

## Precautions for Transport Recommendations on Lithium Batteries

■Date of Issue

June 2017 (Ver.E: March 2020)

■Relevant Models

MELSEC-A/QnA/Q/L/QS/F series and MELSEC iQ-R/MELSEC iQ-F series programmable controllers

Thank you for your continued support of Mitsubishi Electric programmable controllers.

This technical bulletin describes the precautions for the transportation regulation on lithium batteries according to the UN recommendations and the transportation regulation of primary lithium batteries and relevant guidelines in the United States.

Note that the descriptions in this bulletin provide information as of March 2020.

### CONTENTS

1	PRECAUTIONS FOR TRANSPORT RECOMMENDATIONS ON LITHIUM BATTERIES	2
1.1	Change on Lithium Batteries	2
1.2	Models Subject to the UN Recommendations	4
	When only lithium batteries are packed	4
	When lithium batteries are packed with equipment	5
	When lithium batteries are contained in equipment	5
1.3	Effective Dates of the UN Recommendations	5
1.4	Transport Guidelines	6
	When only lithium metal batteries are packed	6
	When lithium metal batteries are packed with equipment	8
	When lithium metal batteries are contained in equipment	9
1.5	Regulation Overview	11
	Dangerous goods regulations	11
	Non-dangerous goods regulations	13
1.6	Lithium Content and Weights of the Products	15
2	REGULATION ON TRANSPORTATION OF PRIMARY LITHIUM BATTERIES AND RELEVANT GUIDELINES IN THE UNITED STATES	16
2.1	Models Subject to the DOT Regulation	16
	When only lithium batteries are packed	17
	When lithium batteries are packed with equipment	17
	When lithium batteries are contained in equipment	17
2.2	Regulation Implementation Schedule	18
2.3	Transport Handling Procedure	18
	For transport aboard cargo aircraft	18
	For hand-carried transport aboard passenger aircraft	18
	REVISIONS	19

## 1 PRECAUTIONS FOR TRANSPORT RECOMMENDATIONS ON LITHIUM BATTERIES

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Transport recommendations on lithium batteries (hereinafter UN Recommendations) have been revised and effective as of January 1, 2009. Accordingly, the corresponding part of the IATA Dangerous Goods Regulations has been changed from the 44th Edition to the 50th Edition.

This technical bulletin summarizes how to transport lithium batteries in compliance with the UN Recommendations by air, based on the 50th Edition of the IATA Dangerous Goods Regulations. The regulations in the IATA Dangerous Goods Regulations are reviewed and changed every year. A customer who transports lithium batteries is responsible for the package. Please check the latest Edition of the IATA Dangerous Goods Regulations and the UN Recommendations whenever transporting lithium batteries.

In the UN Recommendations, lithium batteries are classified into dangerous goods (Class 9) and non-dangerous goods according to the amount of lithium. Packaging methods of the batteries depend on the classification. The 60th Edition of the IATA Dangerous Goods Regulations was issued on January 1, 2019, and there are some changes on the regulations. For details, refer to the 60th Edition of the IATA Dangerous Goods Regulations.

### Point

If lithium batteries will be transported to, from, or through the United States by air, the batteries must comply with the regulations of the United States as well as the UN Recommendations. For details, refer to the following.

 Page 16 REGULATION ON TRANSPORTATION OF PRIMARY LITHIUM BATTERIES AND RELEVANT GUIDELINES IN THE UNITED STATES

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### 1.1 Change on Lithium Batteries


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#### January 2019

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In the revision as of January 1, 2019, only the following labels can be put on the packages to be transported by air.

 Page 12 Class 9 hazard label

 Page 13 Warning notice


When transporting lithium batteries on and after January 1, 2020, the documents for checking the summary of the UN Recommendations test (Test Summary) must be prepared.

 Page 12 Battery safety test

#### January 2018

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In the revision as of January 1, 2018, the requirements for packaging of lithium metal batteries to be transported by air were added.


 Page 6 Transport Guidelines

#### January 2017

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In the revision as of January 1, 2017, the design of the label which is required on the packages to be transported by air has changed.

 Page 12 Class 9 hazard label

 Page 13 Warning notice

FA-A-0222-E

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**January 2015**

Lithium metal batteries has been forbidden for transport aboard passenger aircraft since January 1, 2015.<sup>\*1\*2</sup>

- \*1 Lithium metal batteries transported as cargo are restricted to Cargo Aircraft Only. The change does not apply to lithium metal batteries transported by sea.
- \*2 The change does not apply to lithium metal batteries packed with equipment or contained in equipment.

**January 2009**

In the revision as of January, 2009, the regulations on transport of non-dangerous goods have been changed.

The regulations on transport of dangerous goods have not been changed.

The following are the changes in the 50th Edition from the 44th Edition.

- (1) A declaration for non-dangerous goods must be attached to a product for each shipment. The format depends on a carrier. Contact the carrier for the documentation.
- (2) When only lithium batteries are packed or lithium batteries are packed with equipment, a drop test report must be submitted upon request from a carrier. A drop test must be performed by the shipper with referring to the following.  
☞ Page 13 Packaging certification
- (3) A label showing a shipper's contact must be affixed. Prepare the label referring to the following section. For details, refer to the following.  
☞ Page 13 Non-dangerous goods regulations
- (4) When a product is overpacked (including when multiple packages are packed in one), the package must be marked with the word "OVERPACK" and affixed with a handling label. For details, refer to the following.  
☞ Page 13 Non-dangerous goods regulations
- (5) When only lithium batteries are packed or lithium batteries are packed with equipment, the package is subject to the UN Recommendations independent of the number of batteries. (In the 44th Edition, the package is not controlled if the included number of batteries is within the allowable number.) Also, when lithium batteries are contained in equipment and packed, the package is subject to the UN Recommendations if the contained number of batteries are more than the allowable number. (In the 44th Edition, the package is not controlled independent of the number of batteries.)

## 1.2 Models Subject to the UN Recommendations

The following table lists the models subject to the UN Recommendations among products for Mitsubishi Electric programmable controllers. Batteries are classified in the following table depending on the product supply status (lithium batteries only, lithium batteries packed with equipment, lithium batteries contained in equipment).

Product supply status	Description
Lithium batteries only	Only lithium batteries are packed.
Lithium batteries packed with equipment	Lithium batteries and equipment are separated in the same package. (Example: The Q2MEM-BAT and Q2MEM-1MBS are separated in the same package.)
Lithium batteries contained in equipment	Lithium batteries are contained in equipment and packed. (Example: The Q6BAT is mounted on the R04CPU and packed.)

For the batteries of the programmable controllers used, refer to the manuals for each product.

### When only lithium batteries are packed

Product	Model	Battery type	Classification in transport
Q series battery	Q8BAT	Lithium metal battery (battery)	Dangerous goods
	Q8BAT-SET		
Q/L series, MELSEC iQ-R series battery	Q7BATN	Lithium metal battery (cell)	
	Q7BAT		
	Q7BATN-SET	Lithium metal battery (battery)	
	Q7BAT-SET	Lithium metal battery (cell)	
Q/L/QS series, MELSEC iQ-R series battery	Q6BAT	Lithium metal battery (cell)	
A/QnA series battery	A10BAT	Lithium metal battery (battery)	
	A8BAT		
	A6BAT	Lithium metal battery (cell)	
K series battery	K6BAT		
PM series battery	PM-20BL		
MELSEC-F series battery	F2-40BL		
	F-12BL, F-20BL, F-40BL		
	FX1N-BAT	Lithium metal battery (battery)	
MELSEC-F series and MELSEC iQ-R/MELSEC iQ-F series battery	FX2NC-32BL	Lithium metal battery (cell)	Non-dangerous goods
	FX3U-32BL		
Q series memory card battery	Q2MEM-BAT, Q3MEM-BAT		

For the transport guidelines, refer to the following.

### When lithium batteries are packed with equipment

Product	Model	Battery type	Classification in transport
Q series memory card	Q2MEM-1MBSN, Q2MEM-1MBS, Q2MEM-2MBSN, Q2MEM-2MBS	Lithium metal battery (Q2MEM-BAT)	Non-dangerous goods
	Q3MEM-4MBS, Q3MEM-8MBS	Lithium metal battery (Q3MEM-BAT)	
	Q3MEM-4MBS-SET, Q3MEM-8MBS-SET		
QnA(S) series memory card	Q1MEM-128S, Q1MEM-128SE, Q1MEM-1MS, Q1MEM-1MSE, Q1MEM-256S, Q1MEM-256SE, Q1MEM-2MS, Q1MEM-512S, Q1MEM-512SE, Q1MEM-64S, Q1MEM-64SE	Lithium metal battery (cell)	

For the transport guidelines, refer to the following.

☞ Page 8 When lithium metal batteries are packed with equipment

### When lithium batteries are contained in equipment

Product	Model	Battery type	Classification in transport
AnS/QnA(S) series gateway set	Q6KT-NETGW-SS, Q6KT-NETGW-RS, Q6KT-NETGW-TS, Q6KT-NETGW-TB	Lithium metal battery (A6BAT)	Non-dangerous goods
Q series CPU module	All models	Lithium metal battery (Q6BAT)	
L series CPU module	All models		
QS series CPU module	All models		
MELSEC iQ-R series CPU module (Programmable controller CPU, Process CPU, SIL2 Process CPU, Safety CPU)	All models (other than R00CPU, R01CPU, and R02CPU)		
Q series C Controller module	All models		
MELSEC iQ-R series C Controller module	R12CCPU-V	Lithium metal battery (cell)	
BOX Data Logger	NZ2DL	Lithium metal battery (Q6BAT)	
Q series network module	QJ71WS96, QJ71WS96-MES, QJ71MES96		
FX3U series main module	All models	Lithium metal battery (FX3U-32BL)	
FX3UC series main module	All models		
MELSEC-F series handy programming panel	FX-30P		
MELSEC-F series positioning module	FX2N-20GM	Lithium metal battery (FX2NC-32BL)	
Q series MELSECWinCPU module	Q10WCPU-W1-E, Q10WCPU-W1-CFE	Lithium metal battery (cell)	

For the transport guidelines, refer to the following.

☞ Page 9 When lithium metal batteries are contained in equipment

## 1.3 Effective Dates of the UN Recommendations

The following table lists the dates when the UN Recommendations are taken effect in each transport.

Transport	UN Recommendations	Start of enforcement
Air transport (ICAO <sup>*1</sup> /IATA <sup>*2</sup> )	Controlled	January 1, 2009 (50th Edition)
Sea transport (IMDG Code <sup>*3</sup> )	Controlled	January 1, 2004 (44th Edition)
Land transport (domestic)	Not controlled	Not determined
Land transport (international)	Depends on regulations of each country.	Depends on regulations of each country. United States: October 1, 2004 Europe: July 1, 2003

\*1 ICAO: International Civil Aviation Organization

\*2 IATA: International Air Transport Association

\*3 IMDG Code: International Maritime Dangerous Goods Code specified by IMO (International Maritime Organization)

### 1.4 Transport Guidelines

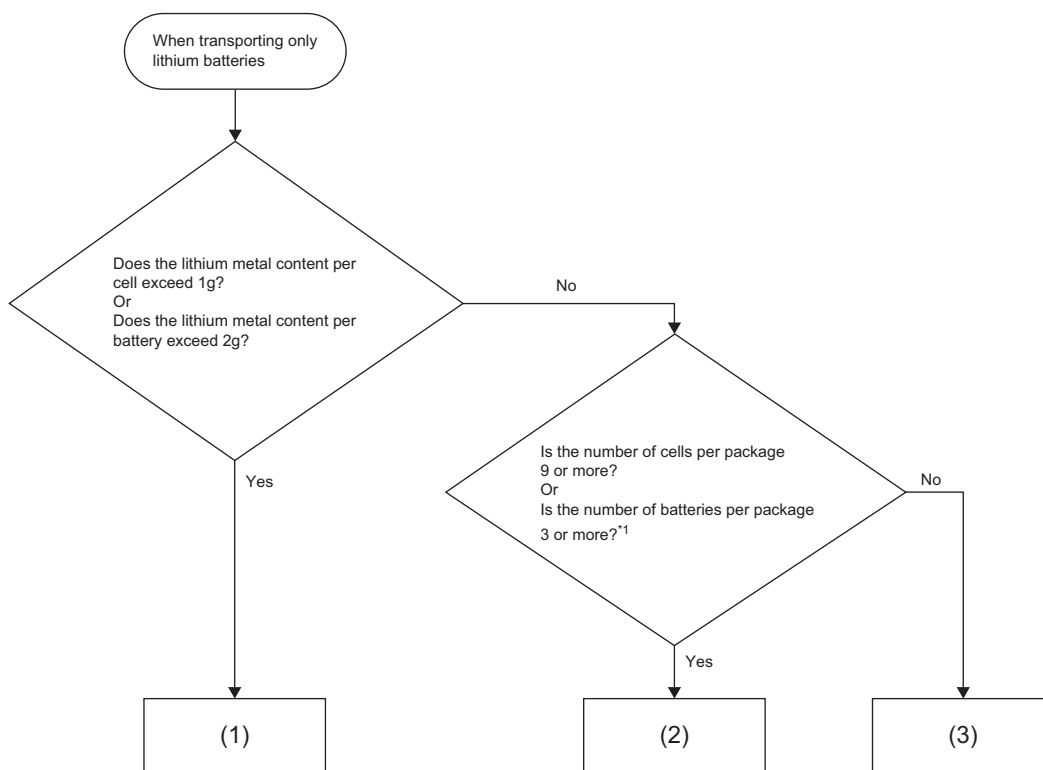
When a customer transports the Mitsubishi Electric programmable controllers by means of transport subject to the UN Recommendations shown below, pay attention to descriptions in this chapter. Note that the packaging guidelines differ between dangerous goods and non-dangerous goods.

For the transportation subject to the UN Recommendations, refer to the following.

(☞ Page 5 Effective Dates of the UN Recommendations)

#### When only lithium metal batteries are packed




Use the following flowchart to take the necessary actions when transporting only lithium metal batteries.



\*1 When a cell or battery contains the lithium metal of 0.3g or less, select "No" regardless of the number of lithium batteries.

Item	(1)	(2)	(3)
Packaging requirements	Section IA	Section IB	Section II
Restrictions	Net weight of lithium batteries per package <ul style="list-style-type: none"> <li>• Passenger aircraft: Prohibition of transport</li> <li>• Cargo aircraft: 35kg</li> </ul>	Net weight of lithium batteries per package <ul style="list-style-type: none"> <li>• Passenger aircraft: Prohibition of transport</li> <li>• Cargo aircraft: 2.5kg</li> </ul>	<ul style="list-style-type: none"> <li>• Passenger aircraft: Prohibition of transport</li> <li>• Up to one package per air way bill or HAWB</li> <li>• Lithium batteries must be carried into the aircraft separately from non-dangerous goods.</li> </ul> Lithium batteries containing the following amounts of lithium metal cannot be packed in the same package. <ul style="list-style-type: none"> <li>■ Cell or battery of 0.3g or less               <ul style="list-style-type: none"> <li>• Number of cells and batteries per package: No restriction</li> <li>• Net weight of cells and batteries per package: 2.5kg</li> </ul> </li> <li>■ Cell of more than 0.3g and 1g or less               <ul style="list-style-type: none"> <li>• Net weight of cells per package: 8 or less</li> <li>• Net weight of cells per package: No restriction</li> </ul> </li> <li>■ Battery of more than 0.3g and 2g or less               <ul style="list-style-type: none"> <li>• Net weight of batteries per package: 2 or less</li> <li>• Net weight of batteries per package: No restriction</li> </ul> </li> </ul>
Dangerous goods declaration	Required (☞ Page 12 Transport document)	Required (☞ Page 12 Transport document)	Not required (☞ Page 14 Transport document)

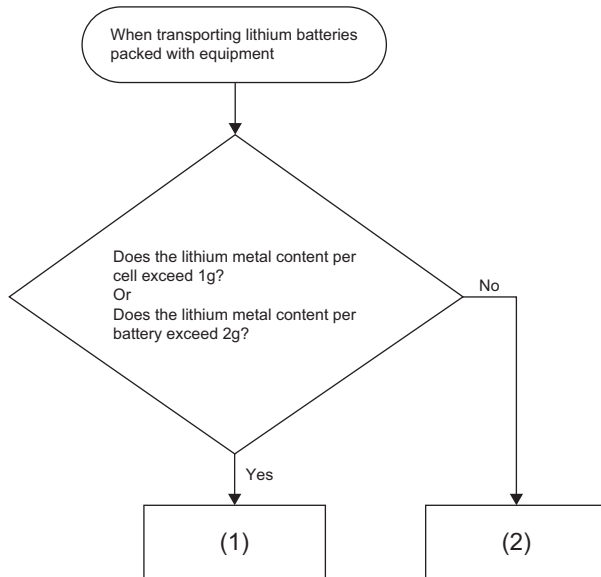
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Item	(1)	(2)	(3)
Air way bill (AWB)	Text of "Dangerous goods as per attached shipper's declaration" or "Dangerous goods as per attached DGD" and "Cargo Aircraft Only" or "CAO"	Text of "Dangerous goods as per attached shipper's declaration" or "Dangerous goods as per attached DGD" and "Cargo Aircraft Only" or "CAO"	Text of "Lithium metal batteries in compliance with Section II of PI968" and "Cargo Aircraft Only" or "CAO"
Warning notice	<ol style="list-style-type: none"> <li>Class 9 label for lithium batteries and CAO handling label</li> <li>Mark as dangerous goods according to the requirements of DGR Chapter 7   Page 11 Warning notice</li> </ol>	<ol style="list-style-type: none"> <li>Class 9 label for lithium batteries, CAO handling label, and lithium battery mark</li> <li>Mark as dangerous goods according to the requirements of DGR Chapter 7   Page 11 Warning notice</li> </ol>	<ol style="list-style-type: none"> <li>CAO handling label and lithium battery mark</li> <li>Mark as required according to the PI968 Section II (for overpack)   Page 13 Warning notice</li> </ol>
UN-approved container	Must be a UN-approved container that meets the requirements of packing group II	Not required (However, the container must have passed the 1.2m drop test.)	Not required (However, the container must have passed the 1.2m drop test.)
Packed with different dangerous goods	Do not pack a lithium battery in the same outer package with dangerous goods classified in Class 1 other than Division 1.4S (explosives), Division 2.1 (flammable gas), Class 3 (flammable liquid), Division 4.1 (flammable solid) or Division 5.1 (oxidizing substances).	Do not pack a lithium battery in the same outer package with dangerous goods classified in Class 1 other than Division 1.4S (explosives), Division 2.1 (flammable gas), Class 3 (flammable liquid), Division 4.1 (flammable solid) or Division 5.1 (oxidizing substances).	Do not pack a lithium battery in the same outer package with other dangerous goods.
Overpack	Do not place a lithium battery in the same overpack with packages containing dangerous goods classified in Class 1 other than Division 1.4S (explosives), Division 2.1 (flammable gas), Class 3 (flammable liquid), Division 4.1 (flammable solid) or Division 5.1 (oxidizing substances).	Do not place a lithium battery in the same overpack with packages containing dangerous goods classified in Class 1 other than Division 1.4S (explosives), Division 2.1 (flammable gas), Class 3 (flammable liquid), Division 4.1 (flammable solid) or Division 5.1 (oxidizing substances).	<ul style="list-style-type: none"> <li>Up to one package per overpack</li> <li>Do not place a lithium battery in the same overpack with packages containing dangerous goods classified in Class 1 other than Division 1.4S (explosives), Division 2.1 (flammable gas), Class 3 (flammable liquid), Division 4.1 (flammable solid) or Division 5.1 (oxidizing substances).</li> </ul>
Shipper-loaded ULD	Not allowed	Not allowed	Not allowed
Three-digit code for dangerous goods (IMP CODE)	RBM (applied to the lithium metal batteries classified in the Section IA and IB)	RBM (applied to the lithium metal batteries classified in the Section IA and IB)	EBM (applied to the lithium metal batteries classified in the Section II)

FA-A-0222-E

### When lithium metal batteries are packed with equipment

Use the following flowchart to take the necessary actions when transporting lithium metal batteries packed with equipment.



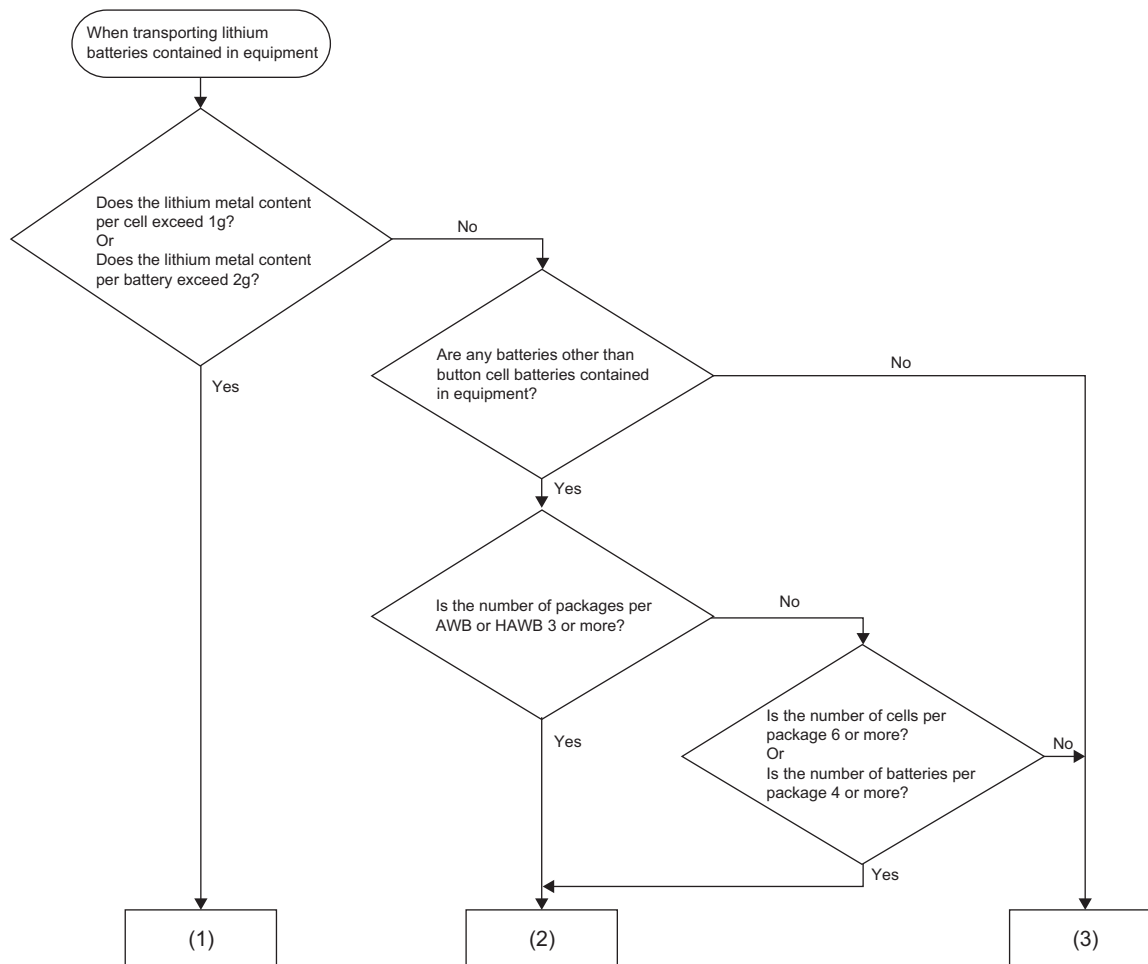
Item	(1)	(2)
Packaging requirements	Section I	Section II
Restrictions	The number of lithium batteries per package is the proper number of lithium batteries to operate equipment and up to two spare lithium batteries. Also take into account the net weight of lithium batteries per package. <ul style="list-style-type: none"> <li>• Passenger aircraft: 5kg</li> <li>• Cargo aircraft: 35kg</li> </ul>	The number of lithium batteries per package is the proper number of lithium batteries to operate equipment and up to two spare lithium batteries. Also take into account the net weight of lithium batteries per package. <ul style="list-style-type: none"> <li>• Passenger aircraft: 5kg</li> <li>• Cargo aircraft: 5kg</li> </ul>
Dangerous goods declaration	Required (☞ Page 12 Transport document)	Not required (☞ Page 13 Warning notice)
Air way bill (AWB)	Text of "Dangerous goods as per attached shipper's declaration" or "Dangerous goods as per attached DGD"	Text of "Lithium metal batteries in compliance with Section II of PI969"
Warning notice	1. Class 9 label for lithium batteries 2. Mark as dangerous goods according to the requirements of DGR Chapter 7 ☞ Page 11 Warning notice	1. Lithium battery mark 2. Mark as required according to the PI969 Section II (for overpack) ☞ Page 13 Warning notice
UN-approved container	The container in which lithium batteries are packed must be a UN-approved container that meets the requirements of packing group II. (In addition, when transporting aboard passenger aircraft, non-flammable and non-conductivity cushioning materials and metal intermediate or outer container must be used.)	Not required (however, the container in which lithium batteries are packed must have passed the 1.2m drop test.)
Shipper-loaded ULD	Not allowed	Allowed (A lithium battery mark is also required on the outside of the ULD.)
Three-digit code for dangerous goods (IMP CODE)	RLM (applied to the lithium metal batteries which are classified in the Section I and packed with or contained in equipment)	ELM (applied to the lithium metal batteries which are classified in the Section II and packed with or contained in equipment)



FA-A-0222-E

### When lithium metal batteries are contained in equipment

Use the following flowchart to take the necessary actions when transporting lithium metal batteries contained in equipment.



Item	(1)	(2)	(3)
Packaging requirements	Section I	Section II	Section II
Restrictions	Lithium metal content per lithium battery <ul style="list-style-type: none"> <li>• Cell: 12g or less</li> <li>• Battery: 500g or less</li> </ul> Also take into account the net weight of lithium batteries per package. <ul style="list-style-type: none"> <li>• Passenger aircraft: 5kg</li> <li>• Cargo aircraft: 35kg</li> </ul>	Net weight of lithium batteries per package <ul style="list-style-type: none"> <li>• Passenger aircraft: 5kg</li> <li>• Cargo aircraft: 5kg</li> </ul>	Net weight of lithium batteries per package <ul style="list-style-type: none"> <li>• Passenger aircraft: 5kg</li> <li>• Cargo aircraft: 5kg</li> </ul>
Dangerous goods declaration	Required (☞ Page 12 Transport document)	Not required (☞ Page 14 Transport document)	Not required (☞ Page 14 Transport document)
Air way bill (AWB)	Text of "Dangerous goods as per attached shipper's declaration" or "Dangerous goods as per attached DGD"	Text of "Lithium metal batteries in compliance with Section II of PI970"	Not required Do not describe the text of Section II on the AWB.
Warning notice	1. Class 9 label for lithium batteries 2. Mark as dangerous goods according to the requirements of DGR Chapter 7 ☞ Page 11 Warning notice	1. Lithium battery mark 2. Mark as required according to the PI970 Section II (for overpack) ☞ Page 13 Warning notice	Not required
UN-approved container	Not required	Not required	Not required
Shipper-loaded ULD	Not allowed	Allowed (A lithium battery mark is also required on the outside of the ULD.)	Allowed

FA-A-0222-E

Item	(1)	(2)	(3)
Three-digit code for dangerous goods (IMP CODE)	RLM (applied to the lithium metal batteries which are classified in the Section I and packed with or contained in equipment)	ELM (applied to the lithium metal batteries which are classified in the Section II and packed with or contained in equipment)	—

## 1.5 Regulation Overview

### Dangerous goods regulations

This section describes regulations on dangerous goods.

For details, refer to the IATA Dangerous Goods Regulations.

#### Packaging specifications

The specifications must comply with the Packing Instructions 968, 969, and 970 in the 50th Edition of the IATA Dangerous Goods Regulations.

Depending on the packaging status, how to handle lithium metal batteries as dangerous goods differs. For details, refer to the following.

Packaging	Packaging requirements	Reference
Lithium batteries only	Section IA, Section IB	Page 6 When only lithium metal batteries are packed
Lithium batteries packed with equipment	Section I	Page 8 When lithium metal batteries are packed with equipment
Lithium batteries contained in equipment	Section I	Page 9 When lithium metal batteries are contained in equipment

#### Packaging certification

The packaging certification (UN3090, UN3091) must be obtained from the authority. For details on a test for the certification, contact the authority.

However, the certification is not required when a UN-approved container is purchased from a manufacturer.

Packaging when lithium batteries are contained in equipment depends on a carrier.

For details, contact the carrier.

#### Warning notice

The UN mark and UN container marking must be described and affixed and the Class 9 hazard label must be affixed on the outer packaging.

Packaging when lithium batteries are contained in equipment depends on a carrier.

For details, contact the carrier.

#### ■ UN mark

This mark is granted by the authority.



#### ■ UN container marking

Describe the following information on the UN container marking.

- "Lithium battery" in the PROPER SHIPPING NAME field
- "UN3090" for transportation of lithium batteries only or "UN3091" for transportation of lithium batteries packed with or contained in equipment in the UN NO. field
- The name and address of the shipper and consignee in the SHIPPER and CONSIGNEE fields, respectively

FA-A-0222-E

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**■ Class 9 hazard label**

For how to obtain this label, contact the authority.



Minimum dimensions: 100mm high, 100mm wide

**Transport document**

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The Shipper's Declaration for Dangerous Goods must be attached to a package for each shipment.

For details, contact the carrier.

**Battery safety test**

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All transported lithium batteries must pass the safety test specified by the UN. The lithium batteries for programmable controller products listed in the following page have passed the safety test. No actions need to be taken by a customer.

 Page 4 Models Subject to the UN Recommendations

When transporting lithium batteries, obtain the required documents from our company to check the summary of the UN Recommendations test (Test Summary). (required from January 1, 2020)

FA-A-0222-E

### Non-dangerous goods regulations

This section describes regulations on non-dangerous goods.  
For details, refer to the IATA Dangerous Goods Regulations.

#### Packaging specifications

Except lithium batteries contained in equipment, lithium batteries and equipment must be individually separated in an inner packaging and they must be packed with strong outer packaging so that the batteries can be protected against external short circuit.

Depending on the packaging status, how to handle lithium metal batteries as dangerous goods differs. For details, refer to the following.

Packaging	Packaging requirements	Reference
Lithium batteries only	Section II	Page 6 When only lithium metal batteries are packed
Lithium batteries packed with equipment	Section II	Page 8 When lithium metal batteries are packed with equipment
Lithium batteries contained in equipment	Section II	Page 9 When lithium metal batteries are contained in equipment

#### Packaging certification

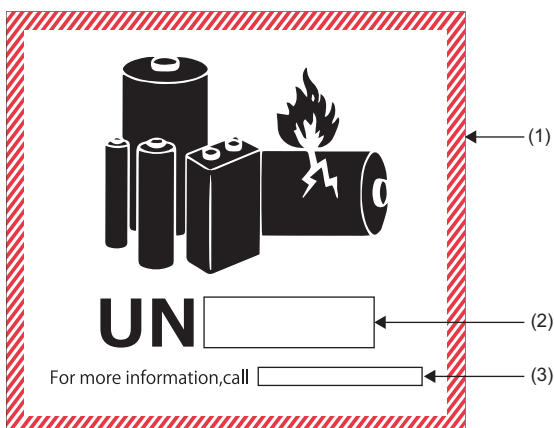
Except lithium batteries contained in equipment, each package must be capable of withstanding a 1.2m drop test in any orientation (self-certification is allowed.) without:

- Damages to lithium batteries contained therein;
- Shifting of the contents so as to allow battery to battery contact;
- Release of contents.

Upon a request from a carrier, a drop test report must be submitted. When only lithium batteries are packed or lithium batteries are packed with equipment, a drop test must be performed to the package and the drop test report must be created. For details, contact the carrier.

#### Warning notice

Affix the below shown handling label specified in the 50th Edition of the IATA Dangerous Goods Regulations on the surface of each outer packaging. (Describe a sender's phone number available for 24 hours.) The label must be affixed on outer packaging of each package that passed a drop test (including individual packaging boxes shipped by us) and to outer packaging after overpack. If individual packaging box is too small to affix the label on, affix the label on the outer packaging only.



(1) The hatching must be red and the minimum width must be 5mm.

(2) Describe the UN number on the label.

- Lithium batteries only: UN3090
- Lithium batteries packed with equipment: UN3091
- Lithium batteries contained in equipment: UN3091

Note: When one or more packages are placed into an overpack, all the applicable numbers must be described.

(3) Describe a sender's phone number available for 24 hours.

Minimum dimensions: 110mm high, 120mm wide

For details, contact the carrier.

When lithium batteries are contained in equipment and the number of lithium batteries (cell) in one package is less than five, the warning notice and the transport document are not required.

FA-A-0222-E

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**Transport document**

A declaration for non-dangerous goods must be attached to a package for each shipment with the following information.

- Inclusion of lithium batteries in the package
- Corrective actions when the package is impacted


Format of the document depends on a carrier.

For details, contact the carrier.

When lithium batteries are contained in equipment and the number of lithium batteries (cell) in one package is less than five, the warning notice and the transport document are not required.

**Battery safety test**


All transported lithium batteries must pass the safety test specified by the UN. The lithium batteries for programmable controller products listed in the following page have passed the safety test. No actions need to be taken by a customer.

 Page 4 Models Subject to the UN Recommendations

**Overpack**

When a package including lithium batteries is overpacked with outer packaging (including when multiple packages are packed in one), the package will be regarded as an overpack and must be marked with the word "OVERPACK" on the outer packaging. (The marking is also required for a package that includes lithium batteries and equipment individually in an inner packaging and not subject to the UN Recommendations.)

When a package subject to the UN recommendations is overpacked, affix the handling label on the outer packaging.

( Page 13 Warning notice)


FA-A-0222-E

## 1.6 Lithium Content and Weights of the Products


The lithium content and weights of Mitsubishi Electric programmable controller batteries are shown below for reference purposes.

Part or product name	Model	Lithium content	Weight
Q series battery	Q8BAT	5.7g <sup>*1</sup>	387g
	Q8BAT-SET	5.7g <sup>*1</sup>	429g
Q/L series, MELSEC iQ-R series battery	Q7BATN	1.8g	48g
	Q7BAT	1.55g	47g
	Q7BATN-SET	1.8g	60g
	Q7BAT-SET	1.55g	57g
Q/L/QS series, MELSEC iQ-R series battery	Q6BAT	0.57g <sup>*2</sup>	17g
A/QnA series battery	A10BAT	4.16g <sup>*4</sup>	275g
	A8BAT	4.68g <sup>*4</sup>	335g
	A6BAT	0.52g <sup>*4</sup>	14g
K series battery	K6BAT	0.65g	17.5g
PM series battery	PM-20BL	0.31g	30g <sup>*3</sup>
MELSEC-F series battery	F2-40BL	0.60g	40g <sup>*3</sup>
	F-12BL, F-20BL, F-40BL	0.60g	40g <sup>*3</sup>
	FX2NC-32BL	0.15g	30g <sup>*3</sup>
	FX1N-BAT	0.07g	30g <sup>*3</sup>
MELSEC-F series and MELSEC iQ-R/MELSEC iQ-F series battery	FX3U-32BL	0.15g	30g <sup>*3</sup>
Q series memory card battery	Q2MEM-BAT	0.014g	0.8g
	Q3MEM-BAT	0.15g	6.7g
Lithium coin battery contained in the MELSEC iQ-R series C Controller module	BR2450A	0.16g	5.0g
Lithium coin battery packed with memory card for the QnA(S) series	BR2325	0.05g	3.2g

\*1 The lithium content of batteries manufactured in November 2017 or earlier differs from this list. For details, refer to the following.


 Changes in battery parts (FA-A-0242)

\*2 The lithium content of batteries manufactured in July 2017 or earlier differs from this list. For details, refer to the following.

 Changes in battery parts (FA-A-0242)

\*3 This weight is measured after the battery is packed.

\*4 The lithium content of batteries manufactured in December 2018 or earlier differs from this list. For details, refer to the following.

 Changes in battery parts (A6BAT, A8BAT, A10BAT) (FA-A-0270)

## 2 REGULATION ON TRANSPORTATION OF PRIMARY LITHIUM BATTERIES AND RELEVANT GUIDELINES IN THE UNITED STATES

Effective from December 29, 2004, the U.S. Department of Transportation (DOT) enacted a battery transport regulation that prohibits the domestic transport of primary lithium batteries aboard passenger aircraft (transport is allowed by cargo aircraft only). A procedure is therefore required to prevent the accidental transport of primary lithium batteries on passenger aircraft to or within the United States (The regulation applies to shipments which pass via the United States and also those from the United States to other final destinations).

This chapter shows guidelines for transportation of primary lithium batteries by air under the DOT regulation (Department of Transportation 49 CFR Parts 171, 172, 173 and 175 Hazardous Materials; Prohibition on the Transportation of Primary Lithium Batteries and Cells Aboard Passenger Aircraft; Final Rule). When arranging the transportation of Primary Lithium Batteries, responsibility for the transportation as the owner of goods is required. Therefore, it is advisable to always confirm the DOT regulation.

Furthermore, please contact the relevant airline for details, as the regulation may be handled differently from one airline to another.



If lithium batteries will be transported to, from, or through the other places than the United States by air, the batteries must comply with the regulations of the UN Recommendations. You do not need to comply with the regulations of the United States. For details, refer to the following.

Page 2 PRECAUTIONS FOR TRANSPORT RECOMMENDATIONS ON LITHIUM BATTERIES

### 2.1 Models Subject to the DOT Regulation

The following table lists control item to the DOT regulation in Mitsubishi Electric programmable controllers. Batteries are classified in the following table depending on the product supply status (lithium batteries only, lithium batteries packed with equipment, lithium batteries contained in equipment).

Product supply status	Description
Lithium batteries only	Only lithium batteries are packed.
Lithium batteries packed with equipment	Lithium batteries and equipment are separated in the same package. (Example: The Q2MEM-BAT and Q2MEM-1MBS are separated in the same package.)
Lithium batteries contained in equipment	Lithium batteries are contained in equipment and packed. (Example: The Q6BAT is mounted on the R04CPU and packed.)


For the batteries of the programmable controllers used, refer to the manuals for each product.



### When only lithium batteries are packed

Product	Model	Battery type
Q series battery	Q8BAT	Lithium battery (assembled battery)
	Q8BAT-SET	Lithium battery (assembled battery) + Q8BAT connection cable
Q/L series, MELSEC iQ-R series battery	Q7BATN	Lithium battery (assembled battery)
	Q7BAT	Lithium battery
	Q7BATN-SET	Lithium battery (assembled battery) with holder
	Q7BAT-SET	Lithium battery with holder
Q/L/QS series, MELSEC iQ-R series battery	Q6BAT	Lithium battery
A/QnA series battery	A10BAT	Lithium battery (assembled battery)
	A8BAT	Lithium battery (assembled battery)
	A6BAT	Lithium battery
K series battery	K6BAT	Lithium battery
PM series battery	PM-20BL	Lithium battery
MELSEC-F series battery	F2-40BL	Lithium battery
	F-12BL, F-20BL, F-40BL	Lithium battery
	FX1N-BAT	Lithium battery (assembled battery)
	FX2NC-32BL	Lithium battery
MELSEC-F series and MELSEC iQ-R/MELSEC iQ-F series battery	FX3U-32BL	Lithium battery
Q series memory card battery	Q2MEM-BAT, Q3MEM-BAT	Lithium battery

For the transport guidelines, refer to the following.

 Page 6 When only lithium metal batteries are packed

### When lithium batteries are packed with equipment

Product	Model	Battery type
Q series memory card	Q2MEM-1MBSN, Q2MEM-1MBS, Q2MEM-2MBSN, Q2MEM-2MBS	Packed with lithium coin battery (Q2MEM-BAT)
	Q3MEM-4MBS, Q3MEM-8MBS	Packed with lithium coin battery (Q3MEM-BAT)
	Q3MEM-4MBS-SET, Q3MEM-8MBS-SET	Packed with lithium coin battery (Q3MEM-BAT) + Memory card protective cover
QnA(S) series memory card	Q1MEM-128S, Q1MEM-128SE, Q1MEM-1MS, Q1MEM-1MSE, Q1MEM-256S, Q1MEM-256SE, Q1MEM-2MS, Q1MEM-512S, Q1MEM-512SE, Q1MEM-64S, Q1MEM-64SE	Lithium metal battery (cell)

For the transport guidelines, refer to the following.

 Page 8 When lithium metal batteries are packed with equipment

### When lithium batteries are contained in equipment

Product	Model	Battery type
MELSEC iQ-R series C Controller module	R12CCPU-V	Lithium metal battery (BR2450A) is contained.
FX3U series main module	All models	Lithium metal battery (FX3U-32BL)
FX3UC series main module	All models	
MELSEC-F series handy programming panel	FX-30P	Lithium metal battery (FX3U-32BL) is contained.
MELSEC-F series positioning module	FX2N-20GM	Lithium metal battery (FX2NC-32BL) is contained.

For the transport guidelines, refer to the following.

 Page 9 When lithium metal batteries are contained in equipment

FA-A-0222-E

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## 2.2 Regulation Implementation Schedule

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Effective from December 29, 2004

## 2.3 Transport Handling Procedure

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The precautions indicated in the following should be observed when products subject to the DOT regulation are shipped to or within the United States aboard aircraft.

☞ Page 18 For transport aboard cargo aircraft

☞ Page 18 For hand-carried transport aboard passenger aircraft

(The regulation applies to shipments which pass via the United States and also those from the United States to other final destinations).

Please note that even if shipment by sea or land (rail) is specified, the transport company may change this to an air shipment. Therefore, be sure to contact the transport company in advance, and inform them that the shipment contains primary lithium batteries.

### For transport aboard cargo aircraft

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The Class 9 hazard label and warning label must be affixed on the packing case if the lithium content of a battery exceeds 1g or that of an assembled battery exceeds 2g. The fabrication and affixing of these labels is the responsibility of the customer.\*1 The customer is also responsible for notifying the transport company that transport aboard a passenger aircraft is prohibited.

For the lithium content of our products, refer to the following.

☞ Page 15 Lithium Content and Weights of the Products

\*1 For details on labels, refer to the following.

☞ Page 12 Class 9 hazard label

☞ Page 13 Warning notice

### For hand-carried transport aboard passenger aircraft

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#### Primary lithium batteries only

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Lithium metal batteries has been forbidden for transport aboard passenger aircraft since January 1, 2015.\*1

\*1 For details on air transport prohibition of lithium metal batteries aboard passenger aircraft, refer to the following.

☞ Page 6 When only lithium metal batteries are packed

#### Lithium batteries packed with or contained in equipment

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The rules for hand-carried transport aboard passenger aircraft of the lithium batteries packed with or contained in equipment are changed by the IATA Dangerous Goods Regulations 60th edition that was taken effect on January 1, 2019.\*1

For the lithium content and weights of our products, refer to the following.

☞ Page 15 Lithium Content and Weights of the Products

\*1 For details on the rules for hand-carried transport aboard passenger aircraft of the lithium batteries packed with or contained in equipment, refer to the following.

☞ Page 8 When lithium metal batteries are packed with equipment

☞ Page 9 When lithium metal batteries are contained in equipment

**REVISIONS**

Version	Date of Issue	Revision
-	June 2017	First edition
A	November 2017	Addition of FX3U-32BL
B	August 2018	Available for e-Manual Viewer
C	May 2019	Change of the classification in transport for Q6BAT, A6BAT, and K6BAT Addition of Q7BATN, Q7BATN-SET, Q2MEM-1MBSN, and Q2MEM-2MBSN Correction of Chapter 4 and 5
D	February 2020	<ul style="list-style-type: none"> <li>• Integration of the content of technical bulletin "Regulation on Transportation of Primary Lithium Batteries and Relevant Guidelines in the United States (FA-A-0221)" to this technical bulletin</li> <li>• In Chapter 1, the content of this technical bulletin is written. In Chapter 2, the content of the technical bulletin "Regulation on Transportation of Primary Lithium Batteries and Relevant Guidelines in the United States (FA-A-0221)" is written. Chapter 3, 4, and 5 are deleted.</li> <li>• Correction of the following sections due to the addition of MELSEC-F and MELSEC iQ-F series Section 1.2, 1.6, and 2.1</li> </ul>
E	March 2020	Partial correction