

Original instructions

# Fox 2

## Foot-operated safety switch



**Fox 232 and Fox 231**

## Read and understand this document

Please read and understand this document before using the products. Please consult your ABB JOKAB SAFETY representative if you have any questions or comments.

### **WARRANTY**

ABB JOKAB SAFETY's exclusive warranty is that the products are free from defects in materials and workmanship for a period of one year (or other period if specified) from date of sale by ABB JOKAB SAFETY.

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The following are some examples of applications for which particular attention must be given. This is not intended to be an exhaustive list of all possible uses of the products, nor is it intended to imply that the uses listed may be suitable for the products:

Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this document.

Nuclear energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, and installations subject to separate industry or government regulations.

Systems, machines, and equipment that could present a risk to life or property.

Please know and observe all prohibitions of use applicable to the products.

NEVER USE THE PRODUCTS FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE ABB JOKAB SAFETY PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

### **PERFORMANCE DATA**

While every effort has been taken to ensure the accuracy of the information contained in this manual ABB JOKAB SAFETY cannot accept responsibility for errors or omissions and reserves the right to make changes and improvements without notice. Performance data given in this document is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of ABB JOKAB SAFETY'S test conditions, and the users must correlate it to actual application requirements. Actual performance is subject to the ABB JOKAB SAFETY Warranty and Limitations of Liability.

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# 1 Introduction

## Scope

The purpose of these instructions are to describe foot-operated safety switch Fox 2, and to provide the necessary information required for assembly, installation, operations, checks and adjustments after installation, and maintenance. The instructions also include information necessary to connect Fox 2 to a safety circuit.

## Audience

This document is intended for authorized installation personnel.

## Prerequisites

It is assumed that the reader of this document has knowledge of the following:

- Basic knowledge of ABB Jokab Safety products.
- Knowledge of machine safety.
- Knowledge of safety devices.

## Special notes

Pay attention to the following special notes in the document:



### **Warning!**

Danger of severe personal injury!

An instruction or procedure which, if not carried out correctly, may result in injury to the technician or other personnel.

### **Caution!**

Danger of damage to the equipment!

An instruction or procedure which, if not carried out correctly, may damage the equipment.

NB: Notes are used to provide important or explanatory information.

## 2 Overview

### General description

The foot-operated safety switch Fox 2 has been developed for industrial application with high mechanical and electrical endurance. The foot-operated switches are used on wood processing machines, CNC machines, building machines and bending machines. Normally a foot-operated safety switch is used when the operator has to have both hands free.

Fox 2 is available with a three or two positioning function in single and double pedal variants. Fox 2 is always supplied with duplicated contacts and robust cover.

**Fox 231/232**, three position function, intended to be used as a safety device. It provides stop signals in the top and bottom position. Start/ready signals for separate starting are provided in a distinct middle position. After a stop in the bottom position a start or clear signal cannot be given before the reset button has been operated and the pedal has been pushed into its middle position.

**Fox 221/222**, two position function, intended to be used as a control device. It provides a stop signal in the top (released position) and a start/ready signal in the bottom position.

A high safety level is secured by monitoring the pedal's double contacts with one safety relay or safety PLC. Furthermore the third emergency position of the Fox 231/232 pedal enhances safety.

### Safety regulations

#### Warning!

Carefully read through this entire manual before using the device.

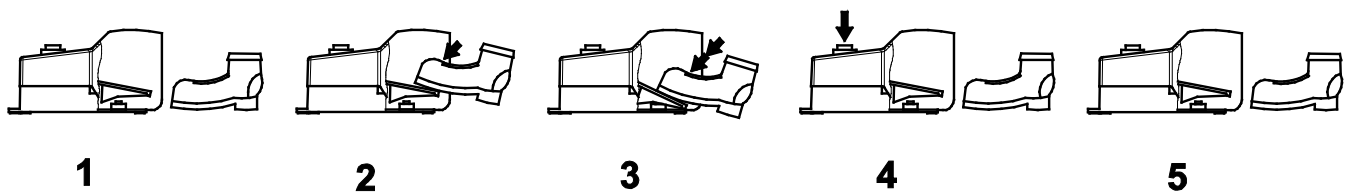
The devices shall be installed by a trained electrician following the Safety regulations, standards and the Machine directive.

Failure to comply with instructions, operation that is not in accordance with the use prescribed in these instructions, improper installation or handling of the device can affect the safety of personnel and the plant.

For installation and prescribed use of the product, the special notes in the instructions must be carefully observed and the technical standards relevant to the application must be considered.

In case of failure to comply with the instructions or standards, especially when tampering with and/or modifying the product, any liability is excluded.

## Function description



- 1) Normal: In resting position, the machine is OFF and the operator is preparing the work piece.
- 2) Operation: By pressing the pedal to the middle position the normally open contact is closed and the safety relay is activated. The machine is running.
- 3) Safe-Stop: If danger occurs the operator press the pedal to the third (bottom) position. The run signal is immediately interrupted, the safety relay falls and the machine stops.

NB! Only available on Fox 231 and Fox 232.

- 4) Reset: After reaching the third position the pedal is locked and must be reset by pushing the reset button, and thereby releasing the latch.

NB! Only necessary/available on Fox 231 and Fox 232.

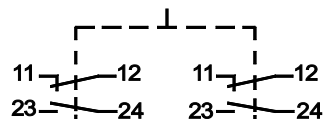
- 5) Normal: The pedal is now in its stand-by position again, ready for next operation.

### 3 Connections

See Chapter Installation and Maintenance for more information regarding installation.

#### Connections

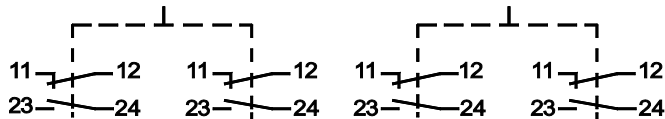
##### Fox 221



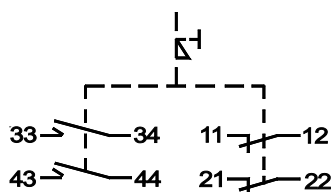
##### Fox 222

left pedal

right pedal



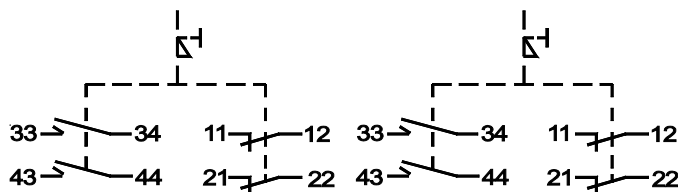
##### Fox 231



##### Fox 232

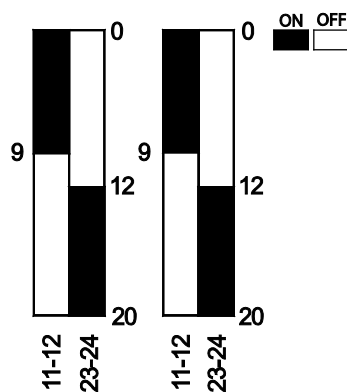
left pedal

right pedal



#### Contact blocks

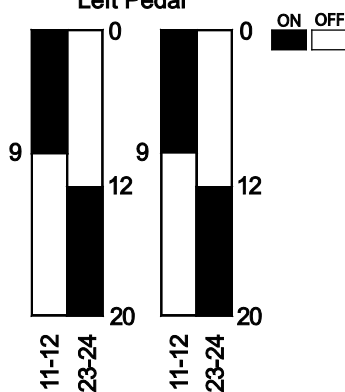
##### Fox 221



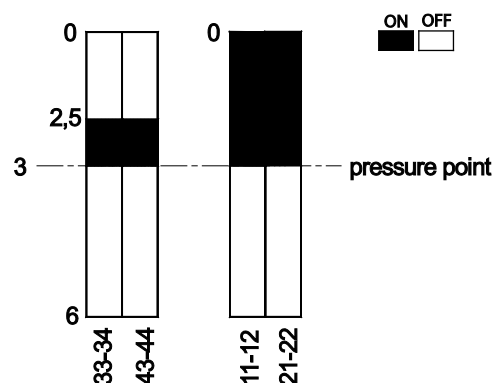
##### Fox 222

Left Pedal

Right Pedal



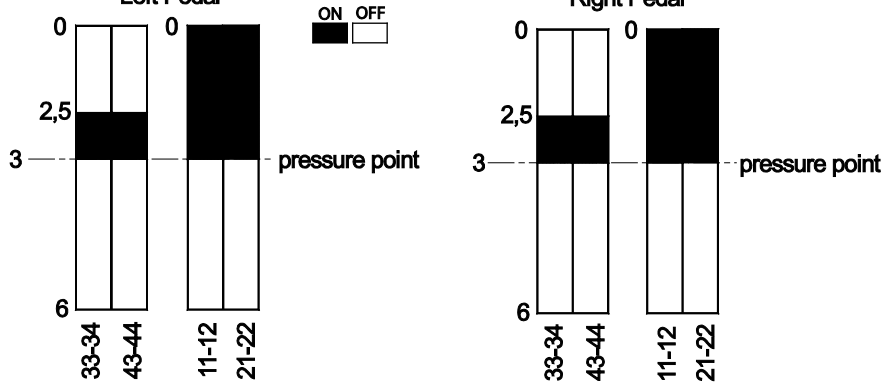
##### Fox 231



##### Fox 232

Left Pedal

Right Pedal



## 4 Installation

### Installation

The installation of all ABB Jokab Safety interlock switches must be done in accordance with a risk assessment for the individual application. Installation must only be carried out by competent personnel and in accordance with these instructions.


Wire the foot switches according to the specified wire colours/terminal labelling. Contact symbols are shown for a not actuated switch. The contact numbers can be found in chapter 3, Connections. For cable entries please use cable glands with the appropriate protection class. Clean the inside of the switch from dirt after wiring.


 **Warning!** All the safety functions must be tested before starting up the system.

### Maintenance

**Every week:** Check correct operation of pedals. Remove all dirt or particles on switch that may affect function. Check enclosure and cable on damages and impurities.

**Every 6 months:** Lubricate cam and roller shafts. Isolate power and remove cover. Check screw terminal tightness and check for signs of moisture ingress.

 **Warning!** The safety functions and the mechanics shall be tested regularly, at least once every year to confirm that all the safety functions are working properly.

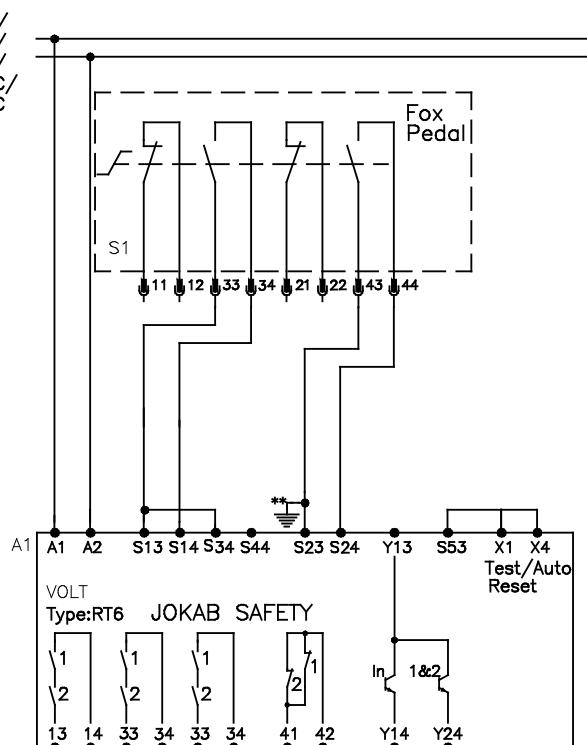
 **Warning!** In case of breakdown or damage to the product, contact the nearest ABB Jokab Safety Service Office or reseller. Do not try to repair the product yourself since it may accidentally cause permanent damage to the product, impairing the safety of the device which in turn could lead to serious injury to personnel.

**Caution!** ABB Jokab Safety will not accept responsibility for failure of the switch functions if the installation and maintenance requirements shown in this sheet are not implemented. These requirements form part of the product warranty.



## 5 Application example

The application examples given are valid for Fox 231/232 only.



Pedal Fox 231/232 with safety module RT6.

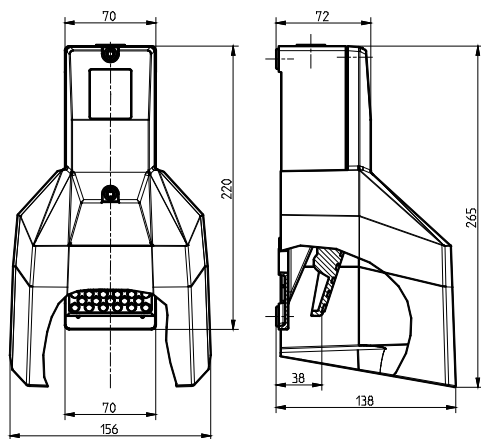
\*\* Only AC-relay

## 6 Model overview

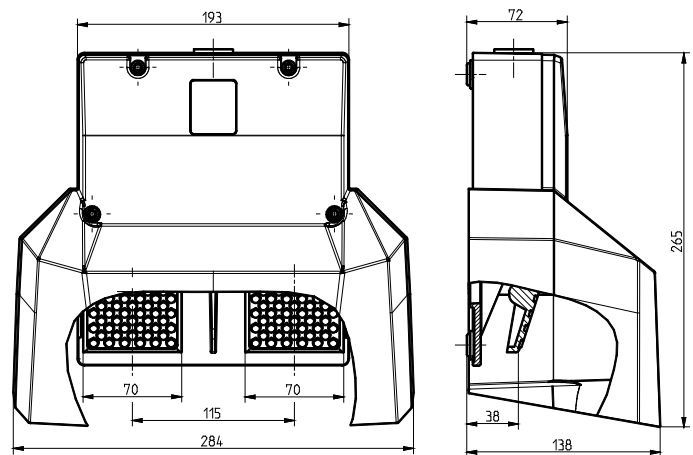
Type	Article number	Description
FOX 221	2TLA020160R4100	Two position single foot pedal
FOX 222	2TLA020160R4200	Two position double foot pedal
FOX 231	2TLA020160R3100	Three position single foot pedal
FOX 232	2TLA020160R3200	Three position double foot pedal

### Dimensions

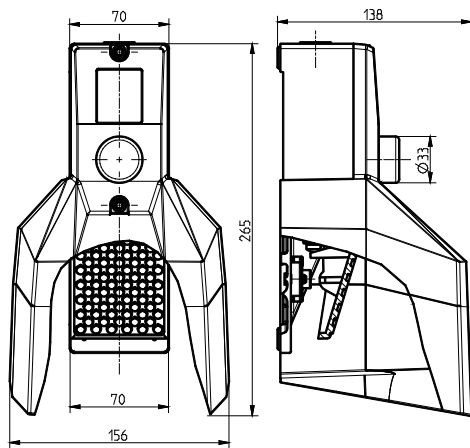
**Fox 221**



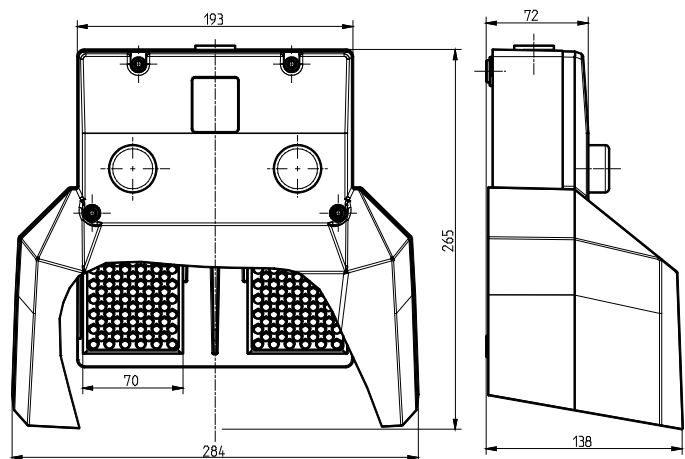
**Fox 222**



**Fox 231**



**Fox 232**



## 7 Technical data

### Manufacturer

Address	ABB JOKAB SAFETY Varlabergsvägen 11 SE-434 39 Kungsbacka Sweden
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### Electrical characteristics

Rated insulating voltage $U_i$	500V
Rated impulse withstand voltage $U_{imp}$	6kV
Utilization category	AC-15
Permissible electrical load	BG: 400 V 6 A AC-15 CSA(Fox 221/222): 300V 6A GP A300 / P300 CSA(Fox 231/232): 250V, 10A, A300, Q150
Connection	Screw terminals, self-lifting clamps
Contact type	Slow action with double break, positive break NC contact per EN 60947-5-1
Contact material	Fine silver
Termination	0.75-2.5 mm <sup>2</sup>
Terminal screws	M4
Conditional short-circuit current	1000A
Short circuit overload protection	6 A gG/gN fuse
Insulation requirements up to	480V~
Maximum frequency of use	1500/h
Conduit entries	Fox 221/231: M20x1.5 Fox 222/232: M25x1.5

### General

Enclosure classification	IP65
Ambient temperature	-25°C...80°C
Switching element	Fox 221: 2*(1NO+1NC) Fox 222: 2*(1NO+1NC) + 2*(1NO+1NC) Fox 231: 2NO+2NC Fox 232: (2NO+2NC) + (2NO+2NC)
Size	See drawing
Material	
Protective Shield	Die casting aluminium alloy
Pedal	Shockproof thermoplastic
Housing	Die casting aluminium alloy
Colour	Yellow and black
Mechanical life	Position 2: 1x10 <sup>6</sup> Position 3: 1x10 <sup>5</sup>
Weight	Fox 221/Fox 231: 1200g Fox 222/Fox 232: 2750g
Actuating force	Approx. 240 N (Pressure point)

## Safety-related characteristic data and Conformity

Conformity Fox 231 & 232	European Machinery Directive 2006/42/EC EN ISO 12100:2010, EN 60204-1:2006+A1:2009, EN ISO 13849-1:2008, EN 60947-5-1:2004+A1:2009
Conformity Fox 221 & 222	EN 60204-1:2006+A1:2009, EN 60947-5-1:2003+A1:2009 European Low voltage directive 2006/95/EC
EN ISO 13849-1	Up to PL c, cat. 1 depending on system architecture B <sub>10d</sub> : 200 000 (Fox 231/232) B <sub>10d</sub> : 2 000 000 (Fox 221/222) Connection in series will reduce the Diagnostic Coverage and thereby the Performance Level. The complete safety function should be validated according to EN ISO 13849-1 & -2.
Certifications	BG, cCSAus

## 8 EC Declaration of conformity



### EC Declaration of conformity

(according to 2006/42/EC, Annex 2A)

<p>We ABB AB JOKAB Safety Varlabergsgatan 11 SE-434 39 Kungälv Sweden</p>	<p>declare that the safety components of ABB AB manufacture with type designations and safety functions as listed below, is in conformity with the Directive</p>
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2006/42/EC

Authorised to compile the technical file

ABB AB  
JOKAB Safety  
Varlabergsgatan 11  
SE-434 39 Kungälv  
Sweden

#### Product

Foot operated safety switch  
Fox 231, Fox 232  
Certification Body

#### Certificate

ET14010, ET 14011  
DGUV Test  
Postfach 50580  
50941 Köln  
Germany

Used standards

EN ISO 12100:2010, EN 60204-1:2006+A1:2009,  
EN ISO 13849-1:2008, EN 60947-5-1:2003+A1:2009

Other standards

GS ET15

  
Jesper Kristensson  
PRU Manager  
Kungälv 2014-08-05

[www.abb.com](http://www.abb.com)  
[www.jokabsafety.com](http://www.jokabsafety.com)

Original

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