Fuji Electric

Innovating Energy Technology

Compact and High Performance Inverters

FRENIC-Mini (C2) Series

Options and Accessories

- **Braking Accessories**
- **Reactors**
- **Remote Keypad**
- **Mounting Adapters**
- **NEMA 1 Kits**

FRENIC-Mini (C2) Inverters

Specifications

Capacity	115V Single phase: 1/8 to 1HP 230V Single phase: 1/8 to 3HP 230V Three phase: 1/8 to 20HP 460V Three phase: 1/2 to 20HP
Overload Capability	150% 1 min; 200% .05 sec
Input Power	115V/230V Single/Three phase: 200 to 240V, 50/60Hz 460V Three phase: 380 to 480V, 50/60Hz Voltage: +10% to -15% (unbalance 2% or less) Frequency: +5% to -5%
Control	V/F control (Induction Motor) Dynamic Torque Vector control (Induction Motor) Permanent Magnet/Synchronous motor V/F control
Output Frequency	0.1 to 400Hz
Output Accuracy	Analog setting: +/-2% of maximum frequency Digital setting: +/- 0.01% of maximum frequency (by keypad setting)
Starting Torque	150% running at 1Hz with Slip compensation and auto-torque boost
Braking Transistor	Built-in except 1/4HP and less
Ambient Temperature	-10 to 50°C (14 to 122°F) for operation -25 to 75°C (-13 to 158°F) for storage
Relative Humidity	5 to 95%RH (without condensation)
Installation Location	IEC60664-1 Pollution degree 2. (Free from corrosive gases, flammable gases, oil mist, dust and direct sunlight) Indoor Use Only
Altitude	Sea level to 3300ft (1000m):No Derate 3300ft(1000m) to 9900ft(3000m): with Derating
Enclosure	UL Open type, NEMA/UL Type 1 by Option Kit
Standard	UL508C, EN 61800-5-1:2007

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Options

Name(Type)

Braking resistor
[Standard]
(DB□□□-2)
(DB□□□-4)
[10%ED type]
(DB□□□-2C)
(DB□□□-4C)

Specifications and dimensions [Unit:mm]

Fig.A

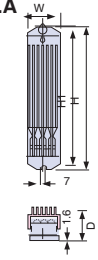


Fig.B

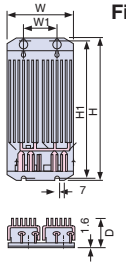


Fig.C

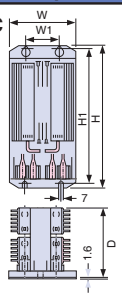


Fig.D

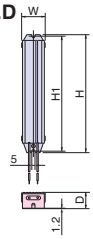


Fig.E

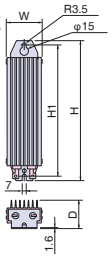
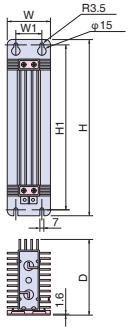


Fig.F



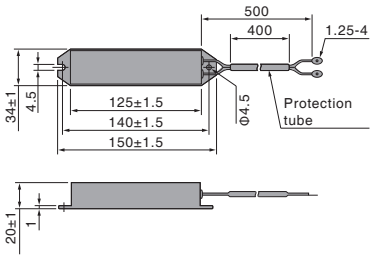
	Type 200V	Type 400V	Fig.	Dimensions [mm] W	H	H1	D	Mass [kg]
Standard type	DB0.75-2	DB0.75-4	A	68	310	295	67	1.3
	DB2.2-2	-	A	80	345	332	94	2.0
	-	DB2.2-4	A	68	470	455	67	2.0
	DB3.7-2	-	A	80	345	332	94	2.0
	-	DB3.7-4	A	68	470	455	67	1.7
	DB5.5-2	-	B	146	450	430	67.5	4.5
	-	DB5.5-4	B	146	470	455	67	4.5
	DB7.5-2	-	B	160	390	370	90	5.0
	-	DB7.5-4	B	146	510	495	67	5.0
	DB11-2	-	C	142	430	415	160	6.9
	-	DB11-4	C	142	430	415	160	6.9
	DB15-2	-	C	142	430	415	160	6.9
	-	DB15-4	C	142	430	415	160	6.9
10%ED type	DB0.75-2C	DB0.75-4C	D	43	221	215	30.5	0.4
	DB2.2-2C	DB2.2-4C	E	67	188	172	55	0.8
	DB3.7-2C	DB3.7-4C	E	67	328	312	55	1.4
	DB5.5-2C	DB5.5-4C	E	80	378	362	78	-
	DB7.5-2C	DB7.5-4C	E	80	418	402	78	-
	DB11-2C	DB11-4C	F	80	460	440	140	-
	DB15-2C	DB15-4C	F	80	580	560	140	-

Type	Power supply voltage	Inverter type	Type	Q'ty	Resistance [Ω]	Max. braking torque [%] 50 [Hz] [N·m]	60 [Hz] [N·m]	Continuous braking (100% torque conversion value) Discharging capability [kWs]	Braking time [s]	Repetitive braking (100 sec or less cycle) Average loss [kW]	Duty cycle [%ED]
Standard Type	Three-phase 200 V	FRN0004C2S-2□	DB0.75-2	1	100	150	4.02	3.32	9	45	0.044	22
		FRN0006C2S-2□					7.57	6.25	17		0.068	18
		FRN0010C2S-2□	DB2.2-2	1	40		15.0	12.4	34		0.075	10
		FRN0012C2S-2□					22.0	18.2	33	30	0.077	7
		FRN0020C2S-2□	DB3.7-2	1	33		37.1	30.5	37	20	0.093	5
		FRN0025C2S-2□	DB5.5-2	1	20		55.1	45.4	55		0.138	
		FRN0033C2S-2□	DB7.5-2	1	15		75.1	61.9	37	10	0.188	
		FRN0047C2S-2□	DB11-2	1	10		110.2	90.8	55		0.275	
		FRN0060C2S-2□	DB15-2	1	8.6		150.3	123.8	75		0.375	
	Three-phase 400 V	FRN0002C2■-4□	DB0.75-4	1	200	150	4.02	3.32	9	45	0.044	22
		FRN0004C2■-4□					7.57	6.25	17		0.068	18
		FRN0005C2■-4□	DB2.2-4	1	160		15.0	12.4	34		0.075	10
		FRN0007C2■-4□					22.0	18.2	33	30	0.077	7
		FRN0011C2■-4□	DB3.7-4	1	130		37.1	30.5	37	20	0.093	5
		FRN0013C2■-4□	DB5.5-4	1	80		55.1	45.4	55		0.138	
		FRN0018C2■-4□	DB7.5-4	1	60		75.1	61.9	38	10	0.188	
		FRN0024C2■-4□	DB11-4	1	40		110.2	90.8	55		0.275	
		FRN0030C2■-4□	DB15-4	1	34.4		150.3	123.8	75		0.375	
	Single-phase 200 V	FRN0004C2■-7□	DB0.75-2	1	100	150	4.02	3.32	9	45	0.044	22
		FRN0006C2■-7□					7.57	6.25	17		0.068	18
		FRN0010C2■-7□	DB2.2-2	1	40		15.0	12.4	34		0.075	10
		FRN0012C2■-7□					22.0	18.2	33	30	0.077	7
	Single-phase 100 V	FRN0003C2S-6U	DB0.75-2	1	100	150	4.02	3.32	9	45	0.044	22
		FRN0005C2S-6U					7.57	6.25	17		0.068	18
10%ED Type	Three-phase 200 V	FRN0004C2S-2□	DB0.75-2C	1	100	150	4.02	3.32	50	250	0.075	37
		FRN0006C2S-2□					7.57	6.25		133		20
		FRN0010C2S-2□	DB2.2-2C	1	40		15.0	12.4	55	73	0.110	14
		FRN0012C2S-2□					22.0	18.2		50		10
		FRN0020C2S-2□	DB3.7-2C	1	33		37.1	30.5	140	75	0.185	
		FRN0025C2S-2□	DB5.5-2C	1	20		55.1	45.4	55	20	0.275	
		FRN0033C2S-2□	DB7.5-2C	1	15		75.1	61.9	37	10	0.375	
		FRN0047C2S-2□	DB11-2C	1	10		110.2	90.8	55		0.55	
		FRN0060C2S-2□	DB15-2C	1	8.6		150.3	123.8	75		0.75	
	Three-phase 400 V	FRN0002C2■-4□	DB0.75-4C	1	200	150	4.02	3.32	50	250	0.075	37
		FRN0004C2■-4□					7.57	6.25		133		20
		FRN0005C2■-4□	DB2.2-4C	1	160		15.0	12.4	55	73	0.110	14
		FRN0007C2■-4□					22.0	18.2		50		10
		FRN0011C2■-4□	DB3.7-4C	1	130		37.1	30.5	140	75	0.185	
		FRN0013C2■-4□	DB5.5-4C	1	80		55.1	45.4	55	20	0.275	
		FRN0018C2■-4□	DB7.5-4C	1	60		75.1	61.9	38	10	0.375	
		FRN0024C2■-4□	DB11-4C	1	40		110.2	90.8	55		0.55	
		FRN0030C2■-4□	DB15-4C	1	34.4		150.3	123.8	75		0.75	
	Single-phase 200 V	FRN0004C2■-7□	DB0.75-2C	1	100	150	4.02	3.32	50	250	0.075	37
		FRN0006C2■-7□					7.57	6.25		133		20
		FRN0010C2■-7□	DB2.2-2C	1	40		15.0	12.4	55	73	0.110	14
		FRN0012C2■-7□					22.0	18.2		50		10
	Single-phase 100 V	FRN0003C2S-6U	DB0.75-2C	1	100	150	4.02	3.32	50	250	0.075	37
		FRN0005C2S-6U					7.57	6.25		133		20

Note: 1) A box (□) in the above table replaces A, C, E, or U depending on shipping destination.
2) A box (■) in the above table replaces S (Basic type) or E (EMC filter built-in type) depending on the enclosure.

Name(Type) — Specifications and dimensions [Unit:mm]

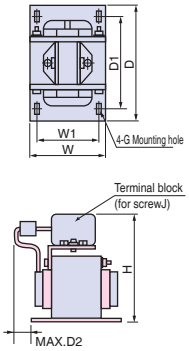
Braking resistor [Compact type] (TK80W120Ω)



Power supply voltage	Type		TK80W120Ω				
200V class	Resistor	Capacity [kW]	0.08				
		Resistance [Ω]	120				
	Applicable inverter model		FRN0004C2■-2□	FRN0006C2■-2□	FRN0010C2■-2□	FRN0012C2■-2□	FRN0020C2■-2□
	Applicable motor output [kW]		0.4	0.75	1.5	2.2	3.7, 4.0
	Average braking torque [%]		150	150	150	100	100
	Allowable braking properties	Allowable duty cycle [%]	15	5	5	5	5
		Allowable continuous braking time	15sec	15sec	10sec	10sec	10sec
	Braking unit		Not required				

NOTE: This type of braking resistors is not applicable to the 400 V class series of inverters or to inverters of 5.5 kW (7.5 HP) or above.

DC REACTOR (DCR2-□□□) (DCR4-□□□)



Inverter type			Reactor type	Dinensions								Mass [kg]
Three-phase 200V	Single-phase 200V	Single-phase 100V		W	W1	D	D1	D2	G	H	J	
FRN0001C2S-2□	FRN0001C2■-7□		DCR2-0.2	66	56	90	72	5	M4(5.2×8)	94	M4	0.8
FRN0002C2S-2□												
FRN0004C2S-2□	FRN0002C2■-7□		DCR2-0.4	66	56	90	72	15	M4(5.2×8)	94	M4	1.0
FRN0006C2S-2□	FRN0004C2■-7□	FRN0001C2S-6U	DCR2-0.75	66	56	90	72	20	M4(5.2×8)	94	M4	1.4
FRN0010C2S-2□	FRN0006C2■-7□	FRN0002C2S-6U	DCR2-1.5	66	56	90	72	20	M4(5.2×8)	94	M4	1.6
FRN0012C2S-2□	–	FRN0003C2S-6U	DCR2-2.2	86	71	100	80	10	M5(6×9)	110	M4	1.8
FRN0020C2S-2□	FRN0010C2■-7□	FRN0005C2S-6U	DCR2-3.7	86	71	100	80	20	M5(6×9)	110	M4	2.6
	FRN0012C2■-7□											
FRN0025C2S-2□			DCR2-5.5	111	95	100	80	20	M6(7×11)	130	M5	3.6
FRN0033C2S-2□			DCR2-7.5	111	95	100	80	23	M6(7×11)	130	M5	3.8
FRN0047C2S-2□			DCR2-11	111	95	100	80	24	M6(7×11)	137	M6	4.3
FRN0060C2S-2□			DCR2-15	146	124	120	96	15	M6(7×11)	180	M8	5.9
Three-phase 400V												
FRN0002C2■-4□			DCR4-0.4	66	56	90	72	15	M4(5.2×8)	94	M4	1.0
FRN0004C2■-4□			DCR4-0.75	66	56	90	72	20	M4(5.2×8)	94	M4	1.4
FRN0005C2■-4□			DCR4-1.5	66	56	90	72	20	M4(5.2×8)	94	M4	1.6
FRN0007C2■-4□			DCR4-2.2	86	71	100	80	15	M5(6×9)	110	M4	2.0
FRN0011C2■-4□			DCR4-3.7	86	71	100	80	20	M5(6×9)	110	M4	2.6
FRN0013C2■-4□			DCR4-5.5	86	71	100	80	20	M5(6×9)	110	M4	2.6
FRN0018C2■-4□			DCR4-7.5	111	95	100	80	24	M6(7×11)	130	M5	4.2
FRN0024C2■-4□			DCR4-11	111	95	100	80	24	M6(7×11)	130	M5	4.3
FRN0030C2■-4□			DCR4-15	146	124	120	96	15	M6(7×11)	168	M5	5.9

Note 1: Generated losses listed in the above table are approximate values that are calculated according to the following conditions:
- The power source is 3-phase 200 V/400 V 50 Hz with 0% interphase voltage unbalance ratio.
- The power source capacity uses the larger of either 500 kVA or 10 times the rated capacity of the inverter.
- The motor is a 4-pole standard model at full load (100%).
- An AC reactor (ACR) is not connected.

Note 2: A box (□) in the above table replaces A, C, E, or U depending on shipping destination.
Note 3: A box (■) in the above table replaces S (Basic type) or E (EMC filter built-in type) depending on the enclosure.

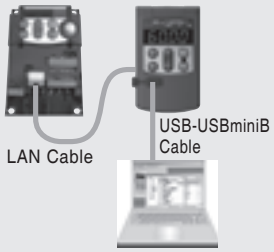
Options

■Remote keypad (TP-E1)

The keypad permits remote control of FRENIC-Mini, and function setting and display (with copy function).

■USB-equipped remote keypad (TP-E1U)

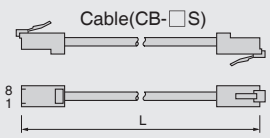
Using the keypad in combination with FRENIC Loader enables a variety of data about the inverter unit to be saved in the keypad memory, allowing you to check the information in any place.



■Remote operation extension cable (CB-□S)

This straight cable is used to connect the RS485 Communications card and the remote keypad, and available in three lengths, i.e. 1m, 3m and 5m.

Type	L(m)
CB-5S	5
CB-3S	3
CB-1S	1



■Rail mounting bases (RMA-C1-□□□)

A rail mounting base allows any of the FRENIC-Mini series of inverter to be mounted on a DIN rail (35 mm (1.38 inches) wide).

Option model	Applicable inverter type
RMA-C1-0.75	FRN0001C2S-2□
	FRN0002C2S-2□
	FRN0004C2S-2□
	FRN0006C2S-2□
	FRN0001C2S-7□
	FRN0002C2S-7□
	FRN0004C2S-7□
	FRN0006C2S-7□
	FRN0001C2S-6U
	FRN0002C2S-6U
	FRN0003C2S-6U
	FRN0001C2E-7□
	FRN0002C2E-7□
	FRN0004C2E-7□
RMA-C1-2.2	FRN0010C2S-2□
	FRN0012C2S-2□
	FRN0002C2S-4□
	FRN0004C2S-4□
	FRN0005C2S-4□
	FRN0007C2S-4□
	FRN0010C2S-7□
	FRN0002C2E-4□
	FRN0004C2E-4□
	FRN0006C2E-7□
RMA-C1-3.7	FRN0020C2S-2□
	FRN0011C2S-4□
	FRN0012C2S-7□
	FRN0005C2E-4□
	FRN0007C2E-4□
	FRN0011C2E-4□
	FRN0010C2E-7□
	FRN0012C2E-7□

Note 1: A box (□) in the above table replaces A, C, E, or U depending on shipping destination.
Note 2: This rail mounting base is not suitable for the inverters of 5.5 kW (7.5 HP) or above.

■Mounting adapters (MA-C1-□□□)

FRENIC-Mini series of inverters can be installed in the control board of your system using mounting adapters which utilize the mounting holes used for conventional inverters (FVR-E11S series of 0.75 kW or below or 3.7 (4.0) kW). The FVR-E11S-2/4 (1.5 kW/2.2 kW) and FVR-E11S-7 (0.75 kW/1.5 kW) models may be replaced with the FRENIC-Mini series inverters without the use of adapters.

Option model	Applicable inverter model	
	FRENIC-Mini	FVR-E11S
MA-C1-0.75	FRN0001C2S-2□	FVR0.1E11S-2□
	FRN0002C2S-2□	FVR0.2E11S-2□
	FRN0004C2S-2□	FVR0.4E11S-2□
	FRN0006C2S-2□	FVR0.75E11S-2□
	FRN0001C2S-7□	FVR0.1E11S-7□
	FRN0002C2S-7□	FVR0.2E11S-7□
	FRN0004C2S-7□	FVR0.4E11S-7□
	FRN0006C2S-7□	
MA-C1-3.7	FRN0020C2S-2□	FVR3.7E11S-2□
	FRN0011C2S-4□	FVR3.7E11S-4□
	FRN0012C2S-7□	FVR4.0E11S-4□
		FVR2.2E11S-7□

Note: A box (□) in the above table replaces A, C, E, or U depending on shipping destination.

■NEMA1 kit (NEMA1-□□□C2-□)

Mounting the NEMA1 kit on the FRENIC-Mini series of inverters brings the inverter's enclosure into compliance with the NEMA1 Standard (UL TYPE1 certified).

Figure A

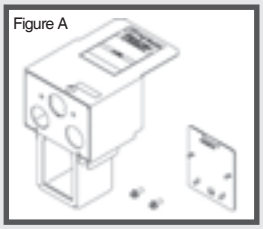


Figure B

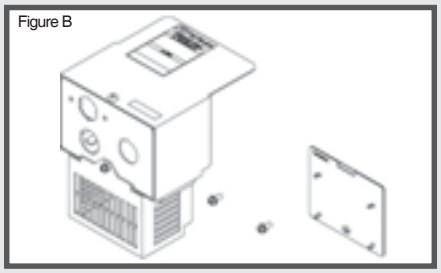
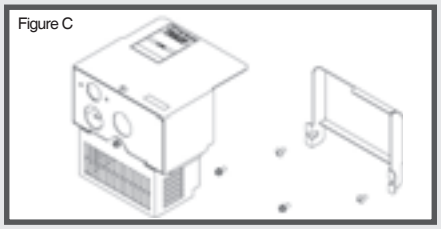


Figure C



Power supply voltage	Inverter type	Option type	Figure
Three-phase 200 V	FRN0001C2S-2□	NEMA1-C2-101	A
	FRN0002C2S-2□		
	FRN0004C2S-2□	NEMA1-C2-102	
	FRN0006C2S-2□	NEMA1-C2-103	
	FRN0010C2S-2□	NEMA1-C2-201	B
	FRN0012C2S-2□		
	FRN0020C2S-2□	NEMA1-C2-301	C
Three-phase 400 V	FRN0002C2S-4□	NEMA1-C2-202	A
	FRN0004C2S-4□	NEMA1-C2-203	
	FRN0005C2S-4□	NEMA1-C2-201	B
	FRN0007C2S-4□		
	FRN0011C2S-4□	NEMA1-C2-301	C
Single-phase 200 V	FRN0001C2S-7□	NEMA1-C2-101	A
	FRN0002C2S-7□		
	FRN0004C2S-7□	NEMA1-C2-102	
	FRN0006C2S-7□	NEMA1-C2-104	
	FRN0010C2S-7□	NEMA1-C2-204	B
	FRN0012C2S-7□	NEMA1-C2-301	C
Single-phase 100 V	FRN0001C2S-6U	NEMA1-C2-105	A
	FRN0002C2S-6U		
	FRN0003C2S-6U	NEMA1-C2-106	
	FRN0005C2S-6U	NEMA1-C2-205	

This option is not applicable to the EMC filter built-in type or inverters of 5.5 kW or above.

To all our customers who purchase Fuji Electric products included in this catalog:

Please take the following items into consideration when placing your order.

When requesting an estimate and placing your orders for the products included in these materials, please be aware that any items such as specifications which are not specifically mentioned in the contract, catalog, specifications or other materials will be as mentioned below.
In addition, the products included in these materials are limited in the use they are put to and the place where they can be used, etc., and may require periodic inspection. Please confirm these points with your sales representative or directly with this company.
Furthermore, regarding purchased products and delivered products, we request that you take adequate consideration of the necessity of rapid receiving inspections and of product management and maintenance even before receiving your products.

1. Free of Charge Warranty Period and Warranty Range

1-1 Free of charge warranty period

(1) The product warranty period is " Three years from shipment"
(2) However, in cases where the use environment, conditions of use, use frequency and times used, etc., have an effect on product life, this warranty period may not apply.
(3) Furthermore, the warranty period for parts restored by Fuji Electric's Service Department is "6 months from the date that repairs are completed."

1-2 Warranty range

(1) In the event that breakdown occurs during the product's warranty period which is the responsibility of Fuji Electric, Fuji Electric will replace or repair the part of the product that has broken down free of charge at the place where the product was purchased or where it was delivered. However, if the following cases are applicable, the terms of this warranty may not apply.
   1) The breakdown was caused by inappropriate conditions, environment, handling or use methods, etc. which are not specified in the catalog, operation manual, specifications or other relevant documents.
   2) The breakdown was caused by the product other than the purchased or delivered Fuji's product.
   3) The breakdown was caused by the product other than Fuji's product, such as the customer's equipment or software design, etc.
   4) Concerning the Fuji's programmable products, the breakdown was caused by a program other than a program supplied by this company, or the results from using such a program.
   5) The breakdown was caused by modifications or repairs affected by a party other than Fuji Electric.
   6) The breakdown was caused by improper maintenance or replacement using consumables, etc. specified in the operation manual or catalog, etc.
   7) The breakdown was caused by a chemical or technical problem that was not foreseen when making practical application of the product at the time it was purchased or delivered.
   8) The product was not used in the manner the product was originally intended to be used.
   9) The breakdown was caused by a reason which is not this company's responsibility, such as lightning or other disaster.

(2) Furthermore, the warranty specified herein shall be limited to the purchased or delivered product alone.
(3) The upper limit for the warranty range shall be as specified in item (1) above and any damages (damage to or loss of machinery or equipment, or lost profits from the same, etc.) consequent to or resulting from breakdown of the purchased or delivered product shall be excluded from coverage by this warranty.

1-3. Trouble diagnosis

As a rule, the customer is requested to carry out a preliminary trouble diagnosis. However, at the customer's request, this company or its service network can perform the trouble diagnosis on a chargeable basis. In this case, the customer is asked to assume the burden for charges levied in accordance with this company's fee schedule.

2. Exclusion of Liability for Loss of Opportunity, etc.

Regardless of whether a breakdown occurs during or after the free of charge warranty period, this company shall not be liable for any loss of opportunity, loss of profits, or damages arising from special circumstances, secondary damages, accident compensation to another company, or damages to products other than this company's products, whether foreseen or not by this company, which this company is not be responsible for causing.

3. Repair Period after Production Stop, Spare Parts Supply Period (Holding Period)

Concerning models (products) which have gone out of production, this company will perform repairs for a period of 7 years after production stop, counting from the month and year when the production stop occurs. In addition, we will continue to supply the spare parts required for repairs for a period of 7 years, counting from the month and year when the production stop occurs. However, if it is estimated that the life cycle of certain electronic and other parts is short and it will be difficult to procure or produce those parts, there may be cases where it is difficult to provide repairs or supply spare parts even within this 7-year period. For details, please confirm at our company's business office or our service office.

4. Transfer Rights

In the case of standard products which do not include settings or adjustments in an application program, the products shall be transported to and transferred to the customer and this company shall not be responsible for local adjustments or trial operation.

5. Service Contents

The cost of purchased and delivered products does not include the cost of dispatching engineers or service costs. Depending on the request, these can be discussed separately.

6. Applicable Scope of Service

Above contents shall be assumed to apply to transactions and use of the country where you purchased the products.
Consult the local supplier or Fuji for the detail separately.