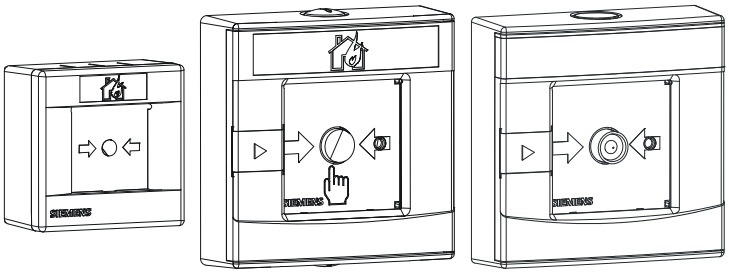
SIEMENS



FDM221, FDM223, FDM224, FDM223H, FDM224H

Manual call points

Technical manual

Building Technologies

Fire Safety & Security Products

We reserve all rights in this document and in the subject thereof. By acceptance of the document the recipient acknowledges these rights and undertakes not to publish the document nor the subject thereof in full or in part, nor to make them available to any third party without our prior express written authorization, nor to use it for any purpose other than for which it was delivered to him.

1 About this document

Purpose of the document

This document contains all information on the manual call points FDM221, FDM223 and FDM224.

The consistent observance of the instructions ensures a trouble-free and safe application.

Target group

This documentation and the instructions contained therein are intended for the following groups of persons, who perform tasks and have the necessary qualification:

Group of persons	Activity	Qualification
Product Manager (PM)	He is in charge of local product management and is responsible for the interchange of information between the plant supplying the equipment and his DU for his product line. He co-ordinates the flow of information between the individual groups of people for the various projects.	He has had training appropriate to his function and product range and has attended the product manager training course.
Project Manager	The project manager is responsible for the local project management. He co-ordinates the schedules of all groups of people working on a project as well as resources. He also continuously obtains the technical information required for project realization.	He has had the technical training appropriate to his function and the size of a project or the product line used in the project and has attended the training courses for project managers at the supplier's works.
Project Engineer	Provides the parameterization of products, devices and systems in the DU for a specific country or customer. He monitors the serviceability of and gives the go-ahead for the commissioning of products, devices and systems at the place of installation. They are also responsible for trouble-shooting.	He has had the training appropriate to his function and to the products, devices and systems to be parameterized and has attended the technical training courses for project engineers at the supply plant.
Installation personnel	They install product, device or system components on site, and subsequently carry out a general performance check.	Professional training in the field of building automation or electrical installations.
Maintenance Personnel	They carry out all the maintenance work indicated in the product documentation and check equipment for total serviceability.	They have had the technical training appropriate to their function and the product.

Reference documents

Number	Name
007904	Installation for FDM221, always enclosed with the detector
007905	Installation for FDM223 and 224, always enclosed with the detector

Operational and safety regulations

Before groups of persons begin work on the system they must have read and understood the related documents, in particular Chapter "Safety regulations".2

Disregard of the safety regulations

Before they are delivered, products are tested to ensure they function correctly when used properly. Siemens disclaims all liability for damage or injuries caused by the incorrect application of the instructions or disregard of warnings of danger contained in the documentation. This applies in particular to:

- Personal injuries or damage caused by improper use and incorrect use;
- Personal injuries or damage caused by disregarding safety instructions in the documentation or on the product;
- Personal injuries or damage caused by poor maintenance or a lack of maintenance.

Symbols and their meaning

=>	Result, note
'Text'	Quotation, reproduced identically
-> see	Cross reference

Technical terms

Term	Explanation
FDnet	Addressed detector line
MC-Link	Maintenance and Commissioning Link

Document identification

Position	Signification
Title page	System names: e.g. CS1140 System Product type: e.g. compact control unit CI1145 Purpose of the document: e.g. assembly, installation
Last page bottom left	Document number Edition date
Last page bottom left	Manual Register

Modification index

Version	Date	Brief description
007002_e_en_--	11.2007	FDMH292/3-x IP64 -> IP65
007002_d_en_--	09.2007	Standards added Diagnosis levels changed
007002_c_en_--	07.2007	'Technical terms' added Corrections in 'Technical data': - Line separator added - Protection categories IP changed - Standard EN54-17 added - VdS and LPCB approvals added
007002_b_en_--	09.2006	FDM224 included Diagnosis levels added
007002_a_en_--	01.2004	First edition

2 Safety notes

This chapter describes the danger levels and the relevant safety regulations applicable for the use of the products from Siemens Building Technologies. Please read the work instructions as well as the chapter 'About this document' before beginning any work.

2.1 Signal words and symbols

2.1.1 Classification and meaning of signal words

The danger level – that is, the severity and probability of danger – is indicated by the signal words listed below. Non-observance may lead to the consequences indicated:

DANGER!	Imminent danger! ● May cause danger to life or serious bodily injury!
WARNING!	Dangerous situation! ● May cause serious bodily harm.
CAUTION!	May cause dangerous situations! ● May cause light injuries!
NOTE!	Possibly harmful situation! ● May cause damage to the product or to objects in the immediate vicinity of the product!

2.1.2 Symbols and their meaning

The symbols listed below indicate the nature and origin of the danger.

General danger

Electrical voltage

Example for an indication of danger
The example below illustrates the appearance and form of danger warnings in our documents.

DANGER!	**External voltage** Disconnect the module from the power supply.

2.1.3 Classification and meaning of additional symbols

Tips and information.

Refers to extremely important or critical decisions to be taken into account before continuing the work.

2.2 Safety-relevant working instructions

Country-specific standards
The products are developed and produced in compliance with the relevant international and European safety standards. Should additional country-specific, local safety standards or regulations concerning project planning, installation, operation and disposal of the product apply in the place of operation, then these standards or regulations must also be taken into account in addition to the safety regulations mentioned in the product documentation.

Electrical installations

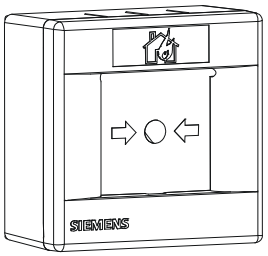
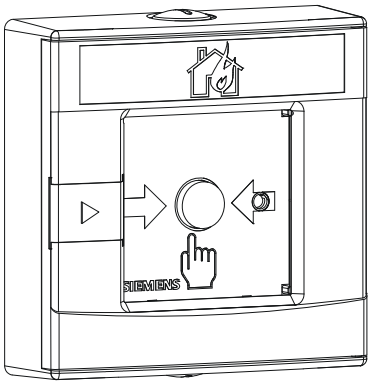
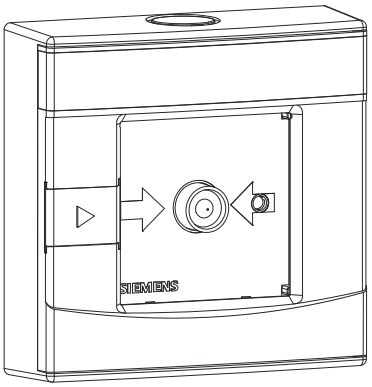
DANGER!	**Work on electrical installations** Work on electrical installations may only be carried out by qualified electricians or by instructed persons working under the guidance and supervision of a qualified electrician, in accordance with the electroctechnical regulations.

Assembly, installation, commissioning and inspection work
- If any tools or accessories such as ladders are required, safe and suitable devices must be used.
- The activation of fire control installations for test purposes must not cause damage to the system or parts thereof.
- Fire control installations must only be activated after the test has been completed and the system has been definitely handed over to the customer.
- Third party systems or devices must only be activated in the presence of the responsible person.

Modifications to the system design and the products
Modifications to a system or to individual products may cause faults or malfunctioning. Please request written approval from us and the relevant authorities concerning in-tended system modifications and system extensions.

Modules and spare parts
Locally procured modules and spare parts must comply with the technical specifica-tions laid down by the manufacturer. This compliance is always ensured for original spare parts supplied by us.

3 Overview

Manual call point FDM221 Housing FDMH291-x	Manual call point FDM223 Housing FDMH293-x	Manual call point FDM224 Housing FDMH293-x
		

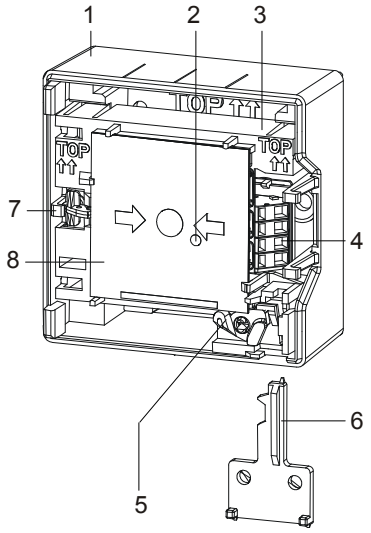
The manual call points consist of a housing and a call point unit. They have the following features:

- Individual call point addressing
- Indication of the condition (Alarm, localization or test) by means of a dichromatic LED
- Integrated line separation function
- Communication via FDnet

4 Setup and function

4.1 Manual call point FDM221

The manual call point FDM221 triggers alarm when the glass pane is pushed in (direct operation). The alarm is immediately transmitted to the control panel.

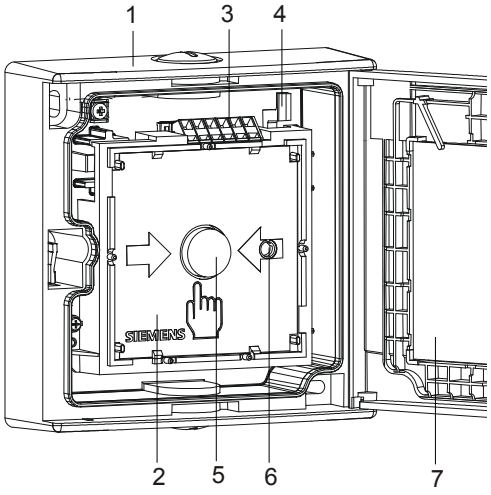


Legend

1 Housing bottom
2 LED
3 Switching unit
4 Terminals
5 Switching lever for test activation
6 Key with double function: Function test and opening housing
7 Alarm actuator (hammer)
8 Glass

4.2 Manual call point FDM223

The manual call point FDM223 triggers alarm when the glass pane is pushed in and the alarm button is pressed (indirect operation). The alarm is immediately transmitted to the control panel.



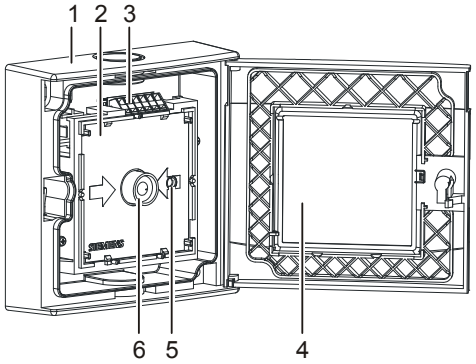
Legend

1 Housing bottom
2 Switching unit
3 Terminals
4 Stopping lever
5 Alarm button
6 LED
7 Glass

4.3 Manual call point FDM224

The manual call point FDM224 triggers alarm when the glass pane is pushed in (direct operation). The alarm is immediately transmitted to the control panel.

To reset the manual call point FDM224 after an alarm, a new glass pane must be inserted.



Legend

1 Housing bottom
2 Switching unit
3 Terminals
4 Glass
5 LED
6 Alarm button

4.4 Diagnosis levels

The detector largely auto-monitors its function.
The following diagnosis levels are derived from the different control measurings:

- Normal
- Exchange required
- Fault

Details see table below.

When a fatal error occurs, which makes the proper function of the detector impossible, a fault message is signalled. To remedy the cause, additional information is available in the detector. This information may be displayed by e.g. the detector exchanger and tester FDUD29x (details see Operation Detector exchanger and tester, doc. nos. 007227 and 009718).

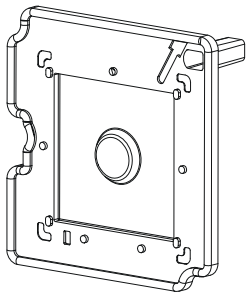
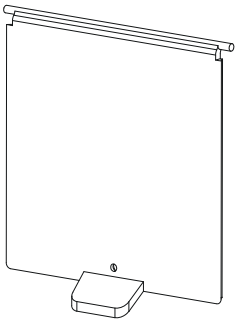
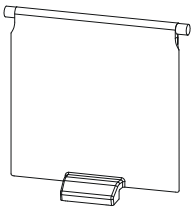
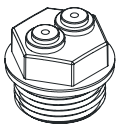
Indication on the detector exchanger and tester	**Signification**	**Actions**
'No Deviation'	**Normal, no fault is present** The detector is fully functional	none
'needed excha.' *	**Exchange required** Button monitoring outside the tolerance	Replace detector
Any fault message	**Fault is present** – Alarming is no longer ensured – Button monitoring outside the tolerance or impaired by extraneous influences	Replace detector
	Supply error	– Check detector line voltage – Replace detector
	Software error (Watchdog error)	Replace detector
	Storage error	Replace detector
	Communication error between detector and control panel	Remedy cause

Note

The status 'Any fault message' can be displayed together with another status, e.g. 'needed excha.' (exchange required).

* Indication on the detector exchanger and tester always in English; no translation into the country-specific language.

4.5 Accessories

Module	Designation	Application
	DMZ1197-AD Sealing	For zones where there is danger of spray water. Note: Thanks to the additional seal, which is placed over the call point unit, the manual call points FDM223H and FDM224H are in compliance with protection category IP65.
	DMZ1197-AC Protective cover	Protection against unintended alarm activation with FDM223 and FDM224
	FDMC291 Protective cover	Protection against unintended alarm activation with FDM221
	Cable gripper	– Cable gripper with 2 cable entries – max. cable diameter 7.8 mm – for FDM223 or FDM224

5 Project planning

Compatibility
Compatible with all control panel types that support the FDnet detector line. Refer to 'List of compatibility' (doc. no. 008331) for details.

Range of application
The manual call points are intended for use in places where a fire can be detected by people who can manually trigger an alarm.

Place of installation
The manual call points must be installed in easily accessible places at a height of 1.3 … 1.6 m.

Environmental influences
If the manual call points are used in industry, this must be precisely clarified with the person responsible for the project, since plastics cannot withstand some environmental conditions. The following factors must be taken into account:
Chemicals
Temperature
Moisture

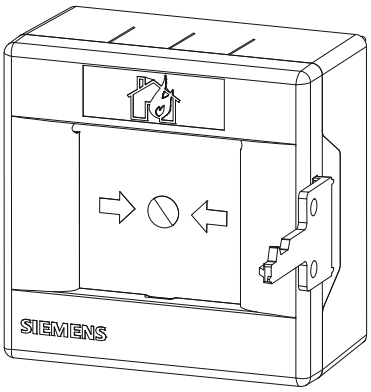
6 Installation

6.1 Preparation

Depending on the cabling (recessed or surface cabling), the housing must be prepared for inserting the cables.

FDM221

1. Break out the key from the housing cover.
2. Press the two key knobs into the recesses (see figure below).
3. Pull the lid forwards.
Keep the key in a safe place.

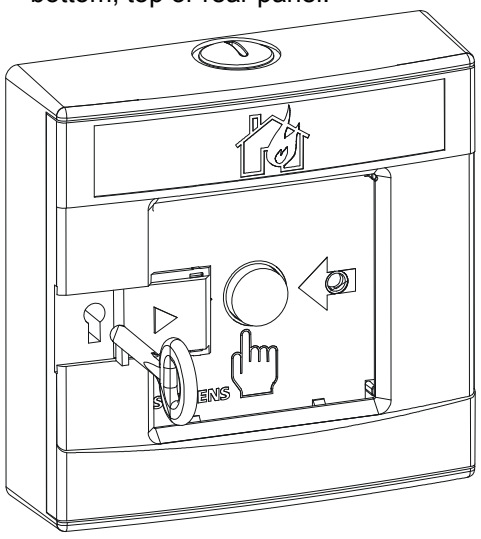


4. Determine the entry opening(s) in the housing:
Recess cabling: Breakout point at the back of the housing base
Surface cabling: Markings on the top and bottom of the housing for the drill hole(s), with a diameter of max. 25 mm
5. Clamp the housing in a bench vice.
6. Drill the entry opening(s).

Danger of injury	Observe the tool manufacturer's safety notes!

FDM223/FDM224

1. Pull the cover of the keyhole to the right.
2. Open the housing with the key enclosed in the delivery.
Keep the key in a safe place.
3. Determine the entry openings in the housing and break them out from the bottom, top or rear panel.



6.2 Installation

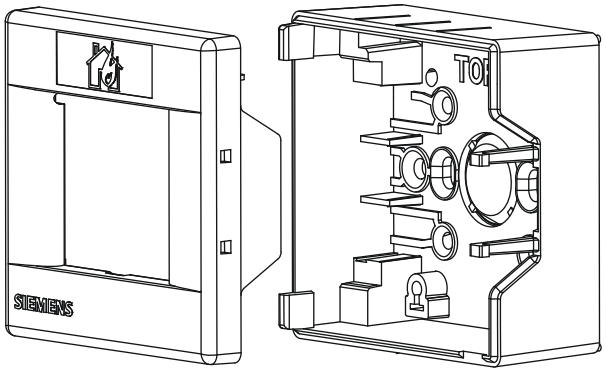
6.2.1 Fixation

FDM221

1. Install the housing at a height of 1.3 … 1.6 m on an even surface.

2. Pull the cables through the entry opening(s) into the housing.

3. For surface mounting, use screwed cable glands (max. M20 with nut).

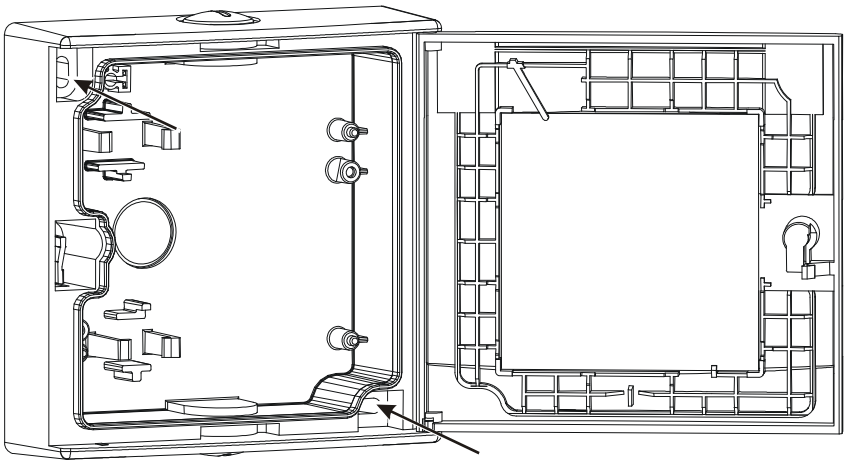


FDM223/FDM224

1. Install the housing at a height of 1.3 … 1.6 m on an even surface. In wet areas, only use the screw holes marked by arrows (see figure below).

2. Pull the cables through the entry opening into the housing.

3. For surface mounting, use screwed cable glands (max. M20).



6.2.2 Inserting the protective cover

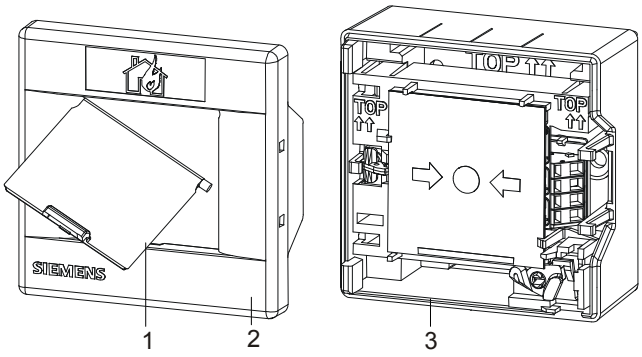
When a protective cover is used, proceed as follows:

1. Open the housing.

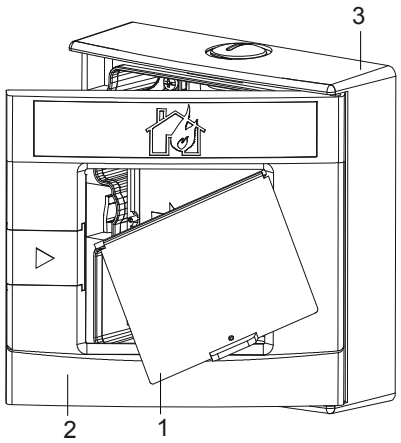
2. Place the protective cover (1) in the lid (2) (see figure below).

3. Close the housing (3) with the lid (2).

FDM221



FDM223/FDM224

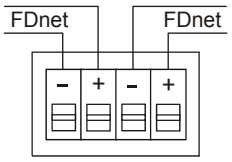
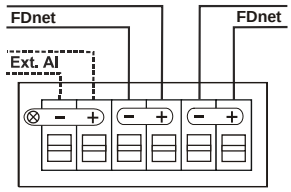


6.2.3 Electric connection

Notes on work on electrical installations

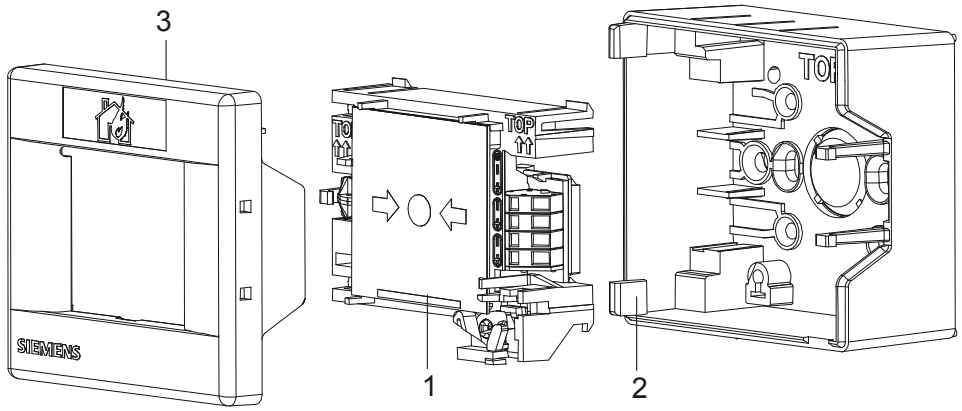
Caution	● Consider the positive and negative poles! ● As long as a manual call point is out of service, it must be provided with a note "OUT OF SERVICE"!

Only one wire may be connected to each terminal point; only this way is it possible to guarantee a faultless connection over the complete life cycle.

Connection diagrams	
FDM221	**FDM223/FDM224**
	

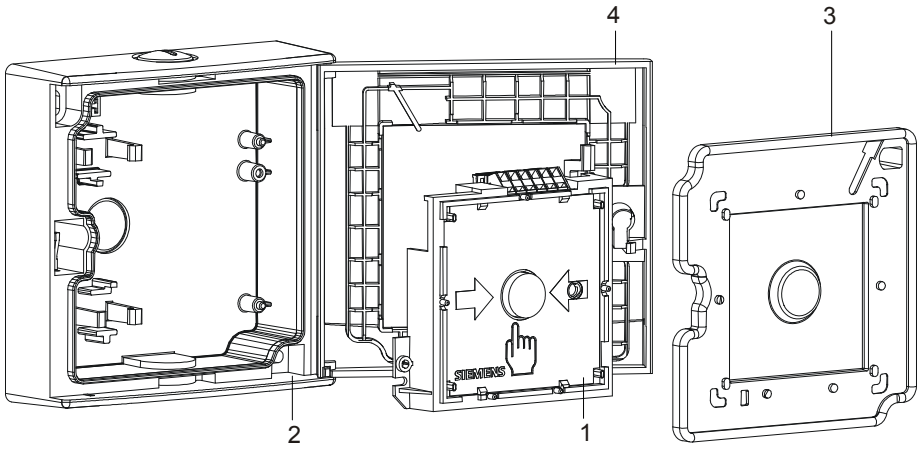
FDM221

1. Connect the feeding line to the terminals in the call point unit (1), in accordance with the connection diagram.
2. When inserting the call point unit (1) into the housing (2), pay attention to the feeding line.
3. Place the call point unit (1) with the inscription “TOP” pointing to the top (terminals on the right) into the housing (2) until the locking device snaps in.
4. Close the housing (2) with the lid (3).



FDM223/FDM224

1. Connect the feeding line to the terminals in the call point unit (1), in accordance with the connection diagram.
2. When inserting the call point unit (1) into the housing (2), pay attention to the feeding line.
3. Place the call point unit (1) into the housing (2) with the terminals pointing upwards; then fix it with two screws.
4. In wet zones, use a seal (3) (DMZ1197-AD).
5. Close the housing (2) with the lid (4).



7 Commissioning

7.1 Localization and device test

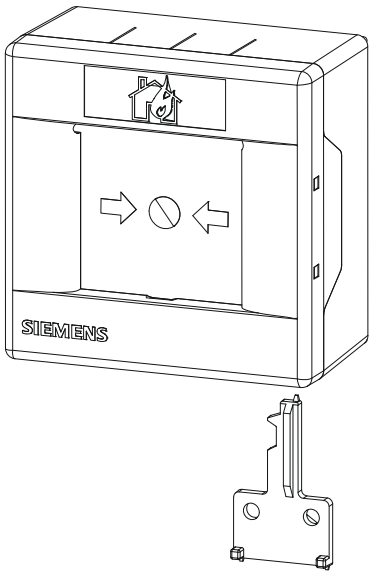
The manual call points are equipped with an internal alarm indicator. This alarm indicator may as well be activated from the control panel for localization and device testing. The table shows the LED indication for the different control panel commands.

Command	LED indication
Device test	green, flashing
Localization	red, flashing

7.2 Performance check

FDM221

1. Set the detector line to Test.
2. Insert the key from below into the housing. The glass pane falls down, actuating the switch. The LED flashes.
3. Pull off the key. The glass is pushed back into its initial position and the detector is again ready for operation.
4. Set the detector line back to normal operation.



FDM223

1. Set the detector line to Test.
2. Pull the cover of the keyhole to the right.
3. Open the door with the key.
4. Push the button. The alarm signal is transmitted.
5. Set the detector in operational availability again.
6. Close the door of the detector.
7. Set the detector line back to normal operation.

FDM224

1. Set the detector line to Test.
2. Pull the cover of the keyhole to the right.
3. Open the door with the key.
   The alarm signal is transmitted.
4. Close the door of the detector.
   The detector is ready for operation again.
5. Set the detector line back to normal operation.

8 Maintenance / Troubleshooting

8.1 Status retrieval

The manual call points are provided with an MC-Link. With this link, proximity exchange of data is possible over short distances between the manual call point and the detector exchanger and tester.
The following actions can be performed from the control panel:

- Commissioning
- Read error list / status register

8.2 General maintenance work

The following maintenance work must be performed on an annual basis:
Check all detectors for mechanical damage.
Replace defective detectors.Carry out a performance check.

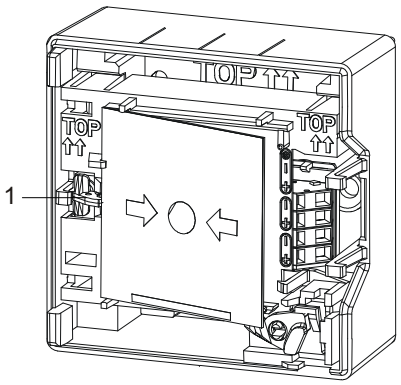
8.3 Resetting

After alarm activation the manual call point must be set in operational availability again. This procedure is different for each of the two detector types.

FDM221

To set the detector back to operational availability, proceed as follows:

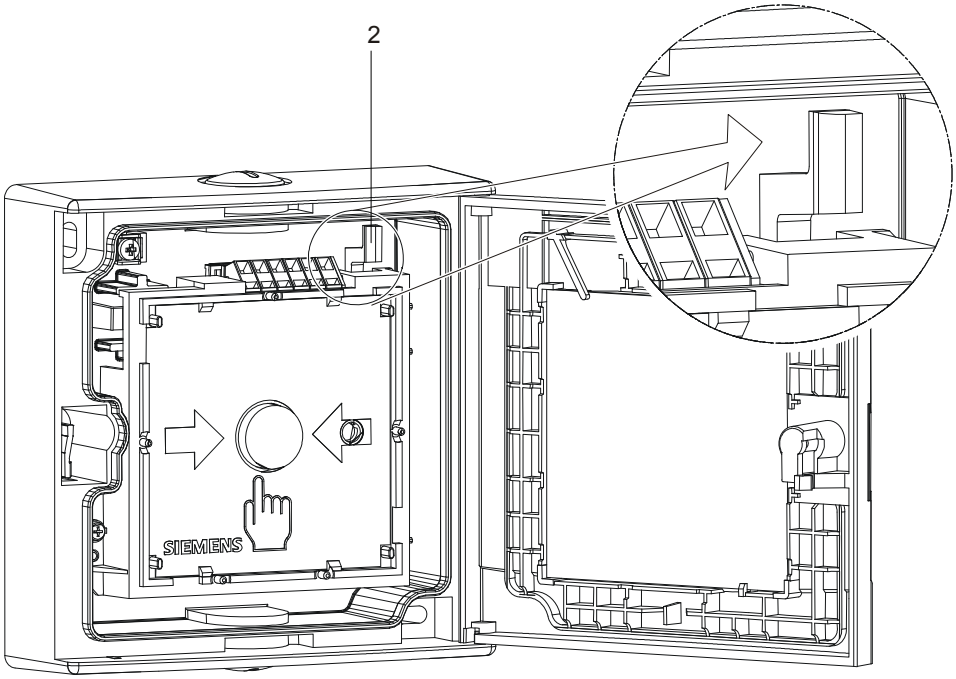
1. Open the housing.
2. Remove the glass pane.
3. Insert a new glass pane.
4. Close the housing.
5. Carry out a performance check.



FDM223

To set the detector back to operational availability, proceed as follows:

1. Open the housing.
2. Remove the glass pane.
3. Insert a new glass pane.
4. Push the black locking lever (2) in the upper right corner to the right until you hear it clicking. The alarm button is now protruding by approx. 5 mm.
5. Close the housing.
6. Carry out a performance check.



FDM224

To set the detector back to operational availability, proceed as follows:

1. Open the housing.
2. Remove the glass pane.
3. Insert a new glass pane.
4. Close the housing.
5. Carry out a performance check.

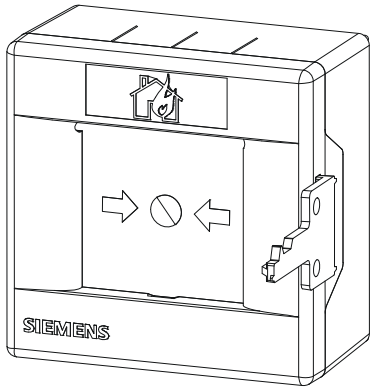
8.4 Replacing the glass pane

FDM221

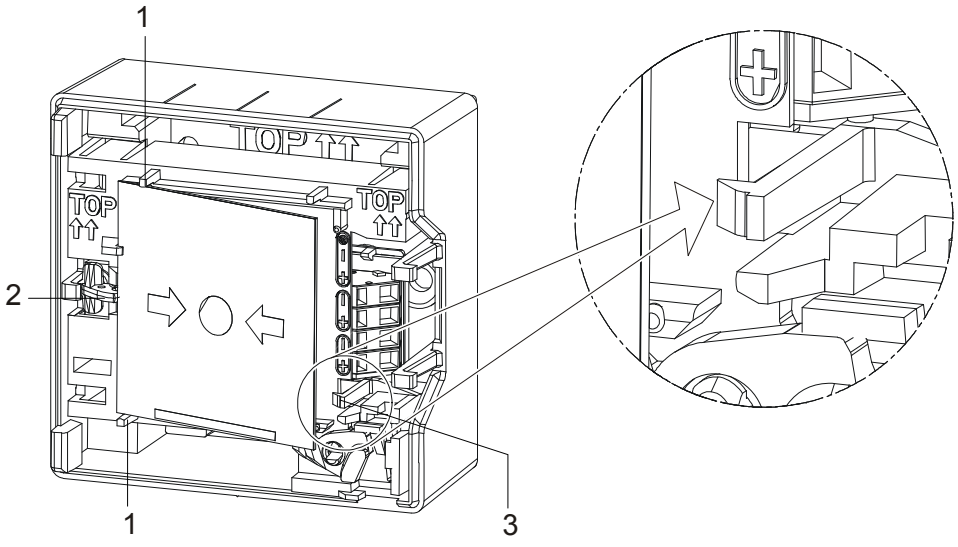
The glass pane is provided with a number. It is covered by a foil layer. This foil holds the glass splinters together when the glass pane is pushed in, enabling trouble-free removal of the glass.

Proceed as follows:

1. Press the two key knobs in the recesses.
2. Pull the lid forwards.



3. Insert the glass pane so that the number is pointing to the bottom and can be read from the front.
4. Insert the glass on the guiding (1) and push it towards the alarm actuator (2).
5. Push the retainer (3) to the right until the glass is below the retainer.
6. Close the housing with the lid.



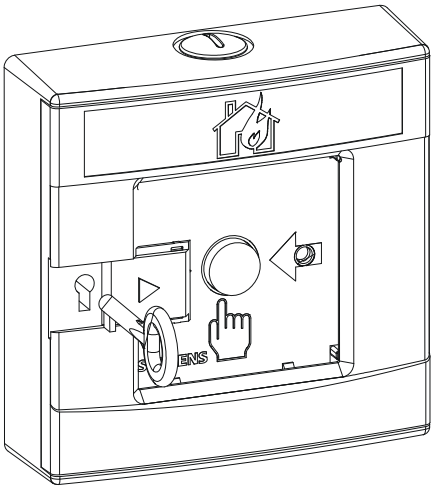
FDM223/FDM224

The glass pane is square-shaped and can be inserted in any direction.

Proceed as follows:

1. Pull the cover of the keyhole to the right.

2. Open the housing with the key enclosed in the delivery.
Keep the key in a safe place.



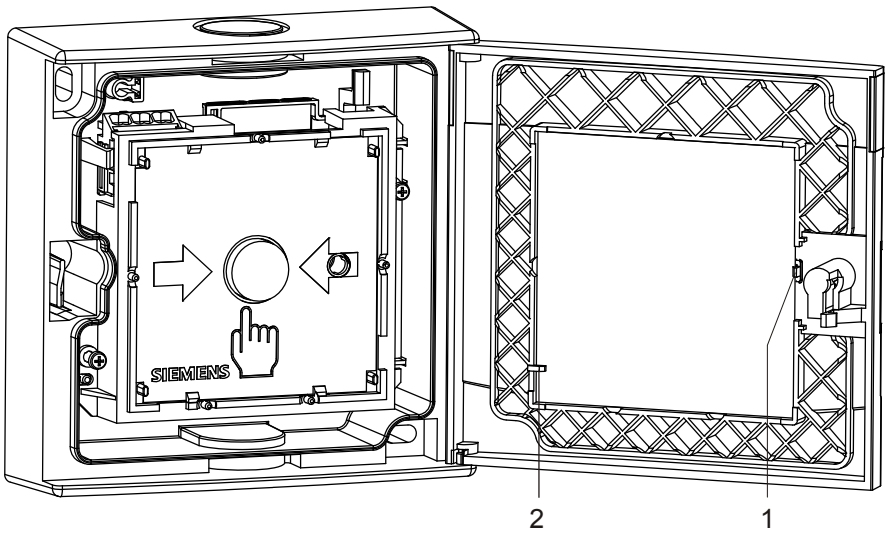
3. Push the retainer (1) to the right.

4. Place the glass pane on the guiding (2) and below the retainer (1).

5. Release the retainer.

6. Set the detector in operational availability by resetting it.

7. Close the door.



8.5 Spare parts

Designation	FDM221	FDM223/FDM224	Application
Cover with key	FDMK291	—	To open the housing and for the performance check of FDM221.
Key	—	DMZ1195	
Glass pane	FDMG291	DMZ1196-AC	A part of the actuation mechanism, protects the switch from soiling.

9 Specifications

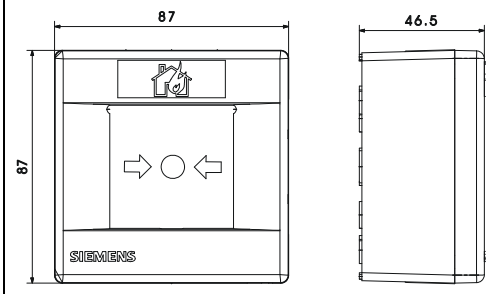
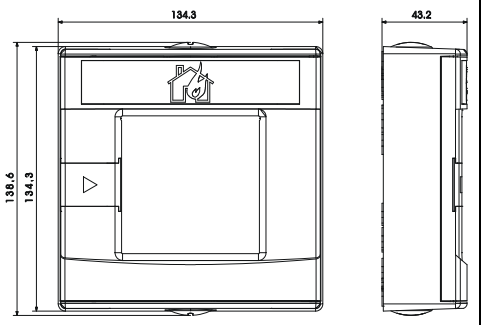
9.1 Technical data

Detector line	Operating voltage	12 … 33 VDC
	Operating current (quiescent)	200 µA
	Maximum current connection factor	1
	Quiescent current connection factor	1
	Address connection factor	1
	Separator connector factor	1
	Protocol	FDnet
	System compatibility	see doc. no. 008331 'List of compatibility'.
Line separator	Line voltage:	
	– nominal	32 VDC (= V_{nom})
	– minimum	12 VDC (= V_{min})
	– maximum	33 VDC (= V_{max})
	Voltage at which the separator opens:	
	– minimum	7.5 VDC (= $V_{SO\ min}$)
	– maximum	10.5 VDC (= $V_{SO\ max}$)
	Permanent current when switches are closed	max. 0.5 A (= $I_{C\ max}$)
	Switching current (e.g. in case of short circuit)	max. 1 A (= $I_{S\ max}$)
	Leakage current when switches are open	max. 1 mA (= $I_{L\ max}$)
	Serial impedance when switches are closed	max. 0.5 Ω (= $Z_{C\ max}$)
External alarm indicator	connectable ext. AI	2 (only with FDM223 and FDM224)
	Electric current	9 … 15 mA
	Voltage	10 … 17 VDC
	Length of line	– max. 30 m with unshielded cables, or when the shielding is connected to the detector's positive pole – max. 5 m, if the shielding is connected with the earth
Connections	Detector line and ext. AI	
	– Design	Spring clips
	– Conductor cross-section	0.2 … 1.5 mm²
	MC-Link	proximity interface

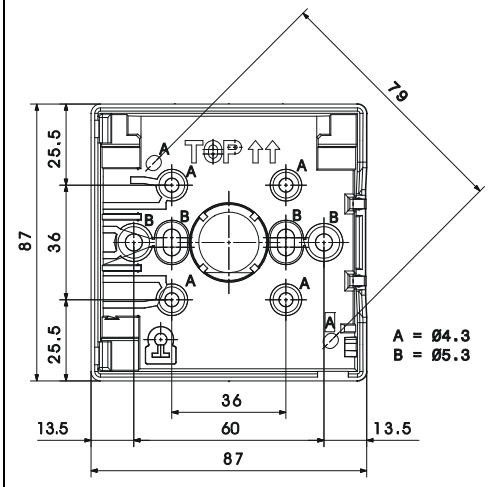
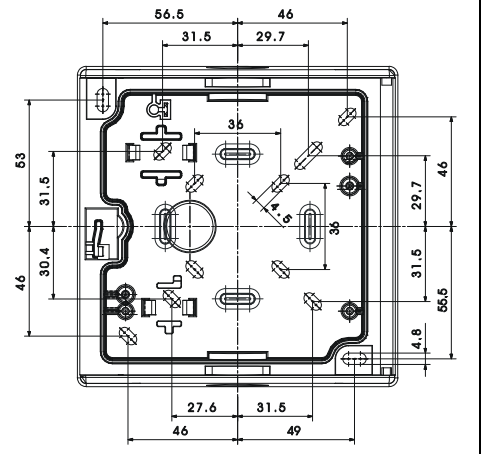
Ambient conditions	Operating temperature	-25 … +70 °C
	Storage temperature	-30 … +75 °C
	Air humidity	≤95 % rel.
	Protection category EN60529/IEC529:	
	– FDM221, housing FDMH291-x	IP44
	– FDM223/FDM224, housing FDMH293-x without sealing DMZ1197-AD	IP44
	– FDM223/FDM224 housing FDMH293-x with sealing DMZ1197-AD	IP65
	– FDM223H/FDM224H, housing FDMH292-x without sealing DMZ1197-AD	IP44
	– FDM223H/FDM224H housing FDMH292-x with sealing DMZ1197-AD	IP65
	Electromagnetic compatibility at:	
	– 1 MHz … 1 GHz	50 V/m
	– 1 GHz … 2 GHz	30 V/m
Mechanical data	Dimensions (W x D x H)	
	– FDM221	87 x 87 x 47 mm
	– FDM223/FDM224	134 x 139 x 43 mm
	Housing material:	
	– FDM221	ABS
	– FDM223/FDM224	PC
	Colours:	
	– FDMxxx-R	– red (RAL 3000)
	– FDMxxx-B	– blue (RAL 5005); House alarm
	– FDMxxx-Y	– yellow (RAL 1023); Extinguishing
	– FDMxxx-G	– green (RAL 6024); Control
Standards	Standards:	
	– FDM221	EN54-11, CEA GEI-052: Draft 2.0, 11/06/97
	– FDM223	EN54-11, CEA GEI-052: Draft 2.0, 11/06/97
	– FDM223H	EN54-11, CEA GEI-052: Draft 2.0, 11/06/97
	– FDM224	EN54-11, EN54-17
	– FDM224H	EN54-11, EN54-17
	VdS approvals:	
	– FDM221	G203059
	– FDM223	G204002
	– FDM223H	G205014
	– FDM224	G206123
	– FDM224H	G206124
	LPCB approvals:	
	– FDM221	126ac/01
	– FDM223	126ac/02
	– FDM223H	126ac/03
	Protection categories	IEC 60529
	QS standards	– Siemens Standard SN 36350 – ISO9001 – ISO9004
	CE conformity mark	yes

9.2 Dimensional drawings

9.2.1 Dimensions

FDM221, housing FDMH291-x	FDM223/FDM224, housing FDMH293-x
	

9.2.2 Master gauge for recesses

FDM221, housing FDMH291-x	FDM223/FDM224, housing FDMH293-x
	

9.3 Environmental compatibility

Electronic components and synthetic materials can be separated. The synthetic material parts are identified and can be disposed of accordingly.

Siemens Switzerland Ltd
Building Technologies Group
International Headquarters
Gubelstrasse 22
CH-6301 Zug
Tel. +41 41 - 724 24 24
Fax +41 41 - 724 35 22
www.siemens.com/buildingtechnologies