CNC ROUTER HUB

G codes for CNC Turning

G00 – Rapid movement in a linear direction.
G01- Linear machining.
G02 – Clockwise machining.
G03 – Counter-clockwise machining.
G04 – Dwell
G09 – Motion Exact stop check
G10 – Programmable data input
G17 – Select X-Y plane
G18 – Select X-Z plane
G19 – Select Y-Z plane
G20 – Programming is in inches
G21 – Programming is in mm
G27 – Reference point return check
G28 – Return to point of reference
G29 – Return to point of reference
G30 – Return to 2nd, 3rd, and 4th point of reference
G32 – Canned Constant lead threading (like G01 synchronized with spindle) G40 – Tool cutter compensation off (radius comp.)
G41 – Tool cutter compensation left (radius comp.)
G42 – Tool cutter compensation right (radius comp.)
G43 – Tool length compensation (positive)
G44 – Tool length compensation (negative)
G49 – Tool length compensation cancel
G50 – Reset all scale factors to 1.0
G51 – Turn on scale factors
G52 – Local work shift for all coordinate systems
G53 – Machine coordinate system (cancel work offsets)
G54 – Work coordinate system (1st Workpiece)
G55 – Work coordinate system (2nd Workpiece)
G56 – Work coordinate system (3rd Workpiece)
G57 – Work coordinate system (4th Workpiece)
G58 – Work coordinate system (5th Workpiece)
G59 – Work coordinate system (6th Workpiece)
G70 – Finish Turning Cycle (canned)
G71 – Rough Turning Cycle (canned)

G72 – Rough Facing Cycle (canned)
G73 – Pattern Repeating Cycle (canned)
G74 – Peck Drilling Cycle (canned)
G75 – Grooving Cycle (canned)
G76 – Threading Cycle (canned)
G80 – Cancel canned cycle (canned)
G83 – Face drilling cycle (canned)
G84 – Face Tapping cycle (canned)
G86 – Boring canned cycle, spindle stop, rapid out (canned)
G87 – Side Drilling Cycle (canned)
G88 – Side Tapping Cycle (canned)
G89 – Side Boring Cycle (canned)
G90 – Absolute programming (type B and C systems)
G91 – Incremental programming (type B and C systems)
G92 – Thread Cutting Cycle (canned)
G94 – Endface Turning Cycle
G96 – Constant Surface Speed ON
G97 – Constant Surface Speed Cancel
G98 – Feedrate in mm/min
G99 – Feed rate in mm/rev

G codes for CNC milling

The following are some of the commonly used G codes and their description in CNC milling. There is some change in G codes as compared to CNC Turning. The codes are listed below:

G00 – Rapid positioning
G01 – Linear travel/interpolation
G02 – Circular travel/interpolation (clockwise)
G03 – Circular interpolation (Anti-clockwise)
G04 – Dwell
G10 – Programmable data input
G17 – XY plane selection
G18 – ZX plane selection
G19 – YZ plane selection
G20 – Programming in inch units
G21 – Programming in metric units
G27 – Reference point return check
G28 – Automatic return to point of reference

G29 – Automatic return from the point of reference
G30 – Return to 2nd, 3rd, or 4th point of reference
G40 – Cutter diameter compensation cancel
G41 – Cutter diameter compensation left
G42 – Cutter diameter compensation right
G43 – Tool length compensation in positive (+) sign
G44 – Tool length compensation in a negative (-) sign
G45 – Tool offset increase
G46 – Tool offset decrease
G49 – Tool length offset cancel
G53 – Machine coordinate system
G54-59 – Work coordinate system
G80 – Canned cycle cancel
G81 – Drilling cycle canned
G82 – Counter boring or countersinking cycle canned
G83 – Peck drilling cycle (canned)
G84 – Tapping cycle (canned)
G85 – Reaming cycle (canned)
G86 – Boring cycle (canned)
G90 – Absolute positioning
G91 – Incremental positioning
G92 – Zero preset
G94 – Feed rate in mm/min
G95 – Feed rate in mm/rev
G96 – Constant surface speed control
G97 – Constant surface speed control cancel

M codes in CNC

M codes in CNC are almost the same for turning and milling. M codes are usually used for turning ON/OFF various processes. The following are the M codes.

M00 – Program stop
M01 – Optional stop
M02 – Program end
M03 – Spindle start
M04 – Spindle start (anti-clockwise)
M05 – Spindle stop
M06 – Tool change
M07 – Coolant ON (Within the spindle)

M08 – Coolant ON
M09 – Coolant OFF
M30 – End program
M98 – Call subroutine
M99 – End subroutine

Note: For more information on cnc routers and machines, visit cncrouterhub.com.