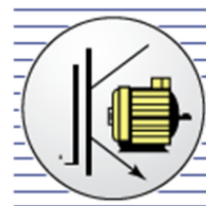




Politechnika Wroclawska



WYDZIAŁ ELEKTRYCZNY

INSTYTUT MASZYN, NAPĘDÓW I POMIARÓW
ELEKTRYCZNYCH

Laboratorium Napędu robotów

Robot typu RH-6FH



1. Charakterystyka robota

Na podstawie tabliczki znamionowej (rys. 1.1) i dokumentacji technicznej robota można określić cechy i przeznaczenie robota (rys. 1.2. i 1.3).

MITSUBISHI		CONTROLLER	
INDUSTRIAL ROBOT		CR750-06HQ1-1-S15	
MODEL RH-6FH5520-Q1-S15			
LOAD CAPACITY	max.	6 kg / 13.2 lb	
MASS		37 kg / 82 lb	
SERIAL		RB311004W	
DATE		2013-11	
MOTOR POWER			
J1	750 W	J4	100 W
J2	400 W		W
J3	200 W		W
MITSUBISHI ELECTRIC CORPORATION			
MADE IN JAPAN			

HEAD OFFICE
 TOKYO BILD...
 2-7-3,
 MARUNOUCHI,
 CHIYODA-KU,
 TOKYO

Rys. 1.1. Tabliczka znamionowa robota RH-6FH

(1) Floor installation type

RH - ◇◇ FH □□ △△ ○ - ● Q ▲ - SMxx

(a) (b) (c) (d) (e) (f) (g) (h) (i) (j)

- (a). RH Indicates the horizontal multiple-joint robot.
- (b). ◇◇ Indicates the maximum load.
 Ex.)
 6: 6kg
 12: 12kg
 20: 20kg
- (c). FH Indicates the FH series.
- (d). □□ Indicates the arm length.
 Ex.)
 35: 350mm
 45: 450mm
 55: 550mm
 70: 700mm
 85: 850mm
 100: 1000mm
- (e). △△ Indicates the vertical stroke length.
 Ex.)
 20: 200mm stroke
 34: 340mm stroke
 35: 350mm stroke
 45: 450mm stroke
- (f). ○ Indicates environment specification.
 Ex.)
 Omitted: General specifications
 C: Clean specifications
 M: Oil mist specifications
- (g). ● Indicates the controller series.
 Ex.)
 Omitted: CR750 controller
 1: CR751 controller
- (h). Q Indicates the controller type.
 Q: iQ Platform
- (i). ▲ Technical standard of Conformity.
 Ex.)
 Omitted: No conformity of technical standard.
 1: Conforms to the CE Marking
- (j). - S M xx Indicates a special model. In order, limit special specification.
 [1] [2]

[1] S: Indicates a special model.

[2] M: Indicates a specification with protection specification controller. (The controller protection box is attached.)

Rys. 1.2. Identyfikacja robota na podstawie typu (zależnie od sposobu montażu) [1]

(2) Hanging installation type

RH - 3 FH R 35 $\Delta\Delta$ \bigcirc - \bullet Q \blacktriangle - Sxx
 (a) (b) (c) (d) (e) (f) (g) (h) (i) (j) (k)

(a). RH.....Indicates the horizontal multiple-joint robot.

(b). 3.....Indicates the maximum load.
 Ex.)
 3: 3kg

(c). FH.....Indicates the FH series.

(d). R.....Indicates the installation posture is hung.

(e). $\square\square$Indicates the arm length.
 Ex.)
 35: 350mm

(f). $\Delta\Delta$Indicates the vertical stroke length.
 Ex.)
 12: 120mm stroke
 15: 150mm stroke

(g). \bigcircIndicates environment specification.
 Ex.)
 Omitted: General specifications
 C: Clean specifications
 W: Waterproof specifications (IP 65)

(h). \bulletIndicates the controller series.
 Ex.)
 Omitted: CR750 controller

(i). Q.....Indicates the controller type.
 Q: iQ Platform

(j). \blacktriangleTechnical standard of Conformity.
 Ex.)
 Omitted: No conformity of technical standard.
 1: Conforms to the CE Marking

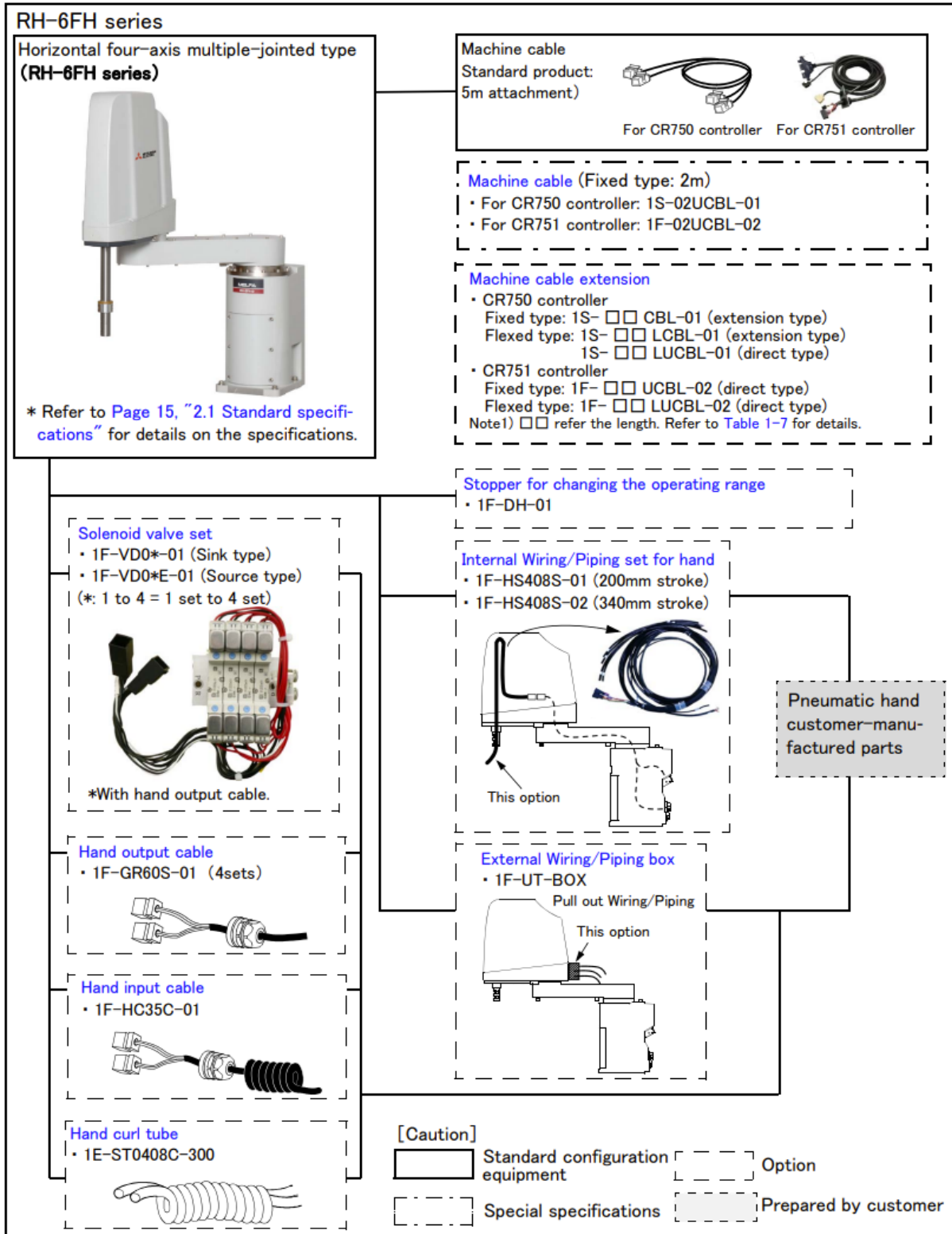
(k). - S xx.....Indicates a special model. In order, limit special specification.

Rys. 1.3. Identyfikacja robota na podstawie typu (zależnie od sposobu montażu) [1]

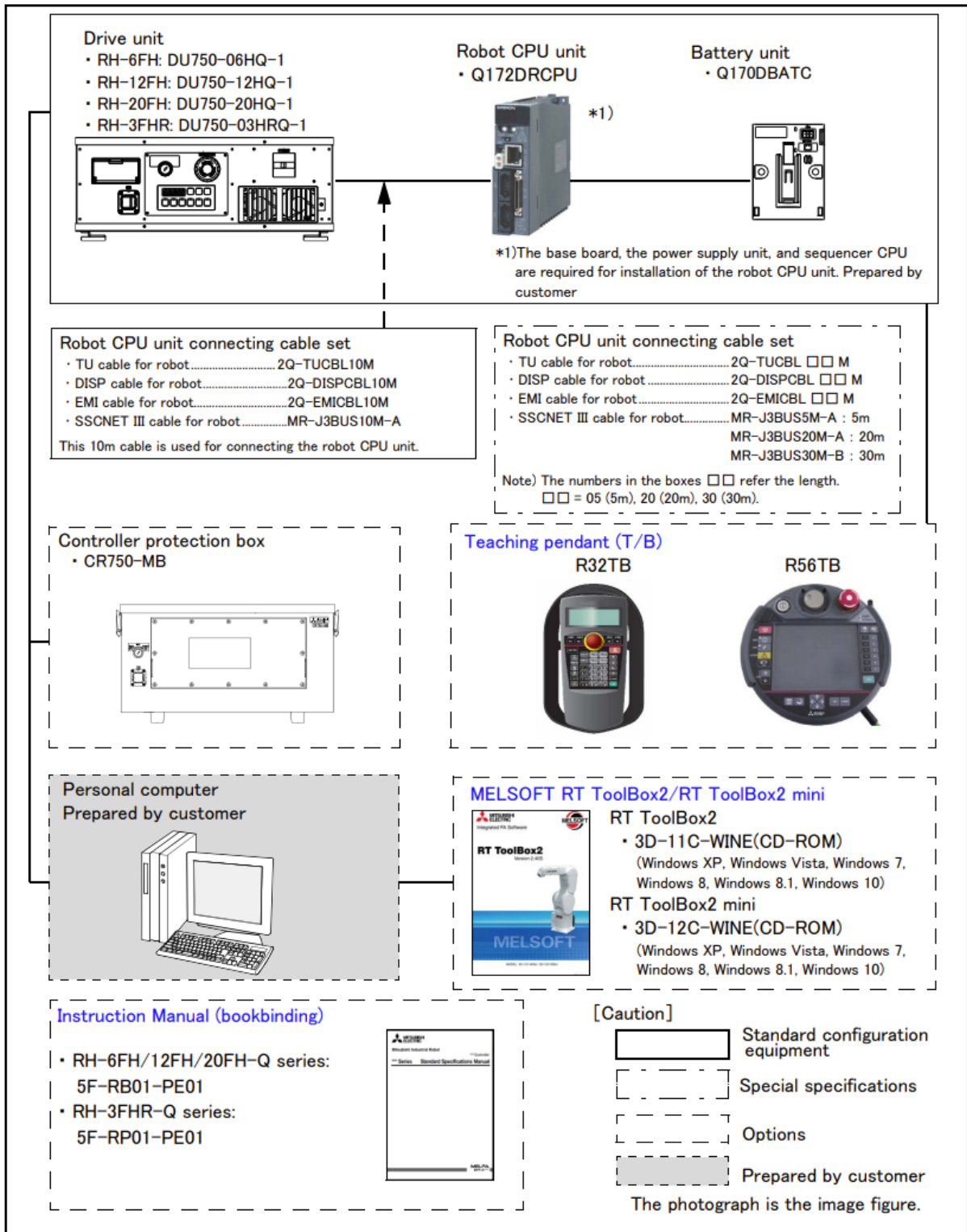
Protection specification	Robot arm (Floor installation type)	Arm length (mm)	J3-axis stroke (mm)	Controller ^{Note1)}
RH-6FH series				
General-purpose environment	RH-6FH3520-Q	350	200	CR750-06HQ-1
	RH-6FH4520-Q	450		
	RH-6FH5520-Q	550		
	RH-6FH3534-Q	350	340	
	RH-6FH4534-Q	450		
	RH-6FH5534-Q	550		
Clean specifications	RH-6FH3520C-Q	350	200	
	RH-6FH4520C-Q	450		
	RH-6FH5520C-Q	550		
	RH-6FH3534C-Q	350	340	
	RH-6FH4534C-Q	450		
	RH-6FH5534C-Q	550		
Oil mist specifications	RH-6FH3520M-Q	350	200	
	RH-6FH4520M-Q	450		
	RH-6FH5520M-Q	550		
	RH-6FH3534M-Q	350	340	
	RH-6FH4534M-Q	450		
	RH-6FH5534M-Q	550		

Rys. 1.4. Kombinacje ramion robota i sterownika [1]

2. Konfiguracja robota



Rys. 2.1. Konfiguracja sprzętowa robota [1]



Rys. 2.2. Układ sterowania robota [1]

Item		Unit	Specifications		
Type ^{Note1)}			RH-6FH3520/3534 RH-6FH3520C/3534C RH-6FH3520M/3534M	RH-6FH4520/4534 RH-6FH4520C/4534C RH-6FH4520M/4534M	RH-6FH5520/5534 RH-6FH5520C/5534C RH-6FH5520M/5534M
Environment			Blank: Standard specification C: Clean specification M: Oil mist specification ^{Note2)}		
Installation posture			On floor		
Degree of freedom			4		
Structure			Horizontal, multiple-joint type		
Drive system			AC servo motor		
Position detection method			Absolute encoder		
Motor capacity	J1	W	750		
	J2	W	400		
	J3 (Z)	W	200		
	J4 (θ axis)	W	100		
Brake			J1, J2, J4: no brake, J3: with brake		
Arm length	No. 1 arm	mm	125	225	325
	No. 2 arm	mm	225		
Max.reach radius(No. 1+ No. 2)		mm	350	450	550
Operating range	J1	deg	± 170		
	J2	deg	± 145		
	J3 (Z)	mm	RH-6FH**20/**20C/**20M: 200 (+133 to +333) RH-6FH**34: 340 (-7 to +333) RH-6FH**34C/**34M: 340 (-43 to +297)		
	J4 (θ axis)	deg	± 360		
Speed of motion ^{Note3)}	J1	deg/s	400		
	J2	deg/s	670		
	J3 (Z)	mm/s	2.400		
	J4 (θ axis)	deg/s	2.500		
Maximum horizontal composite speed ^{Note4)}		mm/s	6,900	7,600	8,300
Cycle time ^{Note5)}		sec	0.29		
Load	Rating	kg	3		
	Maximum	(N)	6		
Z axis pressing force ^{Note6)}	Maximum	N	165		
Allowable inertia	Rating	kg · m ²	0.01		
	Maximum		0.12		
Pose repeatability ^{Note7)}	X-Y direction	mm	± 0.010	± 0.010	± 0.012
	J3 (Z)	mm	± 0.010		
	J4 (θ axis)	deg	± 0.004		
Ambient temperature ^{Note8)}		°C	0 to 40		
Mass		k	36	37	
Tool wiring			· Input 8 points/Output 8 points, (total 20 cores) · Dedicated signal cable for multifunctional hand (Two cores + Power cable two cores) · Ethernet cable one cable (100BASE-TX, eight cores) ^{Note9)}		
Tool pneumatic pipes			Primary: $\phi 6$ x two hoses, Secondary: $\phi 4$ x eight hoses ^{Note10)}		
Supply pressure		MPa	0.5 \pm 10%		
Protection specification ^{Note11)}			Standard specification: IP20 Clean specification: ISO class 3 ^{Note12)} Oil mist specification: IP65 ^{Note13)} ^{Note14)}		
Painting color			Light gray (Equivalent to Munsell: 0.6B7.6/0.2)		

Rys. 2.3. Standardowa specyfikacja ramion robota z serii RH-6FH [1]

<Floor installation type>



Note 1) The operation method of the brake release switch.
 The brake of J3 axis can be released with this switch and the enabling switch of T/B. The brake is released in an off-and-on way.
 Please be sure to perform brake release operation by two-person operations. Always assign an operator other than the switch operator to prevent the arm from dropping. This operation must be carried out with the switch operator giving signals.



CAUTION

When releasing the brake the J3 axis will drop. Be sure to perform brake release operation by two-person operations.

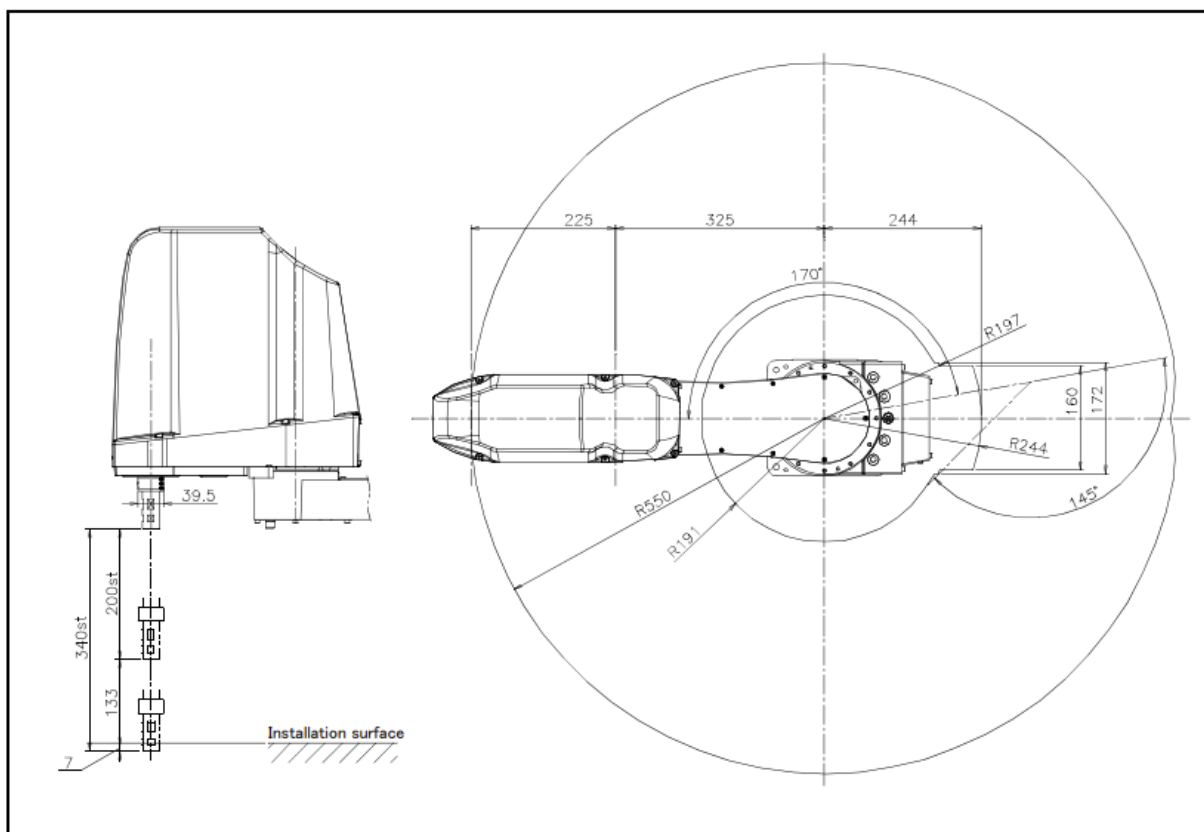
- (1) One person supports so that the J3 axis may not drop.
- (2) The one more person pushes the brake release switch of the robot arm, in the condition that the enabling switch of T/B is turned on. Only when both switches are pressed, the brake is released in an off-and-on way.

Enabling switch
 (Hold down to the left or the right.)



T/B

Rys. 2.4. Nazewnictwo poszczególnych części robota [1]



Rys. 2.6. Zakres roboczy robota z serii RH-6FH55xx [1]

[1] Mitsubishi Industrial Robot RH-6FH-Q/12FH-Q/20FH-Q Series RH-3FHR-Q Series Standard Specifications Manual, melfa BFP-A882-AM