## 2.9.23 TOOL POSITION OFFSET (G45 TO G48)

Tool position offset A is for extending or reducing the movement value designated in the program by the values in the tool offset memory, and is mainly used for tool radius compensation for square patterns. Therefore, this function is not required with controls equipped with G40, G41, G42 (tool radius compensation C).

1. G codes of tool position offset

| G code | Group | Meaning |
|---|---|---|
| G45 | * | Extension |
| G46 | * | Reduction |
| G47 | * | Expansion by double |
| G48 | * | Reduction by double |

2. G45 to G48 extend and reduce the movement value programmed in the block, in the direction of movement by the tool offset value. Extension or reduction is made only in the block in which G45 to G48 are programmed and movements in other blocks are unaffected. Therefore, to restore extended or reduced values to the original program values, an extension or reduction in the opposite direction must be programmed eventually.

3. Make program command by incremental designation (G91) for the sake of making the above operation clear. When the command is given by absolute designation (G90), extension and reduction are made along the direction of movement to the movement value from the end point of the preceding block, to the command target point. That is, extension and reduction are made to the incremental movement amount. The programming may become complicated.

4. When programming G45 to G48, designate the tool offset number by a D code simultaneously with axis designation. Because D codes are modal, they may be omitted if the same D code is used. Store the tool radius value in the tool offset value memory.

EXAMPLE

```
     G91
①    G00  G46  X···  Y···  D01  ;    · · ·   Reduction
②    G01  G47  Y···  (D01)  F···  ;   · · ·   Extension by double
③         G47  X···  (D01)  ;         · · ·   Extension by double
④         G47  Y···  (D01)  ;         · · ·   Extension by double
⑤         G47  X···  (D01)  ;         · · ·   Extension by double
⑥    G00  G46  X···  Y···  (D01)  ;   · · ·   Reduction
```

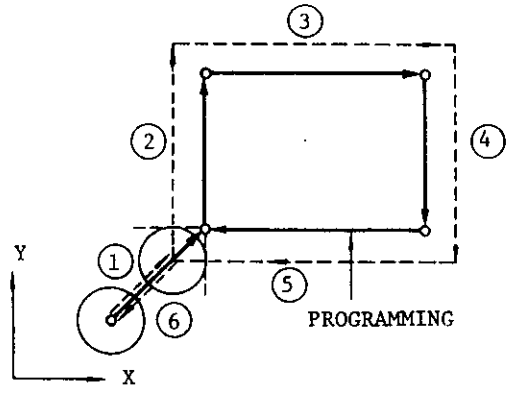


Fig. 2.61