ZEF004491004

VARICAM®

Parallel Type External Display Unit

Specifications and Instruction Manual

NDP-A211A1
NDP-A221A1

CE

GENERAL SAFETY RULES

(Please read this safety guide carefully before operation)

Thank you very much for purchasing our product.
Before operating this product, be sure to carefully read this manual so that you may fully understand the product, safety instructions and precautions.
- Please submit this manual to the operators actually involved in operation.
- Please keep this manual in a handy place.

Signal Words

Safety precautions in this guide are classified into DANGER and CAUTION.

Symbol	Meaning
⚠ DANGER	Incorrect handling may cause a hazardous situation that will result in death or serious injury.
⚠ CAUTION	Incorrect handling may cause a hazardous situation that will result in moderate injury or physical damage.

Instructions accompanied by a symbol ⚠ CAUTION may also result in serious damage or injury. Be sure to follow the all instructions accompanied by the symbol.

Graphic Symbols

Symbol	Meaning
⃠	Indicates prohibited items.
❗	Indicates items that must be performed to.

Application Limitation

This product is not designed to be used under any situation affecting human life. When you are considering using this product for special purposes such as medical equipment, aerospace equipment, nuclear power control systems, traffic systems, and etc., please consult with NSD.

This product is designed to be used under the industrial environments categorized in Class A device.
The supplier and user may be required to take appropriate measures.

1. Handling Precautions

⚠ DANGER	
⚡	- Do not touch components inside of the external display unit; otherwise, it will cause electric shock.
⃠	- Do not damage the cable by applying excessive load, placing heavy objects on it, or clamping; otherwise, it will cause electric shock or fire.
❗	- Turn the power supply OFF before wiring, transporting, and inspecting the external display unit; otherwise, it may cause electric shock.
⏚	- Connect the grounding terminal of the external display unit; otherwise, it may cause electric shock or malfunction.

⚠ CAUTION	
⃠	- Do not use the external display unit in the following places; water splashes, the atmosphere of the corrosion, the atmosphere of the flammable vapor, and the side of the combustibility. Doing so may result in fire or VARICAM may become faulty.
❗	- Be sure to use the external display unit in the environment designated by the general specifications in the manual. Failure to do so may result in electric shock, fire, malfunction or unit failure.

2. Storage

⚠ CAUTION	
⃠	- Do not store the external display unit in a place exposed to water, or toxic gas and liquid.
❗	- Be sure to store the external display unit in designed temperature and humidity range, and do not exposed to direct sunlight. - Be sure to consult with NSD when the external display unit is stored for long periods.

3. Transport

⚠ CAUTION	
⃠	- Do not hold the cable during transport; otherwise, it will cause injury or malfunction.

4. Installation

⚠ CAUTION	
⃠	- Do not step on the external display unit or place heavy objects on the external display unit; otherwise, it will cause injury or malfunction. - Do not block the exhaust port or allow any foreign matter to enter the external display unit; otherwise, it will cause fire or the external display unit failure.
❗	- Be sure to secure the external display unit; otherwise, it may cause malfunction, injury, or drop. - Be sure to secure the specified distance between the external display unit and or other equipments; otherwise, it may cause malfunction.

5. Wiring

⚠ DANGER	
❗	- Be sure to secure the screws of the terminal block firmly; otherwise, it will cause fire. - Be sure to mount the terminal cover provided with the external display unit, before supplying the power, starting operation after the installation, and wiring; otherwise, it may cause electric shock.

⚠ CAUTION	
❗	- Be sure to keep the cable at least 300 mm away from the main circuit and power line; otherwise, it may cause injury or malfunction. - Be sure to connect all cables correctly; otherwise, it may cause injury or malfunction. - Be sure to firmly connect the connector; otherwise, it may cause injury or malfunction.

6. Operation

⚠ CAUTION	
⃠	- Do not change the external display unit's function switch settings during the operation; otherwise, it will cause injury.
❗	- Be sure to check that the power supply specifications are correct; otherwise, it may cause the external display unit failure.

7. Maintenance and Inspection

⚠ CAUTION	
⃠	- Do not disassemble, remodel, or repair the unit; otherwise, it will cause electric shock, fire, and unit malfunction.
❗	- The capacitor of the power line deteriorates through prolonged use. We recommended that the capacitor be replaced every five years to prevent secondary damage.

8. Disposal

⚠ CAUTION	
⃠	- Be sure to handle the external display unit as industrial waste while disposing of it.

REVISION HISTORY

* The Document No. appears at the upper right of this manual's cover page.

Document No.	Date	Revision Description
ZEF004491000	7, Jul., 2008	1st Edition Japanese document: G-HB07000700
ZEF004491001	5, Mar., 2014	2nd Edition Japanese document: G-HB07000701
ZEF004491002	25, Apr., 2014	3rd Edition Japanese document: G-HB07000701
ZEF004491003	4, Apr., 2016	4th Edition Japanese document: G-HB07000702
ZEF004491004	14, May, 2021	5th Edition Japanese document: G-HB07000704

CONTENTS

1. SUMMARY

The parallel type external display unit can display the current position value (angular) and rotation speed of the sensor when it is connected to the current position output connector of VARICAM Series.

●Applicable controller

Series name	Controller name
VS-5F	VS-5FD, VS-5FX VS-5FD-1, VS-5FX-1 VS-5FXG-1
VS-5E	VS-5ED, VS-5EX VS-5ED-1, VS-5EX-1 VS-5EXR-1, VS-5EXG-1
VS-6E	VS-6E, VS-6E-S1 VS-6E-EX, VS-6E-EX-S1
VS-7	VS-7, VS-7-EX VS-7R-1, VS-7R-EX-1

1-1. FEATURES

(1) Easy connection

The ABSOCODER's current position value and rotation speed can be checked simply by connecting to the VARICAM's current position output connector.

(2) Roulette display

NDP Series is able to indicate the current position value by the roulette LED panel; therefore, the machine position can be visually checked during the operation or Teaching operations.

(3) Animation display

The roulette type display of LED panel indicates the current position value by the animation in order to make high-visibility when the rotation speed is over 250spm. The animation display can be invalid by the switch setting.

(4) Rotation speed display

The numeric display area switches from the angle display to the rotation speed display when the rotation speed is over the setting value, so the speed can be checked during the operation.
The switching speed can select from 10spm or 20spm by the switch.

(5) Extend the cable length to 100 meters

The connection cable length between the external display unit to the controller can be extended to 100 meters. Therefore, the place which can be installed spreads.

(6) It is possible to check the connector disconnection

When the connector of the current position value input signal is disconnected, it is indicated as "- - - -" on the numeric value display area.

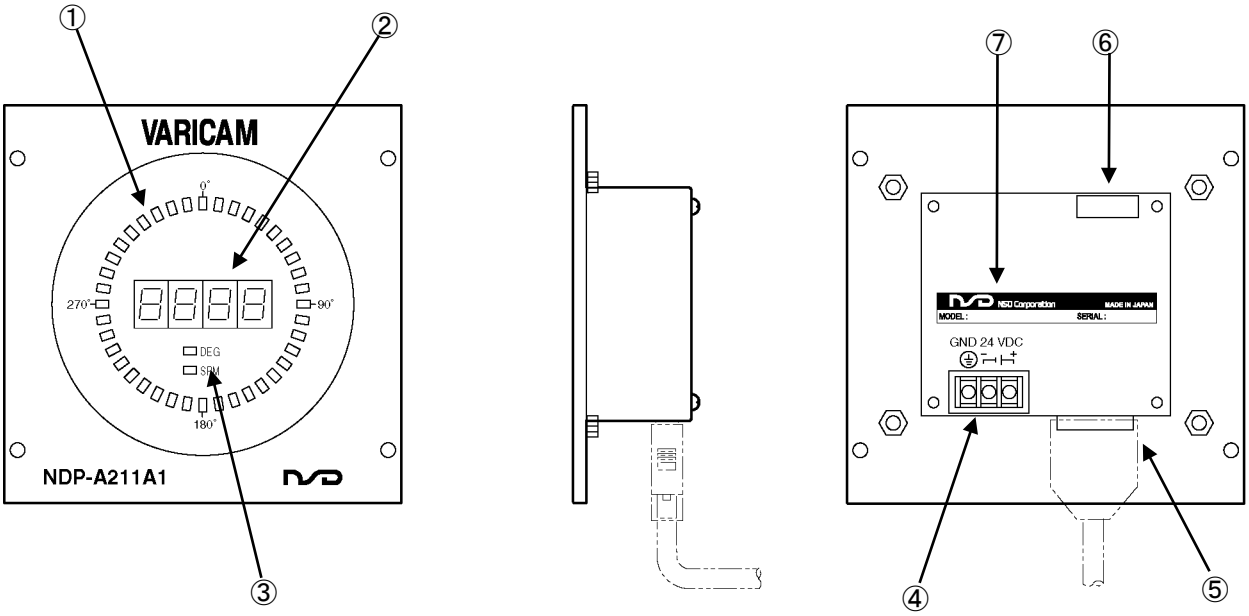
(7) Function selection switch

It is possible to set each function such as the animation, display or non-display of the rotation speed, and etc by the switch operation.

(8) Compliance with CE standards

The external display unit complies with CE (EMC Directive) standards.
For more details, refer to "APPENDIX 2. CE MARKING".

1-2. Part Identification and Functions



① Roulette display area

The roulette position which is in line with VARICAM's current position value is turned ON.

② Numeric display area

The ABSOCODER's current position value or rotation speed is displayed by numeric values.
The current position value is displayed per degree and rotation speed is displayed per spm.

③ Mode display area

“DEG" LED: Turns ON when displaying the current position value.
"SPM" LED: Turns ON when displaying the rotation speed.

④ Power terminal block

Supply the voltage of 24 VDC.

⑤ Input connector

Input the current position value signal that outputs from VARICAM.

⑥ Function selection switch

Sets the function.
For more details, refer to “8-1. External Display Unit Setting”.

⑦ Model seal

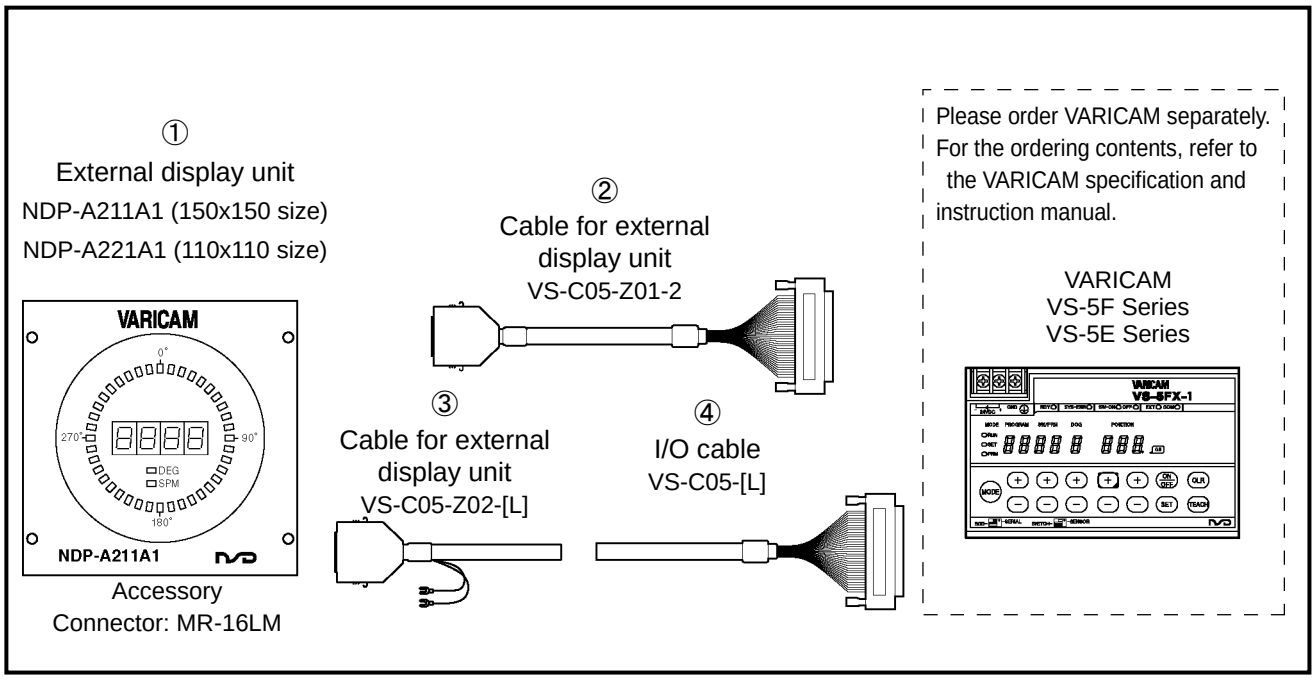
2. MODEL SELECTION WHEN ORDERING

Indicates the cconnection configuration of the external display unit. Refer to the connection configuration and model list when ordering.

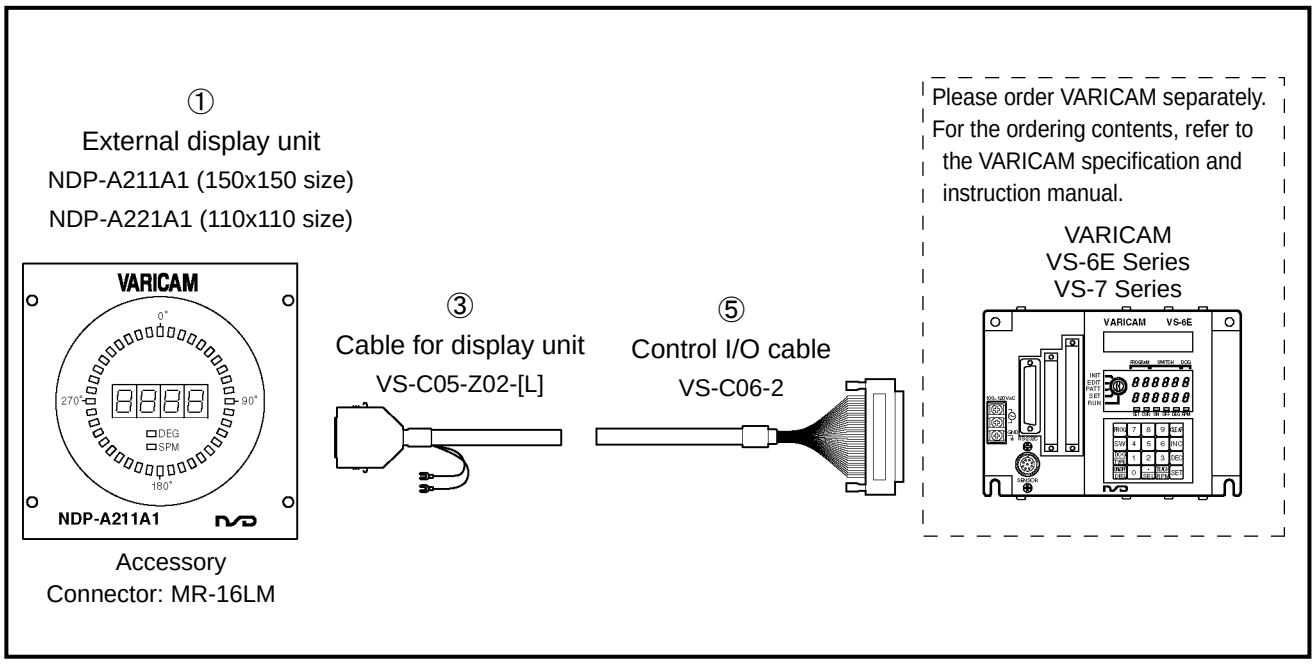
Please prepare the device by customer except ① to ⑤ products of the connection configuration.

(1) Connection configuration

●In the case of connecting VS-5F Series or VS-5E Series



●In the case of connecting VS-6E Series or VS-7 Series



(2) Model list

● External display unit

No.	Name	Model	Description
①	External display unit	NDP-A211A1	150 x 150 size
		NDP-A221A1	110 x 110 size

● External cable

No.	Name	Model	Description
②	Cable for external display unit	VS-C05-Z01-2	Uses this cable when connecting VS-5F or VS-5E Series. Cable length: 2m *1
③	Cable for external display unit (with shield)	VS-C05-Z02-[L]	Uses this cable when connecting with the external display unit. Uses this cable when the external display unit and VARICAM installation site are far. [L]: cable length [m] *2 Use with ④VS-C05-[L] or ⑤VS-C06-2 when using this cable. - VS-5F/VS-5E Series: VS-C05-[L] - VS-6E/VS-7 Series: VS-C06-2
④	I/O cable	VS-C05-[L]	Uses this cable at BCD output connector of VS-5F Series or VS-5E Series. [L]: Cable length 1, 2m
⑤	I/O cable	VS-C06-2	Uses this cable at I/O connector of VS-6E Series or VS-7 Series. [L]: Cable length 2m

*1: Other than two meters of cable length are also available. Please contact your NSD representative.
If the cable is required more than two meters and needed to pull out from the control panel, we would recommend to use VS-C05-Z02-[L] with shield.

*2: The total cable length of VS-C05-Z02-[L] is maximum 100 meters including lengths of VS-C05-[L] and VS-C06-2.

3. SPECIFICATONS

3-1. General Specifications

Item	Specifications	
Model	NDP-A211A1 (standard type)	NDP-A221A1 (compact type)
Power supply voltage	24VDC	
Permissible power voltage range	21.6 to 30VDC	
Power consumption	5W or less	
Insulation resistance	20 MΩ or more between external DC power terminals and ground (by 500 VDC insulation resistance tester)	
Withstand voltage	500 VAC, 60Hz for 1 minute between external DC power terminal and ground	
Vibration resistance	20m/s^2 10 to 500Hz, 10cycles of 5 minutes in 3 directions, conforms to JIS C 0040 standard	
Ambient operating temperature	0 to +55°C (No freezing)	
Ambient operating humidity	20 to 90 %RH (No condensation)	
Ambient operating environment	Free from corrosive gases and excessive dust	
Ambient storage temperature	-10 to +70°C	
Grounding	Must be securely grounded (ground resistance of 100 Ω or less)	
Construction	Panel mounting	
Outside dimension (mm)	150(W) x 150(H) x 46(D) (Refer to dimensions for details.)	110(W) x 110(H) x 46(D) (Refer to dimensions for details.)
Mass	Approx. 0.7kg	Approx. 0.6kg

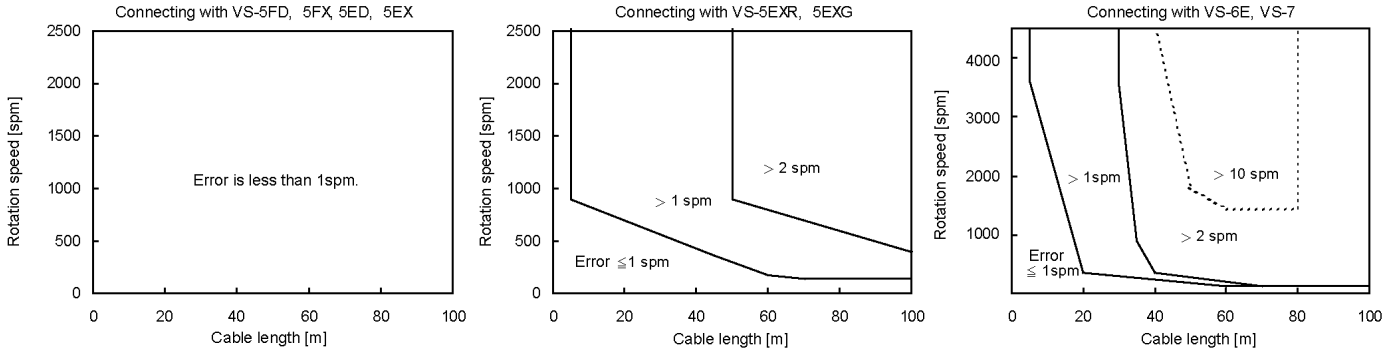
3-2. Performance Specifications

Item	Specifications
Display items	Current position value, rotation speed
Current position value display unit	Roulette display area: 9° Numeric display area: 1°
Rotation speed display range	2500 spm (VS-5FD /5FX /5FXG /5ED /5EX /5EXR /5EXG) 4500 spm (VS-6E /7 /7R)
Rotation speed display sampling time	1 s
Max. cable length	Max. 100 m *1

Note

*1: If a cable between the external display unit and VARICAM is extended, a speed error will occur depending on the rotation speed. For the speed error, refer to the following figures. (The value might be different by the condition.)

Rotation speed accuracy relating cable length
(Cable: VS-C05-Z01 or VS-C05-Z02
Temperature: ambient temperature)



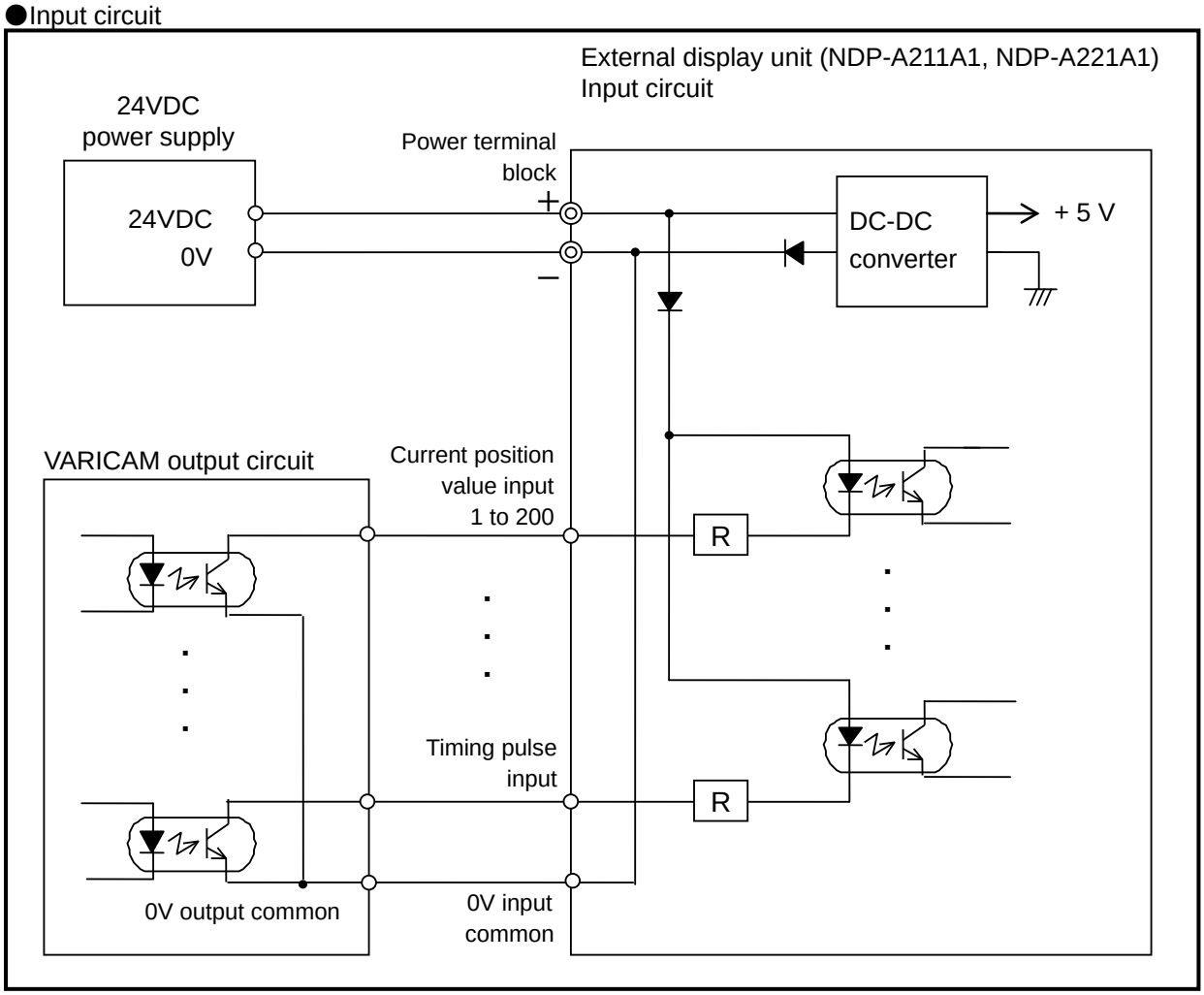
3-3. Input Specification

Specification	Input signal	Points
NDP-A211A1 NDP-A221A1	Current position value input	10 points
	Timing pulse input	1 point

3-3-1. Input Circuit Specification

Item			Specifications
Input	Current position value	Input format	DC input
		Rated input voltage	24 VDC (30 V max.)
		Input current	5 mA (24 VDC)
		Isolation format	Photo-coupler isolation
	Timing pulse	Input format	DC input
		Rated input voltage	24 VDC (30 V max)
		Input current	8 mA (24 VDC)
		Isolation format	Photo-coupler isolation

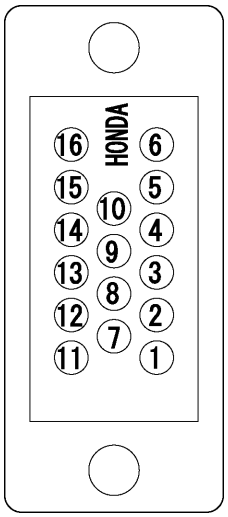
●Input circuit



3-4 Connector Pin Arrangement

Pin No.	Signal name
1	Current position value input 1
2	Current position value input 2
3	Current position value input 4
4	Current position value input 8
5	Current position value input 10
6	Current position value input 20
7	Current position value input 40
8	Current position value input 80
9	Current position value input 100
10	Current position value input 200
11	———————————
12	———————————
13	———————————
14	———————————
15	Timing pulse input *
16	0V input common

Connector model: MR-16LM
(Honda Tsushin)



This drawing shows the arrangement of pins as viewed from the soldered terminals on the rear side of the connector.

*: If the timing pulse input were not connected, the numeric display area would be not switched from the current position value to rotation speed. If the timing pulse input were not connected, the “rotation speed display (No. 5)” of function selection switch would be same state as when turning OFF.
For more details regarding the function selection switch, refer to “8-1. External Display Unit Setting”.

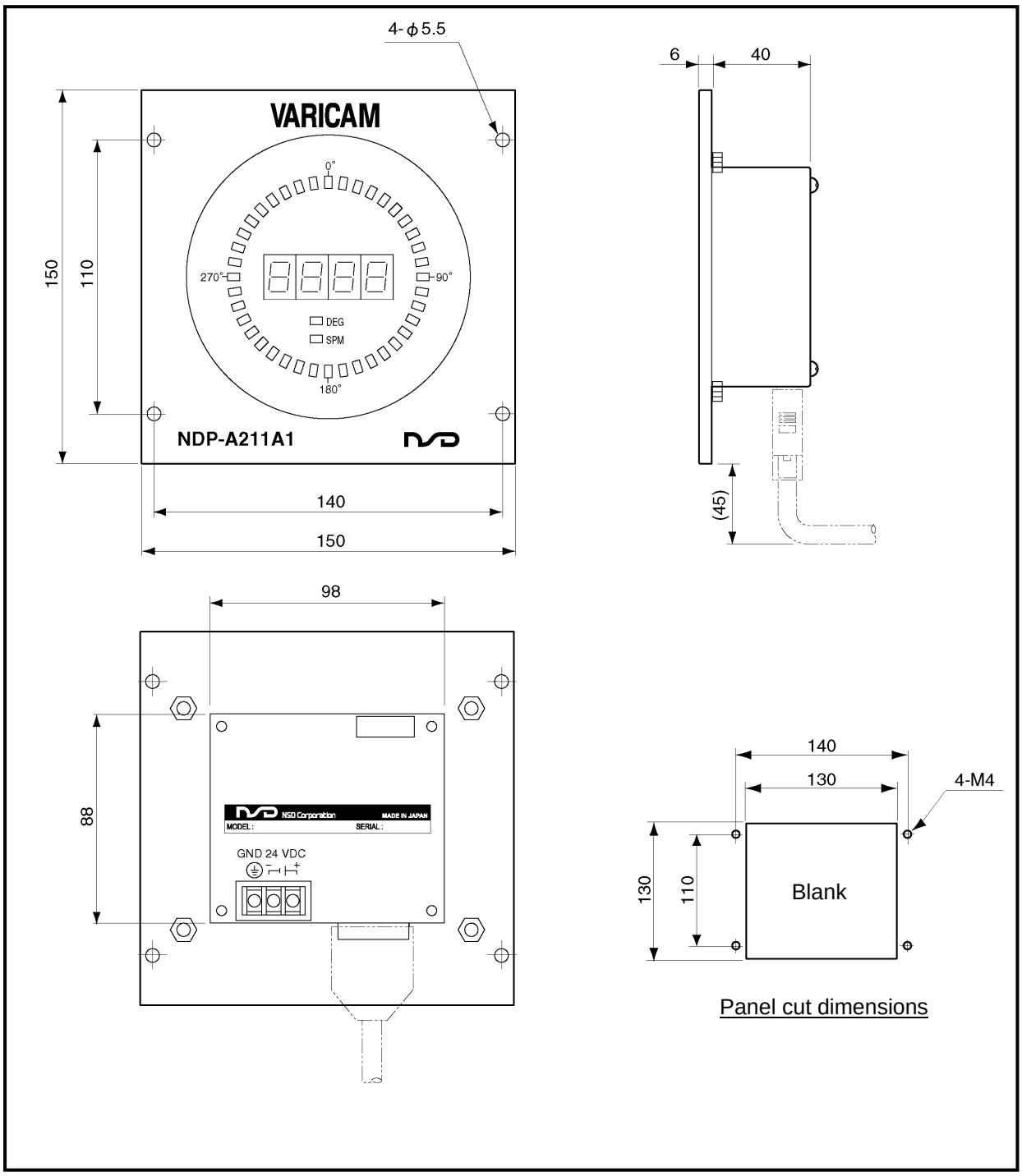
Note Unused pins should not connect anything.

4. DIMENTIONS

4-1. External Display Unit

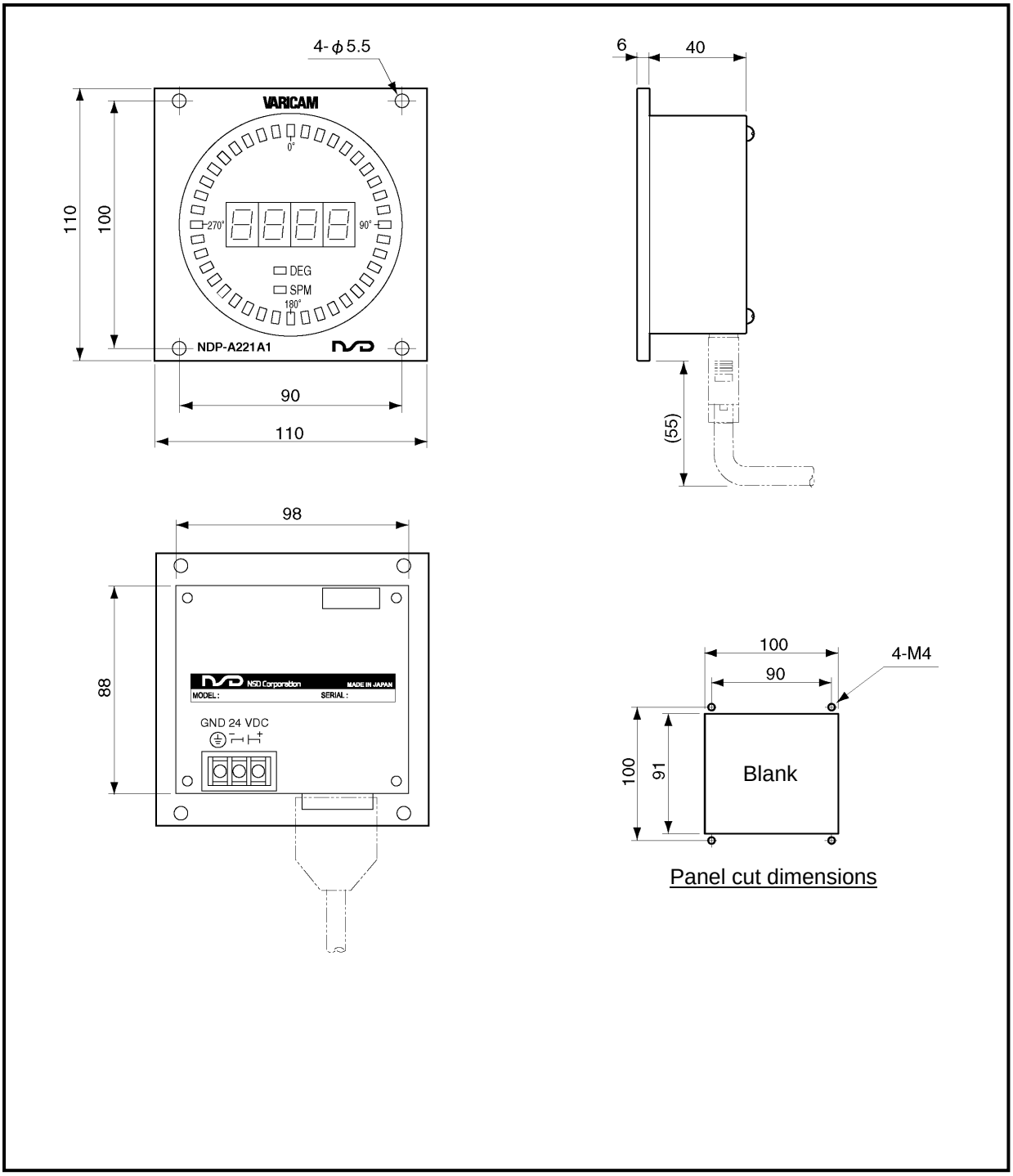
●NDP-A211A1

Units: mm



●NDP-A221A1

Units: mm

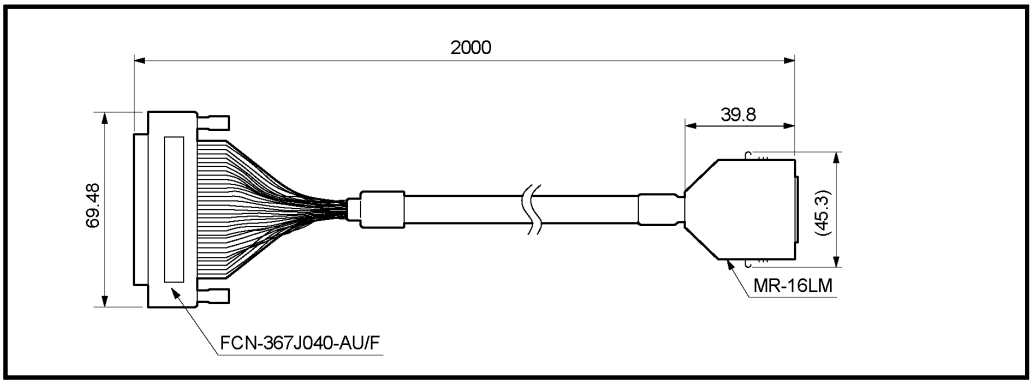


Panel cut dimensions

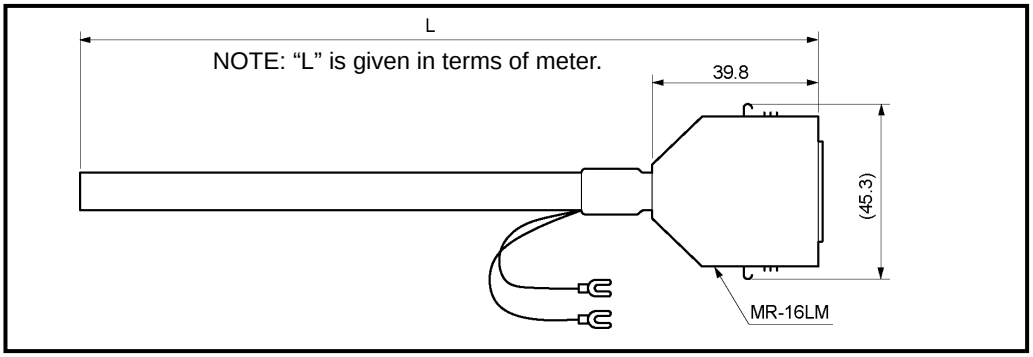
4-2. External Cable

Units: mm

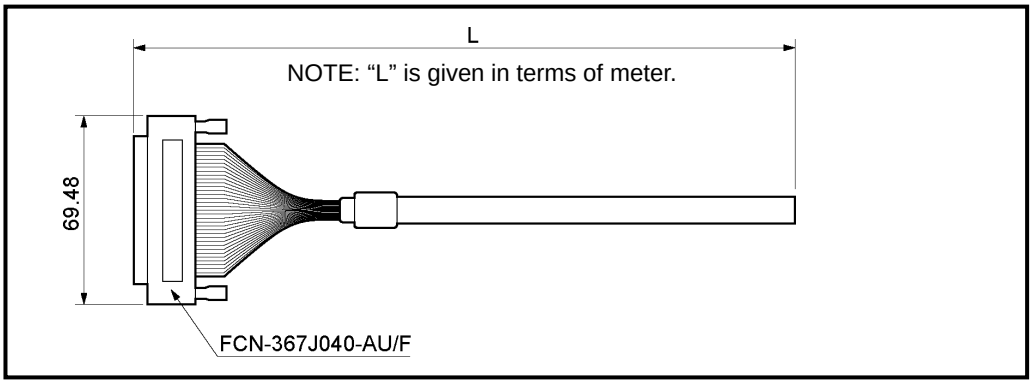
● VS-C05-Z01-2



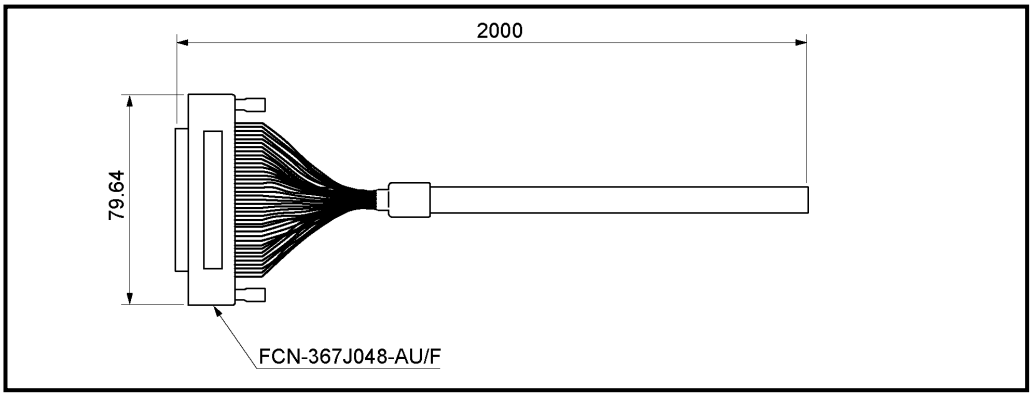
● VS-C05-Z02-[L]



● VS-C05-[L]



● VS-C06-2



5. PRECAUTION FOR INSTALLATION

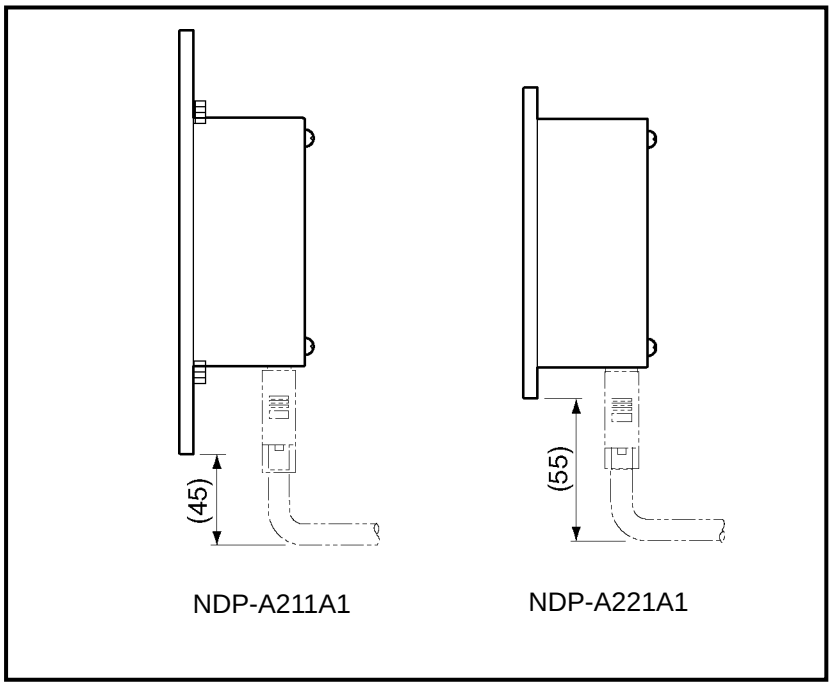
When installing the external display unit, the following conditions and precautions should be observed.

(1) Installation Site

①Avoid sites where the unit is exposed to direct sunlight.
②The ambient temperature should be kept within a 0 to 55℃ range.
③The ambient humidity should be kept within 20 to 90 % RH range.
④Do not install the unit in areas where condensation is likely to occur
(high humidity with extreme temperature changes).
⑤Avoid sites where dust is excessive.
⑥Do not install in areas with an excessive amount of salt and/or metal chips.
⑦Do not install in areas where flammable and/or corrosive gases are present.
⑧The site should be away from splashing water, oil, or chemicals.
⑨Avoid areas where vibration and shocks are excessive.

(2) Installation Precautions

①Installation securely in position with a total of four M4 bolts.
②In order to improve noise resistance, install as far as possible from high voltage and power cables.
③Take a space for plugging in or out the connector.
NDP-A211A1 should take a space over than 45mm.
NDP-A221A1 should take a space over than 55mm.

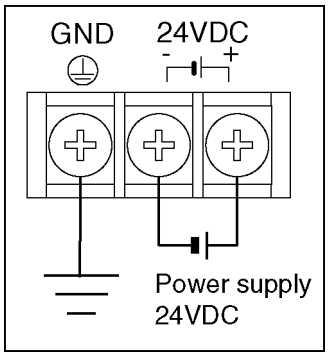


6. POWER SUPPLY CONNECTION

Describes about the power supply connection.

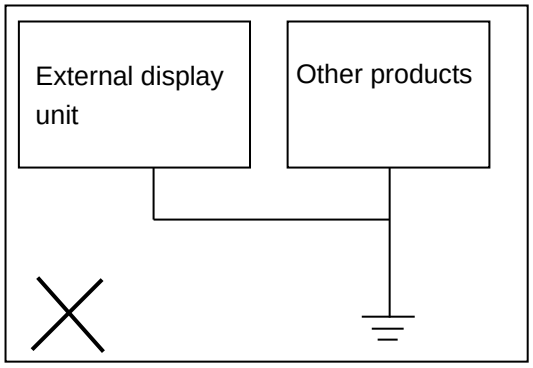
(1) Power supply

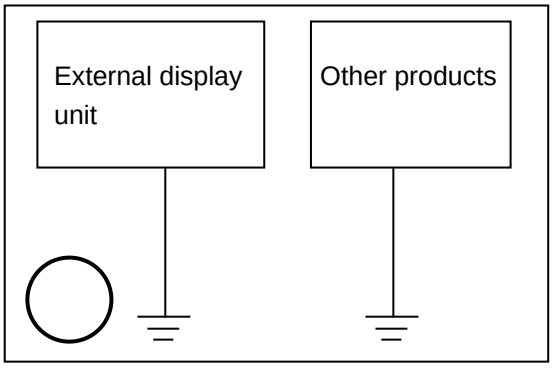
- The power line's nominal cross-sectional area should be 1.25 mm^2 (AWG16) or more.
- Twist the power cable for preventing noises.
- For crimp type terminal, use the M3 size.
- The terminal block tightening torque is 0.6N･m (5.1Lb･In).



(2) Ground

- Be sure the unit is securely grounded in order to prevent electrical shocks. (The ground resistance should be 100 ohm or less.)
- The ground wire's nominal cross-sectional area should be 2 mm^2 (AWG14) or more.
- The ground wire should be connected to the ground terminal as shown below.



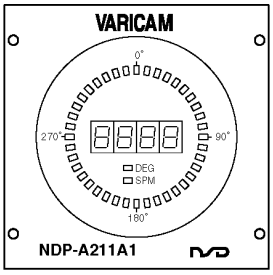


7. CONNECTION WITH VARICAM

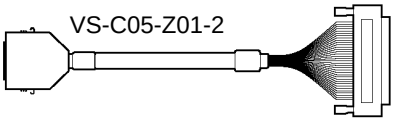
7-1. VS-5F / VS-5E Series

7-1-1. In the Case of Using VS-C05-Z01

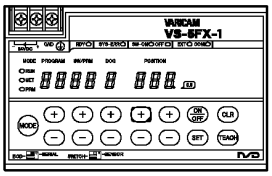
External display unit
NDP-A211A1
NDP-A221A1



Cable for external display unit
VS-C05-Z01-2



VARICAM
VS-5F Series
VS-5E Series



External display unit
input connector

Signal Name	Pin No.
Current position value input 1	1
Current position value input 2	2
Current position value input 4	3
Current position value input 8	4
Current position value input 10	5
Current position value input 20	6
Current position value input 40	7
Current position value input 80	8
Current position value input 100	9
Current position value input 200	10
Timing pulse input	15
0V input common	16

Yellow (Red ■■■■)
White (Red ■■■■)
Gray (Red ■■■■)
Orange (Red ■■■■)
Pink (Red ■■■)
Yellow (Red ■■■)
White (Red ■■■)
Gray (Red ■■■)
Orange (Red ■■■)
Pink (Red ■■)
Orange (Black ■■■)
Orange (Red ■)

VARICAM
BCD OUTPUT connector

Pin No.	Signal Name
19A	Current position value output 1
18A	Current position value output 2
17A	Current position value output 4
16A	Current position value output 8
15A	Current position value output 10
14A	Current position value output 20
13A	Current position value output 40
12A	Current position value output 80
11A	Current position value output 100
10A	Current position value output 200
11B	Timing pulse output
1A	0V output common

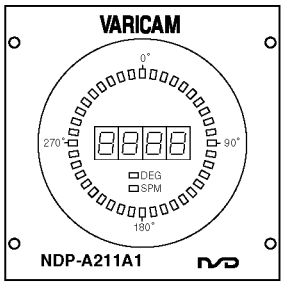
Power terminal block

0V	
24V	

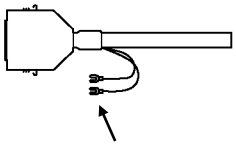
Power supply (+24V)
Power supply (0V)
Connects wires by customer
External power supply

7-1-2. In the Case of Using VS-C05-Z02

External display unit
NDP-A211A1
NDP-A221A1

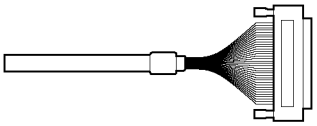


Cable for external display unit
VS-C05-Z02-[L]

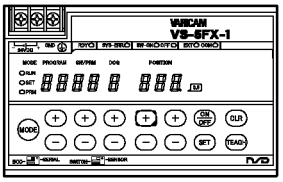


Connects to power terminal block of the external display unit

I/O cable
VS-C05-[L]



VARICAM
VS-5F Series
VS-5E Series



Connects wires by customer

External display unit input connector

Signal name	Pin No.
Current position value input 1	1
Current position value input 2	2
Current position value input 4	3
Current position value input 8	4
Current position value input 10	5
Current position value input 20	6
Current position value input 40	7
Current position value input 80	8
Current position value input 100	9
Current position value input 200	10
Timing pulse input	15
0V input common	16

Power terminal block

0V	
24V	

White (Black ■) — Yellow (Red ■■■■)
White (Black ■■) — White (Red ■■■■)
White (Black ■■■) — Gray (Red ■■■■)
White (Black ■■■■) — Orange (Red ■■■■)
White (Black ■■■■■) — Pink (Red ■■■)
White (Red ■) — Yellow (Red ■■■)
White (Red ■■) — White (Red ■■■)
White (Red ■■■) — Gray (Red ■■■)
White (Red ■■■■) — Orange (Red ■■■)
White (Red ■■■■■) — Pink (Red ■■)
Blue (Black ■■■■■) — Orange (Black ■■■)
Blue (Red ■) — Gray (Red ■)
Blue (Black ■■■) — Orange (Red ■)
Blue (Black ■■■■)
Blue (Black ■)
Blue (Black ■■)

Shield

Power supply (+24V)

Power supply (0V)

VARICAM BCD OUTPUT connector

Pin No.	Signal name
19A	Current position value output 1
18A	Current position value output 2
17A	Current position value output 4
16A	Current position value output 8
15A	Current position value output 10
14A	Current position value output 20
13A	Current position value output 40
12A	Current position value output 80
11A	Current position value output 100
10A	Current position value output 200
11B	Timing pulse output
2A	0V output common
1A	0V output common

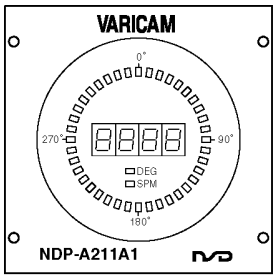
VS-C05-Z02-[L]

External power supply

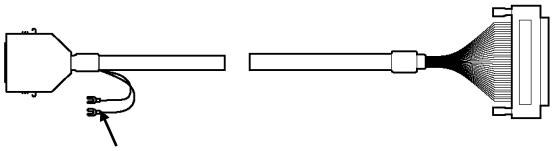
VS-C05-[L]

7-2. VS-6E Series

External display unit
NDP-A211A1
NDP-A221A1



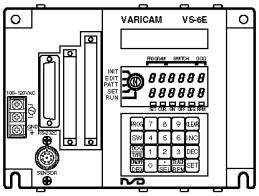
Cable for external display unit
VS-C05-Z02-[L]



Connects to power terminal block of the external display unit

I/O cable
VS-C06-2

VARICAM
VS-6E Series



External display unit input connector

Signal name	Pin No.
Current position value input 1	1
Current position value input 2	2
Current position value input 4	3
Current position value input 8	4
Current position value input 10	5
Current position value input 20	6
Current position value input 40	7
Current position value input 80	8
Current position value input 100	9
Current position value input 200	10
Timing pulse input	15
0V input common	16

Power terminal block

0V	
24V	

Connects wires by customer

White (Black ■)
White (Black ■■)
White (Black ■■■)
White (Black ■■■■)
White (Black ■■■■■)
White (Red ■)
White (Red ■■)
White (Red ■■■)
White (Red ■■■■)
White (Red ■■■■■)
Blue (Black ■■■■■)
Blue (Red ■)
Blue (Black ■■■)
Blue (Black ■■■■)
Blue (Black ■)
Blue (Black ■■)

Orange (Red ■■■■)
Orange (Black ■■■■)
Gray (Red ■■■■)
Gray (Black ■■■■)
White (Red ■■■■)
White (Black ■■■■)
Yellow (Red ■■■■)
Yellow (Black ■■■■)
Pink (Red ■■■■)
Pink (Black ■■■■)
Orange (Red ■■■■■)
White (Red ■■■■■)
Yellow (Red ■■■■■)
White (Black ■■■■■)
Yellow (Black ■■■■■)

Shield

Power supply (+24V)

Power supply (0V)

VARICAM IN/OUT connector

Pin No.	Signal name
16A	Current position value output D4
16B	Current position value output D5
17A	Current position value output D6
17B	Current position value output D7
18A	Current position value output D8
18B	Current position value output D9
19A	Current position value output D10
19B	Current position value output D11
20A	Current position value output D12
20B	Current position value output D13
21A	Timing pulse output
23A	Z24(0V)
24A	Z24 (0V)
23B	P24 (+24V)
24B	P24 (+24V)

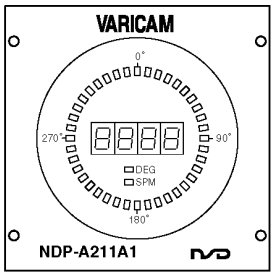
VS-C05-Z02-[L]

VS-C06-2

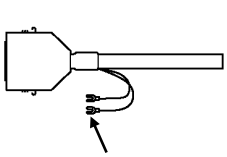
External power supply

7-3. VS-7 Series

External display unit
NDP-A211A1
NDP-A221A1

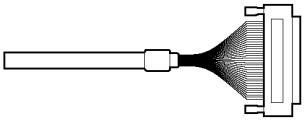


Cable for external display unit
VS-C05-Z02-[L]

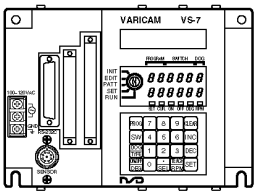


Connects to power terminal block of the external display unit

I/O cable
VS-C06-2



VARICAM
VS-7 Series



External display unit input connector

Signal name	Pin No.
Current position value input 1	1
Current position value input 2	2
Current position value input 4	3
Current position value input 8	4
Current position value input 10	5
Current position value input 20	6
Current position value input 40	7
Current position value input 80	8
Current position value input 100	9
Current position value input 200	10
Timing pulse input	15
0V input common	16

Power terminal block

0V	
24V	

Connects wires by customer

White (Black ■)	Orange (Red ■■■■)
White (Black ■■)	Orange (Black ■■■■)
White (Black ■■■)	Gray (Red ■■■■)
White (Black ■■■■)	Gray (Black ■■■■)
White (Black ■■■■■)	White (Red ■■■■)
White (Red ■)	White (Black ■■■■)
White (Red ■■)	Yellow (Red ■■■■)
White (Red ■■■)	Yellow (Black ■■■■)
White (Red ■■■■)	Pink (Red ■■■■)
White (Red ■■■■■)	Pink (Black ■■■■)
Blue (Black ■■■■■)	Orange (Red ■■■■■)
Blue (Red ■)	White (Red ■■■■■)
Blue (Black ■■■)	Yellow (Red ■■■■■)
Blue (Black ■■■■)	
Blue (Black ■)	White (Black ■■■■■)
Blue (Black ■■)	Yellow (Black ■■■■■)

Shield

Power supply (+24V)

Power supply (0V)

VARICAM IN/OUT connector

Pin No.	Signal name
16A	Current position value output D8
16B	Current position value output D9
17A	Current position value output D10
17B	Current position value output D11
18A	Current position value output D12
18B	Current position value output D13
19A	Current position value output D14
19B	Current position value output D15
20A	Current position value output D16
20B	Current position value output D17
21A	Timing pulse output
23A	Z24 (0V)
24A	Z24 (0V)
23B	P24(+24V)
24B	Pd24(+24V)

VS-C05-Z02-[L]

VS-C06-2

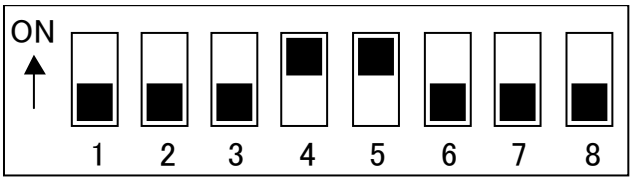
External power supply

8. SETTING METHOD

8-1. External Display Unit Settings

Describes the function selection switch in this section.

The power supply of the external display unit must restart in order to enable accepting the switch's changing contents.



Factory setting

(No. 1, 2)
Fixed at OFF

(No. 7, 8)
Fixed at OFF

(No.6) Threshold value on the rotation speed display

Displays the current position value on the numeric value display area when machine stops; however, the display is switched to rotation speed when the speed exceeds the setting value that is designated.

ON: Switches to rotation speed display when the speed exceeds more than 20spm.

OFF: Switches to rotation speed display when the speed exceeds more than 10spm.

(No. 5) Rotation speed display

Switches the current position to rotation speed value on the numeric value display area.

ON: Switches to the rotation speed display.

OFF: Not switch to the rotation speed display.

*: If the timing pulse input of the input connector is disconnected, it would be same states as when switch is turned OFF.

(No.4) Animation display on the roulette

Switches to the animation on the roulette display.

ON: Switches to the animation display when the speed exceeds more than 250spm.

OFF: Invalidates the animation display.

(No.3) Input logic selection

Sets the same output logic which is designated to VARICAM.

VS-5F/VS-5E Series: Sets the same logic as the parameter (initial) No. 78.

VS-6E/VS-7 Series: Sets the same logic as the initial No. 44.

ON: negative logic

OFF: positive logic

Note

1: Sets the same logic as VARICAM. If the logic were different, it would not display correctly.

2: If negative logic is designated, the no-connection display function of the input connector (displays "----") will not operate.

8-2. VARICAM Setting

VARICAM should be set as below lists when using the external display unit.

● VS-5F Series setting list

Models	Connecting connector	Parameter setting		
		Parameter No.	Setting value	Name
VS-5FD VS-5FX VS-5FD-1 VS-5FX-1	BCD OUTPUT	04	0 (Current position value BCD)	BCD output contents
		93	2 (60 pulses)	Timing pulse
		78 *1	0 (positive logic) or 1 (negative logic)	BCD output logic
		91	0 (0.352ms)	Latch pulse cycle
VS-5FXG-1	BCD OUTPUT	04	0 (Current position value BCD)	BCD output contents
		93	2 (60 pulses)	Timing pulse
		78 *1	0 (positive logic) or 1 (negative logic)	BCD output logic
		91	0 (4ms)	Latch pulse cycle

*1: Set the same contents as the input logic selection (No.3) of the external display unit.

● VS-5E Series setting list

Models	Connecting connector	Initial setting		
		Initial No.	Setting value	Name
VS-5ED VS-5EX VS-5ED-1 VS-5EX-1	BCD OUTPUT	04 *1	0 (Current position value BCD)	Display output content
		93	2 (60 pulses)	Timing pulse
		78 *2	0 (positive logic) or 1 (negative logic)	Display output logic
		91	0 (0.352ms)	Latch pulse cycle
VS-5EXR-1 VS-5EXG-1	BCD OUTPUT	04	0 (Current position value BCD)	Display output content
		93	2 (60 pulses)	Timing pulse
		78 *2	0 (positive logic) or 1 (negative logic)	Display output logic
		91	0 (4ms)	Latch pulse cycle

*1: The setting of initial “04” is not available in VS-5ED and VS-5ED-1.

*2: Set the same contents as the input logic selection (No.3) of the external display unit.

●VS-6E Series setting list

Models	Connecting connector	Initial setting		
		Name	Setting value	Name
VS-6E VS-6E-EX VS-6E-S1 VS-6E-EX-S1	IN/OUT Control I/O connector	41	0 (BCD)	Output code selection
		42	1 (4ms)	Data update format select
		43	1 (Timing pulse)	Pulse change
		44 *1	1 (positive logic) or 0 (negative logic)	Output logic

*1: Set the same contents as the input logic selection (No.3) of the external display unit.

●VS-7 Series setting list

Model	Connecting connector	Initial setting		
		Initial No.	Setting value	Name
VS-7 VS-7-EX	IN/OUT Control I/O connector	41	0 (BCD)	Output code selection
		42	1 (4ms)	Current position output time
		43	1 (Timing pulse)	Pulse change
		44 *1	1 (positive logic) or 0 (negative logic)	Output logic
		50 *2		Number of advanced angle

*1: Set the same contents as the input logic selection (No.3) of the external display unit.

*2: The maximum rotation speed which is able to display is changed depending on the setting value. For more details regarding to relations between setting value and speed, refer to below list.

Setting value	Maximum rotation speed that can be displayed [spm]	
	VS-7	VS-7-EX
0 (no advanced angle)	4500	4500
1 (4-switch)	4500	2200
2 (16-switch)	2200	2200
3 (32-switch)	1000	1000
4 (64-switch)	-	700
5 (128-switch)	-	500

9. MAINTENANCE AND INSPECTIONS

9-1. Inspection

The inspection should be conducted once every 6 months to a year.
Inspected items that do not satisfy the criteria shown below should be repaired.

Inspection item	Inspection description	Criteria	Remark
Power supply	Measure the voltage fluctuation at the power supply terminal block to determine if it is within the prescribed range.	Power supply voltage fluctuation must be within 21.6V to 30VDC range	Tester
Ambient conditions	Check the ambient temperature.	0 to +55°C	Thermometer
	There should be no accumulation of dust.	None	
Mount conditions	Verify that the I/O connector is plugged in all the way.	There should be no looseness.	

9-2. Troubleshooting

The causes and corrective actions for errors that may occur during NDP Series operation are described below.

Error item	Cause	Countermeasure
The numeric display area "----"	The wiring for the current position input has a problem. Or the wiring is severed.	Repair the wiring.
The current position value is not displayed.	The voltage of power supply is out of prescribed range.	Supply the correct power voltage. 21.6V to 30VDC
	The setting of function selection switch is improper.	Set correctly.
	The external display unit malfunctions.	Replace to new external display unit.
The rotation speed is not displayed.	The wiring for timing pulse is improper.	Repair the wiring.
	The parameter (initial) setting of VARICAM is improper.	Set the correct value.
	The setting of function selection switch is improper.	Set correctly.
	The external display unit malfunctions.	Replace to new external display unit.
The incorrect value of the rotation speed is displayed.	The wiring for the current position input has a problem. Or the wiring is severed.	Repair the wiring.
	The parameter (initial) setting of VARICAM is improper.	Set the correct value.
	The external display unit malfunctions.	Replace to new external display unit.
The current position value is not same as VARICAM one.	The wiring for the current position input has a problem. Or the wiring is severed.	Repair the wiring.
	The parameter (initial) setting of VARICAM is improper.	Set the correct value.
	The function selection switch is improper.	Set correctly.
	The external display unit malfunctions.	Replace to new external display unit.
The current position value does not change.	The "HOLD" input signal of VARICAM is turning ON.	Turn off the "HOLD" input.

APPENDIX 1: THE REPLACEMENT FROM EXISTING MODELS TO NEW NDP SERIES

If users who are using existing VS-D5 or NDP Series and plan to replace with new NDP Series, please select the model in the following corresponding chart.

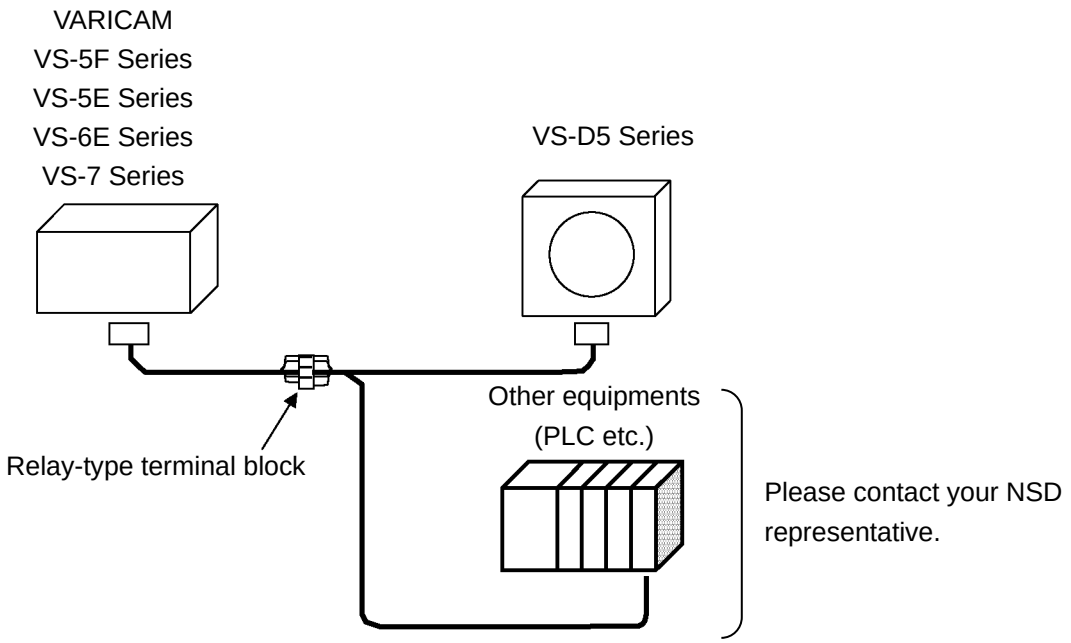
Existing model		New NDP Series model
VS-D5 Series model	Former NDP Series model	
VS-D5	NPD-A210A1	NDP-A211A1
VS-D5-S1	NDP-A210A1-S1	
VS-D5-S2	NDP-A210A1-S2	
VS-D5-T	NDP-A220A1-S2	NDP-A221A1
VS-D5-T-S1	NDP-A220A1-S1	
VS-D5-T-2	NDP-A220A1-S1	
---	NDP-A220A1	

Note

1: If your model currently in use is not on the list, please contact your NSD representative.

2: If other equipments were connected to the wire that connected to VS-D5 Series from VARICAM, please contact your NSD representative. The connection example is shown figure1 below.

Figure1 Connection example between VARICAM and VS-D5



APPENDIX 2. CE MARKING

This product conforms to the EMC Directive.

APPENDIX 2-1. EMC Directives

It is necessary to do CE marking in the customer's responsibility in the state of a final product.
Confirm EMC compliance of the machine and the entire device by customer because EMC changes configuration of the control panel, wiring, and layout.

APPENDIX 2-2. EMC Directive and Standards

EMC consists of emission and immunity items.
It conforms to Table (see below) of EMC standards and Testing.

Class	Standard No.	Standard Name
Emission (EMI)	EN61000-6-4	Generic standards. Emission standard for industrial environments
Immunity (EMS)	EN61000-6-2	Generic standards. Immunity standard for industrial environments
	EN61000-4-2	Electrostatic Discharge
	EN61000-4-3	Radiated, Radio frequency, Electromagnetic Field
	EN61000-4-4	Electrical Fast Transient / Burst
	EN61000-4-5	Surge Immunity
	EN61000-4-6	Conducted Disturbances, Induced by Radio-Frequency Fields
	EN61000-4-8	Power Frequency Magnetic Field

APPENDIX 2-3. Low Voltage Directive

This product doesn't apply to low-voltage directive for the equipment of 24VDC power supply.

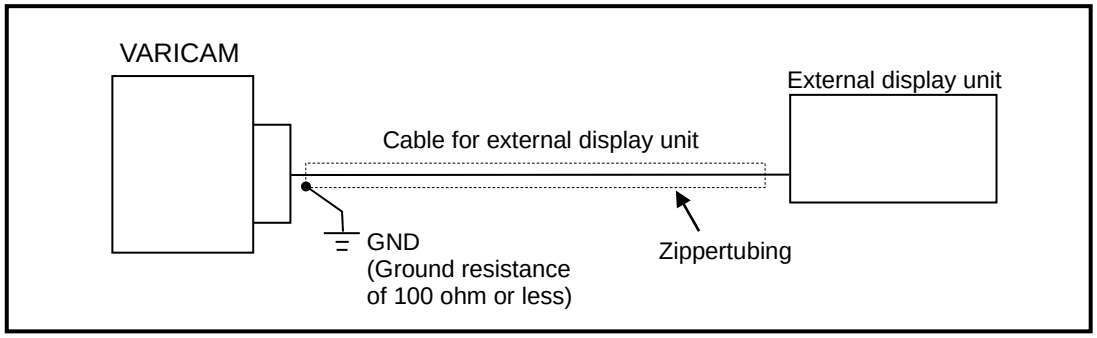
APPENDIX 2-4. Measures for EMC Compliance

Describes measures for EMC compliance when testing the compatibility verification.

●Cable for external display unit
Covered with a shielded zippertubing,and the shield was grounded.

Zippertubing

Model	Manufacturer
MTFS 20ϕ	ZIPPERTUBING (JAPAN), LTD.



NSD Group

Manufacturer
NSD Corporation 3-31-28, OSU, NAKA-KU, NAGOYA, JAPAN 460-8302

Distributor
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