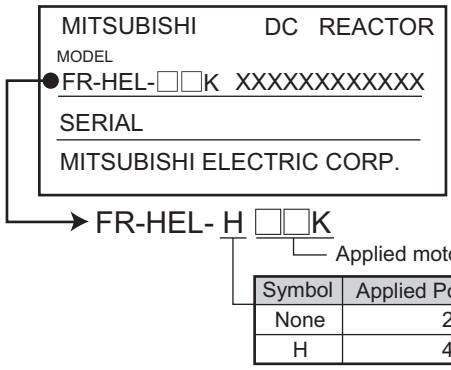
1 Product Checking

(1) Unpack the option unit, and ensure that the product received is as you ordered and it is intact.



Symbol	Applied Power Supply Voltage
None	200V class
H	400V class

(2) Make sure that the package includes all accessories.

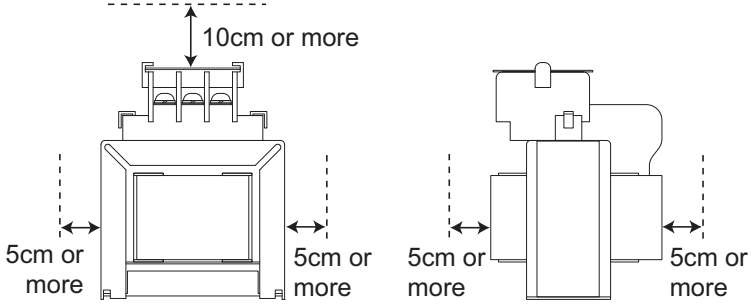
DC reactor (FR-HEL)..... 1	Terminal block cover .....1 (200V class 15K or lower, 400V class 55K or lower)*	Instruction manual 1

*The terminal cover is provided on the terminal block.

2 Installation

(1) Install the reactor horizontally or vertically according to the environment conditions specified on *page 6.* Installing the reactor in an unspecified direction will damage the rector.

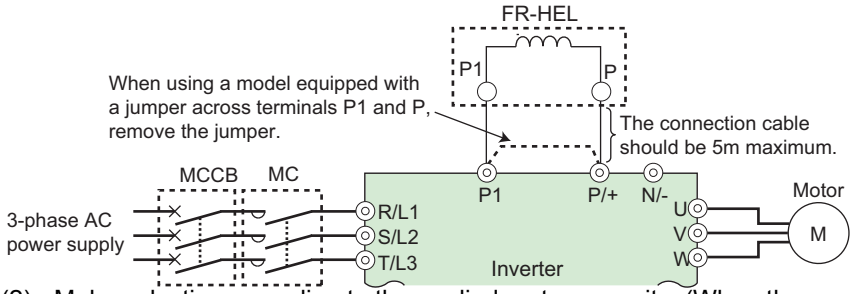
(2) Take full caution not to make the surrounding air temperature higher than the permissible value (-10°C to +50°C). In addition, as the reactor itself generates heat, leave sufficient clearance around it. (Independent of the installation direction of the reactor, 10 cm or more for the above and below, 5 cm or more for the right and left)



3 Wiring

(1) Remove the jumper across terminals P and P1 of the inverter and connect the reactor.

- Minimize the connection cable between the reactor and inverter so that the length is within 5m. (For the size of the cable, refer to page 4)
- The jumper connected across terminals P1 and P must be removed. Otherwise, the reactor will not exhibit its performance.
- When wiring, remove the terminal block cover. After wiring, reinstall the terminal block cover. (The 200V class 18.5K or higher and the 400V class 75K or higher do not have terminal block covers.)



(2) Make selection according to the applied motor capacity. (When the inverter capacity is larger than the motor capacity, make selection according to the motor capacity.)
For a motor of less than 0.4kW, choose the option designed for 0.4kW.

(3) The 55K or lower is usually earthed (grounded) by being mounted securely to the enclosure. If it is not earthed (grounded) enough through the enclosure, use an earthing (grounding) cable.
When you are using an earthing (grounding) cable, wire the cable to the installation hole where varnish is removed.
(Refer to *page 4* for the cable and solderless terminal sizes, and *page 7* for the position of the installation hole where varnish is removed.)
For the 75K or higher, securely earth (ground) the reactor using the earth (ground) terminal.

CAUTION

1. **After wiring, make sure that the terminal block cover has been reinstalled securely.**
2. **Do not perform wiring while power is on and the inverter is running.**
3. **Any person who is involved in the wiring of this equipment should be fully competent to do the work.**
4. **Since high-voltage is applied to the inverter terminals P1, P and N, fully make sure that the input power is off and the voltage across terminals P and N is not exceeding 50VDC before performing wiring.**
5. **The terminal block cover is not provided for the 200V class 18.5K or higher.**
   Provide isolation treatment to avoid contact of terminals.

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4 Cable Size and Crimping Terminal

Refer to *page 3* for the wiring of terminals P and P1 and the earthing cable.

(1) 200V class

Model	P, P1				Earth (Ground) cable	
	Terminal Screw Size	Tightening Torque N•m	Crimping Terminal	HIV Cable Size (mm^2)	Crimping Terminal	Cable Size (mm^2)
FR-HEL-0.4K to 2.2K	M4	1.5	2-4	2	2-4	2
FR-HEL-3.7K	M4	1.5	5.5-4	3.5	5.5-4	3.5
FR-HEL-5.5K	M4	1.5	5.5-4	5.5	5.5-4	5.5
FR-HEL-7.5K	M5	2.5	14-5	14	5.5-4	5.5
FR-HEL-11K	M6	3.8	14-6	14	8-6	8
FR-HEL-15K	M6	3.8	22-6	22	14-6	14
FR-HEL-18.5K	M8	13.2 *	38-8	38	14-6	14
FR-HEL-22K	M10	26.5 *	38-10	38	22-6	22
FR-HEL-30K	M10	26.5 *	60-10	60	22-6	22
FR-HEL-37K	M10	26.5 *	80-10	80	22-6	22
FR-HEL-45K, 55K	M12	46.1 *	100-12	100	38-6	38
FR-HEL-75K	M12	46.1 *	150-12	125	38-6	38
FR-HEL-90K	M12	46.1 *	150-12	150	38-6	38
FR-HEL-110K	M12	46.1 *	100-12	100×2	60-6	60

* Torque value (reference value) for the iron screws with the 4.6 strength rating. Use the tightening torque recommended for the applied screw (bolt).

(2) 400V class

Model	P, P1				Earth (Ground) cable	
	Terminal Screw Size	Tightening Torque N•m	Crimping Terminal	HIV Cable Size (mm^2)	Crimping Terminal	Cable Size (mm^2)
FR-HEL-H0.4K	M3.5	1.2	2-3.5	2	2-5	2
FR-HEL-H0.75K to H2.2K	M3.5	1.2	2-3.5	2	2-4	2
FR-HEL-H3.7K	M4	1.5	2-4	2	2-4	2
FR-HEL-H5.5K, H7.5K	M4	1.5	5.5-4	3.5	5.5-5	3.5
FR-HEL-H11K	M5	2.5	5.5-5	5.5	5.5-5	5.5
FR-HEL-H15K	M6	4.4	8-6	8	5.5-5	5.5
FR-HEL-H18.5K	M6	4.4	14-6	14	8-5	8
FR-HEL-H22K, H30K	M6	4.4	22-6	22	14-5	14
FR-HEL-H37K	M8	7.8	22-8	22	14-5	14
FR-HEL-H45K	M8	7.8	38-8	38	22-5	22
FR-HEL-H55K	M8	7.8	60-8	60	22-6	22
FR-HEL-H75K	M12	46.1 *	60-12	60	22-6	22
FR-HEL-H90K	M12	46.1 *	80-12	80	22-6	22
FR-HEL-H110K	M12	46.1 *	80-12	80	22-6	22
FR-HEL-H132K	M12	46.1 *	100-12	100	38-6	38
FR-HEL-H132K	M12	46.1 *	100-12	100	38-6	38
FR-HEL-H160K	M12	46.1 *	150-12	150	38-6	38
FR-HEL-H185K	M12	46.1 *	150-12	150	38-6	38
FR-HEL-H220K	M12	46.1 *	100-12	2×100	60-6	60
FR-HEL-H250K	M12	46.1 *	125-12	2×125	60-8	60
FR-HEL-H280K	M16	110 *	125-16	2×125	60-8	60
FR-HEL-H315K	M16	110 *	150-16	2×150	60-8	60
FR-HEL-H355K	M16	110 *	200-16	2×200	100-8	100

* Torque value (reference value) for the iron screws with the 4.6 strength rating. Use the tightening torque recommended for the applied screw (bolt).

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5 Specifications

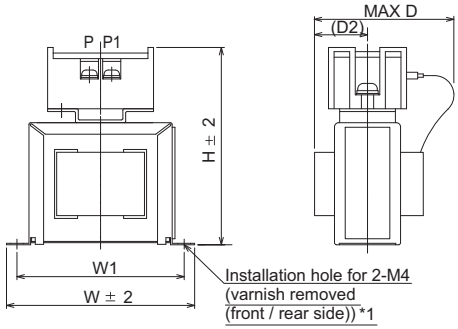
Power factor improving effect *1		Power supply power factor approx. 93%(94.4%) (at 100% load)		
Power specifications		200V class	Three-phase 200 to 240VAC 50Hz/60Hz	
		400V class	55K or lower	Three-phase 380 to 480VAC 50Hz/60Hz
			75K or higher	Three-phase 380 to 500VAC 50Hz/60Hz
Environment	**Surrounding air temperature**	-10°C to + 50°C (non-freezing)		
	Ambient humidity	90%RH or less (non-condensing)		
	Storage temperature	-20°C to + 65°C (non-freezing)		
	Atmosphere	Indoors (free from corrosive gas, flammable gas, oil mist, dust and dirt)		
	Altitude/vibration	Max.1000m above sea level 5.9m/s^2 or less		

*1 The power factor is calculated on the assumption that the power impedance is 1%. The value changes according to the power supply capacity and power impedance. The load is calculated using the fundamental current specified in JEM-TR201 as 100%.
The value is 94.4% when calculated with 1 power factor for the fundamental wave according to the Architectural Standard Specifications (Electrical Installation) (2013 revision) supervised by the Ministry of Land, Infrastructure, Transport and Tourism of Japan.
For a motor of less than 0.4kW, the power factor improving effect will be slightly lower.

6 Outline Dimension Drawings

(1) 200V Class

•FR-HEL-0.4K to 2.2K



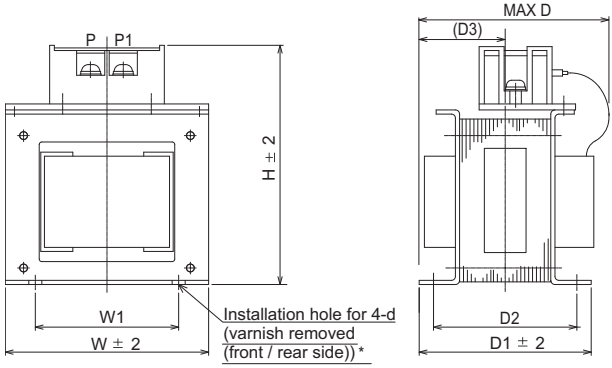
Model	Motor Capacity	W	W1	H	D *2	D2	Mass (kg)
FR-HEL-0.4K	0.4K	70	60	71	61	21	0.4
FR-HEL-0.75K	0.75K	85	74	81	61	21	0.5
FR-HEL-1.5K	1.5K	85	74	81	70	30	0.8
FR-HEL-2.2K	2.2K	85	74	81	70	30	0.9

(Unit: mm)

*1 Use this portion to wire an earthing (grounding) cable. *(Refer to page 4)*

*2 Maximum size (The size changes according to the bending of the input and output cable.)

•FR-HEL-3.7K to 15K



Model	Motor Capacity	W	W1	H	D *2	D1	D2	D3	d	Mass (kg)
FR-HEL-3.7K	3.7K	77	55	92	82	66	57	37	M4	1.5
FR-HEL-5.5K	5.5K	77	55	92	92	76	67	42	M4	1.9
FR-HEL-7.5K	7.5K	86	60	113	98	81	72	43	M4	2.5
FR-HEL-11K	11K	105	64	133	112	92	79	47	M6	3.3
FR-HEL-15K	15K	105	64	133	115	97	84	48.5	M6	4.1

(Unit: mm)

*1 Use this portion to wire an earthing (grounding) cable. *(Refer to page 4)*

*2 Maximum size (The size changes according to the bending of the input and output cable.)

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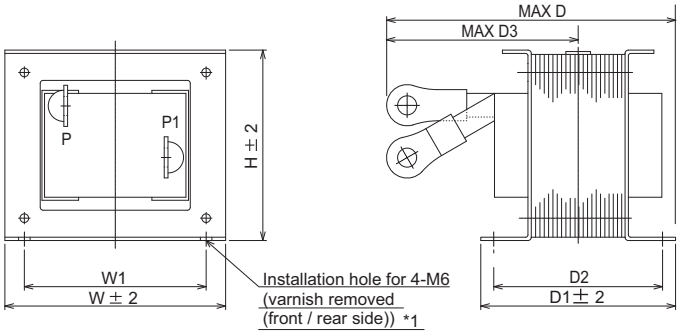
•FR-HEL-18.5K to 55K

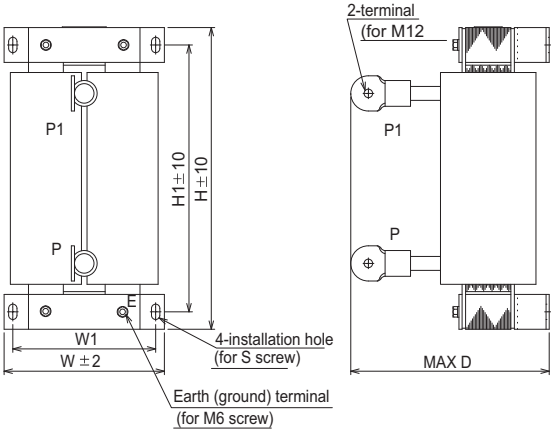


Model	Motor Capacity	W	W1	H	D *2	D1	D2	D3 *2	Mass (kg)
FR-HEL-18.5K	18.5K	105	64	93	165	107	94	110	4.7
FR-HEL-22K	22K	105	64	93	175	117	104	115	5.6
FR-HEL-30K	30K	114	72	100	200	125	101	135	7.8
FR-HEL-37K	37K	133	86	117	195	115	98	135	10
FR-HEL-45K	45K	133	86	117	205	125	108	140	11
FR-HEL-55K	55K	153	126	132	209	135	122	140	12.5

(Unit: mm)

*1 Use this portion to wire an earthing (grounding) cable. *(Refer to page 4)*
*2 Maximum size (The size changes according to the bending of the input and output cable.)

•FR-HEL-75K to 110K

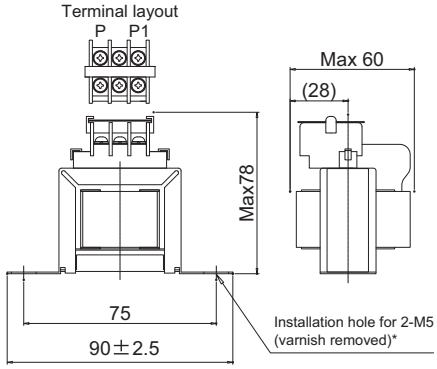


Model	Motor Capacity	W	W1	H	H1	D *2	S	Mass (kg)
FR-HEL-75K	75K	150	130	340	310	190	M6	17
FR-HEL-90K	90K	150	130	340	310	200	M6	19
FR-HEL-110K	110K	175	150	400	365	200	M8	20

(Unit: mm)

(2) 400V Class

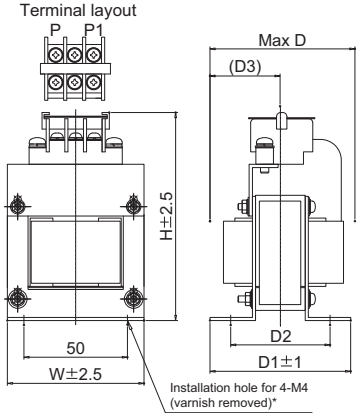
•FR-HEL-H0.4K



Terminal Screw Size	Mass (kg)
M3.5	0.6

Unit (mm)

•FR-HEL-H0.75K to H2.2K



Model	Motor Capacity	W	H	D	D1	D2	D3	Mass (kg)
FR-HEL-H0.75K	0.75K	66	100	70	68	48	34	0.8
FR-HEL-H1.5K	1.5K	66	100	80	74	54	37	1
FR-HEL-H2.2K	2.2K	76	110	80	74	54	37	1.3

Unit (mm)

* Use this portion to wire an earthing (grounding) cable. *(Refer to page 4)*

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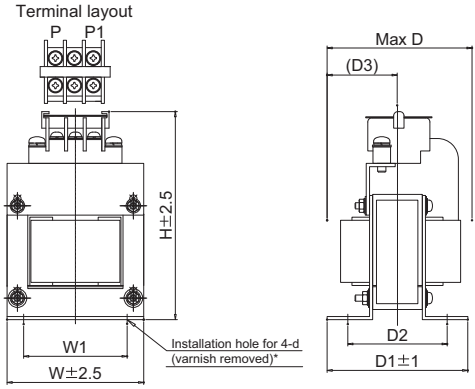
•FR-HEL-H3.7K to H7.5K

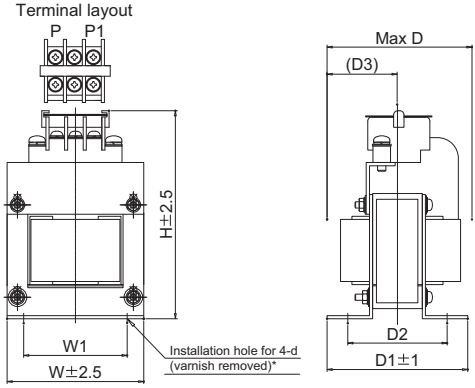


Model	Motor Capacity	W	W1	H	D	D1	D2	D3	d	Mass(kg)
FR-HEL-H3.7K	3.7K	86	55	120	95	89	69	45	M4	2.3
FR-HEL-H5.5K	5.5K	96	60	128	100	95	75	48	M5	3
FR-HEL-H7.5K	7.5K	96	60	128	105	100	80	50	M5	3.5

Unit (mm)

* Use this portion to wire an earthing (grounding) cable. *(Refer to page 4)*

•FR-HEL-H11K to H55K

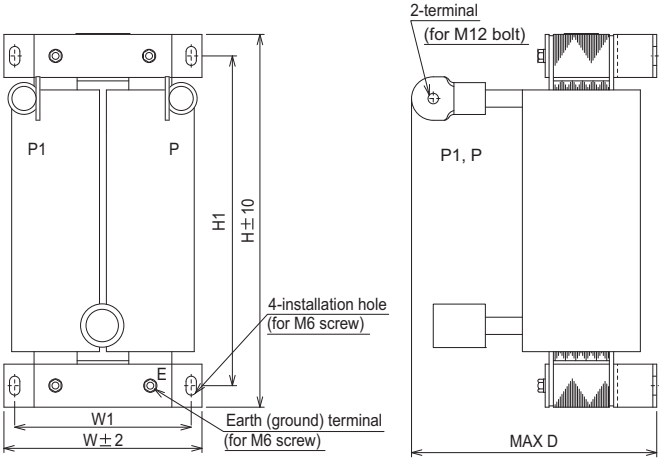


Model	Motor Capacity	W	W1	H	D	D1	D2	D3	d	Mass (kg)
FR-HEL-H11K	11K	105	75	137	110	105	85	53	M5	4.5
FR-HEL-H15K	15K	105	75	152	125	115	95	62	M5	5
FR-HEL-H18.5K	18.5K	114	75	162	120	100	80	58	M5	5
FR-HEL-H22K	22K	133	90	178	120	95	75	53	M5	6
FR-HEL-H30K	30K	133	90	178	120	100	80	56	M5	6.5
FR-HEL-H37K	37K	133	90	187	155	120	100	83	M5	8.5
FR-HEL-H45K	45K	133	90	187	170	130	110	88	M5	10
FR-HEL-H55K	55K	152	105	206	170	126	106	89	M6	11.5

Unit (mm)

* Use this portion to wire an earthing (grounding) cable. *(Refer to page 4)*

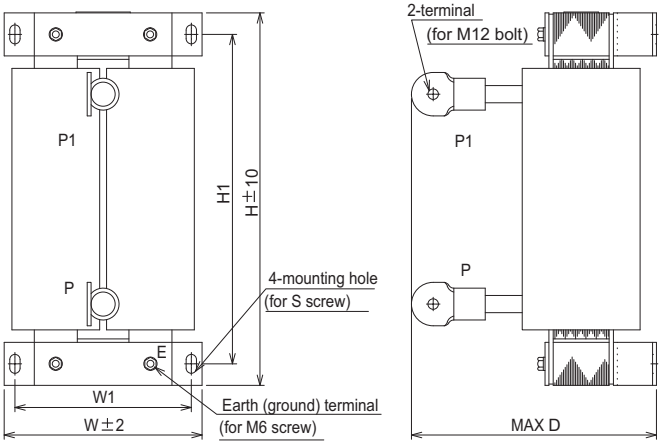
•FR-HEL-H75K, H90K



Model	Motor Capacity	W	W1	H	H1	D	Mass (kg)
FR-HEL-H75K	75K	140	120	320	295	185	16
FR-HEL-H90K	90K	150	130	340	310	190	20

Unit (mm)

•FR-HEL-H110K to H185K



Model	Motor Capacity	W	W1	H	H1	D	S	Mass (kg)
FR-HEL-H110K	110K	150	130	340	310	195	M6	22
FR-HEL-H132K	132K	175	150	405	370	200	M8	26
FR-HEL-H160K	160K	175	150	405	370	205	M8	28
FR-HEL-H185K	185K	175	150	405	370	240	M8	29

Unit (mm)

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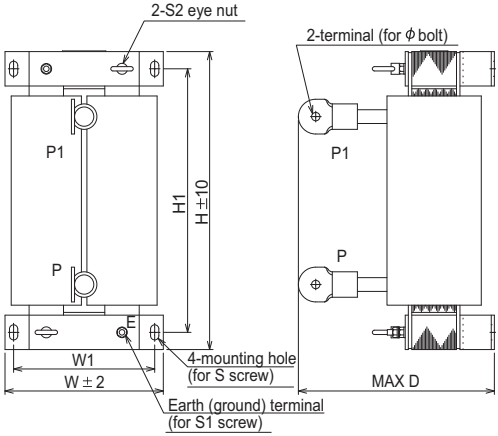
•FR-HEL-H220K to H280K

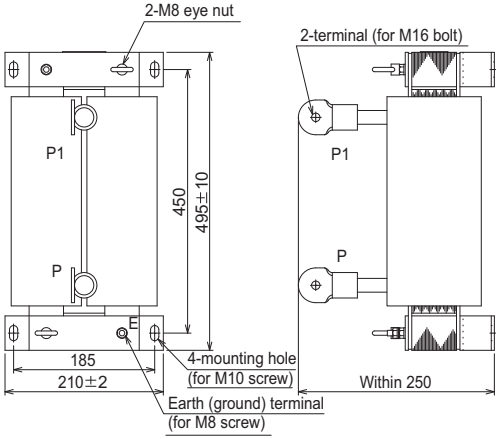


* Remove the eye nut after installation of the product.

Model	Motor Capacity	W	W1	H	H1	D	S	S1	S2	ϕ	Mass (kg)
FR-HEL-H220K	220K	175	150	405	370	240	M8	M6	M6	M12	30
FR-HEL-H250K	250K	190	165	440	400	250	M8	M8	M8	M12	35
FR-HEL-H280K	280K	190	165	440	400	255	M8	M8	M8	M16	38

Unit (mm)

•FR-HEL-H315K, H355K



* Remove the eye nut after installation of the product.

Model	Motor Capacity	Mass (kg)
FR-HEL-H315K	315K	42
FR-HEL-H355K	355K	46

Unit (mm)