

5000M

Conversational CNC Controls For Milling



ANILAM[®]

ANILAM is CNC technology and people.

ANILAM'S headquarters and manufacturing facilities are located in Jamestown, New York. We have been providing reliable, easy-to-learn control solutions for more than 25 years.

All our products, from software to hardware, are specified and designed by ANILAM. Our design team is continually working on innovative ways to improve our products based on market input from users and machine tool builders.

We provide a complete range of CNC products, from simple-to-learn 2-axis retrofits for automating manual machines to 5-axis-plus spindle digital solutions for production machines – and everything in between. Plus, all ANILAM products come with the programming format customers prefer.

ANILAM is an international company with offices located throughout the world, maximizing the support and commitment required for today's manufacturing needs. All ANILAM offices are staffed with qualified sales engineers and technicians.

ANILAM employees are prepared, experienced, and trained to recognize and understand your application needs. We are eager to assist and support customers from the initial product specification right through to the build. Our job begins even before the sale and continues right through with support for the user for as long as they own our product.



The ANILAM 5000 series control is everything you asked for and more. Benefit from the integrated CAM programming. Program with icon-based programming. The 5000 series is one of the most versatile milling controls available.

Ease of use

Intuitive interaction, no prior programming knowledge necessary.

Productivity

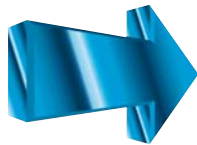
Minimum set-up times and automatic operation boost throughput.

Quality

Better finish, consistency and less scrap ensure less costs.

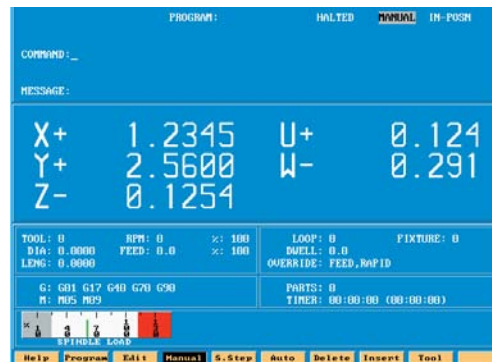
Versatility

More jobs to go for, more choice.



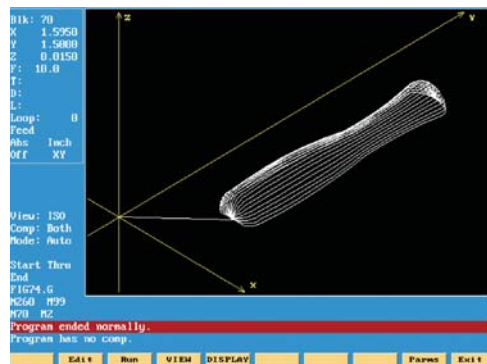
Profitability

Investment is paid off in almost no time, the rest becomes profit.



Manual mode

In manual mode, the mill can be operated just as simply as if it had been a conventional one. In addition, the 5000 series provides a wealth of data and many useful features.



Automatic mode

During automatic operation, the 5000 series will control everything from start to finish. The machinist has several options on how to generate the program and some very powerful programming tools are available.

Single step mode

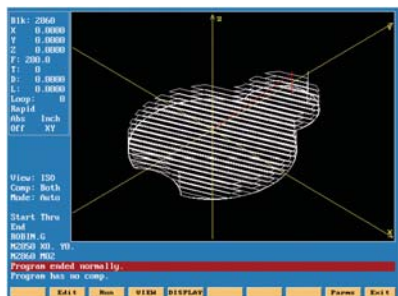
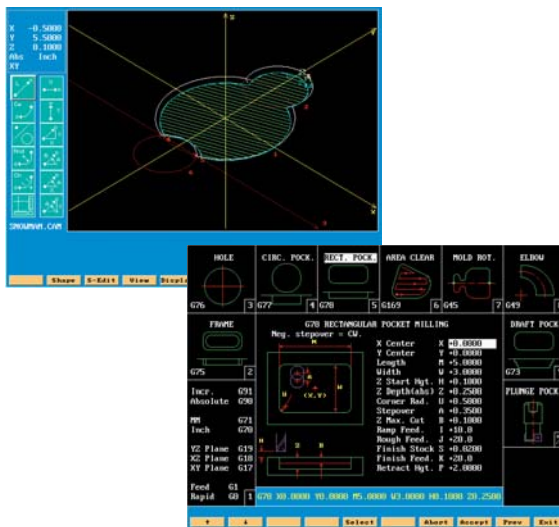
The single step mode allows the machinist to go through all or part of the manufacture by executing the program step by step.

For more information, visit us online at www.anilam.com today.

Programming Formats



Programming Tools



The 5000 series has a conversational programming utility. You don't have to have any prior experience to program ANILAM's 5000 series. Screens are icon-based and you are prompted for data input. The intuitive interaction makes the control easy to learn.

As an alternative, the 5000 series can be programmed direct in G-codes. This enables utilization of some sophisticated features, such as parametric programming. The 5000 series has a help mode where G-codes are explained in clear text.

Teach-in

In Teach-in mode, the machinist can manufacture the part manually while the 5000 series records the corresponding program. Programming couldn't be easier. Additional parts can be manufactured in automatic mode.

CAM

The CAM utility allows creation of the tool path without trigonometry calculations and without G-code programming. The operator simply uses the features in the CAM utility to define a part profile and inputs speeds and feeds, determines offsets and stepovers and selects contouring, drilling or pocketing when prompted. The program is generated automatically within the CAM utility.

Canned Cycles

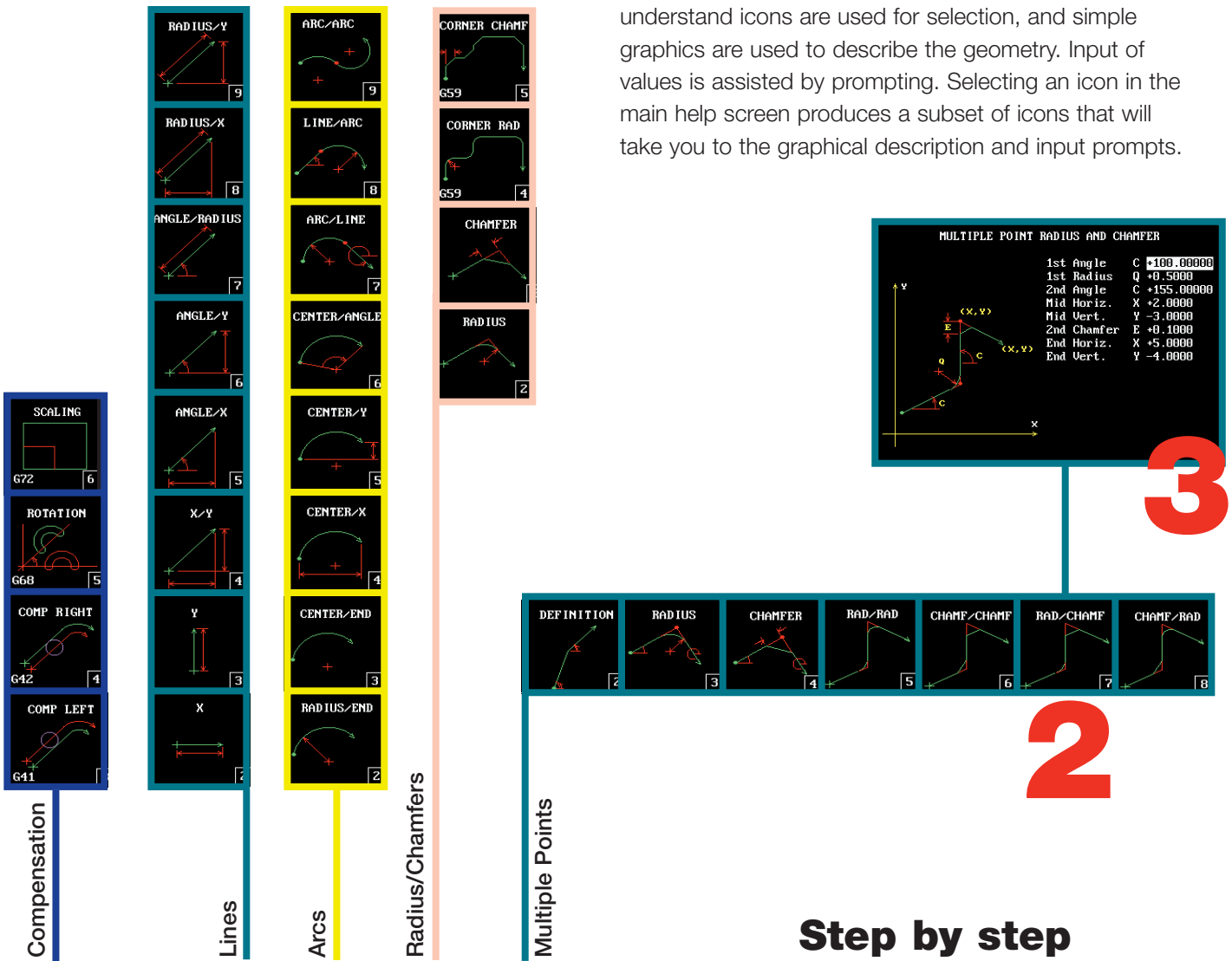
The 5000 series has an extensive set of canned cycles. Canned cycles are used to make the programming of routine machining jobs fast and easy by choosing the job you want, and answering a few simple questions about it. The questions are asked in plain language text; you're further assisted by graphical references. Using your answers, the control will do all calculations.

Draw Mode

When the program is completed, the draw graphics mode can be used to verify the part before machining it. Then simply edit the program if needed.

Icon-Based Programming

The 5000 series allows conversational programming of compensation, points, shapes and cycles. Easy-to-understand icons are used for selection, and simple graphics are used to describe the geometry. Input of values is assisted by prompting. Selecting an icon in the main help screen produces a subset of icons that will take you to the graphical description and input prompts.



MULTIPLE POINT RADIUS AND CHAMFER

1st Angle	C	+100.00000
1st Radius	Q	+0.50000
2nd Angle	C	+155.00000
Mid Vert.	X	+2.00000
2nd Chamfer	E	+0.10000
End Horiz.	X	+5.00000
End Vert.	Y	-4.00000

Multiple Points

- DEFINITION [2]
- RADIUS [3]
- CHAMFER [4]
- RAD/RAD [5]
- CHAMF/CHAMF [6]
- RAD/CHAMF [7]
- CHAMF/RAD [8]

Step by step

Multiple points with radius and chamfer.

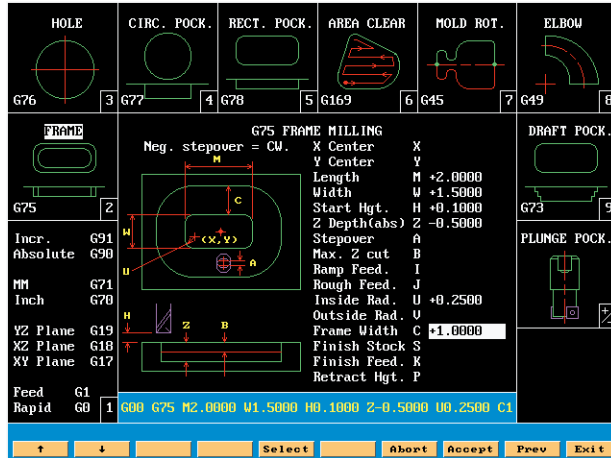
- 1** Select the type of move by icon in the main screen.
- 2** Select the exact shape of the move by icon.
- 3** Enter values as prompted.

From this main screen, you can specify compensation, define geometrical segments, and access canned cycles, just by selecting the corresponding icon.

LINES [3]	ARCS [4]	RAD/CHAMFER [5]	MULTIPLE [6]	POCKETING [7]	PATHS [8]
COMPENSATION [2]	<p>Move the cursor around the screen in a clockwise or counterclockwise direction with the arrow keys or by number required.</p> <p>Press SELECT key to pick the item or group. Certain combinations or groups are not allowed in the same block and if selected an error message will be displayed. Help with other features can be found in the General and Misc. groups.</p>			DRILL/TAP [9]	GENERAL [G]
Incr. G91	From group 1 modals G0/G1, G17/G18 or G19, G70/G71, and G90/G91 can be selected at any time.			?	MISC. [M]
MM G71				?	
Inch G70				?	
YZ Plane G19				?	
XZ Plane G18				?	
XY Plane G17				?	
Feed G1				?	
Rapid G0	G00			?	

↑ ↓ Text Select ReEdit Abort Accept Exit

Canned Cycles: Pocketing



Frame milling

Used for milling a rectangular pocket with an island in the center.

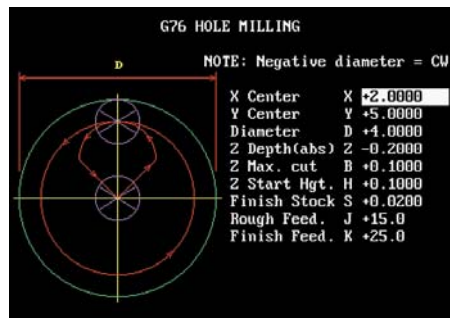
ANILAM's pocketing cycles are designed for milling pockets.

Among the standard cycles included are frame, hole, circular, rectangular and irregular pocket (area clearance) cycles. Also included as standard are advanced cycles for easy programming of elbows and mold rotation. Cutter compensation is built in to all pocketing cycles.



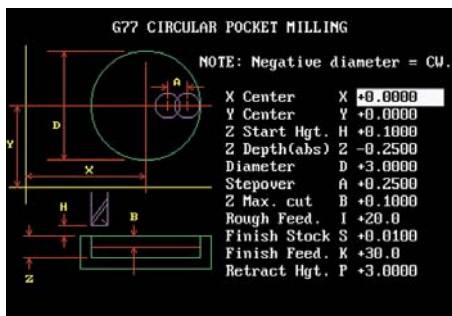
Area clearance

This cycle is also known as irregular pocket milling. Simply program a profile and the cycle will clear the area and take a profile cut.



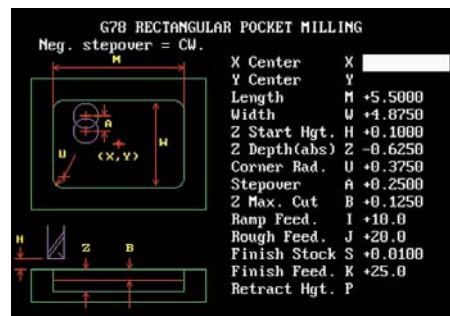
Hole milling

This cycle is used to counter bore an existing hole.



Circular pocket milling

By filling in only the desired depth, starting height, and diameter, this cycle will produce a circular pocket.




Rectangular pocket milling

This cycle will quickly produce a rectangular pocket by filling in the depth, starting height, width and length desired.

Canned Cycles: Pocketing

G45 MOLD ROTATION

NOTE: Two subprograms required.
 J is Z CL if Axis of Rotation is X or Y.
 J is Y CL if Axis of Rotation is Z.
 K only used if Axis of Rotation is X or Y.



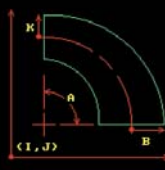
Start Angle	A	+0.00000
End Angle	B	+100.00000
Num of Cycles	C	+20
Num of Fwd Sub	F	+1
Num of Rev Sub	R	+2
Axis of Rotation	X	
Other Ax. CL	I	
CenterLine	J	
Rotation Angle	K	

Mold rotation

Program any profile, once forward and once in reverse, and the cycle will automatically rotate it around any axis.

G49 ELBOW MILLING

NOTE: Tool must be at starting position.



Start Radius	B	+0.7500
End Radius	K	+1.0000
Incl. Angle	A	+90.00000
Num of Cycles	C	+40
X Center	I	
Y Center	J	
Direction CCW	D	
End Angle	F	
Start Angle	E	
Ctr. line Rad.	R	
Rapid Height	Z	
Start Height	H	
Rough Feed.	U	
Finish Stock	S	
Finish Feed.	V	

Elbow milling

Easily create an elbow cavity (radial conical cavity) by simply filling in the start and end radii, the included angle and the number of cycles desired.

G177 PLUNGE CIRCULAR POCKET MILLING

NOTE: Position tool at center (or 3 o'clock) of pocket, Neg. diameter = CW.



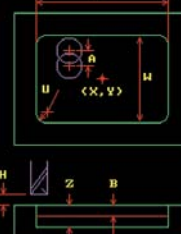
X Center	X	
Y Center	Y	
Z Start Hgt.	H	+0.1000
Z Depth(abs)	Z	-0.6250
Diameter	D	+3.7500
Stepover	A	+0.2500
Z Max. cut	B	+0.1000
Z Feedrate	I	+5.0
Rough Feed.	J	+15.0
Finish Stock	S	+0.0200
Finish Feed.	K	+20.0
Retract Hgt.	P	

Plunge circular pocket milling

Create a circular pocket by filling in the starting height, depth and diameter of the pocket. This can be used when your preference is to have the tool plunge rather than ramp into the work.

G178 PLUNGE RECTANGULAR POCKET MILLING

Neg. stepover = CW.



X Center	X	
Y Center	Y	
Length	M	+3.2500
Width	U	+2.6250
Z Start Hgt.	H	+0.1000
Z Depth(abs)	Z	-0.4250
Corner Rad.	U	+0.2000
Stepover	A	+0.2500
Z Max. Cut	B	+0.1000
Ramp Feed.	I	+5.0
Rough Feed.	J	+20.0
Finish Stock	S	+0.0150
Finish Feed.	K	+10.0
Retract Hgt.	P	

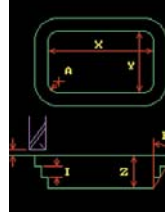
Plunge rectangular pocket milling

Create a rectangular pocket using the simple prompts. This can be used when your preference is to have the tool plunge rather than ramp into the work.

For more information about these and our other product lines, visit us online at www.anilam.com today.

G73 DRAFT POCKET MILLING

NOTE: Position tool at ctr of lwr left corner rad.

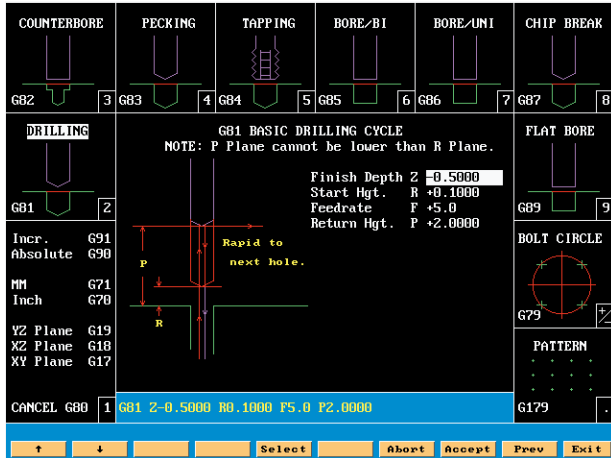


Length, bottom	X	+4.5000
Width, bottom	Y	+3.0000
Start Hgt.	H	+0.1000
Z Depth(abs)	Z	-0.7500
Lower Left Rad	A	+0.3750
Lower Right Rad	B	
Upper Right Rad	C	
Upper Left Rad	D	
Draft Angle	E	+5.00000
Z step Rough	I	+0.1250
Max XY Stepover	U	
Finish Stk XY	S	
Z step Finish	Q	
Finish Feed.	R	
Flat θ , Ball 1	U	

Draft pocket milling

By following the easy rectangular pocket prompts, the cycle will program a rectangular pocket with draft walls. Use either a flat or ball end mill.

Canned Cycles: Drilling and Tapping

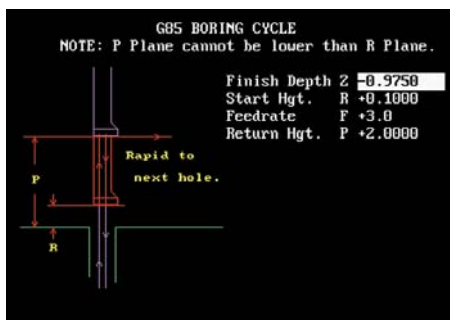


ANILAM's drilling and tapping cycles include cycles for any drilling, boring or tapping routine.

Linear, square, and full or partial bolt hole patterns can be quickly programmed by answering only a few questions.

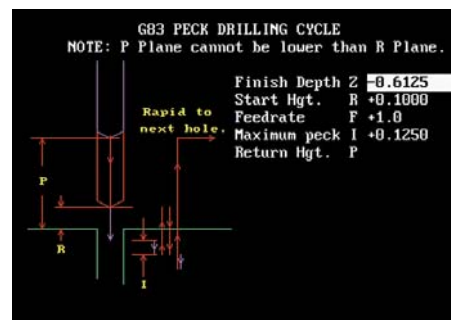
Basic Drilling

Used for basic hole drilling. The cycle will create a drilling program with only the finish depth and start height information needed.



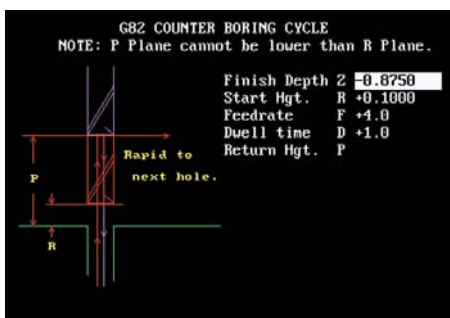
Bore Bi-Directional

Used for boring holes by feeding in and backing out of the hole.



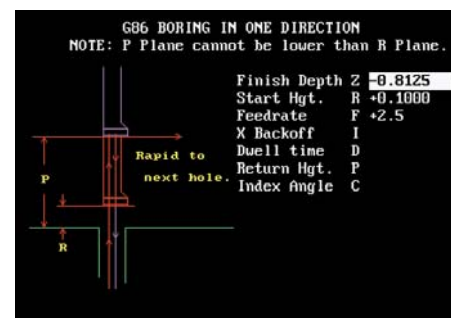
Peck Drilling

Peck drills to a specified depth, retracts and rapids out of the hole. It then rapids back to within .020" of its previous position, and repeats until at the finish depth.



Counter Boring

When using an end mill this cycle is used to create a flat surface by dwelling at the bottom of the hole.



Bore Uni-Directional

When an encoder is present on the spindle of the machine tool, this cycle will bore to depth, orient the spindle back away from the bore and retract.

Canned Cycles: Drilling and Tapping

Tapping

Tapping is easily accomplished with three quick prompts. Note: Spindle control must be present.

Flat bottom boring

When using a boring bar, this cycle will feed it in both directions and dwell at the bottom of the hole producing a flat surface.

Chip breaking

When using this cycle the drill will retract at quick intervals and break the chips keeping the hole clear.

Bolt hole circle

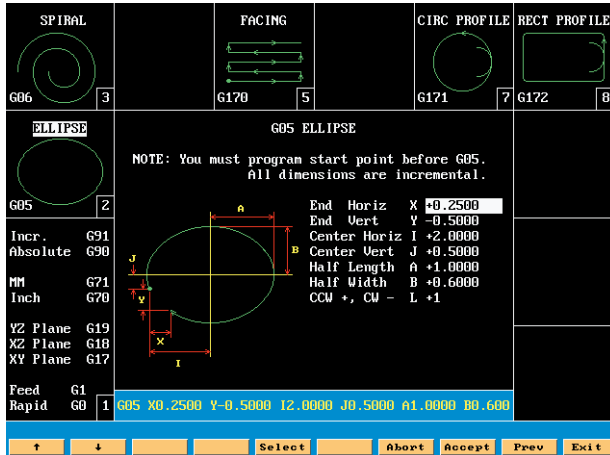
Used to drill either full or partial bolt hole circles by filling in the first angle, number of holes and diameter of the circle.

Hole pattern drilling

Used to produce an array of holes in any square shape. A complete or partial pattern can be quickly done with only six inputs.

For more information about these and our other product lines, visit us online at www.anilam.com today.

Canned Cycles: Paths

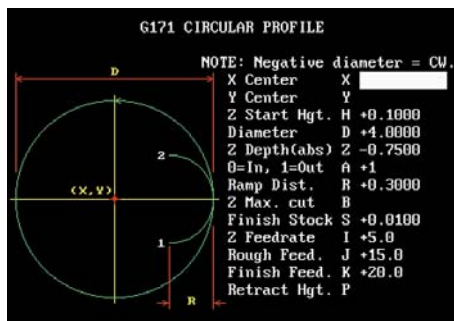


ANILAM's path cycles include those for face milling and circular and rectangular profiling.

These are accomplished using only one line of input. Also included as standard are advanced canned cycles to produce spirals and ellipses. They are done easily and without the use of a CAM system.

Ellipse

This truly advanced cycle is so easy to use. Answer seven simple graphic prompts and the cycle will cut a true ellipse!



Circular profile

This cycle is particularly useful when working with castings and forgings. Among other things, it can be used for sizing or cleaning up existing holes.



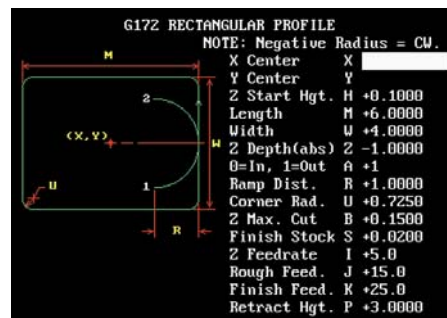
Facing

Any size surface can be faced off quickly and easily.



Spiral

With this cycle you have the unique ability to machine cones or taper threads. This cycle is invaluable for thread milling, too.

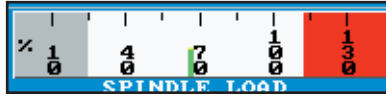


Rectangular profile

By answering five simple prompts, a rectangular shape can be profiled on either the outside or the inside.

On-screen gauges

With ANILAM, the unique facility is available to display gauges direct on the screen, right where you want them to be. Our CAN-bus driven I/O-modules allow for inputting analog signals, for example for monitoring spindle load. Such signals can then be displayed graphically on the screen by configurable gauges.



Tool page

The 5000 series comprehensive tool table allows you to store up to 255 tools. You can specify diameter, length, length offsets and wear offsets.

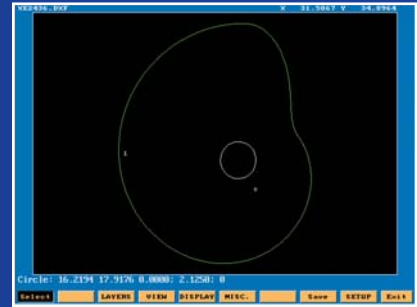
No.	Diameter	Length	Diameter Wear	Length Wear	Type
1	0.0000	11.9200	0.0000	0.0000	FLAT
2	0.5000	-12.2540	0.0000	0.0000	
3	0.1000	-10.2540	0.0000	0.0000	
4	1.0000	-9.2543	0.0000	0.0000	
5	0.0000	0.0000	0.0000	0.0000	
6	0.0000	0.0000	0.0000	0.0000	
7	0.0000	0.0000	0.0000	0.0000	
8	0.0000	0.0000	0.0000	0.0000	
9	0.0000	0.0000	0.0000	0.0000	
10	0.0000	0.0000	0.0000	0.0000	
11	0.0000	0.0000	0.0000	0.0000	
12	0.0000	0.0000	0.0000	0.0000	
13	0.0000	0.0000	0.0000	0.0000	
14	0.0000	0.0000	0.0000	0.0000	
15	0.0000	0.0000	0.0000	0.0000	



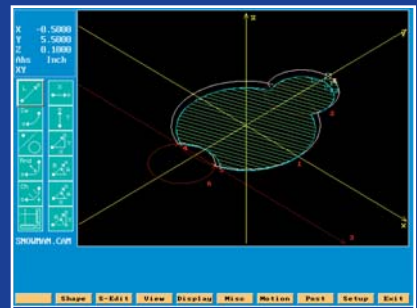
Offline software

The 5000 series CNC software is available for offline use as an option. The offline software enables the programmer to make the program away from the machine tool, at any workstation (PC) of choice. The program can then be transferred to the 5000 series via RS-232 or by using a floppy disk or network.

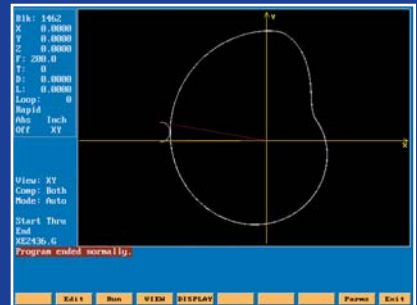
DXF/CAM



ANILAM's DXF/CAM programming feature allows for an easy method of importing a DXF file and modifying it to run in CAM. Start here by opening the desired DXF file.



Next, import the DXF file into CAM. Then, offset the cutter (green line) to show the actual tool size.



Then, check the part in the drawing mode to ensure accuracy. The program is now in a format the control can understand.



Having checked the program in drawing mode, you are now able to run the part in auto mode.

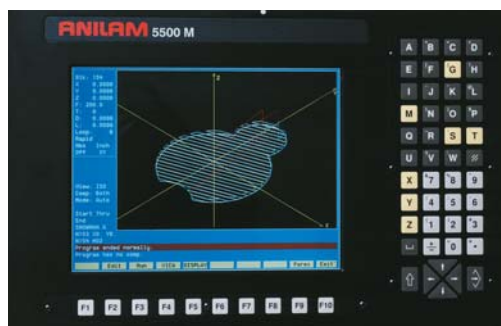
OEM Systems: 3, 4 and 5-Axis

CNC OEM components that are easy to build into a new machine for 3, 4 and 5-axis.

The 5000 series configuration is complete with a console, computer chassis, manual panel, and remote floppy drive – all designed to build into your machine.

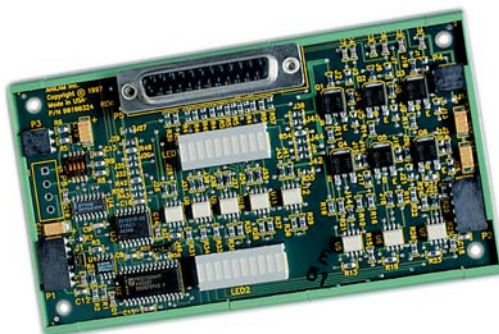
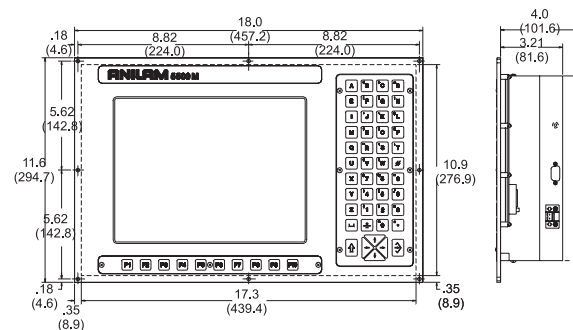


Pictured is the 12.1" Color Monitor



12.1" active matrix TFT flat-panel display

The console has a 12.1" active matrix TFT flat panel display standard. The console features a full alphanumeric keypad and softkeys for the on-screen menus.



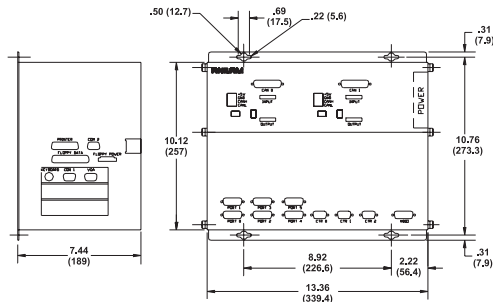
I/O Module

ANILAM's CAN-bus driven I/O-modules can be added as needed. Each module has 10 inputs and 6 outputs (one output can be traded for an analog input) and come as either sink or source. The I/O-module can be mounted remote, where it is needed, and fits in standard DIN-rail holders.

General Specifications

- | | |
|------------------------------------|--|
| 4 Automatic mode | 4 Dwell, time or revolutions |
| 4 Single step mode | 4 Multiple part zero shift |
| 4 Manual mode | 4 Block search/Block start |
| 4 Feedrate/Spindle speed overrides | 4 Background functions (Program edit, RS-232 etc.) |

CNC Chassis



The CNC chassis is installation-friendly with easy access connections.

5300M: X, Y, Z

5400M: X, Y, Z, U

5500M: X, Y, Z, U, W

Display

- Machine pos./Program pos./Target pos./Distance-to-go •
- Program position (Large digit screen) •
- Resolution, up to 0.00002 inch (0.0005 mm) •
- Feedrate •
- Spindle speed •
- Tool •
- Messages/status •
- Part timer/counter •
- Loop counter/dwell time •
- Real time draw mode •
- On-screen gauges •

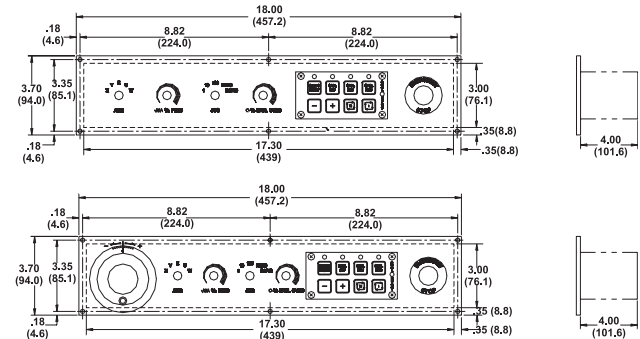
Programming

- Input: MDI, floppy disk, RS 232, network •
- Teach-in mode •
- Icon based programming with graphical support •
- Integrated CAM •
- DXF •
- Canned cycles •
- Block skip •
- Rotation •
- Mirroring •
- Scaling •
- Corner rounding •
- Exact /contouring mode •
- ISO programming •
- Parametric programming •
- Subprograms 256 •
- PC style editing and program management •
- Verification draw mode •

Compensation

- Number of tools in library 255 •
- Radius, length and wear offsets •
- Length offset calibration •
- Leadscrew Compensation (direct input from file) •
- Backlash Compensation •
- Linear Compensation •
- Skew compensation •

Manual Panels



ANILAM's manual panel has keys for Jog+ and Jog- and rotary switches for Jog resolution and Axis selection. There are rotary switches for Feedrate and Spindle speed override and keys for Start, Stop, Servo reset, Spindle forward, Reverse and off, plus the E-stop switch. The manual panel is standard with one integrated handwheel.

Hardware platform

- Pentium CPU, 166 MHZ •
- DSP, 32-bit 50MHz floating point processor •
- DRAM 16MB •
- DRAM 32-64MB Option
- Floppy disk drive 31/2", 1.44MB
- Hard disk drive 8GB or more
- Networking, Ethernet (RJ-45) Option
- RS-232 port (DB-9) •
- Printer port (DB-25) •
- External PC keyboard connector (DIN) •
- Axis feedback inputs (rotary/linear, DB-15) 3, 4, 5
- Handwheel inputs (DB-9) 2, 2, 3
- Universal power supply (90-260VAC) •

Interfacing

- I/O CAN-bus interface •
- Dedicated I/O for manual panel functions 5/1
- Available I/O (2 analog inputs optional) 20/12
- Optional I/O expansion (4 analog inputs optional) 40/24
- ANILAM IPI programming •

Motion control

- Controlled axes X, Y, Z (U) (W)
- Spindle axis •
- DRO axis / or handwheel •
- Servo loop cycle time 0.4 ms
- Block cycle time 5 ms
- Block throughput 200 bps
- DAC resolution 12 bit
- Rapid, interpolating axes X, Y, Z (U) (W)
- Feed, interpolating axes X, Y, Z (U) (W)
- Circular, interpolating axes XY, XZ or YZ
- Ellipse, interpolating axes XY, XZ or YZ
- Spiral, interpolating axes X, Y, Z

Setup support

- Motion/setup/testing utility •
- Auto-tuning •
- Diagnostics •
- I/O status •

Kit Systems: 3 and 4-Axis

With ANILAM's easy-to-install CNC kit systems, you'll find everything you need to fit on your existing machine. Order as much or as little as needed. Our components are time-tested in the market for over 20 years – you can depend on their reliability and endurance.



Hardware to mount the console to your machine.



In the case of non-rigid head applications, ANILAM provides a quill drive assembly for the Z-axis. This rugged, durable, one-

piece casting incorporates ANILAM's unique, time-tested and proven quill-block design. The assembly holds a powerful servo motor and a precision-ground ballscrew for smooth and fast operation.



Precision linear encoders are available as an option for feedback. Using linear encoders optimizes the position accuracy by effectively eliminating backlash.

Ready-to-install limit switch assemblies are available suitable for a variety of machines. ANILAM promotes safety by using both software and hardware limits.



ANILAM ballscrews for X- and Y-axis are precision-ground with preloaded ball nut assemblies. There is a measured set for every machine tool.



One of the most convenient features of ANILAM's CNC controls is how easy they are to install. With just a simple snap of a connector, your CNC machine can be ready to operate and improve your productivity in hours!



ANILAM offers powerful DC servo motors for driving the axes. Standard torque is 31 in-lb (3.5 Nm), but 41 in-lb (4.5 Nm) motors are also available.



For the drive of the X- and Y-axis, rugged one-piece machined castings guarantee reliable and accurate operation.



The control will automatically handle the lubrication of the machine. ANILAM offers an Autolube hardware option for this purpose.

Several optional remote devices can be supplied for manual operations. The remote Start/Stop and the remote electronic handwheel are ideal for set up and teach modes. ANILAM's new Handy Pulser has electronic handwheel, axis selection and resolution switches, all in one.



Hardware platform

Pentium CPU, 166 MHZ	•
DSP, 32-bit 50MHz floating point processor	•
DRAM	8MB or 16MB
DRAM 32-64MB	Option
Floppy disk drive in console	31/2", 1.44MB
Hard disk drive in console	8GB or more
Networking, Ethernet (RJ-45)	Option
Servo enclosure	•
Servo cabinet mounting hardware	•
Prewired snap-in cable (console-to-servo cabinet)	•
RS-232 port (DB-9)	•
Printer port (DB-25)	•
External PC keyboard connector (DIN)	•
Axis feedback inputs (rotary/linear, DB-15)	3
Handwheel inputs (DB-9)	1
Universal power supply (90-260VAC)	•

Interfacing

I/O CAN-bus interface	•
Dedicated I/O for manual panel functions	5/1
Available I/O's (2 analog inputs optional)	10/6
Optional I/O expansion (4 analog inputs optional)	40/24
ANILAM IPI programming	•

Setup support

Motion/setup/testing utility	•
Auto-tuning	•
Diagnostics	•
I/O status	•

5300MK/DLX: X, Y, Z 5400MK: X, Y, Z, U

Kit Components and Options	5300MK	5300MK DLX	5400MK DLX
Spindle forward/reverse/off	Optional	•	•
Coolant on/off	Optional	•	•
Remote start/stop	Optional	Optional	Optional
Remote MPG (handwheel)	Optional	Optional	Optional
Analog spindle output	Optional	Optional	Optional
Precision ground ballscrews	X, Y, Z	X, Y, Z	X, Y, Z
Solid one-piece machined casting _quill drive assembly (includes limit switch)	Z	Z	Z
One-piece machined casting _motor mounting assemblies	X, Y	X, Y	X, Y
31 in/lb (3.5Nm) DC servo motors	X, Y, Z	X, Y, Z	X, Y, Z
Upgrade to 41 in/lb (4.5 Nm) _DC servo motors	Optional	Optional	Optional
Motor cables (motor-to-servo cabinet)	X, Y, Z	X, Y, Z	X, Y, Z
Linear encoder feedback (X, Y axes)	Optional	Optional	Optional
Ready-to-install _limit switch assembly	X, Y	X, Y	X, Y
Auto-Lube	Optional	Optional	Optional
Upgrade from 3- to 4-axis	Optional	Optional	



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