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16553

ELECTRONIC AND OPTICAL REPAIR AND  
MAINTENANCE CENTRE  
DP/VIE/80/039  
VIET NAM

Technical report: Establishment of mechanical workshop\*

Prepared for the Government of Viet Nam  
by the United Nations Industrial Development Organization,  
acting as executing agency for the United Nations Development Programme

Based on the work of Lewis M. Drummond, consultant in  
mechanical engineering/precision measurements

Backstopping officer: V. Smirnov, Engineering Industries Branch

United Nations Industrial Development Organization  
Vienna

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Contents

Page.....	2.	Acknowledgements
	3.	Mission Objectives
	4..5.	Activities
	6..7.	Findings
	8..9..10..11.	Recommendations
	12.	Surface Grinder
	13.	Tool and Cutter Grinder
	14.	Lathe
	15.	Power Hacksaw
	16.	Vertical Bandsaw
	17.	Universal Milling Machine
	18.	MIG. and TIG. Welding Units
	19.	Measuring Instruments
	20..21..22.	Materials
	23..24.	Toolings
	25..26..27..28.	Hardware
	29..30..31.	Machine Tool Spares
	32.	Grinding Wheels
	33.	Book and Documentary Inputs
	34.	Suppliers Notes

The consultant wishes to express his gratitude to the Project Staff, National and International for their efforts and assistance which contributed so much to the mission outputs.

My special thanks to:-

Mr. Doan Xuan Son.	National Project Director.
Mr. Nguyen Van Thinh.	Previous NPD.
Mr. Nguyen Van Tinh.	Assistant To NPD.
Mr. Dinh Xuan Hung.	Secretary/Interpreter.
Mr. Vu An Tuan.	Accounts.
Mr. S.K. Suri.	Chief Technical Advisor.

To improve and increase the capability of the Mechanical Workshop located in the repair centre at Tu Lien. The Consultant will cooperate with the National Project Director and the Chief Technical Advisor.

In particular the Consultant will:-

1. Train local staff in Precision measuring, and in the use of Measuring Instruments.
2. Train local staff in the Operation, Routine Maintenance and Repair of the Workshop Machines comprised as follows. Lathe, Milling Machine, Bench Drill, Spot Welder, Sheet Metal Bender, Guillotine and other tools.
3. Devise and implement a system to organise and control the work of the Machine Shop. He will also prepare a list of required spares for the Machine Tools.
4. Install, Commission, Test and put into operation the machines and other workshop equipment.
5. Provide recommendations and specifications for the supply of Materials, Tooling, Measuring Instruments and Machine Tool inputs as required.

The Consultant will prepare a final report setting out his findings and recommendations to the Government on any further action which may be required.

The mission duration will be two months commencing 1 May 1987.

Activities.

Regular meetings were held throughout the mission, with contributions from National and International staff, a Work Programme was prepared by the consultant to meet the Mission Objectives. The schedule was closely monitored and adhered to with few exceptions.

Workshop Layout Drawings were prepared, as were drawings for the Reinforced Concrete Foundations and Workshop Electrical Circuits.

The workshop area was prepared to receive the machines, foundations manufactured and prepared to specification. The Machine Tools were then installed, cleaned, levelled, lubricated, commissioned and tested.

The Electrical Installation was also completed and tested.

Measuring Instruments were examined and calibrated.

Documentation for previously ordered equipment was examined and shortfalls in requirements noted. The Consultant, further to the mission has located the majority of these items which are available ex-stock Singapore. Quotations are appended with specifications, this was done at the request of the National Project Director and the Chief Technical Advisor. Five Days were spent locating these items and a reputable order supplier who is willing to arrange shipment direct to Haiphong Port.

Visits were arranged in Hanoi to examine the range of items which the workshop is required to manufacture, a few items have been produced and production has been achieved from the installed equipment. Production as required can not be achieved without the inputs as noted in the appendix.

Material Requirements lists have been prepared and sourced, as have the spares lists for the existing Machine Tools.

A Production Control System is in operation and also a Maintenance Schedule for the installed Machine Tools.

Lectures and Demonstrations were prepared and delivered by the consultant to the workshop staff on a variety of appropriate engineering subjects, eg. Tolerances, Fits, Thread Cutting, Cutting Angles, Materials, Methods, Feeds and Speeds, Finishes, Heat Treatment, Etc.

Activities.

Workshop staff skill levels have been assessed at the request of the National Project Director and the findings recorded for his information.

Lists of Books, ISO Standards, Wall Charts and required inputs have been prepared. A Drawing Board is located on the workshop floor and is being utilised to produce drawings of components for manufacture.

Items produced thus far include: Tee Nuts, Threaded Studs, Nuts, Bolts, Washers, Screws etc. utilising materials to hand.

The Sheet Metal Working Machines i.e. the Guillotine and Bender are in position as are the Bench Drill, Bench Grinder, Polisher and Spot Welder. Benches are now in position with Vices mounted at appropriate points.

Neon Tube Lighting has been installed to give sufficient light for precision work.

The Workshop is now ready to produce a limited range of components to meet the centres requirements. With the acquirement of the inputs as appended the capability will improve considerably.

During the mission, "On The Job" Practical and Theoretical instruction was intensive. Subsequent to the Mission, on the Consultants return to Singapore approaches have been made to Avimo Singapore Ltd. in an attempt to secure Fellowship Placements for Two Trainees in the Machine Shop and Optical areas. Avimo is part of the United Scientific Holdings Group of Companies and is considered to be among the leading Optical Engineering Companies Worldwide. Avimo have agreed in principle to accept the nominees and await clearance from the Government of Singapore prior to initiating negotiations with UNIDO. The Economic Development Board of Singapore have intimated that individual assessments of the nominees will be the deciding factor. I have deposited the Bio Datas of the nominees with Avimo and will keep in close contact with them regarding these matters.

Findings.

Machine Tools. The Consultant would draw attention to the fact that the inputs presently in situ can not facilitate production of the components as required to achieve the Project Objectives. The capability of the equipment can not match the accuracy fundamental to optical engineering. At present, achievable accuracy is at best .06mm. The actual requirement is .01mm. or better. To achieve this, substantial inputs are indicated. These inputs are listed and annexed to the report. In addition to the need for accuracy it is required to machine materials harder than RC.40. with surface finishes of 0.1um. Analysis of the components indicates a Cylindrical Grinding capability, Internal and External is required. The substantial outlay to date on milling cutters indicates the need for a Tool and Cutter Grinder. The physical effort of cutting large diameter Bar Stock and Flat Plate can be relieved by use of Mechanical Saws. Please refer to the Recommendations section of the report.

Measuring Instruments.

The Micrometers in the workshop at present and those presently on order can not provide sufficient coverage for the range and complexity of measurements to be encountered in the workshop. Other inputs are required to enable effective capability, again these are noted under Recommendations. Corrosion is evident on the Micrometers and Setting Pieces are missing.

Data Bank. Books, Wall Charts, ISO Standards are essential inputs. The Consultant has given Engineering Data books to the workshop staff in order that some data be available to them, further inputs are required.

Spare. To ensure the continued use of the Machine Tools it is required to obtain sufficient spares, at present spares are insufficient and lists are appended with recommendations.

Maintenance. The Machine Tools require daily attention and recommendations are appended to achieve this ideal.

Production Control.

An unstructured approach is apparent and again recommendations are given.

Safety. There is a lack of awareness by staff to the dangers present in the workshop proper regard to the recommendations is essential.



Power supply.

Voltage fluctuations and power cuts are a common occurrence. The voltage has been noted to vary between 345v. & 375v.. Running the Machines on low voltage will cause damage to the circuits and motor windings. Recommendations are given to assist.

Materials.

The lack of engineering hardware, eg. Screws, Nuts, Bolts, Washers etc. will dilute the effectiveness of the workshops productive capability if demands are placed to manufacture such standard items. These items are available world wide at costs much less than the local market material costs alone. Non standard items can be justifiably manufactured. The lack of engineering materials, eg. Tool Steel, Copper, Alum. Bronze, Brass and Plastics was most noticeable in the course of the mission, unless such materials are readily to hand there is little point to the workshops existence. See Recommendations.

General Observations

The workshop area of approximately 100sq. metres is ample, there is also provision for expansion should the need occur. The area is well lit, ventilated and in close proximity to the main centre building. Tu Lien is an area of high humidity which has already affected the equipment on site. steps to combat this problem are required. The workshop staff are willing workers, keen to learn, and have previous training. Actual working experience is required to update their skill levels. There is apparently difficulty in obtaining fellowship placement and it is the Consultants intention to pursue this matter upon his return to Singapore on completion of the mission. It should be noted that the equipment on site would be more suited to a home workshop and is not in keeping with the stated project objectives. More sophisticated inputs are required to achieve a positive result. In selecting the equipment the Consultant has kept in mind the financial restraints and attempted to balance cost with appropriate technology. The selected inputs are all available ex-stock Singapore, thus savings on freight, and rapid delivery are assured.

Recommendations.

Section One. It is essential that these inputs are obtained in totality, as they are balanced to achieve compatibility with equipment presently on site and on order at this time.

Machine Tools. a. Surface Grinder.

b. Tool & Cutter Grinder.

c. Mechanical Cut off Saw.

d. Vertical Band Saw.

e. Precision High Speed Lathe.

f. Universal Milling Machine. [Advised for Gear Manufacture, Helical Milling]

g. Universal Grinder. [Advised but not vital as many items can be ground utilising attachments specified for the surface and T.& Cutter Grinder.]

h. MIG Welding Set.

i. TIG Welding Set.

j. Measuring Equipment.

k. Materials.

l. Tooling.

m. Hardware.

n. Machine Spares.

o. Grinding Wheels.

p. Books and other Documentary Inputs.

Workshop and Production Controls.

All work must be allocated a Works Order Number.

The Production Control Planning Board must be utilised.

Maintain Records as per the models provided.

Inspect all work and keep records as per models provided.

Prepare and check Drawings prior to commencing manufacture of components.

Follow ISO or Equivalent Standards.

Maintain Stock Records for Tooling, Hardware, Spares and Materials.

Calibrate Measuring Instruments Prior to use, keep records.

Maintain Tool Issue Records.

Resharpen tools before replacing in stores.

Recommendations.

Measurements. Humidity has already caused damage to the Micrometers in the workshop, steps must be taken to prevent similar damage to the inputs yet to arrive. Air Conditioning of the workshop would be the correct solution, should this not be possible, Protective Coatings of Petroleum Jelly or similar medium must be applied to the Measuring Instruments. It is also advised that these precision Instruments be kept in an Airtight Cabinet with ample Vapour Process Corrosion Inhibitors, and or Dehumidifiers.

Calibration of these instruments must be carried out prior to use and records kept to confirm this fact. The suggested inputs will enable most of the workshops measuring requirements to be accommodated.

Databank. Production of even the simplest component requires the application of Standards, it is therefore imperative to have this data accessible by the workshop staff. The inputs as listed will cover most of the requirements.

Machine Maintenance And Spares. A Maintenance Schedule has been prepared utilising the manufacturers recommendations with a simple colour code to guide the staff in the frequency of application, staff have been instructed in this area and are carrying out the daily lubrication schedule. The period before any Major Overhaul is required can be as long as ten years, provided the schedule is followed. There will most likely be minor repairs prior to this and it is wise to prepare for such eventualities, spares for the ten year overhaul and the period prior to it should be obtained now, when they are readily available, Parts Lists are appended to the report. Lubricants, Grease and Protective Coatings have also been specified and sourced.

Materials & Hardware. The difficulties of obtaining Suitable Materials and Engineering Hardware in the Local Market were apparent in the course of the mission, to facilitate optimum utilisation of the considerable Project Inputs it is strongly advised that a Small Stock of commonly used Materials and Hardware be obtained at this time. Lists of Priority Requirements are appended with Cost, Source and Availability noted. It is again advised not to attempt the manufacture of standard engineered items, Machines and Personnel must be utilised to manufacture components which are difficult to obtain, items such as those selected by the Consultant as being suitable for manufacture.

Recommendations.

Power Supply. The Erratic Power supply is a source of potential disruption to the productive capability of the workshop. This fact, in addition to the probability of serious damage to the Machine Tool Electrical Circuits and Motors would justify the installation of a Standby Generator. I have been informed however that fuel supplies are difficult to obtain. In view of the foregoing the Consultant advises that a Low Voltage Cut Out Device be placed in the circuit to ensure the Machines are not run on low voltage, an alternative solution would be to place a Voltage Monitor in a suitable position to let staff be aware of a low voltage condition.

Personnel. The skill requirement level for the type of component and range of activities expected from the workshop is very high. Staff have not had sufficient exposure to the demands which will be placed upon them, training and actual production experience are required to raise their skill levels. Staff are eager to learn and appear to have the capability of running the workshop. Should the difficulties encountered over Fellowship Placement be unresolved, it is recommended that the services of a Skilled Toolmaker/Instrument maker be obtained for a period of six months or more. Engineering Drawing Skills are also required and staff must acquire this skill. The need to produce components from heat treated materials is evident, to allow for this the Consultant has specified grade 01 Oil Hardening Tool Steel, the processes required are within the capability of staff to acquire knowledge of.

General notes. The Machine Tools as specified for inputs can be installed by the workshop staff as they have been familiarised with the processes by the Consultant. Untrained personnel must be forbidden access to the workshop, statistics show there is a fatal accident world-wide in workshops on average every three minutes. Electrical Wiring must be in accord with ISO or similar standards. Plugs and Sockets must be used "No Bare Wires". Fire Extinguishers "Dry Chemical Type" are to be located in the workshop. Do not lock the Fire Escape Door. A First Aid Box has to be made available. Materials must be securely stored to prevent danger or obstruction in the workshop. The Concrete Floor Must be sealed to prevent Abrasive Dust damage to the Machine Tools and Measuring Instruments.

General Notes. Dust Covers are to be provided for all of the Machine Tools.

Corrosion Inhibitors are to be placed under the dust covers at all times.

Storage Cabinets are to be provided for the inputs of Cutters, Measuring Instruments, Hardware and Materials.

Machine Spares are to be placed in clearly marked containers and protected from the possibility of corrosion. Letters are to be sent to the manufacturers of the Spot Welder and Drilling Machines requesting Operating and Spares Manuals, upon receipt of these Manuals orders must be placed for Spares.

As promised, the Consultant has provided a comprehensive Quotation from a reputable Order Supplier who is an Agent for many of these items. The supplier is prepared to ship all items suitably protected, in a container, direct to Haiphong.



# GP SYSTEM (SINGAPORE) PTE LTD

Kalstar House, 8 Gul Avenue, Jurong, Singapore 2262  
Tel: 8612663/4 Telex: RS 39723 KOSTAR Fax: 8613500

Our Ref: Q/VF/001/87/11

Date:

For the attention of Mr Doan Xwan Son  
(National Project Director)

COMPANY FOR THE REPAIRS & MAINTENANCE  
OF OPTICAL & SCIENTIFIC INSTRUMENTS

STATE COMMITTEE FOR SCIENCE & TECHNOLOGY

### FREEPORT PRECISION SURFACE GRINDERS

Model: SGS - 618 High Column Type with Teflon Table Slide Ways

Table Size	: 6" x 18"
Max. Grinding Length	: 18"
Max. Grinding Width	: 6"
Max. Table Travel	: 19"
Max. Wheel Head Cross Feed Travel	: 6-3/4"
Max. Distance Between Table Surface and Spindle Center	: 18"
Spindle Motor	: 1 HP
Spindle Speed	: 2900 rpm

### c/w Standard Accessories of:-

- 1 x Operation Manual
- 1 x Tool Box and Tools
- 1 x Wheel Flange
- 1 x Wheel Balancing base
- 1 x Wheel Balancing Arbor
- 1 x Grinding Wheel
- 1 x Flange Extractor
- 1 x Diamond Dresser
- 1 x Diamond Dresser base
- 1 x Work Light

1-Unit

S\$11222.00

For Terms and Conditions of Sales, please refer to Page 34.



# GP SYSTEM (SINGAPORE) PTE LTD

Kalstar House, 8 Gul Avenue, Jurong, Singapore 2262  
Tel: 8612663/4 Telex: RS 39723 KOSTAR Fax: 8613500

Our Ref: G/VP/001/87/12

Date:

For the attention of Mr Doan Xwan Son  
(National Project Director)

COMPANY FOR THE REPAIRS & MAINTENANCE  
OF OPTICAL & SCIENTIFIC INSTRUMENTS

STATE COMMITTEE FOR SCIENCE & TECHNOLOGY

## JACK MILL UNIVERSAL TOOL & CUTTER GRINDER

Model: J - 40

Swing Over Table	: 10"
Distance Between Centers	: 27-1/2"
Distance Between Tailstock and Workhead	: 22-3/4"
Table Size	: 5-5/16" x 37"
Grinding Wheel Spindle	: 2600, 3700, 6200 rpm
Spindle Motor	: 1 HP
Longitudinal Travel	: 16"
Cross Travel	: 10"
Wheel Head Travel	: 10"

c/w Standard Equipment  
See Attached Catalogues

1-Unit

S\$19618.00

### Optional Accessories :-

1) Cylindrical Grinding Attachment	S\$ 1719.65
2) Internal Grinding Attachment	S\$ 2569.60
3) Spring Collet Chuck	S\$ 1442.90
4) No.1 Radius Grinding Attachment	S\$ 3755.50
5) No.2 Radius Grinding Attachment	S\$ 3518.30
6) Dust Collector	S\$ 1660.30
7) Workhead Indexing Attachment	S\$ 593.00
8) Helical Grinding Attachment	S\$ 5139.10
9) Extended Grinding Wheel Spindle	S\$ 2569.65
10) Raiser Block	S\$ 316.25
11) Wet Grinding Attachment	S\$ 869.70

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# **GP SYSTEM (SINGAPORE) PTE LTD**

Kalstar House, 8 Gul Avenue, Jurong, Singapore 2262  
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Our Ref: VP/001/87/13

Date:

For the attention of Mr Doan Xwan Son  
(National Project Director)

COMPANY FOR THE REPAIR & MAINTENANCE  
OF OPTICAL & SCIENTIFIC INSTRUMENTS

STATE COMMITTEE FOR SCIENCE & TECHNOLOGY

## VICTOR PRECISION HIGH SPEED LATHE

Model: 400 x 1000

Swing Over Bed	: 405mm
Distance Between Center	: 950mm
Swing In Gap	: 585mm
Spindle Nose	: D1-6
Spindle Bore	: 51mm
Spindle Speed	: 65 - 1800 rpm (8 steps)
Spindle Motor	: 5 HP

### c/w Standard Accessories of:-

1 x Coolant Unit  
1 x 3 Jaw Chuck 8"  
1 x 4 Jaw Chuck 12"  
1 x Steady Rest  
1 x Follow Rest  
1 x Work Light

1-unit      S\$19685.00

For Terms and Conditions of Sales, please refer to page 34.





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Kalstar House, 8 Gul Avenue, Jurong, Singapore 2262  
Tel: 8612663/4 Telex: RS 39723 KOSTAR Fax: 8613500

Our Ref/VP/001/87/14

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(National Project Director)

COMPANY FOR THE REPAIRS & MAINTENANCE  
OF OPTICAL & SCIENTIFIC INSTRUMENTS

STATE COMMITTEE FOR SCIENCE & TECHNOLOGY

**CHUN JEI POWERFUL HYDRAULIC SAW MACHINE**

Model: CM - 200H

Maximum Cutting Capacity: Dia.200mm or 190mm x 200mm

Motor : 1 HP

Strokes Per Minute : 100, 140

Blade Size : 350mmx32mmx1.6mmdia.8.1mm

**c/w Standard Accessories of:-**

1-Set Hexagon Wrench

1-Pce Grease Gun

1-Set Open End Wrench

1-Pce Saw Blade

1-unit

S\$ 4375.00

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Tel: 8612663/4 Telex: RS 39723 KOSTAR Fax: 8613500

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Date:

For the attention of Mr Doan Xwan Son  
(National Project Director)

COMPANY FOR THE REPAIRS & MAINTENANCE  
OF OPTICAL & SCIENTIFIC INSTRUMENTS

STATE COMMITTEE FOR SCIENCE & TECHNOLOGY

### LETEN VERTICAL METAL CUTTING BANDSAW

Model: DCM - 4

Max. Distance from Blade to Column:	16"
Max. Work Height	: 11"
Table Size	: 23-1/2" x 19-1/2"
Speed	: 16 - 65 M/min Low
	: 100-100 M/min High
Drive Motor	: 2 HP
Blade Length	: 128"
Max. Blade Width	: 5/8"

### c/w Standard Accessories of:-

- 1) V-Type Saw Guides And Inserts
- 2) Saw Blades Butterwelder With Intergrated Annealing Unit
- 3) Blade Shear, Grinder
- 4) Built In Blade And Tire Cleaning Brush
- 5) Chip Blower And Jet
- 6) 4-Way Tilting Table
- 7) Magnetic Starter with No-Volt and Overload Protection
- 8) Low Voltage Control Circuits
- 9) Low Voltage Work Lamp
- 10) Tachometer Indicating Exact Blade Speed
- 11) Blade Tension Indicator
- 12) Saw Blade Ready For use
- 14) One Set of Required Tools
- 15) One Instruction And Parts Manual      1-Unit      S\$ 9375.00

For Terms and Conditions of Sales, please refer to Page 34



# **GP SYSTEM (SINGAPORE) PTE LTD**

Kalstar House, 8 Gul Avenue, Jurong, Singapore 2262  
Tel: 8612663/4 Telex: RS 39723 KOSTAR Fax: 8613500

Our Ref: VP/001/87/16

Date:

For the attention of Mr Doan Xwan Son  
(National Project Director)

COMPANY FOR THE REPAIRS & MAINTANENCE  
OF OPTICAL & SCIENTIFIC INSTRUMENTS

STATE COMMITTEE FOR SCIENCE & TECHNOLOGY

## DAH LIH UNIVERSAL MILLING MACHINE

Model: DL - U2 with Vertical Milling Head

Table Size : 11" x 51.2"  
Longitudinal Travel : 33.5"  
Cross Travel : 14.2"  
Vertical Travel : 17.7"  
Spindle Speed : 85 - 1300 rpm (9 steps)  
Main Spindle Motor : 5 HP  
Taper of Spindle Nose: N.S.T. #40

### c/w Standard Accessories of:-

1 x Coolant Unit		
1 x Work Light		
1 x Adjusting Tools & Tool Box		
1 x Milling Arbor with Spacer		
1 x Splash Guard		
1 x Levelling Blocks (1-Set)	1-Unit	S\$43723.00

For Terms and Conditions of Sales, please refer to Page 34.



# GP SYSTEM (SINGAPORE) PTE LTD

Kalstar House, 8 Gul Avenue, Jurong, Singapore 2262  
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SYSTEM

## WELDING MACHINE

MIG Semi-Automatic Welding Set  
Complete with standard accessories

- Welding Gun 3 metre
- Input Cable 4 x 1.5mmSq.
- Earth Cable 300amps
- Earth Clamp 300amps
- OKC 50 Male Connector
- One Spool dia.1.0mm wires
- Gas Regulator

1 set      S\$6247.00      S\$6247.00

Spare Wire Dia.1.0mm

1 Spool      S\$ 108.00      S\$ 108.00

## TIG WELDER

Complete with standard accessories

- Control Cable 3 Core x 1.5 metre
- Cannon Plug (2 Pin)
- BTB 150 G Torch 4.0m
- OKC 25 Cable Connector (M)
- OKC 25 Cable Connector (F)
- Argon Regulator c/w Adaptor
- 2% Thoriated Tungsten 1.6metre
- Hose Clip 1/4"

1 Set      S\$3083.00      S\$3083.00

Spare Tungsten 1.6mm

1 Set      S\$166.00      S\$166.00  
(per set = 20pcs)

For Terms and Conditions of Sales, please refer to Page 34.



# GP SYSTEM (SINGAPORE) PTE LTD

Kalstar House, 8 Gul Avenue, Jurong, Singapore 2262  
 Tel: 8612663/4 Telex: RS 39723 KOSTAR Fax: 8613500

## MEASURING INSTRUMENTS

### Holtest Bore Micrometer. Mitutoyo or similar.

<u>Range</u>	<u>Catalogue #</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Total</u>
2-3mm	368-906	1 set	S\$2494.00	S\$2494.00
3-6mm	368-907	1 set	S\$3088.50	S\$3088.50
6-12mm	368-901	1 set	S\$1482.65	S\$1482.65
12-20mm	368-902	1 set	S\$1054.90	S\$1054.90
20-50mm	368-903	1 set	S\$3302.40	S\$3302.40

### Outside Micrometers

0-150mm	103-913	1 set	S\$ 561.90	S\$ 561.90
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### Granite Surface Table

600x450x100mm	517-203	1 Pce	S\$ 648.90	S\$ 648.90
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### Vernier Height Gauge

Metric 300	516-939	1 Pce	S\$3161.00	S\$3161.00
Height Master	515-318	1 Pce	S\$3008.75	S\$3008.75
Sine Bars(100mm)	37132-101	4 Pce	S\$ 716.00	S\$2864.00

### Dial Test Indicators

513.904	4 Sets	S\$ 155.15	S\$ 620.60
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### Screw Thread Micrometers

0-25mm	126-125	1 Pce	S\$ 280.95	S\$ 280.95
25-50mm	126-126	1 Pce	S\$ 366.15	S\$ 366.15

### Fifteen Degree Point Micrometers

0-25mm	112-165	1 Pce	S\$ 197.60	S\$ 197.60
25-50mm	112-166	1 pce	S\$ 213.90	S\$ 213.90

### Measuring Microscope

1 Set	S\$ 95.60	S\$ 95.60
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### Diametral Pitch Gauge (For Gear Manufacture)

24 gear shape on 15 leaves	1 Set	S\$ 238.00	S\$ 238.00
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### Centre Gauges

1 Set	S\$ 22.50	S\$ 22.50
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### Screw Pitch Micrometer

Total 4 Micrometers 0-100mm for measuring metric pitch 0.4-7mm and witworth 60-3.5 TPI	1 Set	S\$3085.70	S\$3085.70
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### Hardness Tester (Bench Type)

for measuring Rockwell, Brinell and Vickers - Complete with standard accessories	1 Set	S\$4300.00	S\$4300.00
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For Terms and Conditions of Sales, please refer to Page 34.



# GP SYSTEM (SINGAPORE) PTE LTD

Kalstar House, 8 Gul Avenue, Jurong, Singapore 2262  
Tel: 8612663/4 Telex. RS 39723 KOSTAR Fax: 8613500

## MATERIALS

**Round Steel DIN 2510, AISI 01  
Oil Hardening Tool & Die Steel**

<u>Diameter</u>	<u>Length</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Total</u>
10.0mm	3 metres	5	S\$ 16.40	S\$ 82.00
12.0mm	3 metres	5	S\$ 21.00	S\$105.00
16.0mm	3 metres	3	S\$ 33.00	S\$ 99.00
20.0mm	3 metres	2	S\$ 51.80	S\$103.60
25.0mm	3 metres	2	S\$ 81.00	S\$162.00
28.0mm	3 metres	2	S\$101.00	S\$202.00
35.0mm	3 metres	1	S\$147.00	S\$147.00
50.0mm	3 metres	1	S\$200.00	S\$200.00
60.0mm	2 metres	1	S\$288.00	S\$288.00
75.0mm	1 metre	1	S\$225.00	S\$225.00
100.0mm	1 metre	1	S\$431.00	S\$431.00

**Round Steel DIN 1730, AISI 1045  
Carbon Steel for Water Hardening**

<u>Diameter</u>	<u>Length</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Total</u>
10.0mm	3 metres	5	S\$ 9.40	S\$ 47.00
12.0mm	3 metres	5	S\$ 9.40	S\$ 47.00
16.0mm	3 metres	3	S\$ 20.00	S\$ 60.00
20.0mm	3 metres	2	S\$ 29.60	S\$ 59.20
25.0mm	3 metres	2	S\$ 46.25	S\$ 92.50
50.0mm	2 metres	1	S\$108.00	S\$108.00
75.0mm	1 metre	1	S\$121.00	S\$121.00
100.0mm	1 metre	1	S\$215.00	S\$215.00

**Flat Steel AISI 01, DIN 2510**  
**Oil-hardening Heavy Duty Steel**

<u>Size(mm)</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Total</u>
1.0 x 25 x 500mm	10	S\$ 9.80	S\$ 98.00
2.0 x 25 x 500mm	5	S\$ 12.00	S\$ 60.00
2.0 x 50 x 500mm	5	S\$ 16.20	S\$ 81.00
2.0 x 100 x 500mm	3	S\$ 32.40	S\$ 97.20
5.0 x 30 x 500mm	5	S\$ 21.50	S\$107.50

**Stainless Steel Rounds 304**

<u>Diameter</u>	<u>Length</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Total</u>
3/8 inches	6 metre	3	S\$ 33.00	S\$ 99.00
1.0 inches	6 metre	1	S\$160.00	S\$160.00
2.0 inches	1 metre	1	S\$117.00	S\$117.00

**For Sales and Conditions of Sales, please refer to Page 34.**



# GP SYSTEM (SINGAPORE) PTE LTD

Kalstar House, 8 Gul Avenue, Jurong, Singapore 2262  
 Tel: 8612663/4 Telex: RS 39723 KOSTAR Fax: 8613500

### Hard Fibre Rod

<u>Diameter</u>	<u>Length</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Total</u>
1 inches	3 feet	2	S\$ 78.00	S\$156.00
2 inches	3 feet	2	S\$160.80	S\$321.60

### Nylon Round Rod (Black)

<u>Diameter</u>	<u>Length</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Total</u>
1/2 inches	3 feet	2	S\$ 17.00	S\$ 34.00
1 inches	6 feet	2	S\$138.00	S\$276.00
2 inches	3 feet	1	S\$259.00	S\$259.00

### Telfon Round Rod (White)

<u>Diameter</u>	<u>Length</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Total</u>
1 inches	3 feet	1	S\$161.00	S\$161.00
2 inches	3 feet	1	S\$657.00	S\$657.00

### Oilite Bronze Bearing Bar Stock

<u>Diameter</u>	<u>Length</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Total</u>
1/2 inches	6 feet	1	S\$ 39.00	S\$ 39.00
1 inches	6 feet	1	S\$ 80.00	S\$ 80.00
2 inches	6 feet	1	S\$249.00	S\$249.00

### Round Copper Bar

<u>Diameter</u>	<u>Length</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Total</u>
1/2 inches	1 metre	2	S\$ 15.00	S\$ 30.00
1 inches	1 metre	2	S\$ 42.75	S\$ 85.50
2 inches	1 metre	1	S\$171.00	S\$171.00

### Rectangular Copper Flat

12.5 x 25 x 4 metres	1	S\$120.00	S\$120.00
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### Solid Bronze Bar (For Gears)

<u>Diameter</u>	<u>Length</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Total</u>
1/2 inches	13 inches	3	S\$ 15.50	S\$ 46.50
1 inches	3 feet	3	S\$ 43.00	S\$129.00
2 inches	2 feet	1	S\$ 96.80	S\$ 96.80
3 inches	2 feet	1	S\$211.00	S\$211.00

### Aluminum Rounds Alloy 6061

<u>Diameter</u>	<u>Length</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Total</u>
1/4 inches	10 feet	10	S\$ 16.00	S\$160.00
1/2 inches	16 feet	5	S\$ 23.00	S\$115.00
1 inches	16 feet	3	S\$ 75.00	S\$225.00
2 inches	12 feet	2	S\$133.00	S\$266.00
4 inches	3 feet	1	S\$133.00	S\$133.00

For Terms and Conditions of Sales, please refer to Page 36.



SYSTEM

# **GP SYSTEM (SINGAPORE) PTE LTD**

*Kalstar House, 8 Gul Avenue, Jurong, Singapore 2262  
Tel: 8612663/4 Telex: RS 39723 KOSTAR Fax: 8613500*

## Grey Cast Iron

<u>Diameter</u>	<u>Length</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Total</u>
2 inches	12 inches	3	S\$ 13.00	S\$ 39.00
3 inches	12 inches	3	S\$ 27.00	S\$ 81.00
4 inches	12 inches	3	S\$ 38.00	S\$114.00

## Phospor Bronze Rounds

<u>Diameter</u>	<u>Length</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Total</u>
1/2 inches	2 feet	5	S\$ 8.89	S\$ 44.45
1 inches	2 feet	5	S\$ 23.80	S\$119.00
2 inches	2 feet	3	S\$ 96.80	S\$290.40
3 inches	2 feet	2	S\$211.00	S\$422.00
4 inches	2 feet	2	S\$369.60	S\$739.20

For Terms and Conditions of Sales, please refer to Page 34.





**SYSTEM**

**GP SYSTEM (SINGAPORE) PTE LTD**

Kalstar House, 8 Gul Avenue, Jurong, Singapore 2262  
Tel: 8612663/4 Telex: RS 39723 KOSTAR Fax: 8613500

TOOLINGS

Metric Counterboring Tools

<u>Description</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Total</u>
M3 - M12 (Medium)	2 Set	S\$251.00	S\$502.00

Thread Taps Metric Fine RH (Machine Tap)

<u>Description</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Total</u>
M4 x 0.5	6 Pcs	S\$ 24.00	S\$ 144.00
M5 x 0.5	6 Pcs	S\$ 25.85	S\$ 155.10
M6 x 0.75	6 Pcs	S\$ 25.85	S\$ 155.10
M7 x 0.75	6 Pcs	S\$ 28.05	S\$ 168.30
M8 x 0.75	6 Pcs	S\$ 28.05	S\$ 168.30
M8 x 1.0	6 Pcs	S\$ 26.40	S\$ 158.40
M9 x 1.0	6 Pcs	S\$ 35.20	S\$ 211.20
M10 x 0.75	6 pcs	S\$ 37.95	S\$ 227.70
M10 x 1.25	6 Pcs	S\$ 33.00	S\$ 198.00
M11 x 1.0	6 Pcs	S\$ 41.25	S\$ 247.50
M12 x 1.0	4 pcs	S\$ 31.35	S\$ 125.40
M12 x 1.25	4 Pcs	S\$ 35.20	S\$ 140.80
M14 x 1.0	4 Pcs	S\$ 41.25	S\$ 165.00
M14 x 1.25	4 Pcs	S\$ 39.60	S\$ 158.40
M14 x 1.5	4 Pcs	S\$ 39.60	S\$ 158.40
M16 x 1.5	2 Pcs	S\$ 44.55	S\$ 89.10
M18 x 1.0	2 Pcs	S\$ 57.20	S\$ 114.40
M18 x 1.5	2 Pcs	S\$ 52.25	S\$ 104.50
M20 x 2.0	2 Pcs	S\$ 60.50	S\$ 121.00
M20 x 1.0	2 Pcs	S\$ 61.60	S\$ 123.20
M20 x 1.5	2 Pcs	S\$ 58.30	S\$ 116.60

Thread Dies Metric Fine

M4 x 0.5 to M20 x 2.0

Total of 21 dies inclusive

Diestocks Dia.16,20,25,30,38 & 45mm

1 Set	S\$1582.00	S\$1582.00
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Tap Holders Sets

for holding taps & dies on  
Lathe or Drilling Machines

M1 - M6	1 Set	S\$ 457.00	S\$ 457.00
M6 - M16	1 Set	S\$ 785.00	S\$ 785.00
M15 - M24	1 Set	S\$1032.00	S\$1032.00

For Terms and Conditions of Sales, please refer to Page 34.



# GP SYSTEM (SINGAPORE) PTE LTD

Kalstar House, 8 Gul Avenue, Jurong, Singapore 2262  
 Tel: 8612663/4 Telex: RS 39723 KOSTAR Fax: 8613500

<b><u>Taper Pin Reamer</u></b>			
7/0 to 10 (per set = 17pcs)	2 Sets	S\$ 886.00	S\$1772.00
<b><u>Morse taper Reamer (Pre and Finishing)</u></b>			
MT 1	1 Set	S\$ 110.88	S\$ 110.88
MT 2	1 Set	S\$ 165.80	S\$ 165.80
MT 3	1 Set	S\$ 224.00	S\$ 224.00
<b><u>Hand Reamer Set H7</u></b>			
Dia.1.5 to 10 H7 in steps of 0.5mm (total = 18pcs)	1 Set	S\$ 520.00	S\$ 520.00
<b><u>Lathe Turning Tools</u></b>			
Braze Carbide Tips P25			
Shank 20 x 20			
Knife Tool			
Facing Tool			
Grooving Tool			
Parting Tool & Blade			
Boring Bars Dia.16, 20, 25			
Regrindable HSS OD Threading Set			
55Degree + 60Degree			
Internal Threading Bar & Insert	1 Set	S\$1100.00	S\$1100.00
<b><u>Arbor Sets for Milling Machine</u></b>			
Arbor for Face Mills Dia.16mm	1 Pce	S\$ 290.00	S\$ 290.00
Arbor for face Mills Dia.22mm	1 Pce	S\$ 290.00	S\$ 290.00
Arbor for face Mills Dia.27mm	1 Pce	S\$ 290.00	S\$ 290.00
Arbor for Drill Chucks (1-13)	1 Set	S\$ 230.00	S\$ 230.00
<b><u>Arbor Collet Sets inclusive</u></b>			
Collets (in Box)	1 Set	S\$2137.00	S\$2137.00
<b><u>HSS Drills Sets</u></b>			
1-10mm in step of 0.5mm	3 Sets	S\$ 58.00	S\$ 174.00
<b><u>Countersunk Set</u></b>	1 Set	S\$ 153.00	S\$ 153.00

For Terms and Conditions of Sales, please refer to Page 34.



# GP SYSTEM (SINGAPORE) PTE LTD

Kalstar House, 8 Gul Avenue, Jurong, Singapore 2262  
Tel: 8612663/4 Telex: RS 39723 KOSTAR Fax: 8613500

## HARDWARE

<u>Description</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Total</u>
<b><u>Hardening Furnace</u></b>			
Capacity : 230 x 250 x 120			
Overall Size : 460 x 660 x 560			
Voltage : 220V 60Kw			
With Programmable Temperature Controller			
Maximum Temperature : 1100 C	1 Set	S\$5981.00	S\$5981.00
<b><u>Complete Set of Pop Rivet with Gun</u></b>			
12 Different rivets material of various sizes dia.3 & dia.4mm	1 Set	S\$ 279.00	S\$ 279.00
Edge Finder dia.10mm	1 Pce	S\$ 120.00	S\$ 120.00
Toolmakers Clamp Set (18-45mm: 7pcs/set)	1 Set	S\$ 98.00	S\$ 98.00
Combi-Spanners Set (12pcs per set)	1 Set	S\$ 113.00	S\$ 113.00
Screw Drivers Set (Slit)	1 Pce	S\$ 35.00	S\$ 35.00
Screw Drivers Set (Philips)	1 Pce	S\$ 35.00	S\$ 35.00
Prussia Blue	6 Pcs	S\$ 8.00	S\$ 48.00
Angular Plate 200x100x150mm	1 Pce	S\$ 570.00	S\$ 570.00
Layout Ink Spray Cans	6 Pcs	S\$ 13.00	S\$ 78.00
Pick-up Tongs 500mm	1 Pce	S\$ 40.00	S\$ 40.00

For Terms and Conditions of Sales, please refer to page 34.



# GP SYSTEM (SINGAPORE) PTE LTD

Kaistar House, 8 Gul Avenue, Jurong, Singapore 2262  
Tel: 8612663/4 Telex. RS 39723 KOSTAR Fax: 8613500

## Files

Assorted Needle Files 160mm	6 Sets	S\$ 60.00	S\$ 360.00
Blunt 250mm Smooth Cut	5 Pcs	S\$ 16.00	S\$ 80.00
Blunt 250mm Dead Smooth	5 Pcs	S\$ 18.00	S\$ 90.00
Flat 250mm Cut No.1	5 Pcs	S\$ 7.50	S\$ 37.50
Flat 250mm Cut No.2	5 Pcs	S\$ 7.50	S\$ 37.50
Flat 250mm Cut No.3	5 Pcs	S\$ 8.00	S\$ 40.00
Warding 150mm Cut No.2	5 Pcs	S\$ 9.50	S\$ 47.50
Warding 150mm Cut No.3	5 Pcs	S\$ 10.20	S\$ 51.00
3-Square 100mm Cut No.1	5 Pcs	S\$ 4.00	S\$ 20.00
3-Square 100mm Cut No.2	5 Pcs	S\$ 4.50	S\$ 22.50
3-Square 100mm Cut No.3	5 Pcs	S\$ 5.00	S\$ 25.00
Square 100mm Cut No.1	5 Pcs	S\$ 4.00	S\$ 20.00
Square 100mm Cut No.2	5 Pcs	S\$ 4.50	S\$ 22.50
Square 100mm Cut No.3	5 Pcs	S\$ 5.00	S\$ 25.00
1/2 Round 100mm Cut No.1	5 pcs	S\$ 7.00	S\$ 35.00
1/2 Round 100mm Cut No.2	5 Pcs	S\$ 7.50	S\$ 37.50
1/2 Round 100mm Cut No.3	5 Pcs	S\$ 8.00	S\$ 40.00
Round 100mm Cut No.1	5 pcs	S\$ 4.00	S\$ 20.00
Round 100mm Cut No.2	5 Pcs	S\$ 4.20	S\$ 21.00
Round 100mm Cut No.3	5 Pcs	S\$ 4.80	S\$ 24.00
Round 150mm Cut No.1	5 Pcs	S\$ 4.00	S\$ 20.00
Round 150mm Cut No.2	5 Pcs	S\$ 4.20	S\$ 21.00
Round 150mm Cut No.3	5 Pcs	S\$ 4.80	S\$ 24.00
Knife 150mm Cut No.1	5 Pcs	S\$ 15.00	S\$ 75.00
Knife 150mm Cut No.3	5 Pcs	S\$ 16.90	S\$ 84.50

Above supplied with handles.

For Terms and Conditions of Sales, please refer to Page 34.



# GP SYSTEM (SINGAPORE) PTE LTD

Kalstar House, 8 Gul Avenue, Jurong, Singapore 2262  
Tel: 8612663/4 Telex: RS 39723 KOSTAR Fax: 8613500

### Assorted Adhesives for :-

Steel, Stainless Steel, Aluminum,  
Brass etc.

1 Set S\$160.00 S\$160.00

### Assorted Dowel Pins :-

<u>Diameter</u>	<u>Length</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Total</u>
3mm	32mm	100 Pcs	S\$ 0.60	S\$ 60.00
4mm	28mm	100 Pcs	S\$ 0.60	S\$ 60.00
5mm	50mm	100 Pcs	S\$ 0.70	S\$ 70.00
6mm	60mm	100 Pcs	S\$ 0.70	S\$ 70.00
8mm	40mm	100 Pcs	S\$ 0.80	S\$ 80.00
10mm	50mm	100 Pcs	S\$ 1.00	S\$100.00

### Heavy Duty Soluble

Cutting Oil (209Litres/Drum)

1 Drum S\$1045.00 S\$1045.00

### All Purposes Grease

1 Ibs Can

25 Cans S\$ 8.00 S\$ 200.00

Oil for Heat Treatment of  
Steel. 209Litres/Drum

2 Drums S\$1672.00 S\$1672.00

Oxidation Inhibitor for  
Passivation of Ferrous &  
Non-Ferrous Metals by Vapour  
Process

50 Packs S\$ 4.00 S\$ 200.00

Concrete Floor Sealer

25 Litres S\$ 480.00 S\$ 480.00

Storage Cabinet with  
6-10 drawers each  
(Heavy-Duty Type)

4 Unit S\$1400.00 S\$5600.00

### Consumable Hardware

#### Hacksaw Blades

<u>Type</u>	<u>TPI</u>	<u>DIM</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Total</u>
HSS	24	300mm	100 Pcs	S\$ 1.60	S\$ 160.00
HSS	18	300mm	100 Pcs	S\$ 1.60	S\$ 160.00

#### Bandsaw Blades

HSS	18	6x0.65mm	2 Rolls	S\$ 75.00	S\$ 150.00
HSS	22	6x0.65mm	2 Rolls	S\$ 75.00	S\$ 150.00
HSS	18	8x0.65mm	2 Rolls	S\$ 75.00	S\$ 150.00
HSS	22	8x0.65mm	2 Rolls	S\$ 75.00	S\$ 150.00

For Terms and Conditions of Sales, please refer to Page 34.



# **GP SYSTEM (SINGAPORE) PTE LTD**

*Kalstar House, 8 Gul Avenue, Jurong, Singapore 2262  
Tel: 8612663/4 Telex: RS 39723 KOSTAR Fax: 8613500*

<b>Assorted Screws, Nuts, Bolts &amp; Washers in Various Materials &amp; Sizes</b>	<b>10,000 Plus Items</b>	<b>S\$2300.00</b>	<b>S\$2300.00</b>
<b>Heat Resist Gloves</b>	<b>4 Pairs</b>	<b>S\$ 20.00</b>	<b>S\$ 80.00</b>
<b>Welding Bib Cape &amp; Apron</b>	<b>1 Set</b>	<b>S\$ 80.00</b>	<b>S\$ 80.00</b>
<b>Crown Head and Face Shield 8 inches x 12 inches</b>	<b>1 Set</b>	<b>S\$ 30.00</b>	<b>S\$ 30.00</b>
<b>Spare Window</b>	<b>4 Pcs</b>	<b>S\$ 10.00</b>	<b>S\$ 40.00</b>
<b>Safety Glasses</b>	<b>8 Pcs</b>	<b>S\$ 12.00</b>	<b>S\$ 96.00</b>
<b>Floor Mark. ing Tape 160metres x 25mm Width</b>	<b>1 Pce</b>	<b>S\$ 40.00</b>	<b>S\$ 40.00</b>
<b>Fire Extinguisher (Dry Chemical)</b>	<b>4 Pcs</b>	<b>S\$ 180.00</b>	<b>S\$ 720.00</b>

**For Terms and Conditions of Sales , please refer to Page 34.**

Appendix L.

Myford Lathe Spares list.

Ordering Information.

ADDRESS:- MYFORD LTD.

BEESTON

NOTTINGHAM NG91ER

ENGLAND. U.K.

MACHINE TYPE:- SUPER 7 3½" CENTRE LATHE with quick change gearbox

SERIAL NUMBER:- SK 159662M

GEARBOX NUMBER:- CC 158924

Drq.ref.#.	Part #.	Description.	stock Actual.	Optimum.	Notes.
H36	A2006	30T Tumbler	2	2	
H46	A2007	28T Tumbler	2	2	
H51	A1939	17/53T Cluster	1	1	
H80	A1993/2	60T Gear Assy	1	1	
*A16	A8735	Wiper	1	2	*
KA21	10018	Feed Nut	1	2	*
KA45	A2166	Feed Nut	1	2	*
Q75	70001	V belt	2	4	*
H28	70000	V Belt	2	4	*
131	A2295	Bush	0	1	*
132	65015	S. Washer	0	1	*
138	65006	Rubber seal	0	1	*
152	A3003	Bush	0	1	*
162	A2605	Oilite Bush	0	1	*
165	A2494	Bush	0	1	*
189	65000	Nipple	0	6	*
191	A9221	Leadscrew	0	1	*
259	65089	Nipple	0	6	*
G70	G9289/2	RH L/Screw Brkt.	0	1	*
H66	65003	Oil Cup	0	4	*
H68	A3610/1	Wick	0	3	*
H73	65006	O Ring	0	4	*
KA53	A2282/1	Fd.Scr.Assy.	0	1	*
KA66	A9307/1	Feed Screw	0	1	*
KA56	65007	O Ring	0	4	*
LA41	A9210	Oilite Bush	0	1	*
LA42	A9211	Oilite Bush	0	1	*
LA43	A9212/1	Oilite Bush	0	1	*
LA44	A7595	Oilite Bush	0	1	*
LA45	A9220	Clutch Insert	0	1	*
LA53	A1975/3	L/Scr. Nut	0	1 Set	*
H29	73003	Ball Brg.	0	2	*
H62	A3609	Spdl. Brg.	0	1	*
M30	73005	Thrust Brg.	0	1	*
H21	A1992	Spindle	0	1	*
Q107	A3313/1	Clutch Plt.	0	1	*
Q125	A9963	Oilite Bush	0	1	*
Q127	A9964	Oilite Bush	0	1	*
Q110	73004	Ball Brg.	0	2	*
Q99	73006	Thrust Brg.	0	1	*

Where noted thus  
Order difference  
Between Actual  
And Optimum.

Capacitor for electric motor 100/125uF 220/275v 50/60Hz

Appendix L2.

Storebro Combimill Spares List.  
 Ordering Information.  
 Address: - Storebro Bruks Aktiebolag  
 S 59083 Storebro, Sweden  
 Cable: - Storebrobruk Vimmerby.  
 Telex: - 3943 STBS.

Machine Type: - Storebro  
 Model: - Combimill.  
 Serial Number: - 1447.  
 Voltage: - 380/220v 3Ph. 50Hz..

Drq. Ref:	Part Number	Description	Actual Stock.	Optimum Stock.	Notes.
H2 1435	CM 104	Bush	0	1	*
"	CM 105	Ball Brg.	0	1	*
"	CM 110	" "	0	1	*
"	CM 122	" "	0	1	*
"	CM 120	" "	0	1	*
"	51104/P6 SKF	" "	0	2	*
"	16004	" "	0	1	*
H3	CM 502	" "	0	1	*
"	CM 595	" "	0	1	*
"	CM 521	" "	0	2	*
"	CM 522	Ball	0	1	*
"	CM 523	Spring	0	1	*
"	CM 529	Needle Brg.	0	2	*
"	CM 530	" "	0	4	*
"	CM 534	" "	0	2	*
"	CM 536	" "	0	1	*
"	CM 539	O Ring	0	1	*
"	CM 548	Ball Bearing	0	1	*
"	CM 551	" "	0	1	*
"	CM 557	Needle Brg.	0	1	*
"	CM 568	Sealing Ring	0	1	*
"	CM 569	Ball Brg.	0	6	*
"	CM 585	" "	0	1	*
"	CM 589	Poly V Belt	0	3	*
H4	CM 600	Ring	0	1	*
"	CM 601	Con Roller Brg.	0	1	*
"	CM 602	Ring	0	1	*
"	CM 603	Con. Roller Brg.	0	1	*
"	CM 609	Ball Bearing	0	1	*
"	CM 613	O Ring	0	2	*
"	CM 622	Con Roller Brg.	0	1	*
"	CM 634	" "	0	1	*
H6	CM 415	Ball Bearing	0	1	*
"	CM 424	" "	0	2	*
"	CM 429	" "	0	1	*
"	CM 426	Needle Brg.	0	2	*
"	CM 420	Spindle Nut	0	1	*
"	CM 432	Ball Bearing	0	1	*
"	CM 437	" "	0	1	*
"	CM 438	Bush	0	1	*
"	CM 439	Nut	0	1	*
"	CM 446	Ball bearing	0	1	*



Appendix L3.

Combinill Electrical & Electronic Spares.

Drawing Number.	Part Number.	Description	.Actual.	Reqd.	Notes.
3-1098-0131		24v Screw in Bulbs	0	10	*
	C10 A442 PK A2	Switch	0	1	*
	099SIN-1A3&A5	"	0	2	*
	100 SBL-ZA6	"	0	1	*
	C2000uF/60v	Capacitor	0	1	*
	D200v/25A	Rectifier	0	1	*
	GIMS302-11Y	Microswitch	0	1	*
K13TB40-17-OAMO	→	Contactoꝛ	0	1	*
K23TB40-10-OAMO	→	Contactoꝛ	0	1	*
	ME35vTc50-24	Feed Drive	0	1	*
	PC Board for Feed Drive		0	2	*
	T1 Transformer	220/24v 80va	0	1	*
	T2 Transformer	220v/25v 120va.	0	1	*

Please NOTE all items Marked \* are to be purchased.



**SYSTEM**

# GP SYSTEM (SINGAPORE) PTE LTD

Kalstar House, 8 Gul Avenue, Jurong, Singapore 2262  
Tel: 8612663/4 Telex: RS 39723 KOSTAR Fax: 8613500

## GRINDING WHEELS

<u>Description</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Total</u>
<b><u>Type 1</u></b>			
150 x 32 x 13 - AA46	10 Pcs	S\$ 15.00	S\$ 150.00
150 x 32 x 13 - AA60	10 Pcs	S\$ 15.00	S\$ 150.00
150 x 32 x 13 - AA80	10 Pcs	S\$ 15.00	S\$ 150.00
150 x 32 x 13 - AA150	10 Pcs	S\$ 15.00	S\$ 150.00
<b><u>Type 1</u></b>			
10 x 3.2 x 10 - AA60	10 Pcs	S\$ 4.00	S\$ 40.00
10 x 3.2 x 13 - AA60	10 Pcs	S\$ 4.00	S\$ 40.00
13 x 6.4 x 13 - AA60	10 Pcs	S\$ 4.00	S\$ 40.00
20 x 6.4 x 13 - AA60	10 Pcs	S\$ 4.00	S\$ 40.00
25 x 6.4 x 20 - AA60	10 Pcs	S\$ 4.00	S\$ 40.00
<b><u>Type 5</u></b>			
13 x 3.2 x 13 - AA60	10 Pcs	S\$ 4.00	S\$ 40.00
20 x 6.4 x 20 - AA60	10 Pcs	S\$ 5.20	S\$ 52.00
25 x 6.4 x 20 - AA60	10 Pcs	S\$ 4.50	S\$ 45.00
32 x 10 x 32 - AA60	10 Pcs	S\$ 5.20	S\$ 52.00
<b><u>Type 6</u></b>			
80 x 40 x 13 - AA80	10 Pcs	S\$ 22.00	S\$ 220.00
80 x 50 x 20 - AA60	10 Pcs	S\$ 16.00	S\$ 160.00
<b><u>Type 12</u></b>			
80 x 13 x 20 - AA60	10 Pcs	S\$ 9.70	S\$ 97.00
<b><u>Grinding Points</u></b>			
Dia.6 x 10 x dia.6mm	10 Pcs	S\$ 2.70	S\$ 27.00
Dia.8 x 16 x dia.6mm	10 Pcs	S\$ 2.70	S\$ 27.00

For Terms and Conditions of Sales, please refer to Page 34.

Documentary Inputs.

Author.	Title.	Publisher
Adams	Engineering Measurement & Instrumentation.	Hodder & Stoughton
Chapman	Elementary Workshop Calculations.	Edward Arnold
Chapman	Senior Workshop Calculations	Edward Arnold
Chapman	Workshop Technology Parts 1,2&3.	Edward Arnold
Haslehurst	Manufacturing Technology.	Hodder & Stoughton
Pritchard	Workshop Processes For Mechanical Engineering Technicians.	
Rosenberg	Electric Motor Repair.	Holt Rinehart And Winston.
	Mechanical World Year Book.	Model & Allied World Publication Agos Books Ltd.
Eric Oberg. F.D. Jones. H.L. Horton.	Machinerys Handbook.	Industrial Press Inc.
	ISO. Thread Handbook ISO. Fits, Tolerances & Allowances.	
	Engineering Tables.	McMaster Carr.



# **GP SYSTEM (SINGAPORE) PTE LTD**

*Kalstar House, 8 Gul Avenue, Jurong, Singapore 2262  
Tel: 8612663/4 Telex: RS 39723 KOSTAR Fax: 8613500*

Nett Amount	S\$197,540.03
Packing and Freight Charges	S\$ 5,300.00
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<b>TOTAL AMOUNT :</b>	<b>S\$202,840.03</b>
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Please note total amount S\$202,840.03 does not include optional accessories.

Nett Amount for Optional Accessories (Page 12)	S\$ 24,153.95
	=====

Prices quoted in Singapore Dollars.

(TWO HUNDRED AND TWO THOUSAND, EIGHT HUNDRED AND FORTY AND CENTS THREE ONLY.)

### TERMS AND CONDITIONS

- 1) Prices quoted C & F Haiphong, Insurance, Tax and Duties unpaid.
- 2) Delivery Time : Complete within Two Months.
- 3) Validity of Quote: 45 days
- 4) Payment Terms: By confirmed irrevocable Letter of Credit at sight from reputable International Banking Institute, in favour of :-

The Development Bank of Singapore Ltd  
Block 51 Chin Swee Road  
#01-107/113  
Singapore 0316

Telex No.: RS24455  
Fax No. : 2251874

Account No.: 07-06165-0

Letter of Credit should be valid for Four Months.