Computer Numerical Control (Part-4)

6ME4-02: Computer Integrated Manufacturing Systems

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Outcomes

- **Write CNC manual part programming using circular interpolations**
- **First manual CNC program using circular interpolations**

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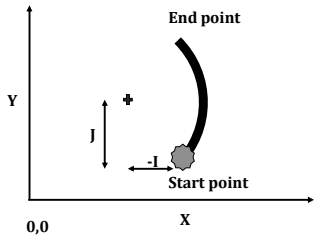
Circular Interpolation

Syntax G03 Xx Yy Ii Jj
G03 Xx Zz Ii Kk
G03 Yy Zz Jj Kk

Example

N20 G03 X15.0 Y20.0 I10.0 J0.0



Coordinates of Centre Points (I, J) with respect to start point are always in Incremental Mode

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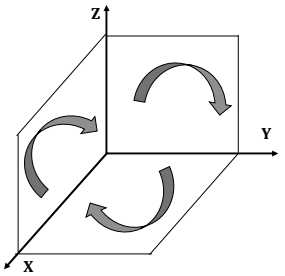
Circular Interpolation: G02 (C.W.)

Syntax G02 Xx Yy Ii Jj
G02 Xx Zz Ii Kk
G02 Yy Zz Jj Kk

Example

N20 G02 X15.0 Y20.0 I10.0 J10.0



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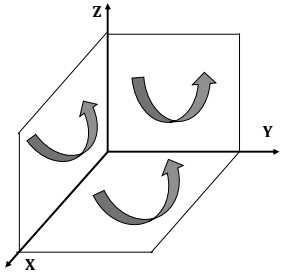
Circular Interpolation: G03 (C.C.W)

Syntax
G03 Xx Yy Ii Jj
G03 Xx Zz Ii Kk
G03 Yy Zz Jj Kk

Example

N20 G03 X15.0 Y20.0 I10.0 J10.0



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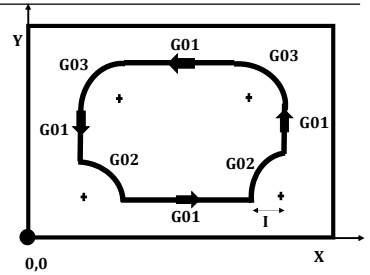
Circular Interpolation: G02 (C.W) and G03 (C.C.W)

Syntax
G03 Xx Yy Ii Jj
G03 Xx Zz Ii Kk
G03 Yy Zz Jj Kk

Example

N20 G03 X15.0 Y20.0 I10.0 J0.0



Coordinates of Centre are always in Incremental Mode

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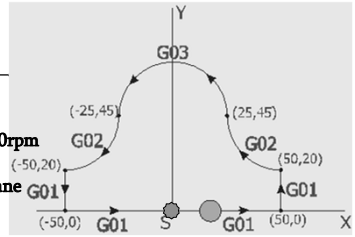
Example



N01 G91 Absolute Mode
N02 G21 Metric programming
N03 M03 S1000 Spindle start clockwise with 1000rpm
N04 G00 X0 Y0 Rapid motion towards (0,0)
N05 G01 Z-1.0 M08 Rapid motion towards Z=-1.0 plane
N06 G01 X50.0 Y0.0 Linear interpolation
N07 G01 X50.0 Y20.0 Linear interpolation
N08 G02 X25.0 Y45.0 I0.0 J25.0 Circular interpolation C.W.
N09 G03 X-25.0 Y45.0 I-25.0 J0.0 Circular interpolation C.C.W
N10 G02 X-50.0 Y20.0 I-25.0 J0.0 Circular interpolation C.W.
N11 G01 X-50.0 Y0.0 Linear interpolation
N12 G01 X0.0 Y0.0 Linear interpolation
N13 G00 Z2.0 Rapid motion towards Z=10 plane
N14 M05 M09 Spindle stop and program end

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Summary

- G Codes for circular interpolation
- G02: Circular interpolation in clockwise direction
- G03: Circular interpolation in anticlockwise direction

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