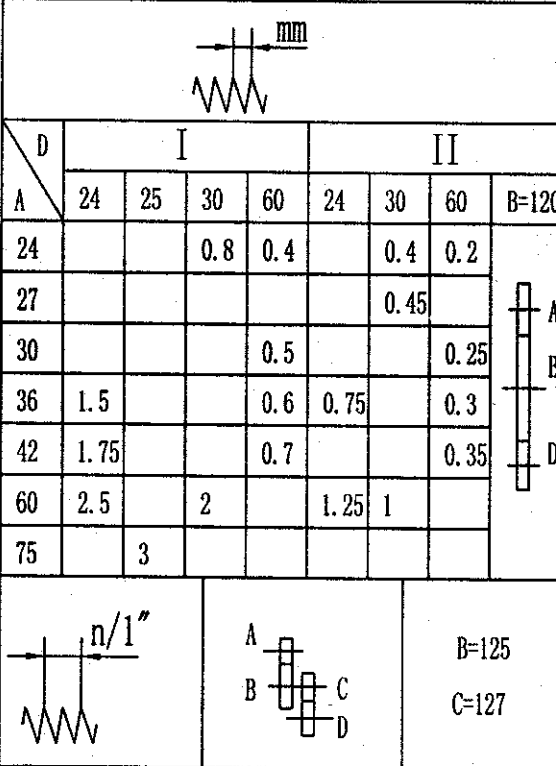
For imperial leadscrew (GT. P. I)

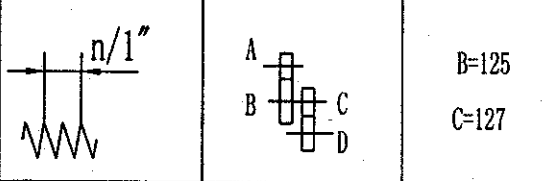
THREAD CUTTING

The spindle is at the lowest speed, place the handle (14) on the left move the lever (11) to engage the half-nuts, The spindle rotation drive gear mechanism and the leadscrew-nut mechanism, the threading is provided by the toolpost movement.

Place the handle (3 see fig.2) on the position, change the gears A and D, different metric threads and imperial threads as shown may be obtained.

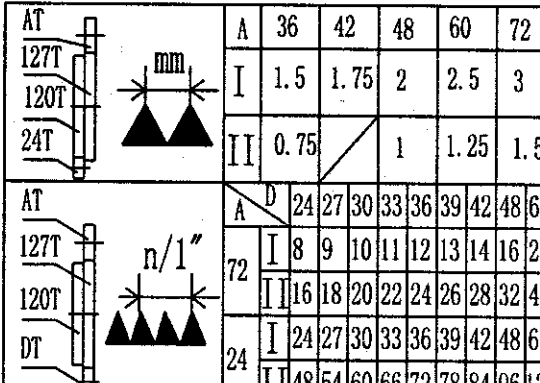
CAUTION: The lever (14) must remain on the left until the thread cutting process is complete. The tool is withdrawn from the work at the end of the cut by the handwheel (13) and the motor is reversed bringing the tool back to the start for successive cuts. When the motor is turned from forward to reverse, you must turn the switch from forward to stop at first, wait the motor stop, then turn the switch from stop to reverse. See fig.(5)



D		I				II			
		24	25	30	60	24	30	60	
A								B=120	
24			0.8	0.4		0.4	0.2		
27						0.45			
30				0.5			0.25		
36	1.5			0.6	0.75		0.3		
42	1.75			0.7			0.35		
60	2.5		2		1.25	1			
75		3							

A		D							
		24	27	30	33	36	42	48	60
75	I	8	9	10	11	12	14	16	20
	II	16	18	20	22	24	28	32	40
25	I	24	27	30	33	36	42	48	60
	II	48	54	60	66	72	84	96	120

For metric leadscrew(4mm)



A		D				
		36	42	48	60	72
I	I	1.5	1.75	2	2.5	3
	II	0.75		1	1.25	1.5

A		D									
		24	27	30	33	36	39	42	48	60	
72	I	8	9	10	11	12	13	14	16	20	
	II	16	18	20	22	24	26	28	32	40	
24	I	24	27	30	33	36	39	42	48	60	
	II	48	54	60	66	72	78	84	96	120	

For imperial leadscrew(6T.P.I)