

TH10、TH15 Emergency Escape Breathing Devices



JIANGSU HUAYAN MARINE EQUIPMENT CO., LTD.

Preface

TH10、TH15 Emergency Escape Breathing Devices(EEBD) is a personal protective equipment for the people to self-protect when escaping from the accident spot. Only when the device is operated properly, can it performance well, and help the people escape from the accident spot safely within the effective time. Please treasure life, equip with the EEBD in the workplace, and get familiar with its functions and use.

EEBD can't be used for fire fighting, entering oxygen-lacking or liquid-hold cabin, or for the firemen's use.

With the fast renewal of EEBD, the directions will be revised as well. We will not make any further notice about the details of revision.

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Chapter 1 General

1 Main application and range

1.1 Main application

TH10、TH15 EEBD is a self-supplying device, which is mainly used in the condition of fire, heavy smoke, poison gas or less oxygen taken place in marine, high building, business places, chemical industries, transportation and other circumstances. It is a personal protective equipment to protect the respiratory of people to escape from the accident spot.

1.2 Range

a. the atmosphere that is polluted by smoke, poisonous gas or hot vapor, or in the hypoxia situation.

b. In the atmosphere of $-30^{\circ}\text{C} \sim +60^{\circ}\text{C}$, with $0 \sim 100\%$ relative humidity and $0.7\text{bar} \sim 1.25\text{bar}$ air pressure.

2 Main performance index

a. Pressure reducer's inside pressure : (6.5 ± 2) bar

b. Rated working time: TH10 $\geq 10\text{min}$, TH15 $\geq 15\text{min}$

c. The absolute value of breathing resistance: $\leq 300\text{Pa}$

d. Cylinder's rated working pressure: 210bar

e. Cylinder's effective capacity: TH10: 2.2L , TH15: 3.2L

f. Fixed air flow: $\geq 40\text{L/min}$

g. Total weight: TH10 $\leq 6\text{Kg}$, TH15 $\leq 8.56\text{Kg}$

h. Package size (mm): TH10: $480 \times 150 \times 250$

TH15: $520 \times 150 \times 250$

Chapter 2 Structure and Technical Note

1 Structure

Figure 1: The structure of EEBD

- 1-Cylinder valve
- 2-Pressure gauge
- 3-Quick connector
- 4- Cylinder
- 5-Breathing hose
- 6-Head harness
- 7-Pressure reducer
- 8—chain, bolt

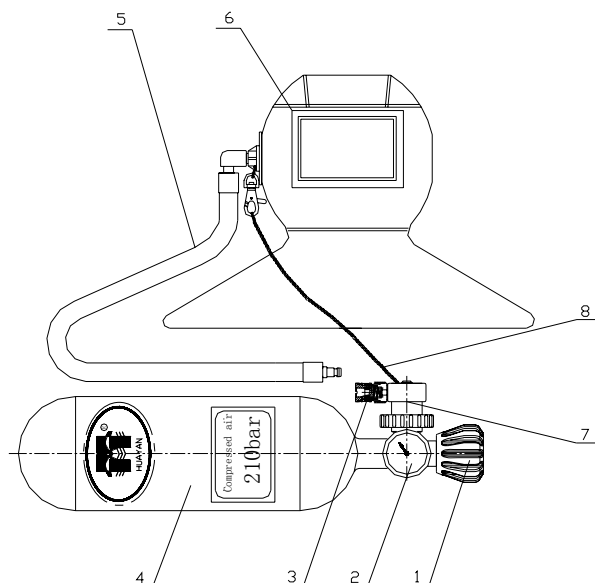


Figure 1 structure of EEBD

2 Technical Note

2.1 Cylinder

The cylinder is made from steel alloy materials. Its capacity and rated working pressure are showed in table 1. Check its term of validity before using the cylinder, it is forbidden to use after expiry. Cylinder's hydrostatic test must be taken every three years and must be retaken over three years. Only when the water pressure is up to standard, can it be put to use. Find the term of validity in the cylinder's certificate and directions, which should be 12 years in general.

Table 1

Model	Capacity (L)	Rated working pressure(bar)	Weight	Material	Term of validity
TH10	2.2	210	≤6Kg	Steel	12
TH15	3.2	210	≤8.5Kg	Steel	12

2.2 Cylinder valve

Cylinder valve is so designed for opening and closing the gas resource, equipped with over pressure protective diaphragm, When the inside pressure exceeds rated working pressure by 25% or more, the diaphragm will blast automatically to release the pressure. In this case, the blasted diaphragm shall be delivered to the manufactory for replacement.

The cylinder has been subject to rated working pressure test after assembled, so it shall not be disassembled at random. If it needs to be disassembled for repair, 210bar air pressure leak tightness test shall be taken after being reassembled.

The cylinder valve is equipped with pressure gauge which shows the inside pressure of cylinder (the standard pressure is 210bar at a temperature of 20°C). The user shall check the value on the gauge regularly, and recharge the cylinder when the value is less than 210bar. The cylinder valve has two kinds of structure: 1) the pressure gauge indicates the exact value of inside pressure, which can be read directly; 2) The pressure gauge does not show the value of inside pressure. The cylinder valve shall be open when checking the pressure and close soon after in order not to waste the air, as shown in Figure 2-1, Figure 2-2.

1. Screw off locknut anticlockwise and unplug the quick connector.

2. Screw off the plastic handle of cylinder valve anticlockwise, and check the Pressure.

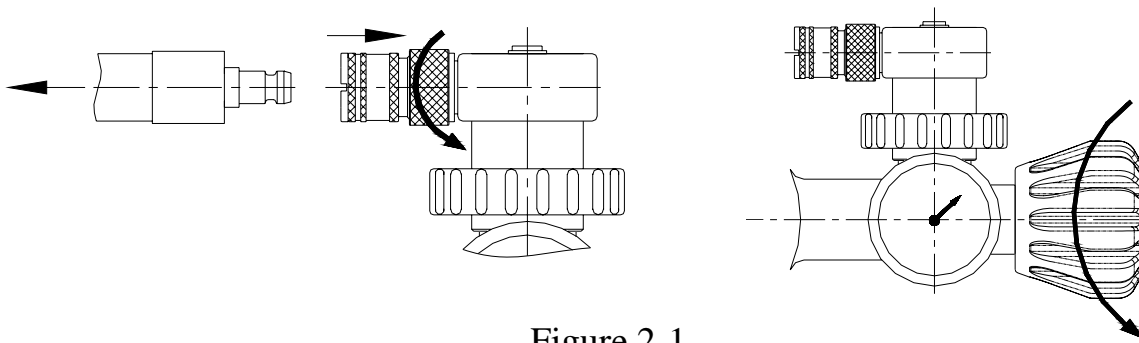


Figure 2-1

3. Switch off the head Valve,
and plug the quick connector.

4.Screw the quick connector in
clockwise and lock the nut.

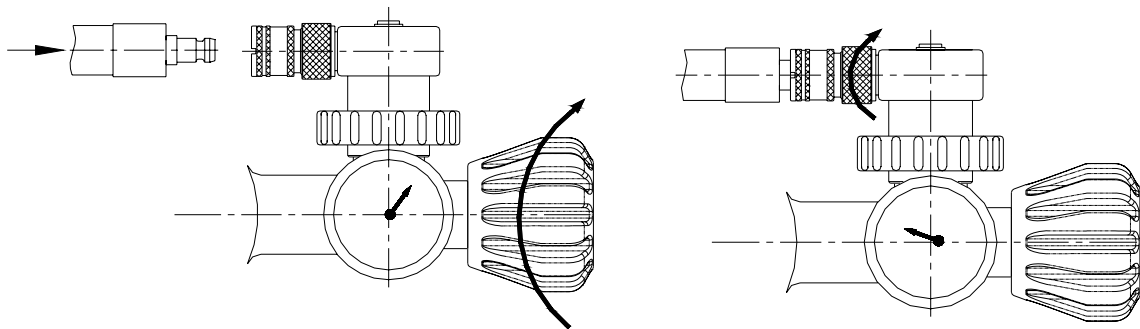


Figure 2-2

2.3 Pressure reducer

a. Structure

Find the structures of pressure reducer in Figure 3

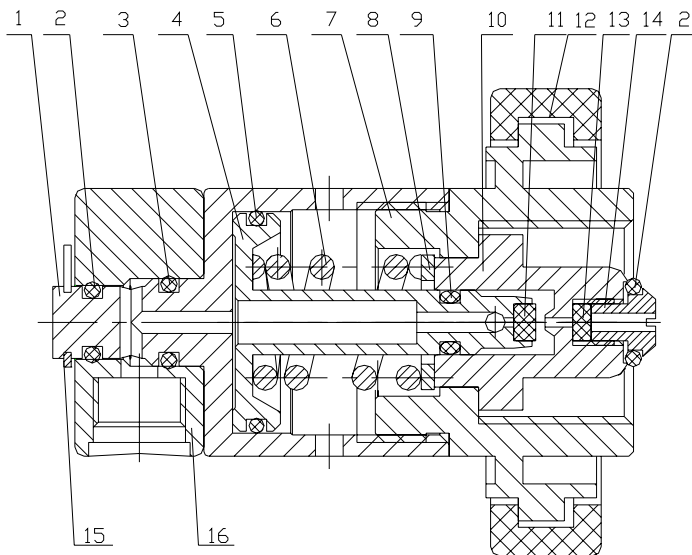


Figure 3 the structure of pressure reducer

- | | | | |
|---------------------------------|--------------------|-------------------------------|-----------------|
| 1-Main body of pressure reducer | 2-O-ring 5×1.8 | | |
| 3- O-ring 6×1.8 | 4-piston | 5- O-ring 20×1.8 | |
| 6-ring | 7-Handle connector | 8-Adjust pad | 9- O-ring 4×1.8 |
| 10-Connector fuse | 11-Seal pad | 12-Connector nut handle wheel | |

13-Filter net 14-Top wire 15-Split washer 16-Ferrule

Pressure reducer can reduce 210bar high-pressure air into (6.5 ± 2) bar, which passes through the breathing hose into head harness and supplies fresh air to the wearer.

b. Technical Parameter

(1) Input pressure: 210bar

(2) Output pressure: (6.5 ± 2) bar

2.4 Breathing hose

Breathing hose is made of high-pressure rubber hose, one port of which is connected with the quick connector of the pressure reducer, please check the illustration in figure 4; The other one connects with the head harness, the hose has ration hole, through which the air passes to the wearer.

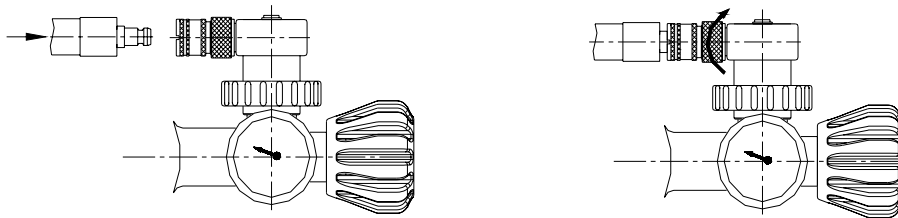


Figure 4

2.5 Head harness

Head harness is made up of window、face piece、tippet. The face mask is made from fire-resistant fabric, resistant to fire.

Notice:Because the face mask and cylinder valve are connected by a metal chain, the chain will be separated from cylinder valve only when turn on the cylinder valve , so user can not take out the face mask or wear until he turn on the cylinder valve .

2.6 Satchel

When keeping in reserve, satchel can be used to pack the EEBD, and can be hung around the neck of user to take head harness out conveniently and carry the cylinder when using, it. The satchel is printed with wearing directions and simplified diagram.

Chapter 3 Donning Instruction

3.1 Wear the satchel over the neck of user, contrarotate the cylinder valve to open it .



Figure 5



Figure 6

3.2 Take out the face mask from Satchel promptly ,

Wear the face mask on the head from up to down; make sure the transparent window toward the face and the tippet covering the shoulder. Escape from the accident spot promptly .



Figure 7



Figure 8

Chapter 4 Management after Use

Shall finish the work as following steps to restore EEBD to its reserving state timely after using as required:

1. Take off the head harness, clean the polluted parts, and examine to see if

there's any damage in the other parts of EEBD, which shall be maintained or replaced timely in case of damage. The whole set of face mask shall be replaced if there is any damage in the compound part.

2. Take the chain part from the face mask , see Figure 9



Figure 9



Figure 10

3. Recharge the air into cylinder , turn off the cylinder valve after finishing the charging , place the bolt to the groove of cylinder valve, turn off the handwheel and the bolt must be entirely covered by the handwheel . (see figure 11)

The inside pressure shall not be less than 210bar (at 20°C) when the cylinder cools down.



Figure 11



Figure 12

4. Reconnect the cylinder to EEBD, connect the other side of chain to the face mask (see Figure 12) then put EEBD into satchel for standby.

Chapter 5 Inspection and Maintenance

EEBD shall be subject to a complete examination every quarter when in reserve.

5.1 Routine check

5.1.1 Check every part of EEBD to see if there is any spoilage.

5.1.2 Observe value of the pressure gauge to check the inside pressure of the cylinder, which shall not be less than 200bar. Recharge to 210bar (at 20°C) when

it is less than standard value, but shall not exceed pointed value.

※Note: The inside pressure of the cylinder will change with the temperature outside fluctuating. It is a normal phenomenon that the inside pressure is on the low side under a low temperature or on the high side due to a high temperature. The inside air pressure is 210bar at the normal temperature of 20°C. Please check the table 2 for the interrelation of the temperature and the pressure as follows (approximation).

Table 2

Temperature	Air pressure inside the cylinder (bar)	Temperature	Air pressure inside the cylinder bar
-30°C	160	20°C	210
-20°C	170	30°C	220
-10°C	180	40°C	230
0°C	190	50°C	240
10°C	200	60°C	250

5.2 Routine Maintenance

5.2.1 Cylinder

a. the air cylinder shall be protected from crash, scar, and knock; shall avoid pyro-roast, frozen, and insolation; Repair the surface if the old paint peeled off to prevent from corrosion on the outside wall of cylinder.

b. Cylinder shall be used within the term signed on it, and shall be inspected periodically, once every three years, the user must have the cylinder examined accordingly at least every three years. Only when it passes the examination, can it be put into use.

c. Recharge the empty cylinder timely for the next use.

5.2.2 Pressure Reducer

Do not disassemble the pressure reducer at random. Reset its inside pressure and flux during the course of repair.

5.3 Notice

- (1) Keep EEBD at the dry, clear, and easy-reached place, avoided sunshine.
- (2) Never touch with grease or other corrosive liquid.
- (3) The hollow cylinder shall be subject to water pressure test every three years at the manufactory or the government-appointed organization, and can be put to use only when passing the test.
- (4) EEBD shall be protected from crash, scar, knock, and sunshine.
- (5) The user shall be trained properly before using the EEBD
- (6) The damaged parts shall be repaired in the manufactory or its authorized institution.
- (7) Never charge the hollow cylinder with oxygen.
- (8) Charge the cylinder to 210bar, and recharge it to 210bar when it cools

down to ensure service time.

(9) The compressed air for breathing must be clean, meeting the requirements as follows:

CO: no more than 5.5 mg/m³

CO₂: no more than 900 mg/m³

Oil: no more than 0.5 mg/m³

Water: no more than 50 mg/m³

(10) EEBD can't be used for fire fighting, entering oxygen-lacking or liquid-hold cabin, or for the firemen's use.

(11) Don't pull the face mask too forcibly during routine inspection to avoid breaking the chain or bolt. The face mask can not be worn until turn on the cylinder valve . Take chain part from the face mask before taking out the face mask for inspection , re-connect the chain and face mask after inspection .

Chapter 6 Identification and Solutions to Malfunctions

Table 3

Malfunction	Causes	Solutions
Air leakage of cylinder valve	The diaphragm in security valve broken, the screw thread loosen, or the O-ring aging.	Replace diaphragm or O-ring washer
Pressure gauge out of work	The gauge damaged, the breathing hose obstructed or leaking	Replace pressure gauge or breathing hose
Leakage in the connections	O-ring spoiled or aging	Release O-ring washer
Damage of mask or satchel	Aging or spoiled	Release the mask or satchel
Rationed air over-supplied	The changing ration hole in the pressure reducer obstructed	Re-adjust pressure Reducer or repair or replace ration hole

Chapter 7 Complete set of EEBD

Complete set includes:

- | | |
|----------------------|-------|
| 1. EEBD | 1 set |
| 2. Satchel | 1 pc |
| 3. Packing case | 1 set |
| 4. Attached document | 1 set |
| 5. Spare part | 1 set |

Chapter 8 Transportation and Storage

1. Transportation

Forbid to be left in the rain or sunshine; Forbid to be transported together with oil, combustibles or corrosive agent in a same carriage; lift and put down gently.

2. Storage

EEBD shall be stored in the dry, clear, and easy-touched place where relative humidity shall be not more than 80% and the distance between EEBD and heat source shall be not less than 1.5m, and avoid the direct sunshine.

Chapter 9 Service and Maintenance

1. Service period

The manufactory will be responsible for the maintaining EEBD for 6 months after sold, and it's the client's responsibility when exceeding 6 months, i. The maintenance should be taken by the manufactory or its authorized service station.

2. Maintenance

The client should check the EEBD regularly, and make the records. If there is any problem, it should be solved timely. See chapter 6-identification and solutions to malfunctions. If needing to replace the pressure gauge, please follow these steps:

- a. switch on the cylinder valve of EEBD, deflate out the air in the cylinder.
- b. Dispatch the pressure gauge by spanner.
- c. Install the new pressure gauge, and tighten.
- d. Dispatch the pressure reducer (turn the rubber handle wheel anticlockwise)
- e. Charge the cylinder to 210bar by air compressor or charging machine (the pressure should be more than 210bar), and recharge to 210bar after the air cools down.
- f. Check the water tightness by putting the cylinders in water.
- g. connect the qualified cylinder with pressure reducer, and then put the whole set of EEBD into the bag.

Chapter 10 Spare Parts

In terms of the customers' demand and the vulnerable condition of each part, the EEBD equips with it spare parts as follows.

Table 4

No	Diagram Number	Name and specifications	Quantity	Equipped part	
				Code	Name
1		Pressure gauge	1	TH10-11	Cylinder valve
2	TH10-11011	Demolish slice	1	TH10-11	Cylinder valve
3	RHZK6/30-01	Pressure gauge Washer	1	TH10-11	Cylinder valve
4		"O" ring 4×1.8	2	TH10-2	Pressure reducer

5		"O" ring 5×1.8	2	TH10-2	Pressure reducer
6		"O" ring 6×1.8	2	TH10-2	Pressure reducer
7		"O" ring 16×2.9	2	TH10-1	Cylinder

Approval Certificate



Germanischer Lloyd

This is to certify, that the product identified below was found in compliance with the applicable requirements contained in the specified standard.

Certificate No.	43 292 - 02 HH
Company	Jiangsu Huayan Marine Equipment Co., Ltd No. 6 Jiuwei Road, Economic and Development Zone Danyang City, Jiangsu Province 212303, P.R. CHINA
Product Description	TH10 (10 minutes version) and TH15 (15 minutes version), self-contained, open circuit, EEBD with hood.
Product Type	Emergency Escape Breathing Device
Approval Standard	-IMO Res. MSC.98(73) - (International Code for Fire Safety Systems), -EN 1146:1997.
Documents	Test report no.: 42002102 of 12.08.2002 issued by National Mine anti-Explosion Laboratory, P.R. of China.
Application	The above product may be applied on ships classed with Germanischer Lloyd and on ships for which the Society is responsible for the issue of the relevant certificate required by the "International Convention for the Safety of Life at Sea, 1974" including amendments as authorized by contracting governments.
Remarks	The device (mass exceeds 5kg) is not suitable to be carried on the man for a complete shift acc. to EN 1146:1997.
Valid until	2012-07-04
	The company must inform Germanischer Lloyd of any modification or changes to approved product in order to obtain a valid certificate.

Approval Certificate



Germanischer Lloyd

principle components:

- cylinder with regulator assembly/ pressure gauges,
- hood with hose assembly,
- carrying bag.

the following markings shall be printed on each EEBD:

- brief instructions or diagrams clearly illustrating the use,
- maintenance requirements,
- manufacturer's trademark and serial number,
- shelf life with accompanying manufacturer date,
- "GL 43292-02 HH",
- "FOR ESCAPE ONLY".

All EEBD training units shall be clearly marked.

Certificate No. 43 292 - 02 HH

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Hamburg, 2007-07-05



GL Luxembourg

EC Type Examination Certificate

of a Notified Body within the meaning of Article 9 of the Marine Equipment Directive 96/98/EC of 20 December 1996.

This is to certify that the equipment identified below has been tested in accordance with the relevant type approval procedures of the Marine Equipment Directive (MED) 96/98/EC, as amended, and was found in compliance with requirements of the specified standards contained therein subject to any conditions on the schedule attached hereto.

Certificate No.	47 326 - 03 Lux
Applicant	Jiangsu Huayan Marine Equipment Co., Ltd. 6, Jiuwei Road Economic and Development Zone Danyang City, Jiangsu Province 212303, CHINA
Manufacturer	Jiangsu Huayan Marine Equipment Co., Ltd. 6, Jiuwei Road Economic and Development Zone Danyang City, Jiangsu Province 212303, CHINA
Product Description	TH10 (10 minutes version) and TH15 (15 minutes version), self-contained, open circuit, EEBD with hood.
Product Name	Emergency Escape Breathing Device
Trade Name	
Specified Standards	-IMO Res. MSC.98(73) - (International Code for Fire Safety Systems), -EN 1146:1997.
Related Directive	2002/75/EC
Equipment Section	Fire protection
Item No.	A.1/3.41
Conformity Assessment Module	B
Valid until	2013-06-10



GL Luxembourg

Certificate No: 47 326 - 03 Lux

Schedule of Approval

Documents

Test report no.: 42002102 of 12.08.2002 issued by National Mine anti-Explosion Laboratory, P.R. of China.

Technical Data

principle components:

- cylinder with regulator assembly/ pressure gauges,
- hood with hose assembly,
- carrying bag.

the following markings shall be printed on each EEBD:

- mark of conformity, acc. to the Directive,
- brief instructions or diagrams clearly illustrating the use,
- maintenance requirements,
- manufacturer's trademark and serial number,
- shelf life with accompanying manufacturer date,
- "FOR ESCAPE ONLY".

All EEBD training units shall be clearly marked.

Remarks

None

Note:

This certificate is valid for equipment, which is conform to the approved type. The manufacturer must inform the Notified Body named on this certificate of any modifications or changes to the approved product in order to obtain a valid certificate.

Should the specified standards be amended during the validity of this certificate, the product is to be re-approved prior to being placed on board the vessel to which the amended standards apply.

The mark of conformity may only be affixed to the above type approval equipment and a Manufacturer's Declaration of Conformity issued when the production-surveillance module (D, E or F) of Annex B of the MED is fully complied with and controlled by a written inspection agreement with a Notified Body.

Wheelmark Format:



xxxx/yy

xxxx
yy

Notified Body identification number undertaking surveillance module.
Last two digits of year mark affixed

EC Certificate of Conformity

Quality System



GL Luxembourg

of a Notified Body within the meaning of Article 9 of the Marine Equipment Directive 96/98/EC of 20 December 1996.

This is to certify that the applicant / manufacturer maintains a quality system which is in conformity with the requirements of the Marine Equipment Directive (MED) 96/98/EC, as amended, ensuring that the equipment identified below is conform to type as described in the EC Type Examination Certificate (listed in the annex to this certificate), subject to any conditions in the schedule attached hereto.

Certificate No.	47 327 - 03 Lux
Applicant	Jiangsu Huayan Marine Equipment Co., Ltd.
Manufacturer	6, Jiuwei Road Economic and Development Zone Danyang City, Jiangsu Province 212303, CHINA Jiangsu Huayan Marine Equipment Co., Ltd.
Product Description	6, Jiuwei Road Economic and Development Zone Danyang City, Jiangsu Province 212303, CHINA TH10 (10 minutes version) and TH15 (15 minutes version), self-contained, open circuit, EEBD with hood.
Product Name	Emergency Escape Breathing Device
Trade Name	
EC Type Examination Certificate No.	47 326 - 03 Lux
Date of Issue	11.06.2008
Valid Until	10.06.2013
Notified Body ID No.	0801
Related Directive	2002/75/EC
Equipment Section	Fire protection
Item No.	A.1/3.41
Conformity Assessment Module	D
Valid until	2013-06-10

A handwritten signature in blue ink, reading "Dariusz Polowinski", is written over a faint circular stamp in the bottom right corner of the page.



GL Luxembourg

Certificate No: 47 327 - 03 Lux

Schedule of Approval

Remarks

None

Note:

This certificate loses its validity if the manufacturer makes any changes or modifications to the approved quality system, which have not been notified to, and agreed with the notified body named on this certificate and/or after lapse of time, withdrawal or revocation of the EC Type Examination Certificate.

This certificate authorises the applicant to affix the mark of conformity (wheelmark) to the equipment.

Wheelmark Format:



0801/yy

yy

Last two digits of year mark affixed



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