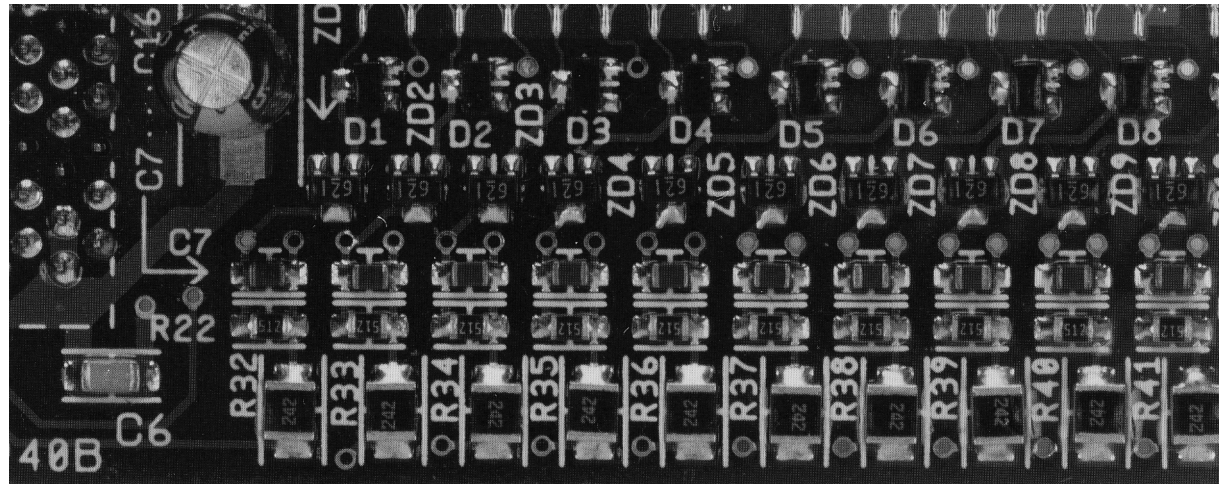


DIGITAL SPEED REFERENCE CARD

FOR Varispeed SERIES OPTION CARD

MODEL DI-08



Before initial operation, read these instructions thoroughly, and retain for future reference.



YASKAWA

MANUAL NO. TOE-C736-30.15B

Digital speed reference card DI-08 (hereinafter called DI-8), an on-board type optional card, is mounted on the inverter control board. This allows digital speed reference setting with high accuracy and high resolution. When DI-08 is used to set speed reference, select inverter system constant 4 (run signal selection 1) so that external terminal input will be set as main speed frequency reference.

Also select system constant 8 (run signal selection 5) so that frequency reference from the optional card will be effective.

- VS-S616G3/H3 series
 - Sn-04: ☐☐☐☐ Set 0 as the 1st digit, where 1 has been set prior to shipping.
 - Sn-08: ☐☐☐☐ Set 0 as the 1st digit, where 0 has been set prior to shipping.
- VS-616G5 series
 - bl-01: Set 3. (1 has been set prior to shipping.)

Name	Code No.	Input Method
Digital Speed Reference Card DI-08	73600-C003X	• Input signal: Binary 8 bits/BCD 2-digit, SIGN signal, SET signal • Input voltage: +24 V (isolated)

CAUTION

- (1) Read this instruction paper and instruction manuals of the inverter (VS-616G3, VS-616H3, or VS-616G5) which will be provided with this DI-08 before use.
- (2) When connection to DI-08 connector or external terminals is required, turn off the inverter AC main circuit power supply and check that the inverter CHARGE indicator lamp is out.
- (3) When ordering the DI-08, specify the name and code No.

INSTALLATION TO INVERTER (Fig. 1)

- (1) Turn off AC main circuit power supply and remove inverter face plate. Check if CHARGE indicator lamp is out.
- (2) Mount DI-08 connector 2CN on connector 2CN (number of pins: 60 poles) on the inverter control board. Insert optional card supports on the control board to DI-08 support mounting holes (2 places) to stabilize DI-08.
- (3) After mounting DI-08, perform connection with peripheral equipment. When the connection is completed, replace inverter face plate.

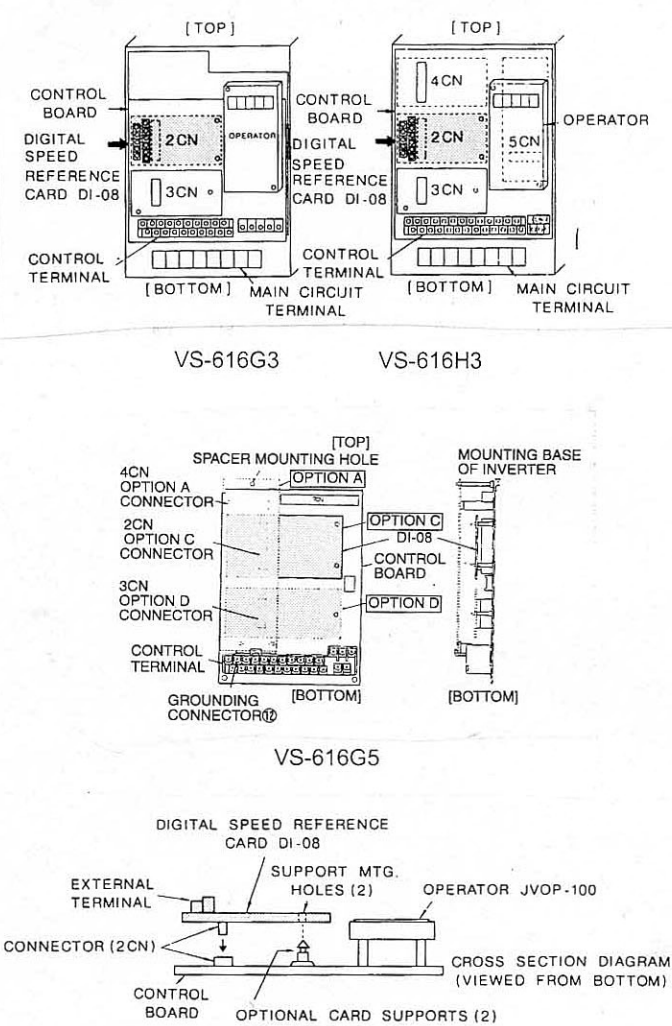
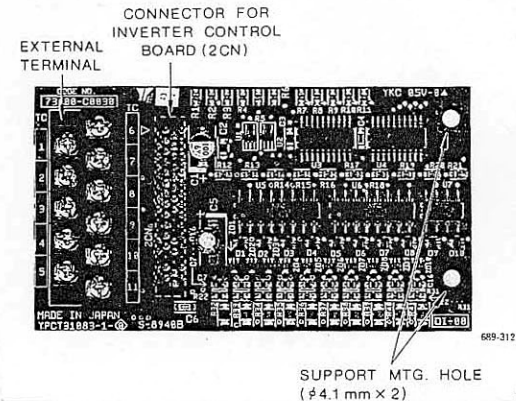
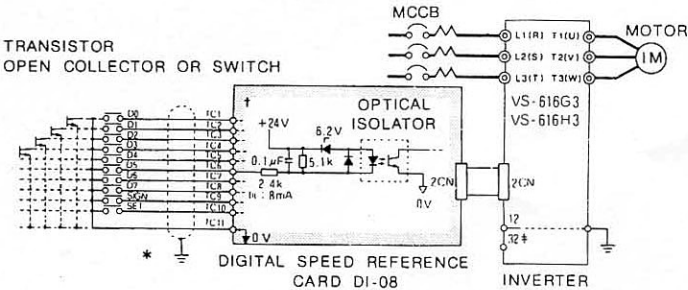


Fig. 1 Installation of Digital Speed Reference Card DI-08

INTERCONNECTION BETWEEN EQUIPMENT

Fig. 2 shows a typical inverter interconnection with DI-08 to peripheral equipment.



- * Connect cable shield to control terminal ⑫ on the inverter control board.
- † Input circuits of TC1 to TC10 are the same. (Figure shows TC6 input circuit.)
- ‡ For VS-616H3, control terminal ⑬ on the control board can also be grounding.

Fig. 2 Interconnection Diagram

PRECAUTIONS FOR WIRING

(1) Separate control signal wiring (terminal TC1 to TC11) of DI-08 from main circuit wiring or other power lines.

(2) To prevent malfunction caused by noise, use shielded cable for control signal wiring and prepare its terminal ends as shown in Fig. 3.
Wiring length must not exceed 10m.

(3) Connect terminal ends of cable which is not used in shielded cables to 0V.

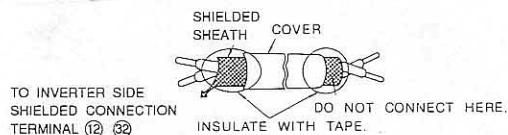


Fig. 3 Preparation of Shielded Cable Ends

EXTERNAL TERMINAL FUNCTIONS

DI-08 has external terminals (11 poles) for connection with peripheral equipment so that digital signals (binary 8 bits/BCD 2-digit+SIGN and SET signals) can be input. Table 1 shows the terminal functions.

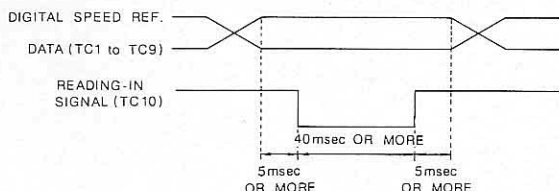


Fig. 4 Digital Speed Reference Read-in Signal Timing

Table 1 DI-08 External Terminal Functions

Terminal	Function		Remarks
	Binary Input	BCD Input	
TC1	2 ⁰	1	× 10 ⁰ · Input signal Open: 0 Close: 1 (shortcircuited with TC11)
TC2	2 ¹	2	
TC3	2 ²	4	
TC4	2 ³	8	
TC5	2 ⁴	1	× 10 ¹ · Binary or BCD input is selected by setting inverter system constant 26. (Refer to DIGITAL SPEED REFERENCE SELECTION METHOD).
TC6	2 ⁵	2	
TC7	2 ⁶	4	
TC8	2 ⁷	8	
TC9	· SIGN signal		· External terminal screw size: M3
TC10	· SET (reading-in signal)*		
TC11	· Speed ref. common signal (0V)		

* Terminal symbol TC10 "SET (read-in) signal" enables digital speed reference reading-in. When reading-in, short circuit TC10 and TC11 as shown in Fig. 4. When continuous reading-in required without using this read-in signal, short circuit TC10 and TC11 in advance.

PRECAUTIONS FOR INPUT SIGNAL APPLICATION

DI-08 input circuit can receive output from relay contacts or transistor (open collector). The following should be carefully noted.

- (1) When relay contact is used as digital as digital speed reference signal, use highly reliable relay contact (for very small current) with a capacity of 30VDC or more and rated current of 100mA or higher.
- (2) Use transistor (open collector) with rated voltage of 35VDC or more and rated current of 30mA or higher.

DIGITAL SPEED REFERENCE SELECTION METHOD

(1) VS-616G3/H3 Series

Digital speed reference (binary 8-bit input, BCD 2-digit input) can be selected by setting SN-26.

Table 2 shows set values and digital speed references that may be selected. When the contents of digital speed reference is selected as shown in Table 2, however, set 0 or to (Cn-20). (0 has been set prior to shipping.)

Table 2 Digital Speed Reference Selection

System Constant No.	Set Value	Digital Speed Ref. *	Setting Range
Sn-26	0000	BCD 1%	0 to 159%
	0001	BCD 0.1%	0.0 to 15.9%
	0010	BCD 0.01%	0.00 to 1.59%
	0011	BCD 1Hz	0 to 159Hz
	0100	BCD 0.1Hz	0.0 to 15.9Hz
	0101	BCD 0.01Hz	0.00 to 1.59Hz
	0111	Binary 255/100%	0.0 to Max. frequency/100% †
	1000	Binary 255/100%	0.0 to Max. frequency/100% †

* For BCD 2-digit input, 0 to F can be set for upper digit.

† Operator displays of set values 0111 and 1000 differ as follows:

0111: Digital speed reference is expressed in %.

1000: Digital speed reference binary 8-bit input is expressed in a value converted to decimal.

(2) VS-616 G5 Series

Set 3 (option card) to b1-01(reference selection).

Table 3 Digital Speed Reference Selection

Inverter Constant Setting No.	Ref. Input Mode	Setting Range* †	Monitor Display Unit	
F3-01			o1-3=0	o1-3=1
0	Signed BCD 2-digit, 1%	-110 to +110%	0.01 Hz	0.01%
1	Signed BCD 2-digit, 0.1%	-15.9 to +15.9%		
2	Signed BCD 2-digit, 0.01%	-1.59 to +1.59%		
3	Signed BCD 2-digit, 1 Hz	-159 to +159 Hz		
4	Signed BCD 2-digit, 0.1 Hz	-15.9 to +15.9 Hz		
5	Signed BCD 2-digit, 0.01 Hz	-1.59 to +1.59 Hz		
6				
7	8-bit binary, 100%/255	-255 to +255		

* This setting range is under the following conditions:

-400 Hz is set for E1-04 (Max. output frequency) and 110% for d2-01 (frequency reference upper limit)

-upper limit ≤ E1-04 or d2-01, lower limit ≥ E1-09 (Min. output frequency) or d2-02 (frequency reference lower limit)

† For BCD input, 0 to 15 can be set to the most upper digit.

Table 4 Related Constants

Operator Function	Operator Display	Constant No.	Name	Setting Range	Factory Setting	Change during Operation	Description
Operation Mode Selection	Reference Source	b1-01	Reference selection	0 to 3	1	No	0: Digital Operator 1: Control circuit terminal 3: Option card
Monitor Select	Display Scaling	o1-03	Frequency units of reference setting and monitor	0 or 1	0	No	0: 0.01 Hz units 1: 0.01% units
DI-08	DI Input	F3-01	Digital input option	0 to 7	0	No	0: Signed BCD 2-digit, 1% 1: Signed BCD 2-digit, 0.1% 2: Signed BCD 2-digit, 0.01% 3: Signed BCD 2-digit, 1 Hz 4: Signed BCD 2-digit, 0.1 Hz 5: Signed BCD 2-digit, 0.01 Hz 6: - 7: 8-bit binary, 100%/255
Status Monitor	Frequency Ref	U1-01	Frequency reference	-	-	-	The unit is set in o1-03.

DIGITAL SPEED REFERENCE CARD

FOR Varispeed SERIES OPTION CARD

MODEL DI-08

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