

NACHI

Standard specifications

SC700DL-05-AX20/FD11
SC700DL-07-AX20/FD11

4th edition

NACHI-FUJIKOSHI CORP.

1302, SSCEN-018-004,001

Table of contents

1. Outline.....	1
2. Characteristics	1
3. Basic Specifications	2
4. Robot Dimensions and Working Envelope.....	3
5. Detail of Tool Mounting Face.....	4
6. Installation Space	5
7. Allowable Load	6
8. Application Wiring and Piping.....	7
8.1 Wiring Diagram	7
8.2 Wiring and Piping Detail.....	9
8.3 Connectors.....	10
9. Option Specifications.....	13
10. Delivery style (specification which contains a robot)	13
11. Paint color	13
12. Warranty.....	13

1. Outline

"NACHI ROBOT" has used mechatronic techniques, cultivated throughout the last few decades, to supply robots suited for industries utilizing welding and the material handling techniques.

"SC700DL" is 700Kg payload robot and is suitable for material handling application.

2. Characteristics

1. This robot is suitable for handling of heavy payload such as car body.
2. 3,970mm reach point at maximum and 4,920mm up/down stroke at maximum makes it possible to carry big work piece.
3. High wrist torque opens this robot to more diverse handling application.
4. Software resetting of encoder and replacing encoder itself makes the maintenance work much easier.

3. Basic Specifications

Item		Specifications	
Robot model		SC700DL-05	SC700DL-07 (Note 2)
Construction		Articulated	
Number of axis		6	
Drive system		AC servo motor	
Max. working envelope	Axis 1	±2.79 rad (Note1)	
	Axis 2	+1.48 to -0.79 rad	
	Axis 3	+0.70 to -1.57 rad	
	Axis 4	+1.57 to -0.17 rad	
	Axis 5	±2.18 rad	
	Axis 6	±0.17 rad	
Max. speed	Axis 1	0.79 rad/s	
	Axis 2	0.52 rad/s	
	Axis 3	0.52 rad/s	
	Axis 4	0.52 rad/s	
	Axis 5	0.87 rad/s	
	Axis 6	0.52 rad/s	
Max. pay load	Wrist	700 kg	
Allowable static load torque	Axis 4	13800 N·m	
	Axis 5	3920 N·m	
	Axis 6	2940 N·m	
Allowable moment of inertia	Axis 4	3000 kg·m ²	
	Axis 5	1800 kg·m ²	
	Axis 6	1000 kg·m ²	
Position repeatability		±0.5 mm	
Installation		Floor mounting	
Ambient conditions		Temperature: 0 to 45 °C Humidity: 20 to 85%RH (No dew condensation allowed) Vibration to the installation face: Not more than 0.5G (4.9 m/s ²)	
Robot mass		7000 kg	

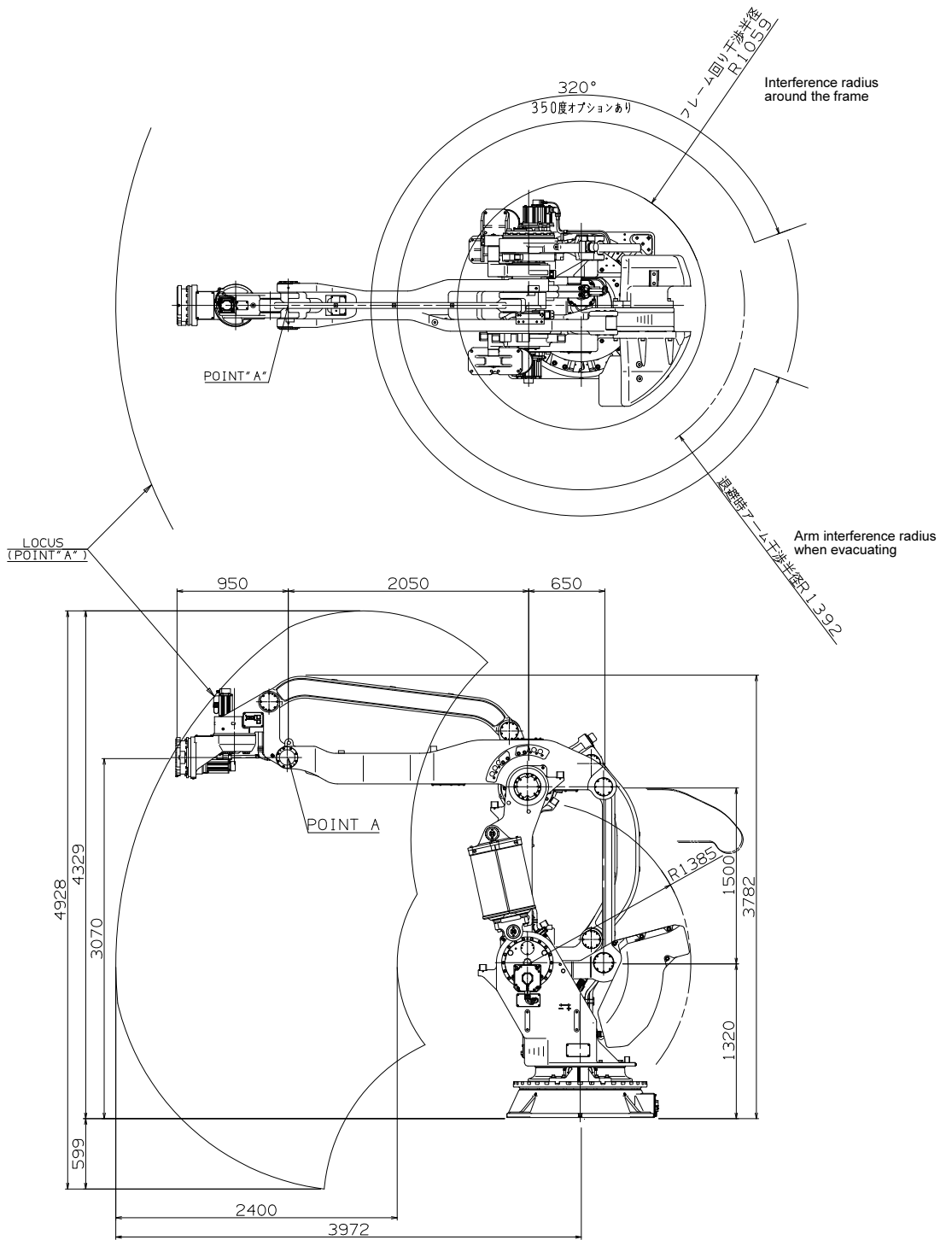
1[rad] = 180/π[°], 1[N·m] = 1/9.8[kgf·m]

On controller display, axis 1 to 6 is displayed as J1 to J6 for each.

(Note 1). It is possible to change within the range of +170° to -150° or +150° to -170° by shifting stopper block. And the above turns to ±175° when mounting a 350° option stopper.

(Note2): Only application wiring specification differs from SC700DL-05 type.

4. Robot Dimensions and Working Envelope



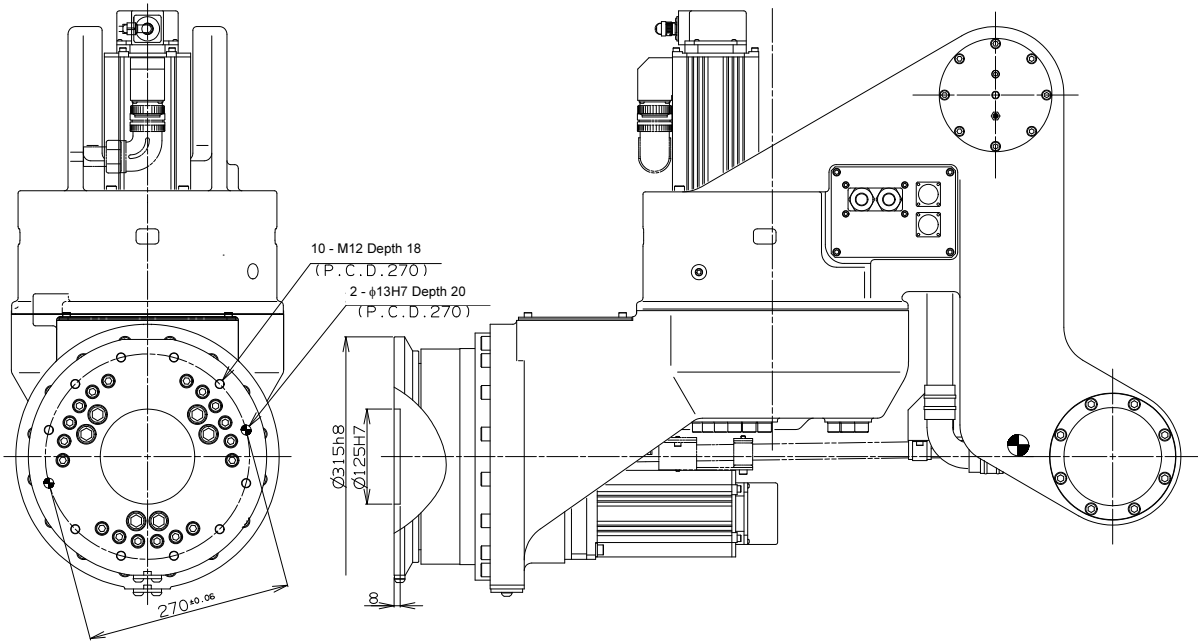
5. Detail of Tool Mounting Face

For the end effector fixing bolts, use the mounting P.C.D. shown in the following figures.




CAUTION

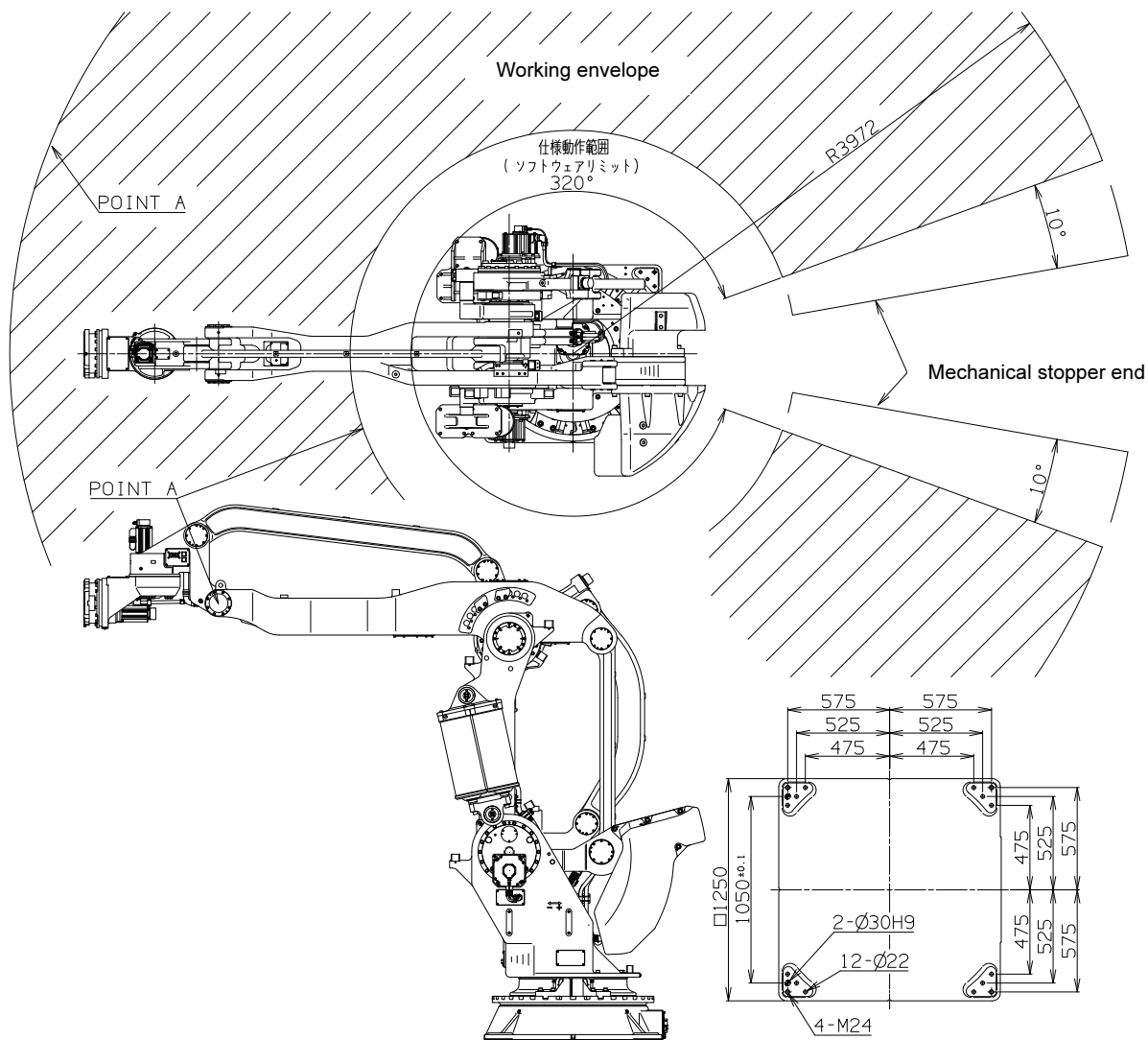
Be sure to screw the M12 tool fixing bolts in the wrist not deeper than the screw depth in the mounting face. Screwing the bolts deeper than the screw depth may damage the wrist.



6. Installation Space

To install the robot, lock the swiveling base of the robot.

 CAUTION	<p>The mechanical stopper end is located in a position exceeding the specified working envelope (software limit) of axis 1 by 10°. To install the safety fence, with consideration given to the wrist configuration and the shape of end effector.</p>
---	--



7. Allowable Load

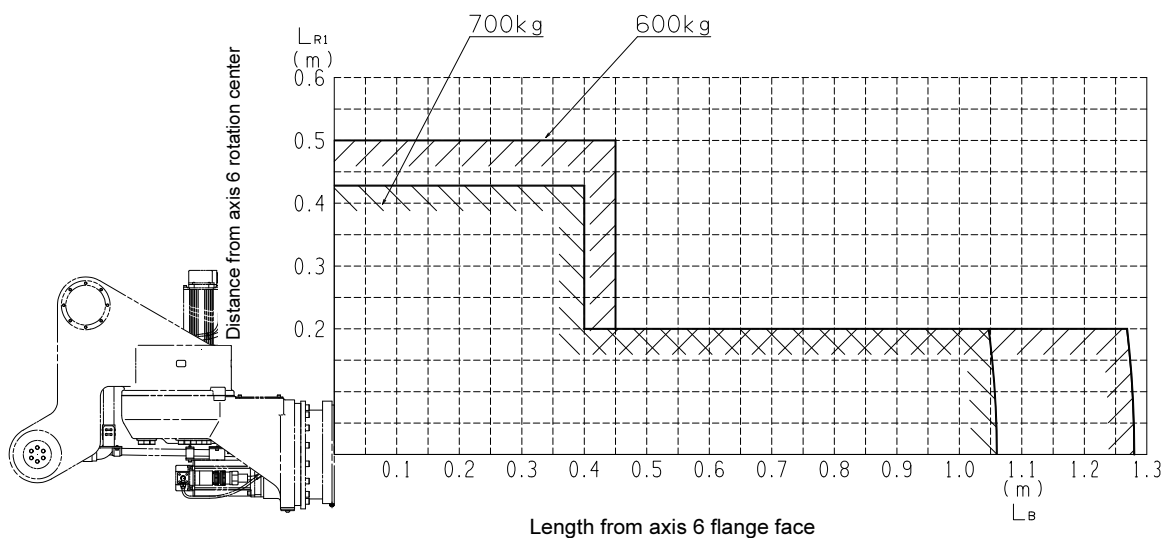


The wrist load is regulated by the allowable pay load mass, allowable static load torque, and allowable moment of inertia. If wrist load exceeds these allowable values, this robot is out of guarantee.

Please refer to "3. Basic Specifications" and following figures for the detail.

Use the robot under condition that COG of wrist load falls in the range shown in the torque map. This figure shows the position range in which the tool COG can be. However, moment of inertia about each axis must be determined and evaluated.

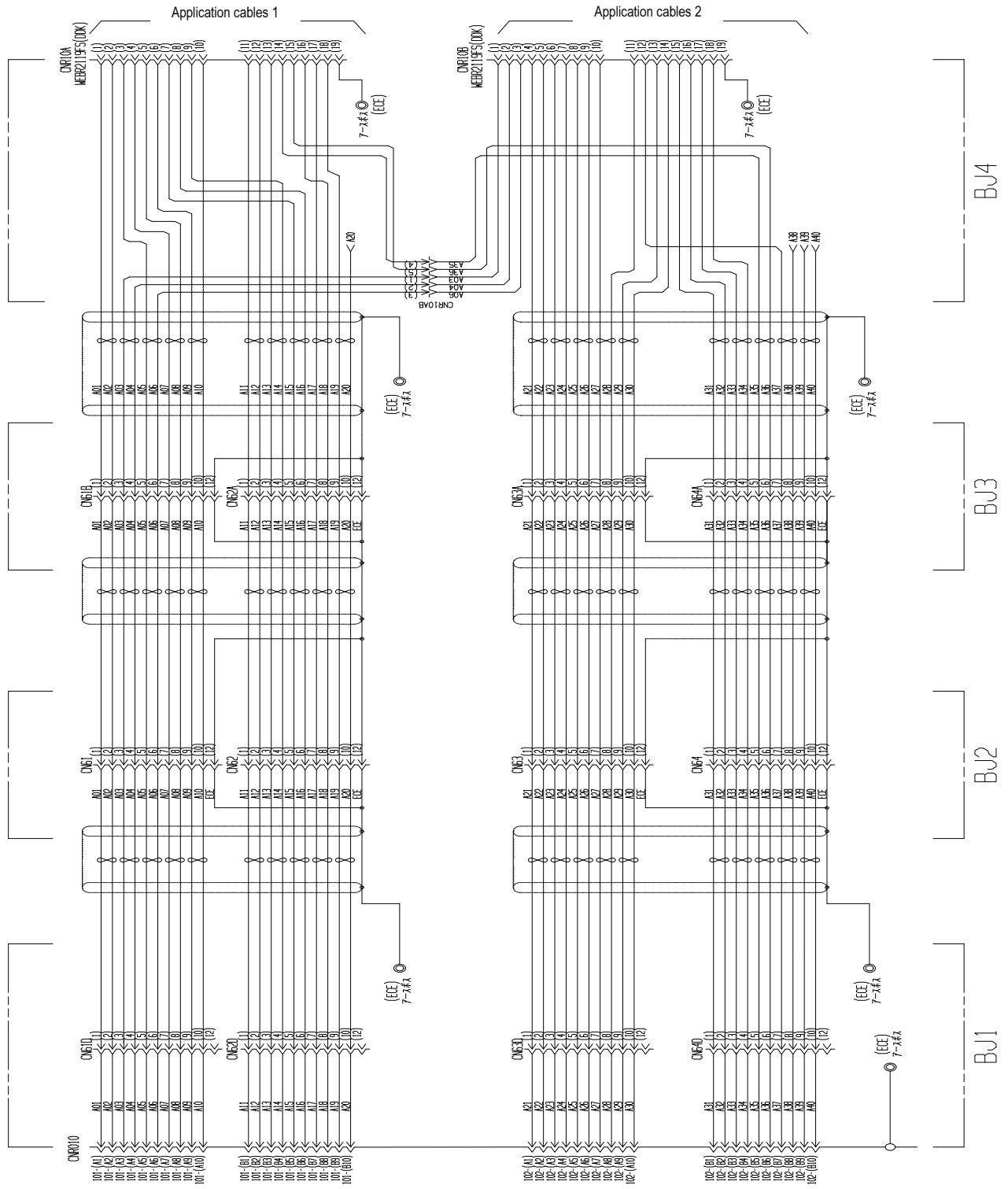
When an attached load mass is smaller than an robot rated load there is a possibility that the moment of inertia may exceed the rated limit even though the COG was within limits.



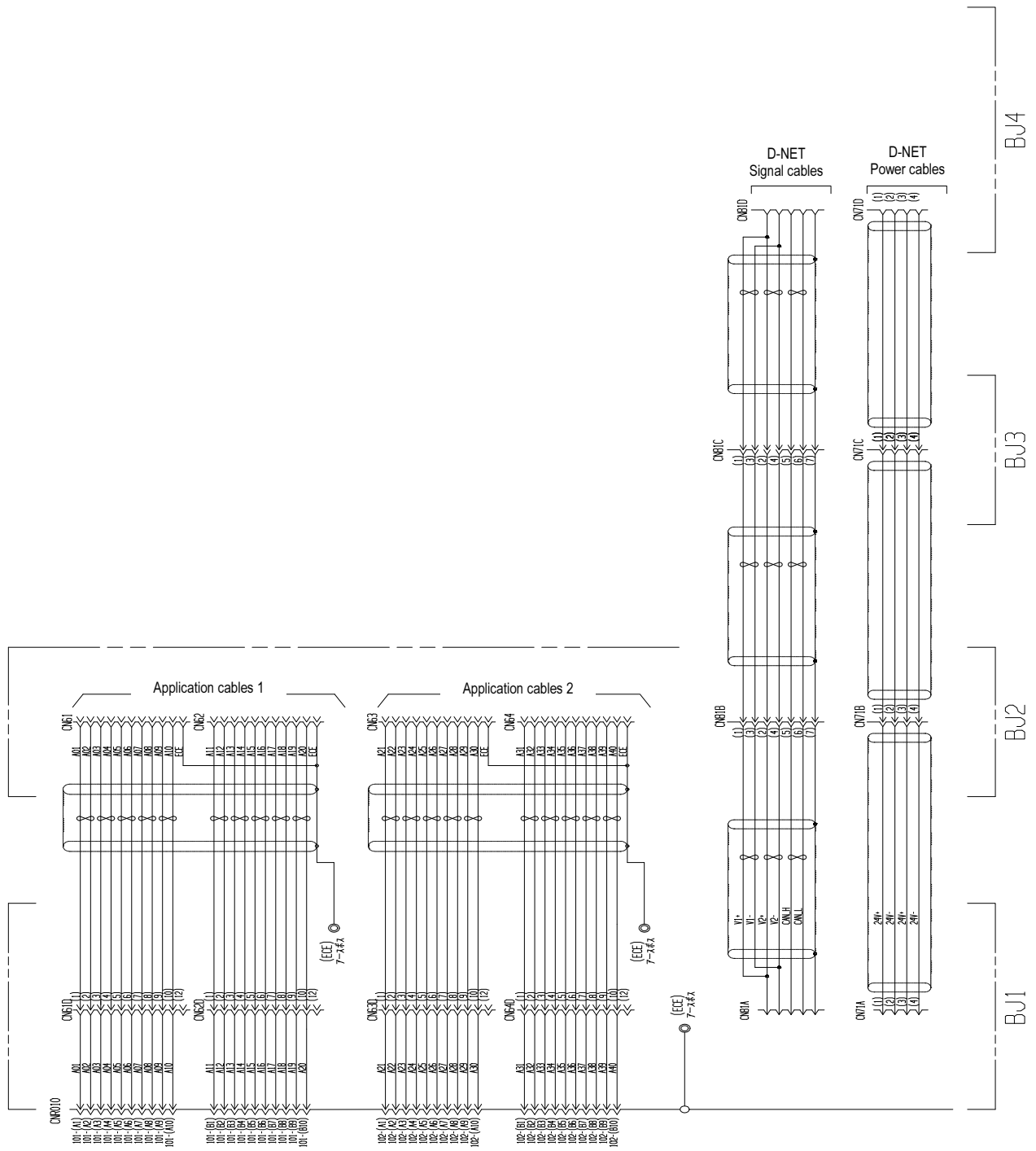
8. Application Wiring and Piping

8.1 Wiring Diagram

[SC700DL-05]

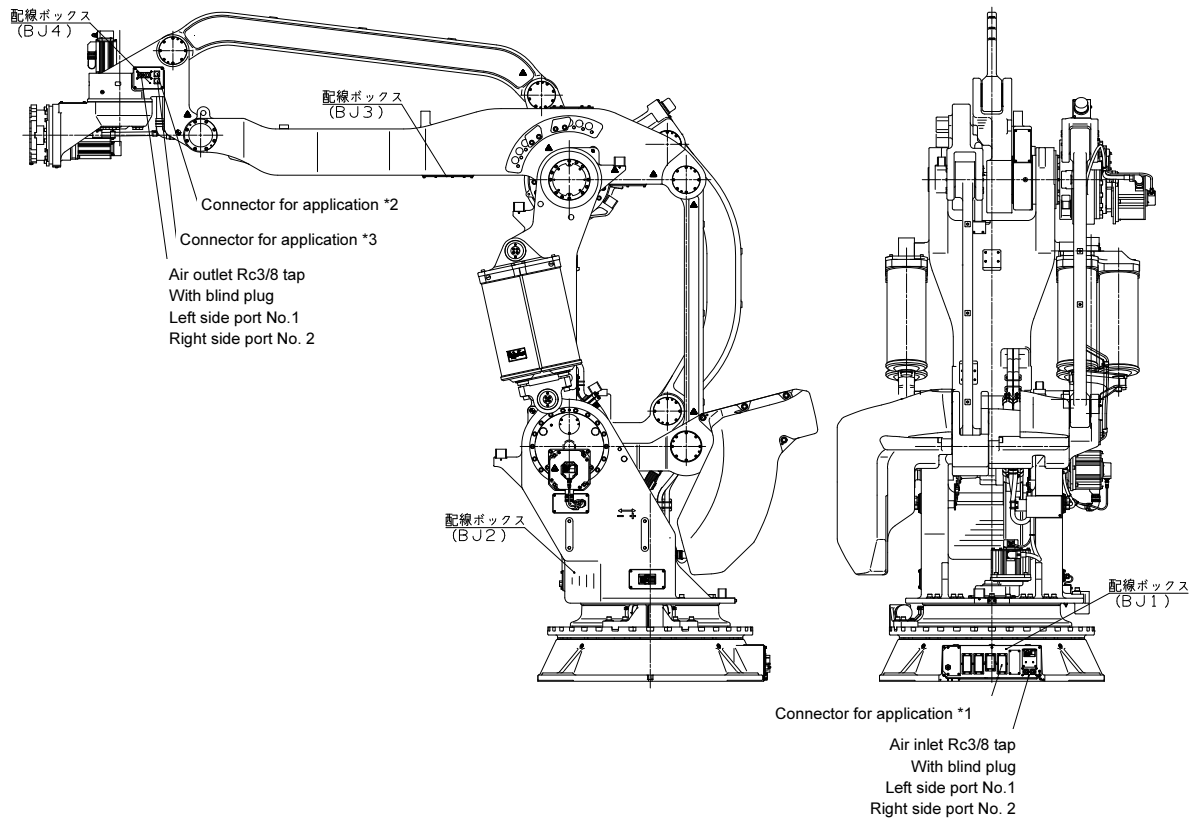


【SC700DL-07】

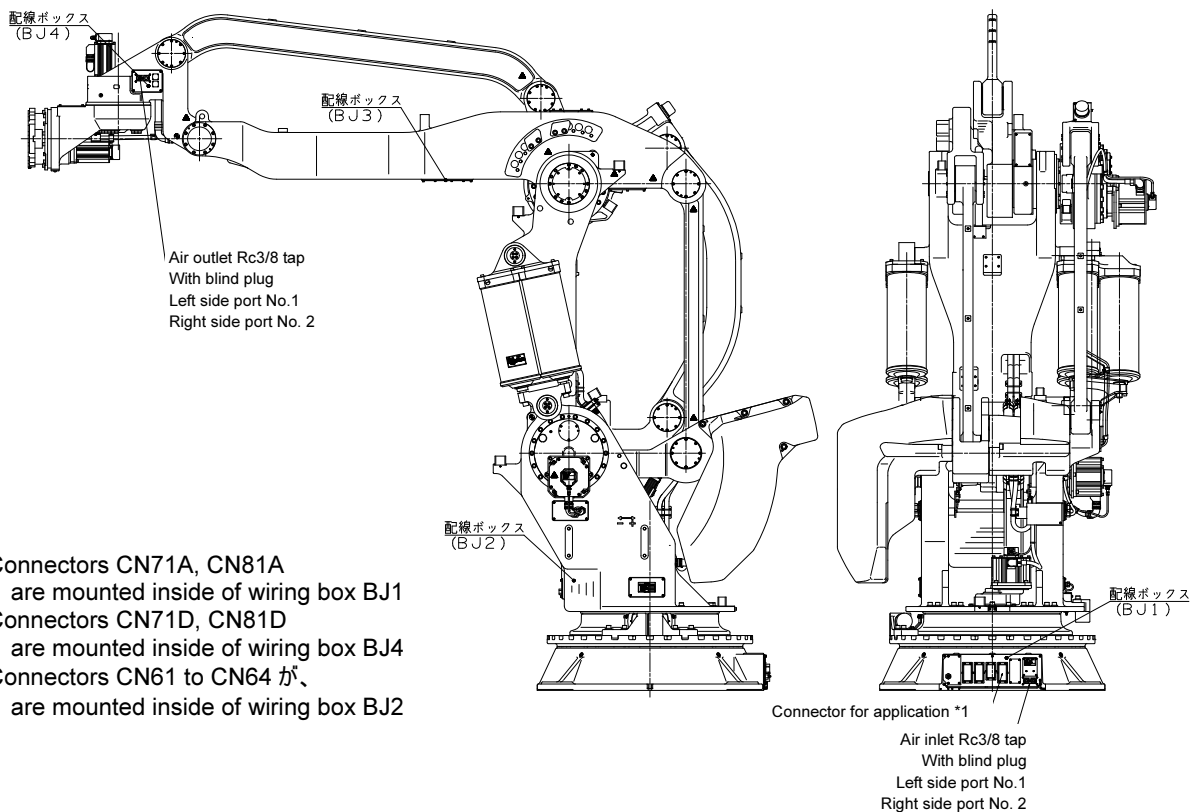


8.2 Wiring and Piping Detail

【SC700DL-05】



【SC700DL-07】

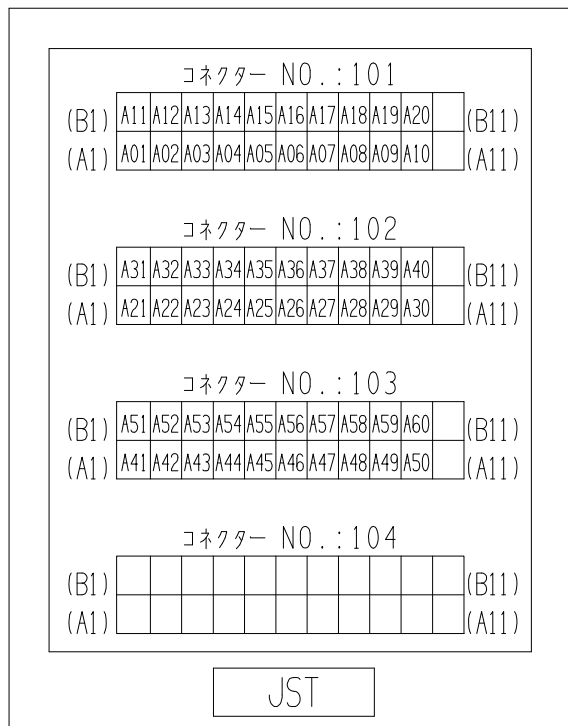


Connectors CN71A, CN81A
are mounted inside of wiring box BJ1
Connectors CN71D, CN81D
are mounted inside of wiring box BJ4
Connectors CN61 to CN64 が、
are mounted inside of wiring box BJ2

8.3 Connectors

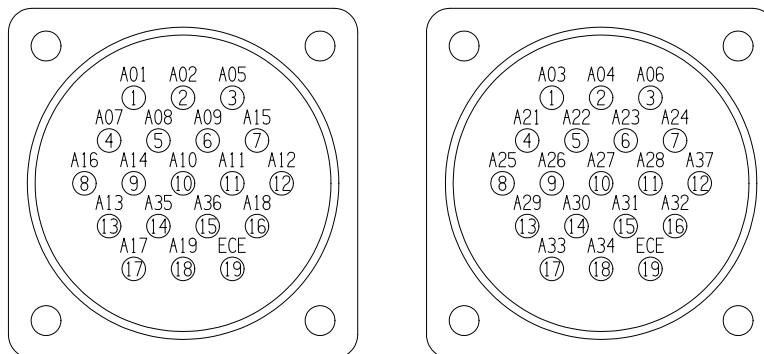
【SC700DL-05】

- Connector *1



- Wire-side shell: JFM-WSA-4-A (JST)
- Guide plate kit A: JFM-GPAK-4 (JST)
- Receptacle housing: JFM2FDN-22V-K (JST)
- Receptacle contact: SJ2F-01GF-P1.0 (JST)
0.20 to 0.50sq
SJ2F-01GF-P1.0 (JST)
0.30 to 0.75sq
- Hand terminal crimper: YRS-8861
- Cable diameter suitable for wire-side shell: $\phi 26.2$ to $\phi 28.0$

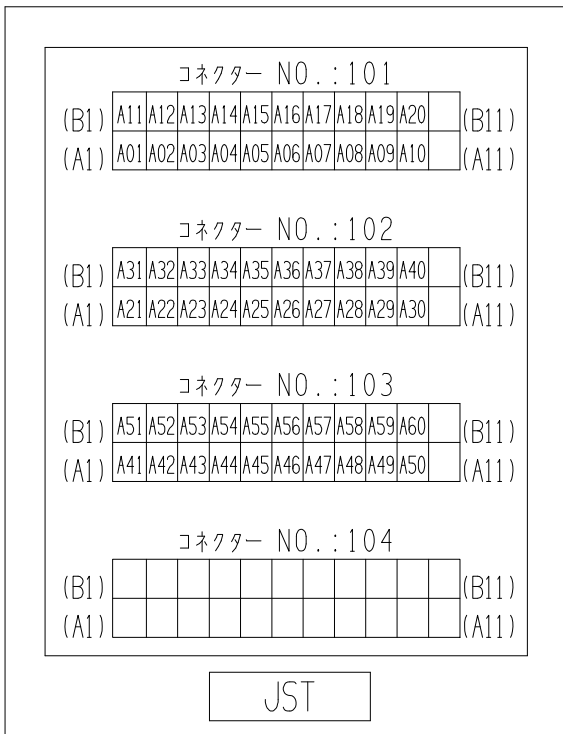
- Connector *2, Connector *3



		Connector *2	Connector *3
Recommended cable		0.3sqx20pcs	0.3sqx20pcs
Connector on the other end	Connector	WEBR2119FS (DDK)	WEBR2119FS (DDK)
	Receptacle	WEBS2119M (DDK)	WEBS2119M (DDK)
	Plug	WEBS2119M (DDK)	WEBS2119M (DDK)
	Contact	Diameter of conductor: Not more than 1.0 mm Cross-section area of conductor: Not more than 0.5 mm ²	Diameter of conductor: Not more than 1.0 mm Cross-section area of conductor: Not more than 0.5 mm ²
End bell			
Cable clamp		Max. allowable cable diameter: $\phi 14$	Max. allowable cable diameter: $\phi 14$

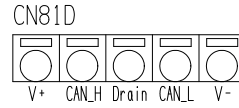
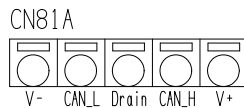
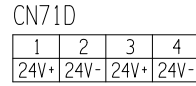
【SC700DL-07】

• Connector *1



Wire-side shell: JFM-WSA-4-A (JST)
 Guide plate kit A: JFM-GPAK-4 (JST)
 Receptacle housing: JFM2FDN-22V-K (JST)
 Receptacle contact: SJ2F-01GF-P1.0 (JST)
 0.20 to 0.50sq
 SJ2F-01GF-P1.0 (JST)
 0.30 to 0.75sq
 Hand terminal crimper: YRS-8861
 Cable diameter suitable for wire-side shell:
 φ26.2 to φ28.0

•CN71A, 71D, 81A, 81D connectors / inside of BJ1 and inside of BJ4



This connector is inside of BJ1 box

This connector is inside of BJ3 box

		CN71A	CN71D
Connector	housing	VLR-04V	VLP-04V
Connector on the other end	housing	VLP-04V	VLR-04V
	Connector	SVF-61T-P2.0 (0.5~2.0 mm ²) SVF-42T-P2.0 (0.3~1.25 mm ²)	SVM-61T-P2.0 (0.5~2.0 mm ²) SVM-42T-P2.0 (0.3~1.25 mm ²)
	Retainer	VLS-02V	
	Contact	YC-590 (SV*-61T-P2.0) YC-592 (SV*-42T-P2.0)	

		CN81A	CN81D
Connector		231-635/010-DM	231-305/037/010-DM
Connector on the other end	Connector	231-305/037/010-DM	231-635/010-DM
	Hand terminal crimper	231-131	
	Contact	CAN_L, CAN_H : 216-301 V-, V+ : 216-201 Drain : 216-201 Hand terminal crimper : 206-204	

(Pin location shows the connector mounted on robot, and the view from the connecting side)
 Note) Please use contact and hand terminal crimper that is suitable for cable.
 (Connector on the other end needs to be prepared by customer.)

【SC700DL-07】

-CN61, 62, 63, 64 connectors / inside of BJ2

CN61

12	11	10	9	8	7	6	5	4	3	2	1
ECE		A10	A09	A08	A07	A06	A05	A04	A03	A02	A01

CN63

12	11	10	9	8	7	6	5	4	3	2	1
ECE		A30	A29	A28	A27	A26	A25	A24	A23	A22	A21

CN62

12	11	10	9	8	7	6	5	4	3	2	1
ECE		A20	A19	A18	A17	A16	A15	A14	A13	A12	A11

CN64

12	11	10	9	8	7	6	5	4	3	2	1
ECE		A40	A39	A38	A37	A36	A35	A34	A33	A32	A31

Connector	housing	SMP-12V-BC
Connector on the other end	housing	SMR-12V-B
	Connector	SYM-001T-P0.6
	Retainer	
	Hand terminal crimper	YC-121R (tooth type B)

(Pin location shows the connector mounted on robot, and the view from the connecting side)

Note) Please use contact and hand terminal crimper that is suitable for cable.
 (Connector on the other end needs to be prepared by customer.)

