| (11) ELECLROחICAITDUSLRIPL |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| GENERAL DATASHEET VARIABLE SPEED DRIVE |  |  |  |  |
| ${ }^{\text {F510 }}$ |  |  |  |  |
|  |  |  |  |  |
|  |  |  | Werreaturer |  |
|  | ${ }_{9.6}$ Oufiver mes | ${ }^{380.480}$ | 5060 |  |
| 5 | $\xrightarrow{\text { Nom }}$ | ${ }_{\text {acourorvo }}^{0.480}$ | ${ }_{\text {acouruer feauerer }}^{0.400}$ |  |
|  |  |  |  |  |
|  |  |  |  |  |

### 3.8 General Wiring Diagram



## Notes:

*1: Models IP20 200V $1 \sim 30 \mathrm{HP}, 400 \mathrm{~V} 1 \sim 40 \mathrm{HP}$ have a built-in braking transistor. To use this braking transistor a braking resistor can be connected between B 1 and B 2 .
*2: Use SW3 to select between Sink (NPN, with 24VG comm on) or Source (PNP, with +24 V common) for multi-function digital input terminals S1~S6.
*3: Use SW2 to switch between voltage and current input for Multi-function analog input 2 (AI2). See parameter 04-00.
*4: Safety input F1 and F2 is a normally closed input. This input should be closed to enable the inverter output. To activate this inp ut remove the jumper wire between F1 and F2.
*5. Terminating resistor can be set to ON or bypass (Off). This is used when connecting multiple drives in an RS485 network.
*6. Models IP20 1 ~ 3HP do not support an option card.

### 3.9 User Terminals (Control Circuit Terminals)

IP20 Type:

200V: 1 ~ 3 HP, 400V: 1~3HP

\[

\]



200V: 5 ~ $50 \mathrm{HP}, 400 \mathrm{~V}: 5 \sim 75 \mathrm{HP}$

| $\mathrm{S}(+)$ | $\mathrm{S}(-)$ |  | S 1 | S 3 | S 5 | 24 V | +10 V | MT | GND | GND | Al 1 | Al 2 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | E


| R1A | R1B | R1C |  |
| :---: | :---: | :---: | :---: |
| R2A | A R2C | R3A | R3C |

200V: 60 ~ 175 HP, 400V: 100 ~ 800HP

| $\mathrm{S}(+)$ | $\mathrm{S}(-)$ | S 1 | S 3 | S 5 | 24 V | +10 V | MT | GND | GND | A 11 |  | A 2 |
| ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | E


| R1A | R1B | R1C | R2A | R2C | R3A | R3C |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |


| Type | Terminal | terminal function | Signal level / Information |
| :---: | :---: | :---: | :---: |
| Digital input signal | S1 | 2-Wire Forward Run - stop command (default), multi-function input terminals * 1 | Signal Level 24 VDC <br> (opto isolated) <br> Maximum current: 8 mA <br> Maximum voltage: 30 Vdc |
|  | S2 | 2-Wire Reverse Run - stop command (default), multi-function input terminals * 1 |  |
|  | S3 | Multi-speed/ position setting command 1 (default), multi-function input terminals * 1 |  |
|  | S4 | Multi-speed/ position setting command 2 (default), multi-function input terminals * 1 |  |
|  | S5 | Multi-speed/ position setting command 3 (default), multi-function input terminal* 1 |  |
|  | S6 | Fault reset input, multi-function input terminal * 1 |  |
| 24 V <br> Power supply | 24V | Digital signal SOURCE (SW3 switched to mode) | $\pm 15 \%,$ <br> Max. output current: $250 \mathrm{~mA}$ <br> (The sum of all loads connected ) |
|  | 24VG | Common terminal for Digital signals Common point for digital signal SINK ( SW3 switched to SINK ) |  |
| Analog input signal | +10V | Power for external speed potentiometer | $\pm 5 \%$ (Max. current: 20mA ) |
|  | MT | Motor temperature detector for eccternally connected PTC | Range, return |
|  | Al1 | Multi-function analog input for speed reference (0-10V input) | Range 0 to +10 V <br> Resolution: 12bit |
|  | Al2 | Multi-function analog input terminals *2, SW2 switched between voltage or current input $(0 \sim 10 \mathrm{~V}) /(4-20 \mathrm{~mA})$ | Range 0 to +10 V <br> Range 4 to 20 mA <br> Input impedance: <br> Resolution: 12bit |
|  | GND | Analog signal ground terminal | ---- |
|  | E | Shielding wire connecting terminal (Ground) | ---- |
| Analog output signal | AO1 | Multi-function analog output terminals *3 ( $0 \sim 10 \mathrm{~V} /$ 4-20mA output) | Range 0 to 10 V <br> Max. current: 2mA <br> From 4 to 20 mA |
|  | AO2 | Multi-function analog output terminals *3 ( $0 \sim 10 \mathrm{~V} /$ $4-20 \mathrm{~mA}$ output) |  |
|  | GND | Analog signals ground terminal |  |
| Type | Terminal | terminal function | Signal level / Information |
| Pulse output signal | PO | Pulse output, Bandwidth 32KHz | Max. Frequency: 32 KHz Open Collector output |
|  | GND | Analog signals ground terminal | ---- |


| Pulse input signal | PI | Pulse command input, bandwidth is 32 KHz | L: from 0.0 to 0.5 V <br> H: from 4.0 to 13.2 V <br> Max. Frequency: 0-32KHz |
| :---: | :---: | :---: | :---: |
|  | GND | Analog signals ground terminal | ---- |
| Relay output | R1A-R1B-R1C- | Relay A contact (multi-function output terminal) Relay B contact (multi-function output terminal) Relay contact common terminal, please refer to parameter group 03 in this manual for function description. | Rating: <br> $250 \mathrm{Vac}, 10 \mathrm{~mA} \sim 1 \mathrm{~A}$ <br> $30 \mathrm{Vdc}, 10 \mathrm{~mA} \sim 1 \mathrm{~A}$ |
|  | R2A-R2C | Same functions as R1A/R1B/R1C | Rating: <br> 250Vac, $10 \mathrm{~mA} \sim 1 \mathrm{~A}$ <br> $30 \mathrm{Vdc}, 10 \mathrm{~mA} \sim 1 \mathrm{~A}$ |
|  | R3A-R3C | Same functions as R1A/R1B/R1C | Rating: <br> 250Vac, $10 \mathrm{~mA} \sim 1 \mathrm{~A}$ <br> $30 \mathrm{Vdc}, 10 \mathrm{~mA} \sim 1 \mathrm{~A}$ |
| Run <br> Permissive Input | F1 | On: normal operation. <br> Off: stop. <br> (Jumper wired between F1 and F2 has to be removed by using external contact to stop.) | $24 \mathrm{Vdc}, 8 \mathrm{~mA}$, pull-up |
|  | F2 | Safety command common terminal | 24V Ground |
| $\begin{aligned} & \text { RS-485 } \\ & \text { port } \\ & \hline \end{aligned}$ | S (+) | RS485/MODBUS | Differential input and output |
|  | S (-) |  |  |
| Grounding | E (G) | Grounding to earth Shield the connecting terminal | ---- |

## Notes:

*1:Refer to:

- Group 03: External Terminals Digital Input / Output Function Group.
*2:Refer to:
- Group 04 - External Terminal Analog Signal Input (Output) Function Group.
*3:Refer to:
- Group 04 - External Terminal Analog Signal Input (Output) Function Group.

|  |
| :--- |
| Maximum output current capacity for terminal 10 V is 20 mA . |
| Multi-function analog output AO 1 and AO 2 are intended as analog output meter signabo not |
| use them for feedback control. |
| $\qquad \mathrm{V}$ are to be used for internal control only, Do not use the internal |
| power-supply to power external devices. |

### 3.10 Power Terminals

IP00 / IP20 Type

| Terminal | $\begin{aligned} & \text { 200V: } 1 \sim 30 \mathrm{HP} \\ & \text { 400V: } 1 \sim 40 \mathrm{HP} \end{aligned}$ | $\begin{aligned} & \text { 200V: } 40 \sim 175 \mathrm{HP} \\ & \text { 400V: } 50 \sim 800 \mathrm{HP} \end{aligned}$ |
| :---: | :---: | :---: |
| R/L1 | Input Power Supply (For single phase use terminals R/L1 and S/L3) |  |
| S/L2 |  |  |
| T/L3 |  |  |
| B1 P | B1 P : DC power supply <br> B1 P B2: external braking resistor |  |
| B2 |  | - |
|  |  | - : DC power supply or connect braking module |
|  | - |  |
| U/T1 | Inverter output |  |
| V/T2 |  |  |  |
| W/T3 |  |  |  |
| E | Ground terminal |  |

*1. All models 400 V 25 HP ( 18.5 KW ) and below have a built-in braking transistor.
*2. Before connecting DC reactor, please remove factory supplied jumper between terminal 1 and
2.

## IP20 Type

200V: 1-3HP/ 400V: 1-3HP


| Terminal screw size |  |
| :---: | :---: |
| T | $\Theta$ |
| M 4 | M 4 |

200V: 5-7.5HP/ 400V: 5-10HP


| Terminal screw size |  |
| :---: | :---: |
| T | $\Theta$ |
| M 4 | M 4 |

200V: 10-15HP/ 400V: 15-20HP



| Terminal screw size |  |
| :---: | :---: |
| T | $\ominus$ |
| M 6 | M 6 |

200V: 40-50HP/ 400V: 50-75HP


| Terminal screw size |  |
| :---: | :---: |
| T | $\Theta$ |
| M 8 | M 8 |

200V: 60-75HP/ 400V: 100-125HP


| Terminal screw size |  |  |
| :---: | :---: | :---: |
| Power supply | T | $\Theta$ |
| 400 V 100 HP | M 8 | M 10 |
| $200 \mathrm{~V} 60-75 \mathrm{HP} /$ | M 10 | M 10 |
| 400 V 125 HP |  |  |

200V: 100-125HP/ 400V: 150-250HP


| Terminal screw size |  |
| :---: | :---: |
| T | $\bigoplus$ |
| M 10 | M 10 |

200V: 150-175HP/ 400V: 300-425HP


| Terminal screw size |  |
| :---: | :---: |
| T | $\ominus$ |
| M12 | M10 |

400V: 530-800HP


| Terminal screw size |  |
| :---: | ---: |
| T | $\doteq$ |
| M10 | M 10 |

### 3.11 Input / Output Power Section Block Diagram

The following diagrams show the basic configuration for IP00/IP20 power sections for the range of horsepower and input voltages. This is shown for reference only and is not a detailed depiction.

## IP00/IP20 Type

1: 200V: 1 HP / 400V: 1 ~ 2 HP


2: 200V: 2 ~ 30 HP / 400V: $3 \sim 40$ HP



4: 200V: $60 \sim 75$ HP / 400V: $100 \sim 125$ HP


5: 200V: $100 \sim 175 \mathrm{HP}$


6: 400V: $150 \sim 425 \mathrm{HP}$


7: 400V: $535 \sim 800 \mathrm{HP}$


## OUT of the Box Startup - Overview

This document is intended as a quick setup guide for the F510 PID function. Please note this document is not a substitute for the F510 User Manual and it is important that you reference the F510 user manual before proceeding.

## Introduction to PID Control

The PID function in the inverter can be used to maintain a constant process variable such as pressure, flow, temperature by regulating the output frequency (motor speed).

A feedback device (transducer) signal is used to compare the actual process variable to a specified setpoint. The difference between the set-point and feedback signal is called the error signal.

The PID control tries to minimize this error to maintain a constant process variable by regulating the output frequency (motor speed). The amplitude of the error can be adjusted with the Proportional Gain parameter 10-05 and is directly related to the output of the PID controller, so the greater the gain the larger the output correction.

However, in any system as the gain is increased there is a point that the system becomes unstable (oscillation).

To compensate for instability, the response time of the system may be slowed down by increasing the Integral Time set by parameter 10-06. Slowing the system down too much may be unsatisfactory for the process.

The end result is that these two parameters in conjunction with the acceleration (00-14) and deceleration (00-15) times require to be adjusted to achieve optimum regulation of the process.

## STEP 1 How to Change Parameters



## STEP 2 Transducer Wiring

2 Wire / 4-20mA Transducer


## Step (3) Enable PID Control

The PID control mode 10-03 has to be enabled, as well as the correct settings for the setpoint 10-00 and feedback source 10-01.
$10-00=4$; Setpoint 10-02/12-28
$10-01=$ Set to 1 for 0-10VDC and 2 for $4-20 \mathrm{~mA}$; Transducer
10-03 = 0001b; PID Control Enable

## Application Example:

Maintain 60.0 PSI with a feedback transducer maximum of $150.0 \mathrm{PSI}(4-20 \mathrm{~mA})$ and use the keypad as the setpoint source.

## Step (4) PID Setpoint

$10-00=4(10-02 / 12-38)$; the main keypad display or actual parameter $10-02$ will be the PID setpoint source .

## Step (5) Scaling of PID Feedback Signal

10-01 = 2; 4-20mA Transducer
10-33 = 1500; Maximum Feedback Value
$10-34=1$; Maximum Feedback Value Scaling
10-35 = 3; Engineering Units
After setting 10-33~35 this display will scale to a maximum of 150.0 and will show 'PSI' as the engineering units. When you return to the main screen you can set 12-38 $=0060.0 \mathrm{PSI}$.

## Step (6) PID Tuning

$10-05=1.00$; Proportion Gain
10-06 = 10.00; Integral Time
00-14 = 10.00; Acceleration Time
$00-15=10.00$; Deceleration Time
Slowing the system down too much may be unsatisfactory for the process. The end result is that these two parameters (10-05 and 10-06) in conjunction with the acceleration (00-14) and deceleration (00-15) times are adjusted to achieve optimum performance for a particular application.

For typical fan and pump applications a Proportional Gain (10-05) of 2.0 and an Integral Time (10-06) of 5.0 seconds is recommended. Increase or decrease these values in small increments.

## Step (7) Sleep / Wakeup Function (Optional)

The PID Sleep function can be used to prevent a system from running at low speeds and is frequently used in pumping applications. The PID Sleep function is turned on by setting parameter 10-29 to 1 . The inverter output turns off when the PID output falls below the PID sleep level (10-17) for the time specified in the PID sleep delay time parameter (10-18).

The inverter wakes up from a sleep condition when the PID output (Reference frequency) rises above the PID wake-up frequency (10-19) for the time specified in the PID wake-up delay time (10-20).

10-17 = Set to minimum motor Sleep frequency; PID Sleep Frequency
10-19 = Set to the motor Wake-Up frequency; PID Wake-Up Frequency
$10-29=1$; PID Sleep Function


For the complete F510 parameter listing and descriptions, refer to the F510 Instruction manual on our website www.tecowestinghouse.com

### 1.0 Built-in PLC Function

The PLC ladder logic can be created and downloaded using the TECO link software.

### 1.0.1 Basic Command

|  | L | A | $\checkmark$ | P | H1 | $1 /$ | NO / NC |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Inputs |  |  |  |  | 1 | i | 11~18 / i1~i8 |
| Outputs | Q | Q | Q | Q | Q | q | Q1~Q2 / q1~q2 |
| Auxiliary command | M | M | M | M | M | m | M1~MF / m1~mF |
| Special registers |  |  |  |  |  |  | V1~V7 |
| Counter function | C |  |  |  | C | c | $\mathrm{C} 1 \sim \mathrm{C8} / \mathrm{c} 1 \sim \mathrm{c} 8$ |
| Timer function | T |  |  |  | T | t | T1~T8 / t1~ 8 |
| Analog comparison function | G |  |  |  | G | g | G1~G8 / g1~g8 |
| Operation control function | F |  |  |  | F | f | F1~F8 / f1~f8 |
| summation and subtraction function | AS |  |  |  |  |  | AS1~4 |
| Multiplication and division function | MD |  |  |  |  |  | MD1~4 |

## Description of registers

V1: Set frequency
V2: Operation frequency
V3: Al1 input value
V4: Al2 input value
V5: Keypad input value
V6: Operation current
V7: Torque value

Range: $0.1 \sim 1200.0 \mathrm{~Hz}$
Range: $0.1 \sim 1200.0 \mathrm{~Hz}$
Range: 0~1000
Range: 0~1000
Range: 0~1000
Range: 0.1~999.9A
Range: 0.1~200.0\%

| Command | Upper Differential | Lower Differential | Other command symbol |
| :---: | :---: | :---: | :---: |
| Differential command | D | d |  |
| SET command |  |  | A |
| RESET command |  |  | $\vee$ |
| P command |  |  | P |


| Open circuit | "" " |  |
| :---: | :---: | :---: |
| Short circuit | "--" |  |


| Connection symbol | Definition |
| :---: | :--- |
| - | Connect components on the left and right side |
| $\perp$ | Connects components on the left , right and top side |
| + | Connects components on the left , right , top and bottom side |
| $工$ | Connects components on the left , right and bottom side |

### 1.0.2 Basic Command Function

© $D(d)$ command function
Example 1: I1-D -[ Q1


Example 2: i1-d - [ Q1

© NORMAL( -[ ) output I1-[Q1

| 11 OFF <br> ON OFF <br> Q1 OFF$\sqrt{\text { ON }}$ | OFF |
| :---: | :---: | :---: | :---: |

© SET ( $A$ ) output
I1-A Q1

| I1 | OFF | ON |
| :---: | :---: | :---: |
| Q1 |  |  |
| OFF |  | ON |

© RESET ( $\vee$ ) output
I1- $\vee$ Q1

| I1 | OFF | ON |
| :---: | :---: | :---: |
| O1 $\quad$ ONF |  |  |

## © P output

i1-PQ1

| 11' | OFF | ON | OFF | ON | OFF | ON | OFF |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| I1' is the inverse logic of i1 |  |  |  |  |  |  |  |
| $i 1$ |  |  |  |  |  |  |  |
| Q1 | ON |  | OF |  | ON |  | OFF |

### 1.0.3 Application Functions

## 1: Counter Function



| Symbol | Description |
| :---: | :--- |
| $(1)$ | Counter mode $(1 \sim 4)$ |
| $(2)$ | UP/Down counting modes can be set by (I1~f8). |
|  | OFF: Count up $(0,1,2,3 \ldots)$ |
|  | ON: Count down $(\ldots 3,2,1,0)$ |
| $(3)$ | Use (I1~f8) to reset counting value |
|  | ON: Internal count value is reset and counter output © $)$ is OFF |
|  | OFF: Internal counter value retained |
| (4) | Internal counter value |
| (5 | Counter compare value (AS1~AS4,MD1~MD4,T1~T8,C1~C8,V1~V7, constant) |
| (6) | Counter output (C1 to C8, there are a total of 8 counters) |

## Counter modes:

Mode 1: Counter value is locked to the set value. The value will not be retained when the power is cut off.
Mode 2: Counter value is not locked. The value will not be retained when the power is cut off.
Mode 3: Counter value is locked. The value will be retained when the power is cut off.
Mode 4: Counter value is not locked. The value will be retained when the power is cut off.

## Counter mode 1

## Example:



## Input from ladder program



## Counter mode 2

| (5) | 20 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| (4) | 0 | 19 | 19 | 20 | 20 | 21 | 21 | 20 | 20 | 19 | 20 | 18 | 18 | 19 | 19 | 20 | 0 | 20 | 20 |


| Counter input pulse |  | $\square$ | $\square$ | $\square$ | $\square$ |
| :--- | :--- | :--- | :--- | :--- | :--- |

Note: In this mode the internal counter may increase past the counter compare value, unlike mode 1 where the internal counter value is limited to the counter compare value.

## 2: Timer Function



| Symbol | Description |
| :---: | :--- |
| (1) | Timer mode (1-7) |
|  | Timing unit: |
|  | 1:0.0~999.9 second |
|  | 2:0~9999 second |
|  | Use (I1~f8) to reset timing value |
|  | ON: Internal timing value is reset and timer output © is OFF |
|  | OFF: Internal timer stays running |
| (4) | Internal timer value |
| (5) | Timer set value (AS1~AS4,MD1~MD4,T1~T8,C1~C8,V1~V7,constant) |
| (6) | Timer output (T1 to T8, there are a total of 8 timers) |

Timer mode description:

## (1) Timer mode 1 (ON-delay Timer mode 1)


(1) Counter mode 3 is similar to the counter mode 1 , with the exception that the counter value is saved when the drive is powered down and reloaded at power up.
(2) Counter mode 4 is similar to the counter mode 2, with the exception that the counter value is saved when the drive is powered down and reloaded at power up.


Counter input pulse $\square$

| Power switch | $\square$ |
| :---: | :---: |
| 6 |  |

## Example:


(2) Timer mode 2 (ON-delay Timer mode 2)

(3) Timer mode 3 (OFF-delay Timer mode 1)

| Timer reset Internal timer value $=0$ |  |  | 4 Internal timer value | Reset internal timer value and output OFF |
| :---: | :---: | :---: | :---: | :---: |
| Timer start | OFF | ON |  |  |
| 66 | OFF | ON |  | OFF |
| When the set value is reached, the timer output turns on (T1 to T8) |  |  | $5$ |  |
| 3 Reset timer and output | OFF |  |  | OFF |



T= timer set value
(4) Timer mode 4 (OFF-delay Timer mode 2)


## T= timer set value

(5) Timer mode 5 (FLASH Timer mode 1)


## (6) Timer mode 6 (FLASH Timer mode 2)


(7) Timer mode 7 (FLASH Timer mode 3)


## 3: Analog comparator function



| Symbol | Description |
| :---: | :--- |
| $①$ | Analog comparator mode (1~3) |
| $(2)$ | Input comparison value selection (AS1~AS4,MD1~MD4,T1~T8,C1~C8,V1~V7) |
| $(3)$ | Current analog input value |
| $(4)$ | Set the reference comparison value (Upper limit) <br> (AS1~AS4,MD1~MD4,T1~T8,C1~C8,V1~V7, constant ) |
| (5) | Set the reference comparison value (lower limit) <br> (AS1~AS4,MD1~MD4,T1~T8,C1~C8,V1~V7, constant ) |
| (6) | Comparator output (G1 to G8, there are a total of 8 comparators) |

## The description of analog comparison mode:

(1) Analog comparison mode 1 (3 $\leq$ (5), © ON)
(2) Analog comparison mode 2 (3) ④, © ON)
(3) Analog comparison mode 3 ( $5 \leq$ (3) $\leq$ (4), © ON)

## Input comparison value selection (V1~V7)

(1) Input comparison value selection = V1: Set frequency
(2) Input comparison value selection = V2: Operation frequency
(3) Input comparison value selection = V3: Al1 input value
(4) Input comparison value selection = V4: A12 input value
(5) Input comparison value selection $=\mathrm{V} 5$ : Keypad input value
(6) Input comparison value selection = V6: Operation current
(7) Input comparison value selection = V7: Torque value

## 4: Operation control function



| Symbol | Description |
| :---: | :---: |
| (1) | Forward /Reversal control can be set by ( I1~f8 ) OFF: Forward(FWD) <br> ON: Reversal(REV) |
| (2) | Speed terminal control can be set by ( $11 \sim$ f8 ) |
|  | OFF: Operation based on (3) set frequency |
|  | ON: Operation based on frequency of speed (4) |
| (3) | Set frequency (can be constant or V3, V4, V5 ) |
| (4) | Speed frequency (can be constant or V3, V4, V5) |
| (5) | Acceleration time (ACC Time) |
| © | Deceleration time (DEC Time) |
| (2) | Operation command output (F1 to F8, there are a total of 8 operation control functions) |

## Example:

Input from the Ladder Program


## 5: Summation and subtraction functions



RESULT (calculation result) $=\mathrm{V} 1+\mathrm{V} 2-\mathrm{V} 3$

| Symbol | Description |
| :---: | :--- |
| $(1)$ | Calculation result : RESULT |
| (2) | Addend V1(AS1~AS4,MD1~MD4,T1~T8,C1~C8,V1~V7, constant ) |
| $(3)$ | Addend V2(AS1~AS4,MD1~MD4,T1~T8,C1~C8,V1~V7, constant ) |
| (4) | Subtrahend V3(AS1~AS4,MD1~MD4,T1~T8,C1~C8,V1~V7, constant ) |
| (5) | Coil output of error signal (M1~MF) |
| (6) | Addition and subtraction modes number (AS1~AS4) |

## 6: Multiplication and division modes



RESULT (calculation result) =V1*V2/V3

| Symbol | Description |
| :---: | :--- |
| $\oplus(1)$ | Calculation result : RESULT |
| (2) | Multiplier V1(AS1~AS4,MD1~MD4,T1~T8,C1~C8,V1~V7, constant ) |
| (3) | Multiplier V2(AS1~AS4,MD1~MD4,T1~T8,C1~C8,V1~V7, constant ) |
| $④$ | Divisor V3(AS1~AS4,MD1~MD4,T1~T8,C1~C8,V1~V7, constant ) |
| (5) | Coil output of error signal (M1~MF) |
| $③$ | Multiplication and division modes number (MD1~ MD4) |

