BERNSTEIN

Complete Range – Foot switches

Individual solutions for sophisticated technical requirements

BERNSTEIN – We have been developing and producing **foot switches for over 50 years**

Welcome to the world of industrial foot switches

In this catalog, we present an extensive selection of high-quality foot switches that have been specially developed for industrial applications. Whether you are looking for robust switches for your production line or reliable solutions for automation – we have the right foot switches for you. Extreme durability is just as much a matter of course as mechanical stability, functionality, and absolute safety.
BERNSTEIN foot switches are used wherever manual operation is not possible for ergonomic or safety reasons. Here they are used to switch work and production processes on and off.
Discover our wide range of foot switches in this catalogue and find the perfect solution for your individual needs.

Thanks to our decades of experience, we are in a position to implement customer wishes individually and to complement them with our own know-how in a target-oriented manner.

Find out more here on the topic of safety technology

“Whatever you need...”

We can offer all of our switches in a customer-specific design.
So, please do not hesitate to contact us. We are always happy to advise you.

Tel +49 571 793-0 | info@bernstein.eu | **www.bernstein.eu**

Made for practical work

Foot switches for every application

6 **Standard foot switches**

8 **Foot switch with protective shroud**

10 **Foot switch with hinged protective shroud**

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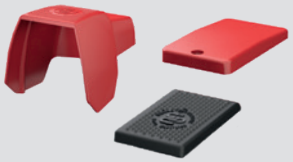
36 Spare parts 

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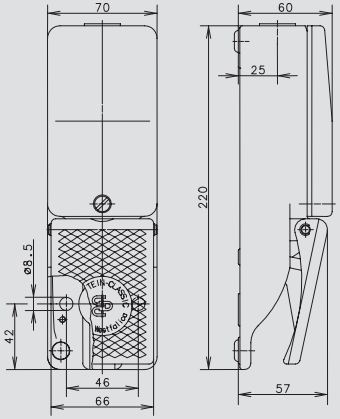
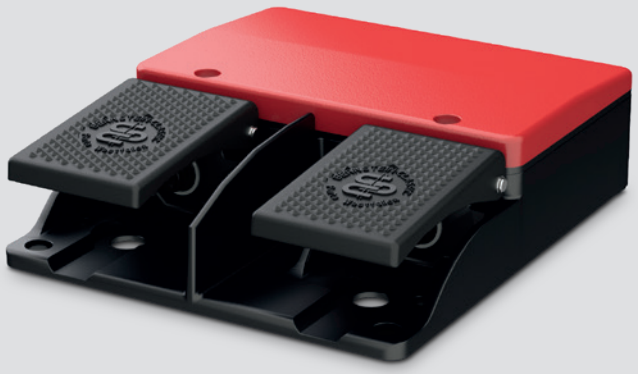
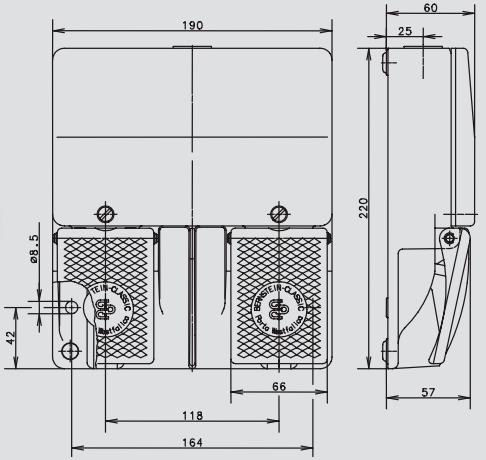
Foot switches
Standard version

Three basic enclosures of the same length and height with different width dimensions for one (F1), two (F2) and three (F3) pedals.

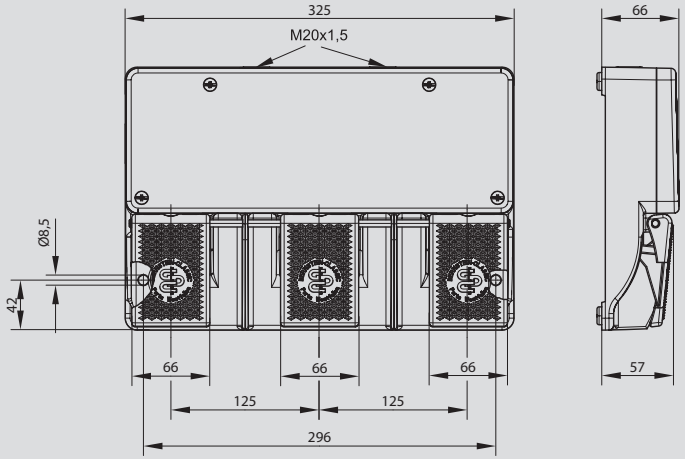






Single-pedal foot switch F1		
Article number	**Designation**	**Switching contacts**
Snap-action		
		Pedal 1
6061300011	F1-SU1Z	1NC / 1NO
6061400061	F1-SU2Z	2NC / 2NO
Slow-action		
		Pedal 1
6061100005	F1-U1Z	1NC / 1NO
6061200003	F1-U2Z	2NC / 2NO

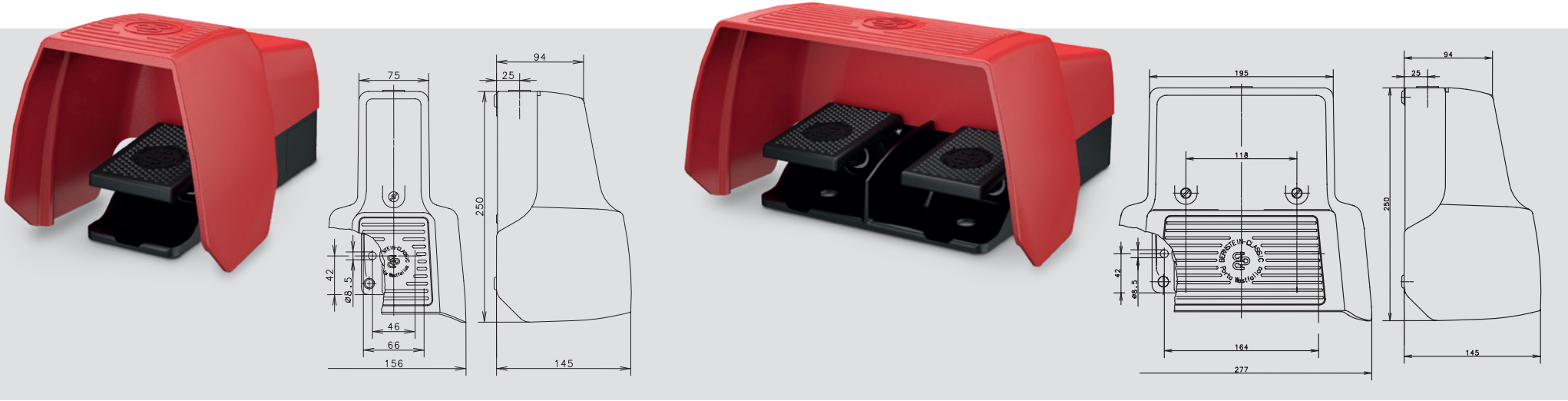
Two-pedal foot switch F2			
Article number	**Designation**	**Switching contacts**	
Snap-action			
		Pedal 1 (l.)	Pedal 2 (r.)
6062330021	F2-SU1Z/SU1Z	1NC / 1NO	1NC / 1NO
6062440065	F2-SU2Z/SU2Z	2NC / 2NO	2NC / 2NO
Slow-action			
		Pedal 1 (l.)	Pedal 2 (r.)
6062110013	F2-U1Z/U1Z	1NC / 1NO	1NC / 1NO
6062220015	F2-U2Z/U2Z	2NC / 2NO	2NC / 2NO



Three-pedal foot switch F3				
Article number	**Designation**	**Switching contacts**		
Slow-action				
		Pedal 1 (l.)	Pedal 2 (m.)	Pedal 3 (r.)
6063111025	F3-U1Z/U1Z/U1Z	1NC / 1NO	1NC / 1NO	1NC / 1NO

Foot switches
with protective shroud

The aluminium pressure die-cast protective shroud (F3: aluminium sand casting) fully shields the pedal at the top and sides while the wide base provides a high degree of stability. It reliably prevents accidental operation from above by falling objects or inadvertent operation from the side. Due to its robust construction, the protective shroud can withstand a 20 kg object dropping from a height of 1 m.



Single-pedal foot switch F1

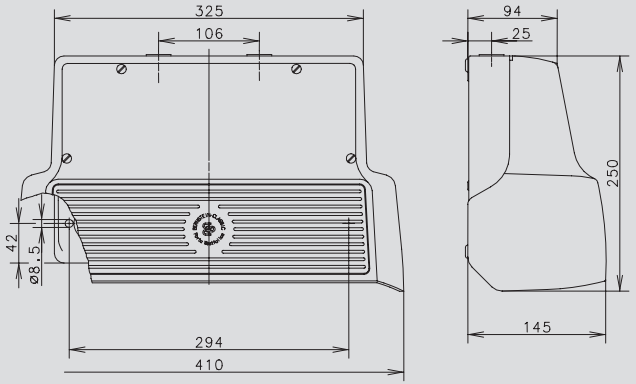
Article number	Designation	Switching contacts	Special feature
Snap-action			
		Pedal 1	
6061800012	F1-SU1Z UN	1NC / 1NO	Protective shroud UN
6061900062	F1-SU2Z UN	2NC / 2NO	Protective shroud UN
Slow-action			
		Pedal 1	
6061600006	F1-U1Z UN	1NC / 1NO	Protective shroud UN
6061700004	F1-U2Z UN	2NC / 2NO	Protective shroud UN

Two-pedal foot switch F2

Article number	Designation	Switching contacts		Special feature
Snap-action				
		Pedal 1 (l.)	Pedal 2 (r.)	
6062830022	F2-SU1Z/SU1Z UN	1NC / 1NO	1NC / 1NO	Protective shroud UN
6062940066	F2-SU2Z/SU2Z UN	2NC / 2NO	2NC / 2NO	Protective shroud UN
Slow-action				
		Pedal 1 (l.)	Pedal 2 (r.)	
6062610014	F2-U1Z/U1Z UN	1NC / 1NO	1NC / 1NO	Protective shroud UN
6062720016	F2-U2Z/U2Z UN	2NC / 2NO	2NC / 2NO	Protective shroud UN

- Emergency stop button
- Contactor on DIN rail as main power switch for can be delivered in single-pedal version
- Customized installations (e.g. light indicators)

The foot switch is uniquely designed to allow for inclusion of additional equipment.

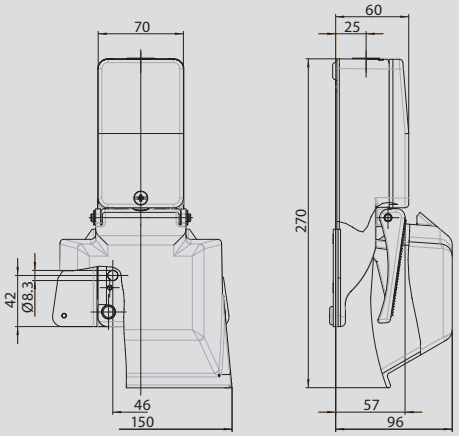


Three-pedal foot switch F3					
Article number	**Designation**	**Switching contacts**			**Special feature**
Snap-action					
		Pedal 1 (l.)	Pedal 2 (m.)	Pedal 3 (r.)	
6063833045	F3-SU1Z/SU1Z/SU1Z UN	1NC / 1NO	1NC / 1NO	1NC / 1NO	Protective shroud UN
Slow-action					
		Pedal 1 (l.)	Pedal 2 (m.)	Pedal 3 (r.)	
6063611026	F3-U1Z/U1Z/U1Z UN	1NC / 1NO	1NC / 1NO	1NC / 1NO	Protective shroud UN

Foot switches with protective shroud have “UN” in the article designation.

Foot switches
with hinged protective shroud

The cast-aluminium hinged protective shroud (which must be raised by the foot before the pedals can be operated), is optionally available for the F1 enclosure to protect against falling objects and inadvertent pedal operation.



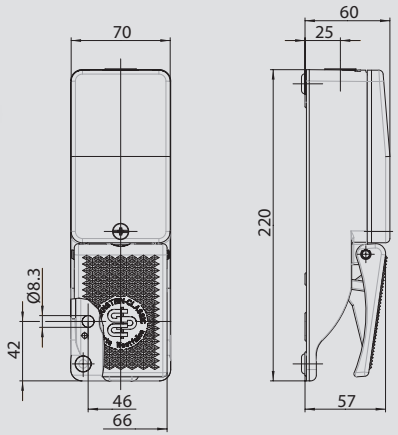
Single-pedal foot switch F1			
Article number	**Designation**	**Switching contacts**	**Special feature**
6161600071	F1-U1Z UK	1NC / 1NO	Hinged protective shroud UK

Foot switches with hinged protective shroud have “UK” in the article designation and can only be delivered in single-pedal version.

Foot switches
with protection degree IP67

Foot switches with increased degree of protection are dustproof and protected against partial submersion in water.

IP67 foot switches are available in single-pedal and two-pedal versions.



Images and drawings are examples only

Single-pedal foot switch F1

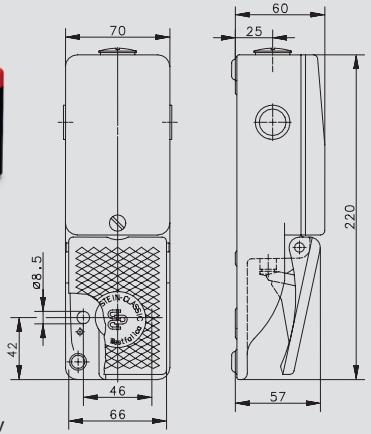
Article number	Designation	Switching contacts Pedal 1	Special feature
6161100469	F1-U1Z	1NC / 1NO	IP67
6161100424	F1-U1Z	1NC / 1NO	IP67, 3 cable entries
6161600538	F1-U1Z UN	1NC / 1NO	IP67, protective shroud UN
6161600345	F1-U1Z UN	1NC / 1NO	IP67, 3 cable entries, protective shroud UN

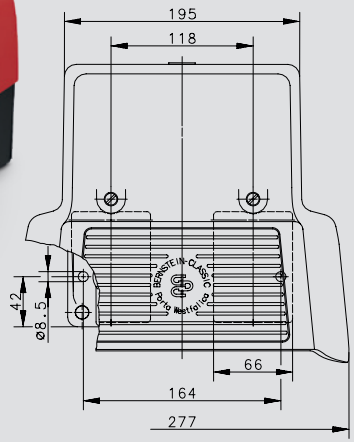
Two-pedal foot switch F2

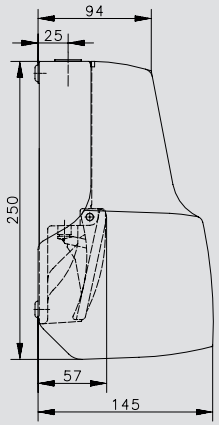
Article number	Designation	Switching contacts Pedal 1	Pedal 2	Special feature
6162610468	F2-U1Z/U1Z UN	1NC / 1NO	1NC / 1NO	IP67, 3 cable entries, protective shroud UN
6162000553	F2-SU1ZUV1DR/ SU1ZUV1DR UN	2NC / 2NO	2NC / 2NO	IP67, pressure point D, latching R, protective shroud UN

Foot switches
with latch-action switching

After initially pressing the pedal, the switch setting is retained even after the pedal is released.
The contact is not interrupted before the pedal is pressed again (bistable).







Images and drawings are examples only

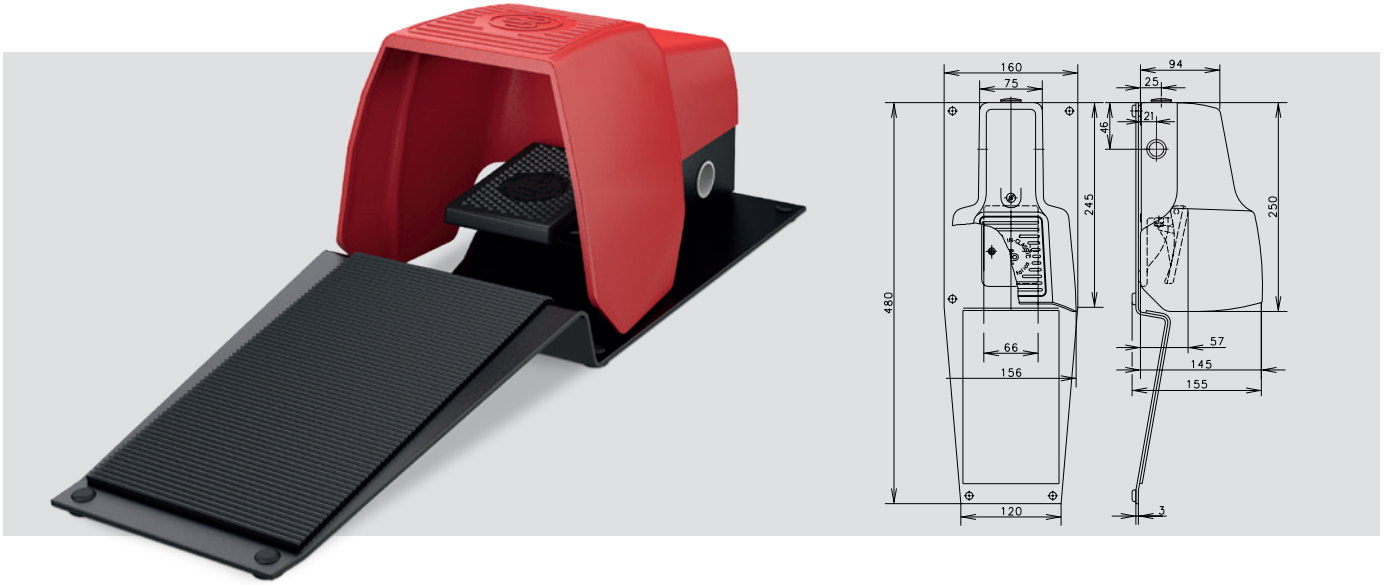
Single-pedal foot switch F1			
Article number	**Designation**	**Switching contacts**	**Special feature**
		Pedal 1	
6161800247	F1-SU1Y UN	1NC / 1NO	bistable Y, protective shroud UN
6061100001	F1-U1Y	1NC / 1NO	bistable Y
6061600002	F1-U1Y UN	1NC / 1NO	bistable Y, protective shroud UN

Two-pedal foot switch F2				
Article number	**Designation**	**Switching contacts**		**Special feature**
		Pedal 1 (l.)	Pedal 2 (r.)	
6162840655	F2-SU1Y/SU2Z UN	1NC / 1NO	2NC / 2NO	bistable Y (Pedal 1), protective shroud UN
6062610018	F2-U1Y/U1Y UN	1NC / 1NO	1NC / 1NO	bistable Y (Pedal 1+2), protective shroud UN
6062610047	F2-U1Y/U1Z UN	1NC / 1NO	1NC / 1NO	bistable Y (Pedal 1), protective shroud UN

Foot switches with latch-action switching have “Y” in the article code and can be delivered in single-pedal and two-pedal versions.

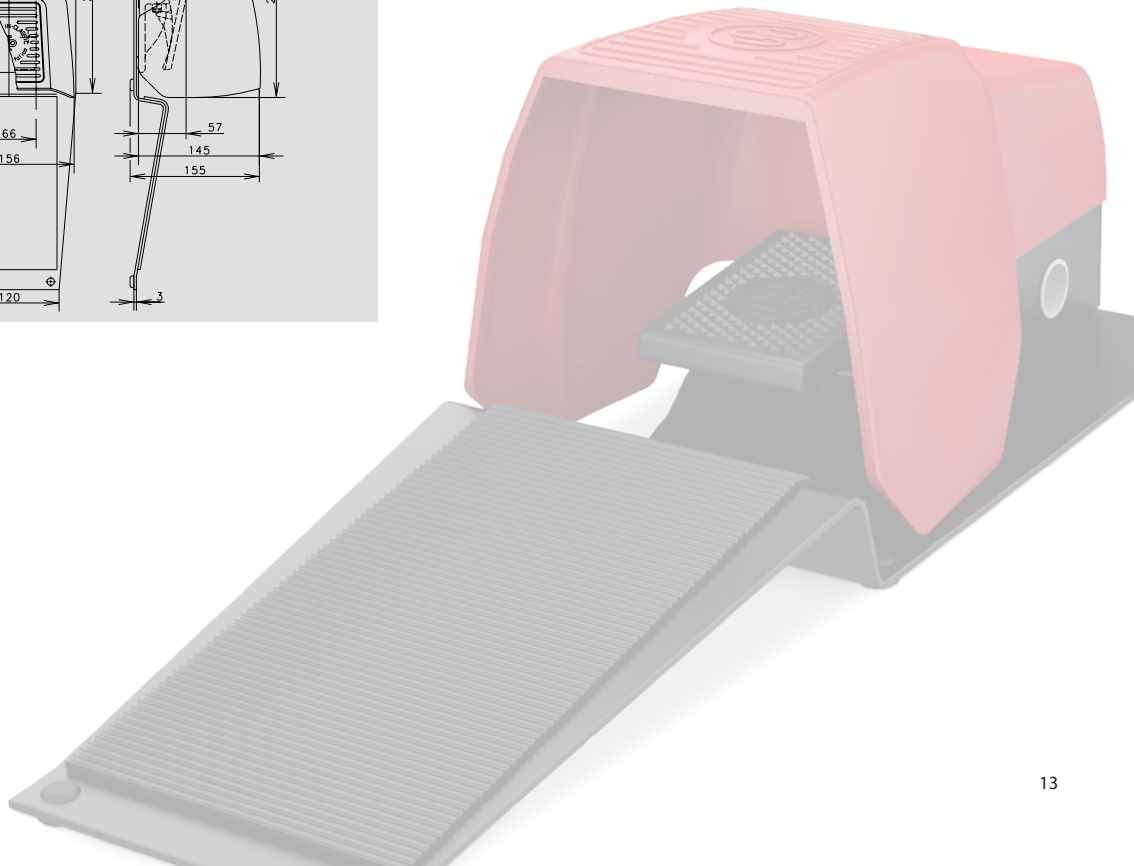
Foot switches
with footrest

The sturdy tread face is covered with ribbed rubber and allows actuation of the foot switch with reduced operator fatigue due to its angle. It is equipped with six rubber feet to prevent slipping.



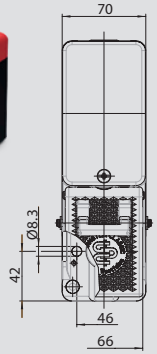
Single-pedal foot switch F1			
Article number	**Designation**	**Switching contacts**	**Special feature**
6161700091	F1-U2Z FS UN	2NC / 2NO	Protective shroud UN, footrest FS

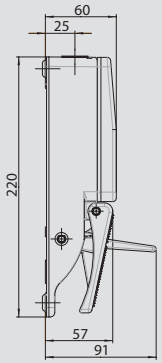
Foot switches with footrest have “FS” in the article code and can only be delivered in single-pedal version.

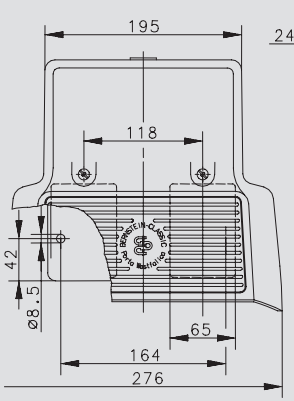


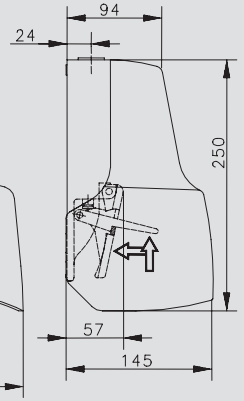
Foot switches
with pedal lock

The pedal cannot be operated before the locking lever is released by the foot. This prevents inadvertent actuation of the pedals even in the event of strong vibration/shaking caused by incorrect handling.









Single-pedal foot switch F1

Article number	Designation	Switching contacts	Special feature
6161800482	F1-SU1Z AT UN	1NC / 1NO	Pedal lock AT, protective shroud UN
6161100554	F1-U1Z AT	1NC / 1NO	Pedal lock AT
6161600400	F1-U1Z AT UN	1NC / 1NO	Pedal lock AT, protective shroud UN
6161700483	F1-U2Z AT UN	2NC / 2NO	Pedal lock AT, protective shroud UN
6161700660	F1-U2ZD AT UN	2NC / 2NO	Pressure point D, pedal lock AT, protective shroud UN

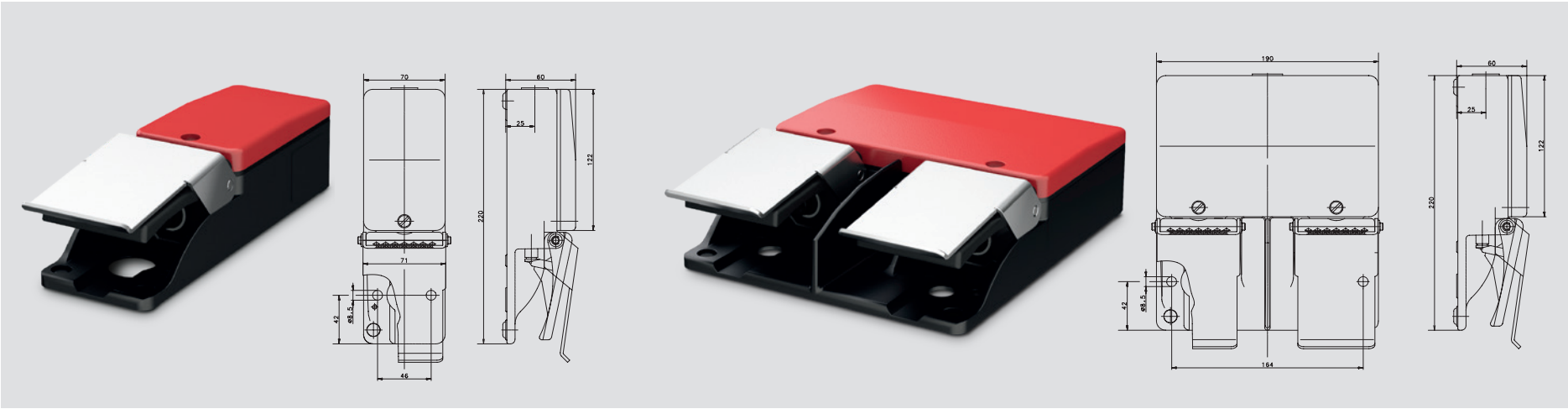
Two-pedal foot switch F2

Article number	Designation	Switching contacts		Pressure point		Special feature
		Pedal 1 (l.)	Pedal 2 (r.)	Pedal 1 (l.)	Pedal 2 (r.)	
6162830500	F2-SU1ZAT/SU1ZAT UN	1NC / 1NO	1NC / 1NO			Pedal lock AT (Pedal 1+2), protective shroud UN
6162930689	F2-SU1ZAT/SU2ZDAT UN	1NC / 1NO	2NC / 2NO		200 N	Pressure point D (Pedal 2), pedal lock AT (Pedal 1+2), protective shroud UN
6162720504	F2-U2ZAT/U2Z UN	2NC / 2NO	2NC / 2NO			Pedal lock AT (Pedal 1), protective shroud UN

Foot switches with pedal lock have “AT” in the article code and can be delivered in single-pedal and two-pedal versions.

Foot switches
with hinged pedal protection

The hinged pedal protection is placed on the pedal to provide protection against inadvertent pedal operation.
The pedal cannot be operated before raising the protective guard with the foot.



Single-pedal foot switch F1

Article number	Designation	Switching contacts	Special feature
6061400572	F1-SU2Z PS	2NC / 2NO	Pedal protection PS

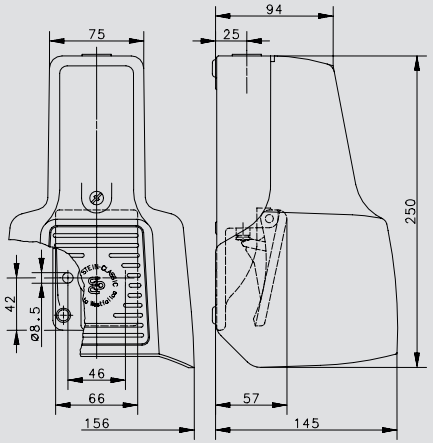
Two-pedal foot switch F2

Article number	Designation	Switching contacts		Special feature
		Pedal 1 (l.)	Pedal 2 (r.)	
6062440573	F2-SU2ZPS/SU2ZPS	2NC / 2NO	2NC / 2NO	Pedal protection PS

Foot switches with hinged pedal protection have “PS” in the article designation and are available in single-pedal and two-pedal versions.

Foot switches
with contactor

Foot switches with contactor LS combine an auxiliary power switch with a main power switch. Thus, the control of an engine can be realized without the need for an additional switch box. The contactor is directly mounted onto a standard mounting rail in the shrouded enclosure.

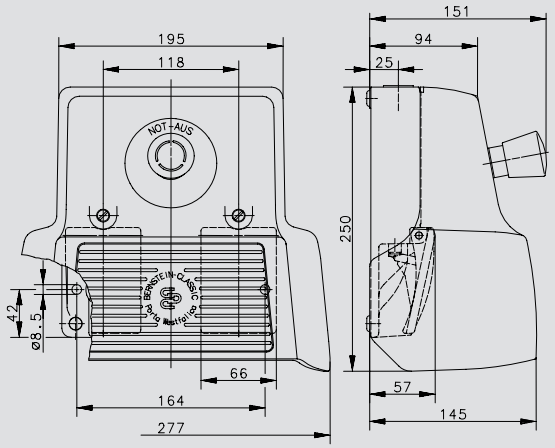


Single-pedal foot switch F1			
Article number	**Designation**	**Switching contacts**	**Special feature**
6061800436	F1-SU1Z LS22 UN	1NC / 1NO	Power contactor LS, protective shroud UN

Foot switches with contactor have “LS22” in the article designation and can only be delivered in single-pedal version.

Foot switches
with emergency stop button

Since the foot switch is often used in different locations other than on an actual machine or system, a conforming “emergency stop” button is directly available to the operator on the command unit.



Images and drawings are examples only

Single-pedal foot switch F1

Article number	Designation	Switching contacts	Special feature
6061600435	F1-U1Z NA2 UN	1NC / 1NO	Emergency stop button NA2 in the housing cover, protective shroud UN

Two-pedal foot switch F2

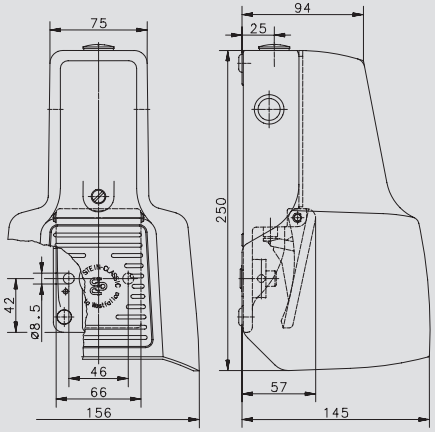
Article number	Designation	Switching contacts		Special feature
		Pedal 1 (l.)	Pedal (r.)	
6162720700	F2-U2Z/U2Z NA2 UN	2NC / 2NO	2NC / 2NO	Emergency stop button NA2 in the housing cover, protective shroud UN

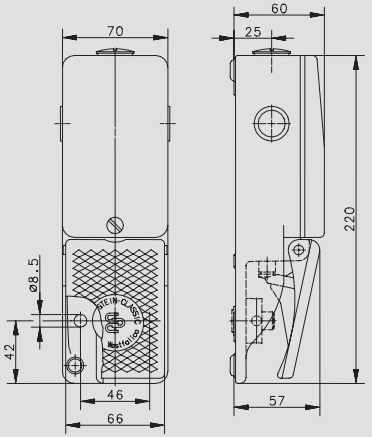
Foot switches with Emergency Stop button have “NA2” in the article designation and can be delivered in single-pedal and two-pedal versions.

Foot switches
with pressure point

The pressure point is a mechanical resistance during the actuating pedal travel. This provides the user with added physical signals about the actuator position (tactile feedback).

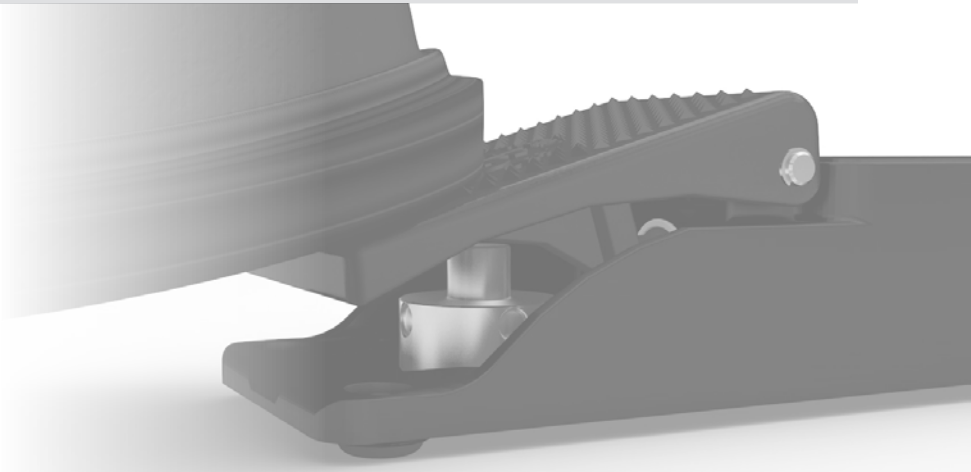
The pressure point applies when using two contact elements with differently adjusted forward travel (two-stage switch).





Images and drawings are examples only

- Pedal pressed up to pressure point:
  Switching point for first contact element
- Pedal pressed as far as it will go beyond the pressure point:
  Switching point for second contact element.
  The first contact element remains switched on.



Single-pedal foot switch F1

Article number	Designation	Switching contacts	Pressure point	Special feature
Snap-action				
		Pedal 1	Pedal 1	
6161800073	F1-SU1ZD UN	1NC / 1NO	200 N	Pressure point D, protective shroud UN
6061900433	F1-SU2ZD UN	2NC / 2NO	200 N	Pressure point D, protective shroud UN
Slow-action				
6061200007	F1-U2ZD	2NC / 2NO	200 N	Pressure point D
6061700008	F1-U2ZD UN	2NC / 2NO	200 N	Pressure point D, protective shroud UN

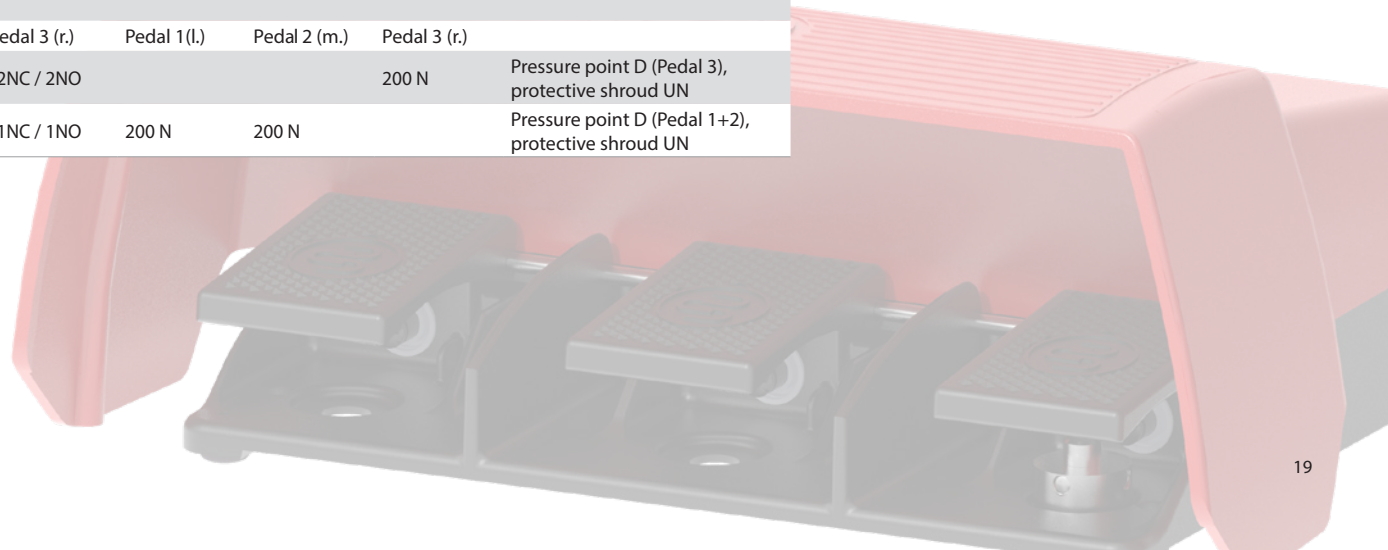
Two-pedal foot switch F2

Article number	Designation	Switching contacts		Pressure point		Special feature
Snap-action						
		Pedal 1 (l.)	Pedal 2 (r.)	Pedal 1 (l.)	Pedal 2 (r.)	
6162000418	F2-SU1Z/SU2ZD UN	1NC / 1NO	2NC / 2NO		460 N	Pressure point D (Pedal 2), protective shroud UN
6162000503	F2-SU4ZD/SU4ZD UN	4Ö / 4S	4Ö / 4S	200 N	200 N	Pressure point D (Pedal 1+2), protective shroud UN
Slow-action						
6062620086	F2-U1Z/U2ZD UN	1NC / 1NO	2NC / 2NO		200 N	Pressure point D (Pedal 2), protective shroud UN
6062220019	F2-U2ZD/U2ZD	2NC / 2NO	2NC / 2NO	200 N	200 N	Pressure point D (Pedal 1+2)
6062720020	F2-U2ZD/U2ZD UN	2NC / 2NO	2NC / 2NO	200 N	200 N	Pressure point D (Pedal 1+2), protective shroud UN

Three-pedal foot switch F3

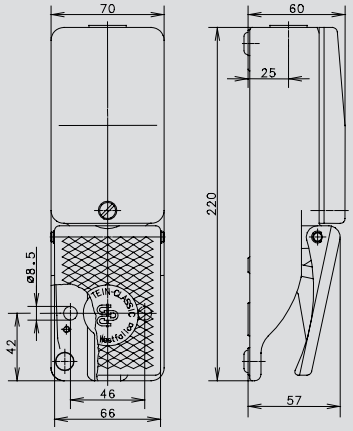
Article number	Designation	Switching contacts			Pressure point			Special feature
Slow-action								
		Pedal 1 (l.)	Pedal 2 (m.)	Pedal 3 (r.)	Pedal 1(l.)	Pedal 2 (m.)	Pedal 3 (r.)	
6063612423	F3-U1Z/U1Z/U2ZD UN	1NC / 1NO	1NC / 1NO	2NC / 2NO			200 N	Pressure point D (Pedal 3), protective shroud UN
6063721262	F3-U2ZD/U2ZD/U1Z UN	2NC / 2NO	2NC / 2NO	1NC / 1NO	200 N	200 N		Pressure point D (Pedal 1+2), protective shroud UN

Foot switches with pressure point have “D” in the article code which is suffixed to the contact element code. The protective shroud “UN” and the pressure point “D” are often used in combination in one foot switch.



Foot switches
with analog output

This foot switch version has a variable controlling current and voltage output that is directly proportional to the pedal position. A programmable signaling output is additionally activated when a predetermined pedal position is reached. The analog output can be delivered in a 0–5 V, 0–10 V, 0–20 mA or 4–20 mA version.
The foot switch is available in single-pedal version. Two and three-pedal versions available on request.



Images and drawings are examples only

Single-pedal foot switch F1	
Article number	**Designation**
6161500723	F1-AU0-5
6161500724	F1-AU0-10
6161500725	F1-AI0-20
6161500726	F1-AI4-20

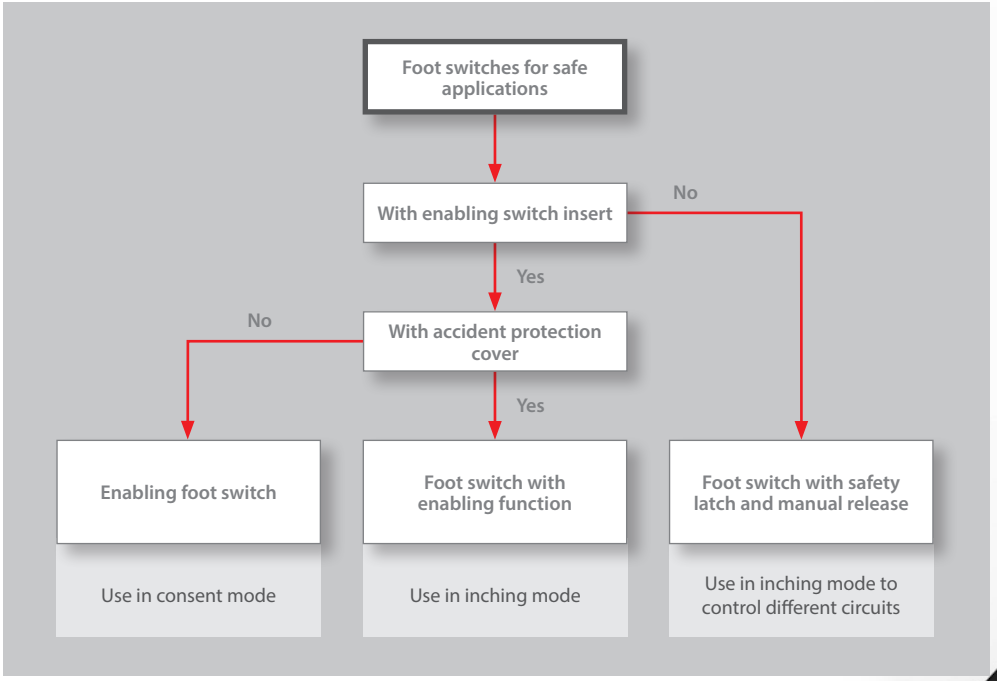
Single-pedal foot switch F1 with protective shroud UN	
Article number	**Designation**
6161000727	F1- AU0-5 UN
6161000728	F1- AU0-10 UN
6161000729	F1- AI0-20 UN
6161000730	F1- AI4-20 UN

Foot switches
with enabling function

In fully automated manufacturing processes, operators are protected from any hazardous machine movements by guards such as safety gates or safety bonnets. However, how can this protection be maintained in the event of maintenance? How is the employee protected when the machine needs to be repaired or cleaned? When and how may the operator deliberately override the protective devices? This is where BERNSTEIN's three-stage enabling foot switches come into play: the answer to these questions is the enabling function.

Find out more on the topic

Areas of use of the foot switches



Foot switches
with enabling function

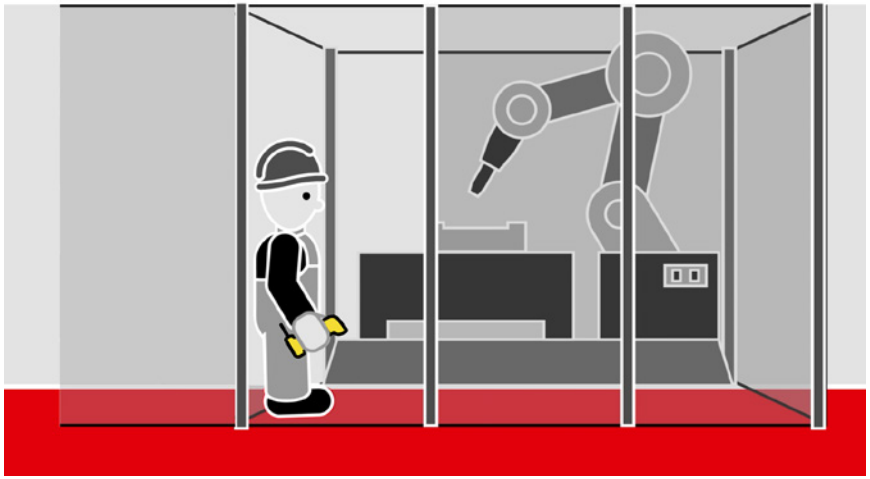
Enabling function

The enabling function has been a proven function for many years and has also been part of various standards for a long time, such as EN ISO 12100. This standard relates to the safety of machines and describes the enabling function as: “Additional manually operated device used in conjunction with a start-up control which, when continuously actuated, allows the machine to function”.

The regulations state that when the safety fence is open, machine operation is prevented by a door interlock. During manual operation, when the operator approaches the machine during programming, maintenance or test runs, the danger must be reduced by means of various measures.
This includes slow machine operation (reduction of kinetic energy) and restriction of the moving part of the machine.
Measures must also be taken to be able to stop the machine in an emergency.
Such safety measures include the use of enabling switches.
However, no movement may be started by actuating the enabling switch alone.
The movement is only permitted, and must be initiated, by means of a separate start control. This is prescribed, for example, by EN 60204-1, which also relates to the safety of machines.

Two-step and three-step enabling function

In essence, enabling switches are divided into two and three-stage variants.
The two-stage types are now obsolete and are only used in old machines.
For new products, for example, EN ISO 10218-1 (safety requirements for industrial robots) prescribes three-stage enabling switches.

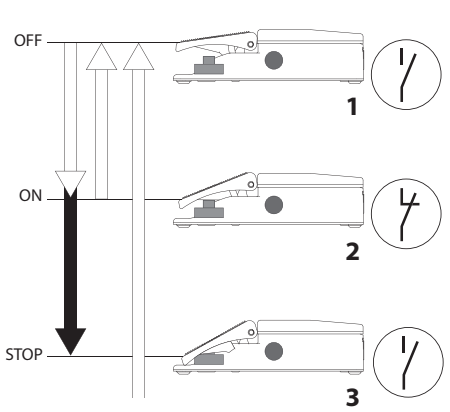


Teaching a robot function through a manually operated enabling switch

Function of a three-stage enabling foot switch

A three-stage enabling switch must have the following basic switching stages:

- In the idle state (level 1), it is in the off function (control element not pressed, contacts open).
- Slightly pressed (level 2), it switches to the enabling function (actuator pressed to middle position, contacts closed).
- If it is pressed further (level 3), it switches to the off function (forced opening of the contacts, actuator fully pressed beyond the middle position).



Enabling switch insert

Foot switch with and without accident protection cover

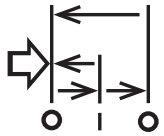
Foot switch for enabling operation

If it is released again in level 3, the switch returns to level 1 without closing the contacts during the transition. The two-level enabling switches thus lack level 3.

However, since a person tends to tense up more when in panic or severe pain, i.e. to push through, and is less likely to let go, this level 3 is of enormous importance for the safety of the operator and is therefore prescribed for new machines.

Compulsory labeling

Three-position enabling switches must be permanently and easily legibly marked with the following symbol in accordance with IEC 60947-5-8:

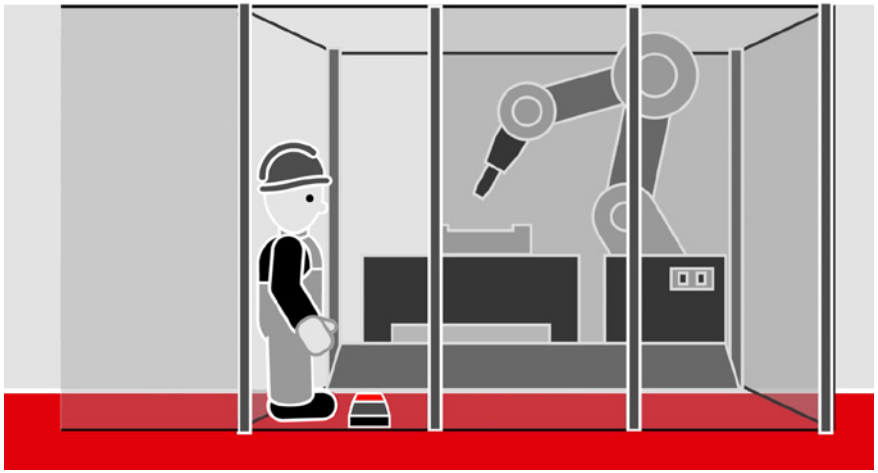


Symbol for a three-position enabling switch

Three-stage enabling foot switch

The electromechanical design of an enabling foot switch is identical to that of the manually operated version. The difference is that the switching stages are logically operated with the foot. Level 1 is also the rest position. In level 2, the operator presses the pedal of the foot switch up to the so-called pressure point (tactile resistance) to close the enabling contacts and release the machine movement. If the pedal is fully depressed beyond the middle position (level 3), the contacts open again.

Foot switches
with enabling function



Teaching a robot function through a three-stage enabling footswitch

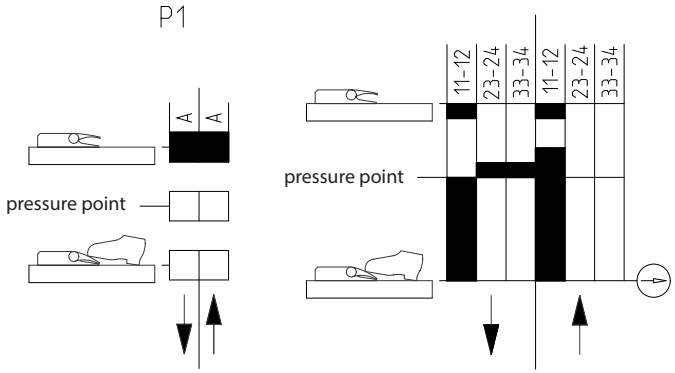
Why now with the foot?

The advantages of an enabling foot switch in contrast to a manually operated enabling device are not difficult to explain. Especially in set-up operation, during a repair or while cleaning a machine, having both hands available is an advantage. Very often in these cases, the machine has to be moved through a step-by-step feed by means of stepping.

For example, the operator has both hands free when changing reels on a wire winding machine. Here, the wire of the newly inserted reel must be threaded and during this process, the machine moves at reduced speed and the release of the hazardous movement is given by pressing an enabling foot switch. The machine operator thus has the possibility to bring the wire to the desired position with both hands after he has started the movement by means of a separate start control.

Why should it be a BERNSTEIN enabling foot switch?

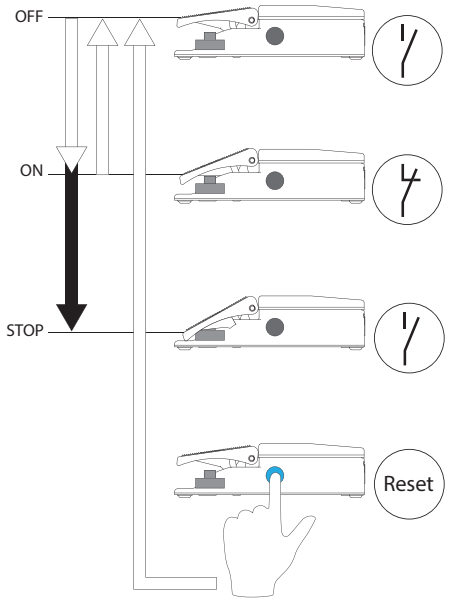
Another advantage of the BERNSTEIN enabling foot switch is position monitoring. From a control point of view, pedal positions 1 and 3 are completely identical. In both cases, the enabling contacts are open. If you now want to evaluate the exact position of the pedal, this is not possible without aids. The BERNSTEIN enabling foot switches have an optional additional PNP signal output which indicates the exact pedal position.



Example of a switching diagram for an enabling switch with additional position detection (output A)

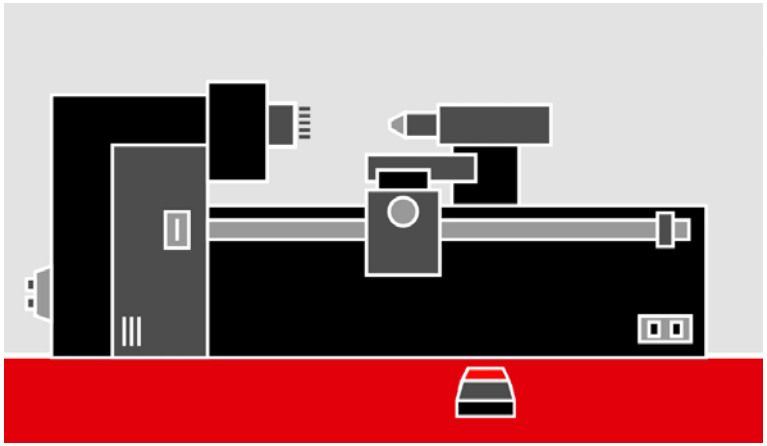
It is also possible to use a so-called accident protection cover. This protects the foot switch from unintentional actuation and damage by falling parts. However, foot switches with accident protection covers are not approved for enabling operation for ergonomic reasons. Therefore, these products are dealt with in the next chapter “Foot switches for inching operation” (from page 28).

In addition, the enabling foot switches can be equipped with a safety latching mechanism. This ensures that the foot switch engages after reaching switch position 3 and that the machine cannot be started without first being unlocked.



Integration of an enabling foot switch into a safety system

The DGUV's Wood and Metal Division has published a technical paper (FBHM-39) detailing the integration of an enabling foot switch into a safety system. The foot switch is used in this application to safely set up a lathe.

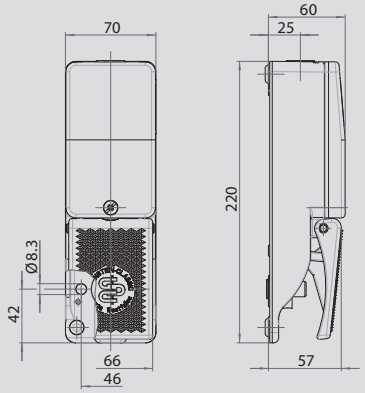


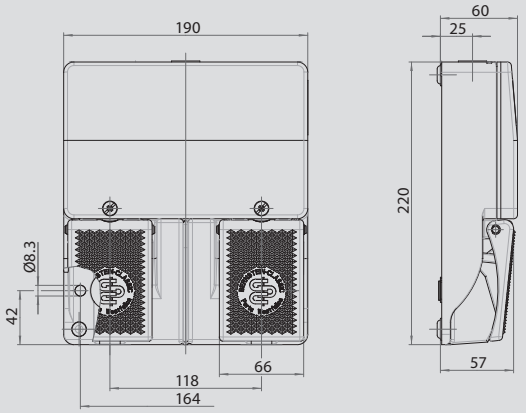
Enabling foot switch for the set-up operation of a lathe

Features:
DGUV-approved enabling foot switches do not have an accident protection cover.

Enabling foot switch
3-stage

The enabling foot switch offers two enabling contacts and one signaling contact, and is available both with and without latching.





Images and drawings are examples only

Single-pedal foot switch F1

Article number	Designation	Switching contacts	Pressure point	Special feature
6061500559	F1-ZSD	1NC / 2NO	200 N	Pressure point D
6061500567	F1-ZSDR	1NC / 2NO	200 N	Pressure point D, Latching R
6061500569	F1-ZSP1D	1NC / 2NO	200 N	Pressure point D, PNP output level 1*
6061500570	F1-ZSP3D	1NC / 2NO	200 N	Pressure point D, PNP output level 3**

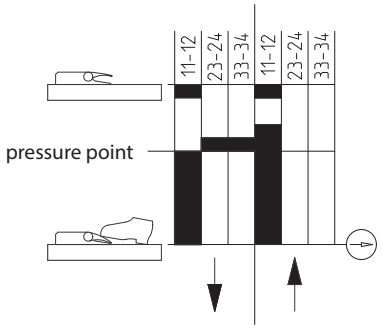
* Additional board PNP for determination of switching position 1
** Additional board PNP for determination of switching position 3

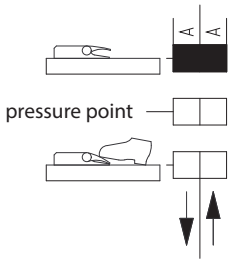
Two-pedal foot switch F2

Article number	Designation	Switching contacts		Pressure point		Special feature
		Pedal 1(l.)	Pedal 2 (r.)	Pedal 1(l.)	Pedal 2 (r.)	
6062500561	F2-U1Z/ZSD	1NC / 1NO	1NC / 2NO		200 N	Pressure point D (Pedal 2)
6062500568	F2-ZSDR/ZSDR	1NC / 2NO	1NC / 2NO	200 N	200 N	Pressure point D, Latching R

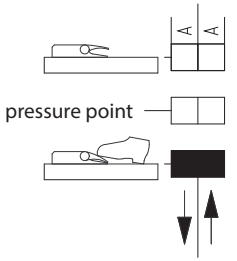
Technical data

Mechanical data		
Enclosure		Cast aluminium (powder-coated)
Cover, Protective shroud UN		Cast aluminium (powder-coated)
Actuation		Pedal (Thermoplastic)
Ambient temperature (with no icing/no condensation)		–30°C to +80°C
Type of connection		Screw connections (M3.5)
Conductor cross sections		0.5 – 1.5 mm² (single-wire or stranded wire with ferrule)
Cable entry		M20x1.5
Protection class		IP65 IP67 (in type designation "ZS")
Electrical data		
Rated insulation voltage	U_i	400 V AC 250 V AC (in type designation "ZS")
Rated impulse strength	U_{imp}	2.5 kV (in type designation "C", "ZS")
Conventional thermal current	I_{the}	10 A 5 A (in type designation "ZS")
Utilization category		AC-15, U_e / I_e 240 V / 3 A DC-13, U_e / I_e 24 V / 3 A AC-15, U_e / I_e 240 V / 1.5 A (in type designation "ZS") DC-13, U_e / I_e 24 V / 1 A (in type designation "ZS")
Positive opening		according to IEC / EN 60947-5-1, Appendix K (when reaching the pedal stop)

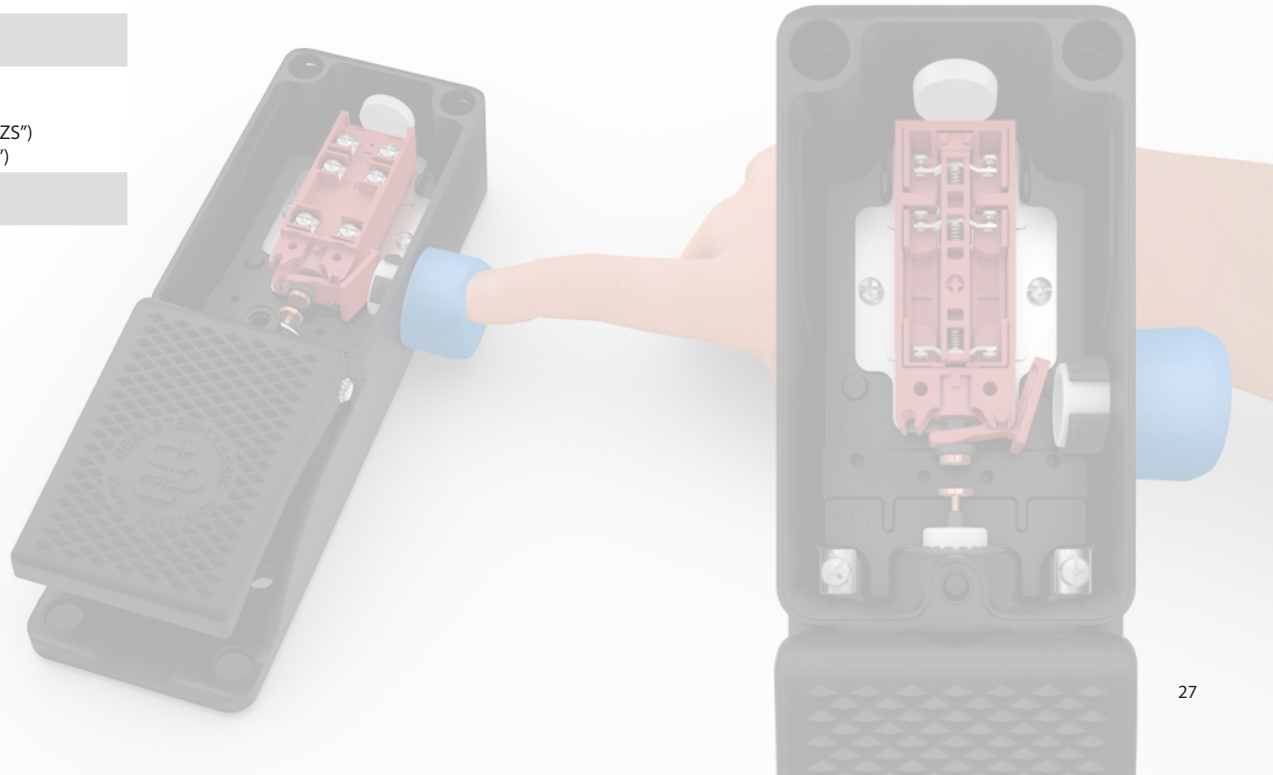




PNP output level 1



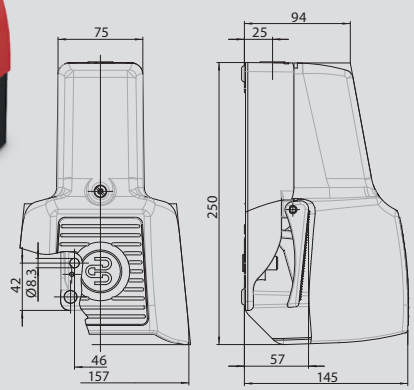
PNP output level 3

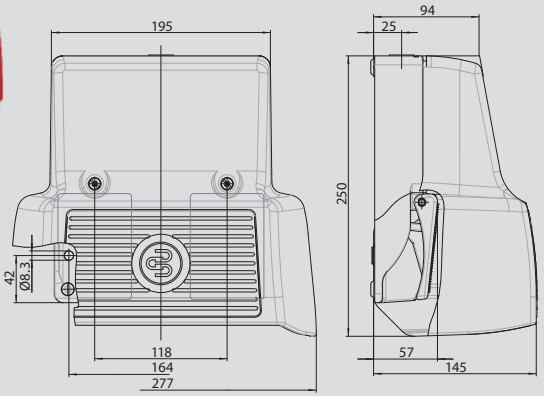


Foot switches
with enabling function for inching operation

Foot switches are often used as so-called “command devices with automatic reset” or “jog switches” for short, to set a machine to the operating state. Foot switches with enabling function are ideally suited for this purpose, as they meet very high safety requirements with the integrated approved enabling switch insert.

The contact design and the switching function of these switches are identical to those of enabling foot switches. The pedal position can be detected dynamically with the signal contact or statically with the additional circuit board. The foot switch with enabling function is available with and without detent as well as with accident protection cover.





Images and drawings are examples only

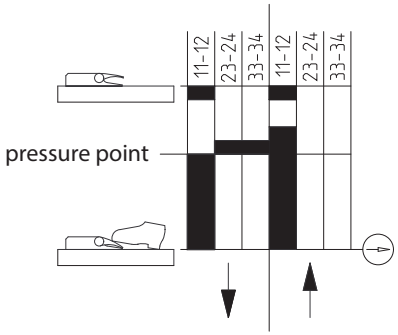
Foot switches for inching operation usually have an accident protection cover. As this is not permissible for enabling operation for ergonomic reasons, they are not approved for enabling operation despite having the same contact function.

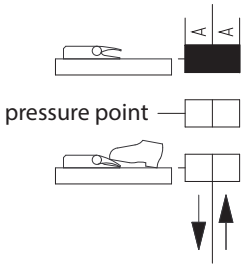
Product selection	Single-pedal foot switch with enabling function F1			
Article number	**Designation**	**Switching contacts**	**Pressure point**	**Special feature**
6061000558	F1-ZSD UN	1NC / 2NO	200 N	Pressure point D, protective shroud UN
6061000560	F1-ZSDR UN	1NC / 2NO	200 N	Pressure point D, latching R, prot. shroud UN
6061000564	F1-ZSP1D UN	1NC / 2NO	200 N	Additional board 1*, pressure point D, prot. shroud UN

* PNP additional board for differentiating the switching position 1

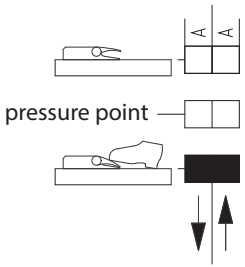
Product selection	Two-pedal foot switch with enabling function F2				
Article number	**Designation**	**Switching contacts**		**Pressure point**		**Special feature**
		Pedal 1 (l.)	Pedal 2 (r.)	Pedal 1 (l.)	Pedal 2 (r.)	
6062000562	F2-U1Z/ZSD UN	1NC / 1NO	1NC / 2NO		200 N	Pressure point D (Pedal 2), protective shroud UN
6062000563	F2-U1Z/ZSDR UN	1NC / 1NO	1NC / 2NO		200 N	Pressure point D (Pedal 2), latching R, protective shroud UN
6062000565	F2-ZSP1D/ZSP1D UN	1NC / 2NO	1NC / 2NO	200 N	200 N	Additional board 1*, pressure point D (Pedal 1+2), prot. shroud UN
6062000566	F2-ZSP3D/ZSP3D UN	1NC / 2NO	1NC / 2NO	200 N	200 N	Additional board 3**, pressure point D (Pedal 1+2), prot. shroud UN

* PNP additional board for differentiating the switching position 1
** PNP additional board for differentiating the switching position 3

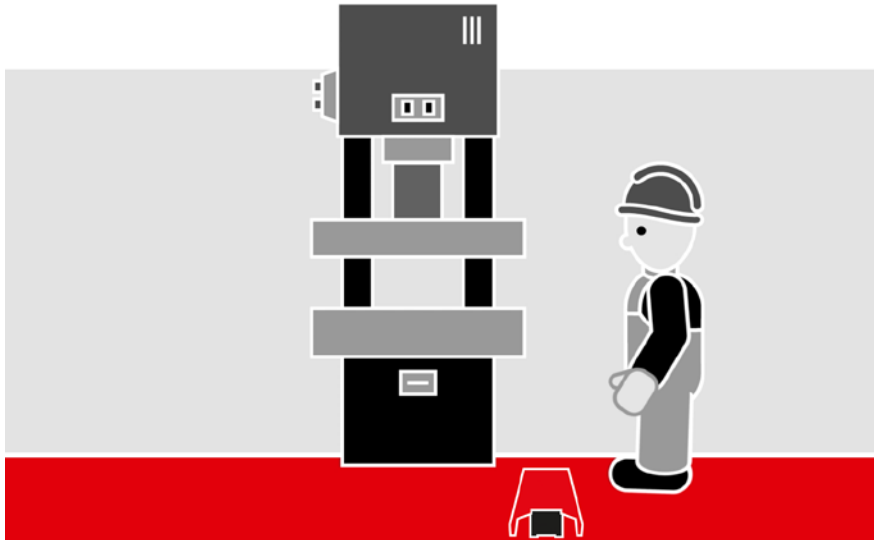




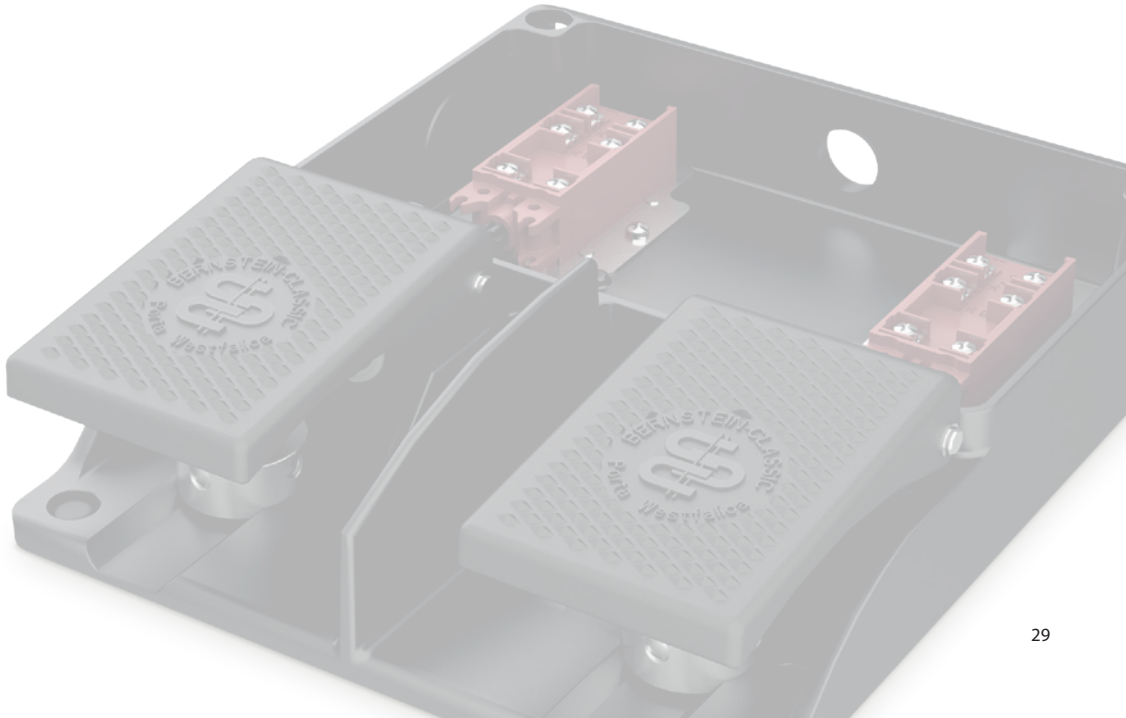
PNP output level 1



PNP output level 3

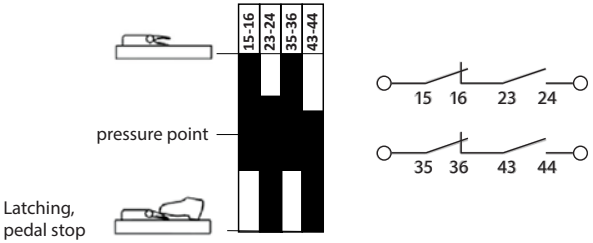


Enabling foot switch for inching operation on a press



Foot switches
with safety latch and manual release

Enabling function through contact combination
The enabling function on the foot switches with safety latch and manual release is not achieved by an enabling switch insert, but by a combination of contacts.
Example:

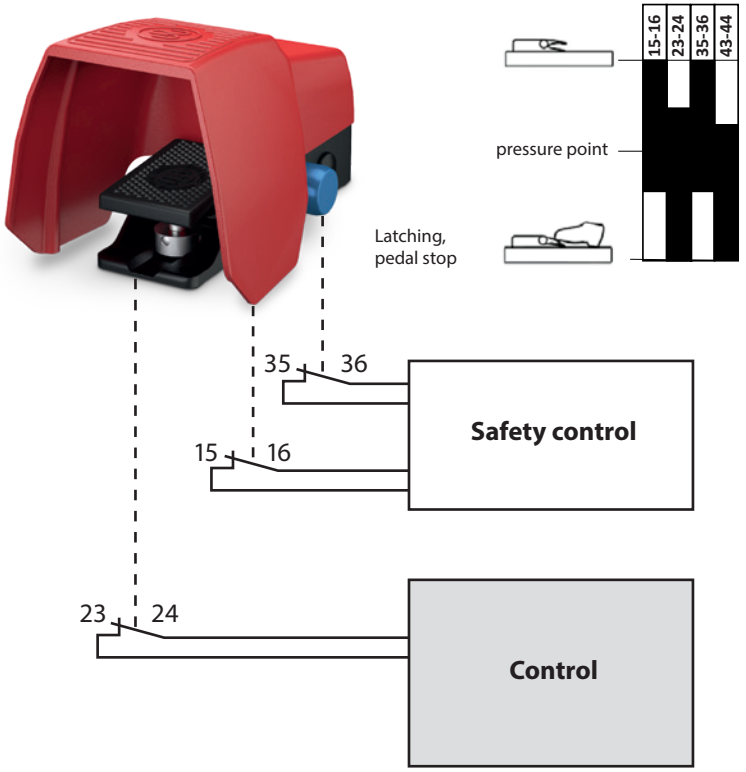


Due to the series connection of the overlapping contacts, an OFF-ON-OFF function is achieved as with the enabling function. However, when the pedal is returned from the 3rd level, the 2nd level is always passed through as well. For this reason, the foot switches with safety latch and manual release are only available with a reset button. When this button is pressed, the 2nd level is passed through within a few milliseconds.

The advantage of these switches is that the contacts can also be used individually without series connection, and thus the OFF-ON-OFF function can also be achieved by control means as in the example opposite.

Example application
A foot switch with safety catch and manual release is used on a woodworking machine to control the saw blade. The foot switch has an accident protection cover to prevent an unintentional start of the dangerous movement by falling objects. In this case, contact 23/24 acts as a make contact on the control. If the pedal is depressed to the stop by the pressure point, contacts 15/16 and 35/36 cause a safety shutdown, as an unusual situation is assumed.

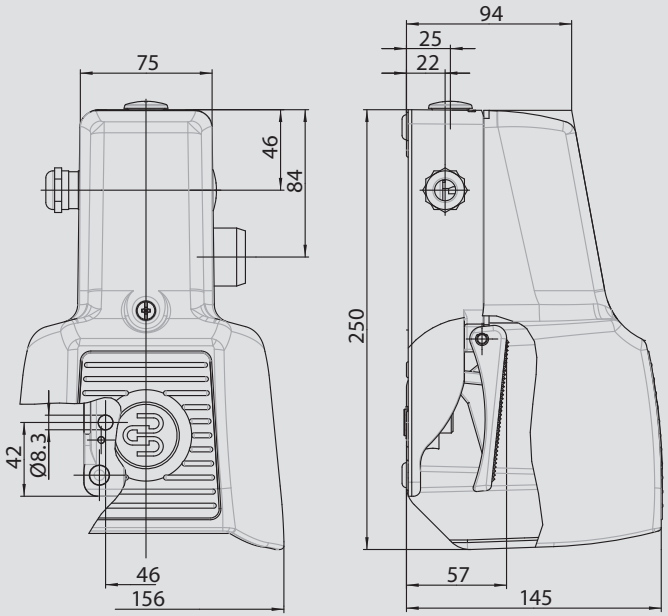
Foot switch with safety catch and manual release on a woodworking machine



Product selection	Single-pedal foot switch F1			
Article number	**Designation**	**Switching contacts**	**Pressure point**	**Special feature**
6161000560	F1-SU1ZUV1ZDR UN	2NC / 2NO	200 N	Pressure point D, Latching R, protective shroud UN
6161000203	F1-SU1Z/UV1ZD UN	1NC / 2NO	200 N	Pressure point D, Latching R, protective shroud UN
6161000626	F1-SU1ZCA2ZDR UN	3NC / 1NO	200 N	Pressure point D, Latching R, protective shroud UN
6161000443	F1-UV1Z/UV1ZD	2NC / 2NO	200 N	Pressure point D, latching R
6161000532	F1-UV1Z/UV1ZD UN	2NC / 2NO	200 N	Pressure point D, latching R, protected release button, protective shroud UN

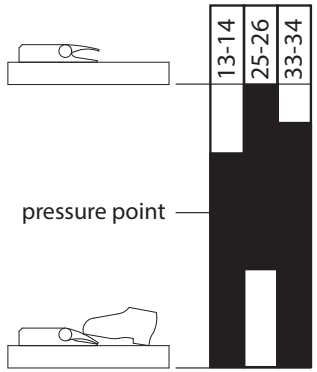
Two-pedal foot switch F2						
Article number	**Designation**	**Switching contacts**		**Pressure point**		**Special feature**
		Pedal 1 (l.)	Pedal 2 (r.)	Pedal 1 (l.)	Pedal (r.)	
6162000486	F2-SU1ZUV1ZD/ SU1Z UN	2NC / 2NO	1NC / 1NO	460 N		Latching R (Pedal 1), pressure point D (Pedal 1), prot. shroud UN
6162000553	F2-SU1ZUV1D/ SU1ZUV1D UN	2NC / 2NO	2NC / 2NO	200 N	200 N	Latching R (Pedal 1+2), pressure point D (Pedal 1+2), prot. shroud UN
6162000338	F2-SU1ZUV1D/ SU1ZUV1D UN	1NC / 2NO	1NC / 2NO	200 N	200 N	Latching R (Pedal 1+2), pressure point D (Pedal 1+2), prot. shroud UN
6162000709	F2-SU1ZCA2ZD/ SU1ZCA2ZD	3NC / 1NO	3NC / 1NO	200 N	200 N	Latching R (Pedal 1+2), pressure point D (Pedal 1+2), prot. shroud UN
6162000583	F2-UV1ZD/ UV1ZD UN RAST	1NC / 1NO	1NC / 1NO	200 N	200 N	Latching R (Pedal 1+2), pressure point D (Pedal 1+2), prot. shroud UN

For wiring diagrams, see pages 32-33.



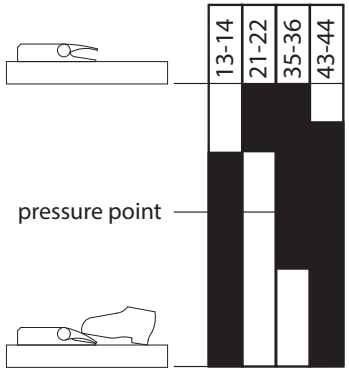
Foot switches with safety latch and manual release
Dimensional drawings

6161000203



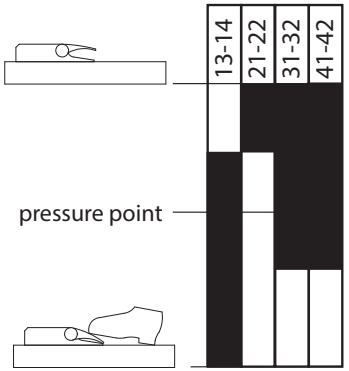
Latching,
pedal stop

6161000560



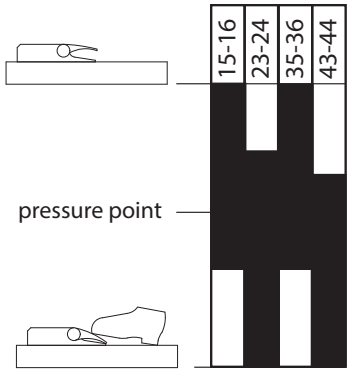
Latching,
pedal stop

6161000626



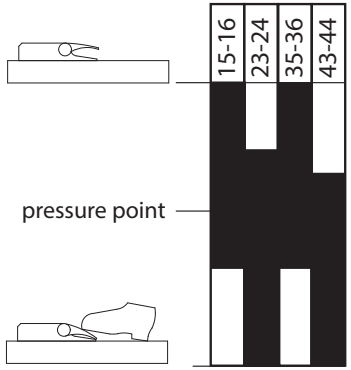
Latching,
pedal stop

6161000443



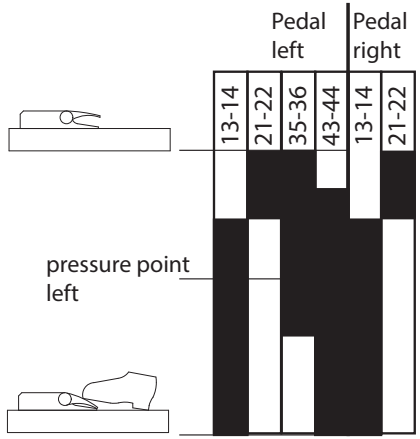
Latching,
pedal stop

6161000532



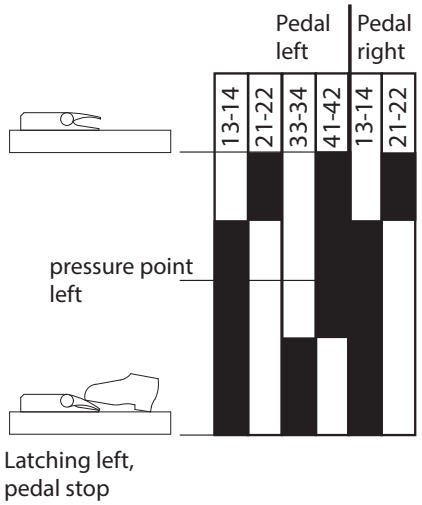
Latching,
pedal stop

6162000486



Latching left,
pedal stop

6162000364



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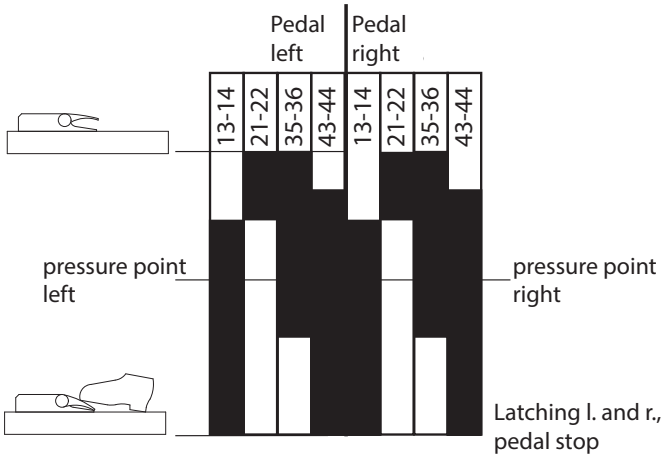
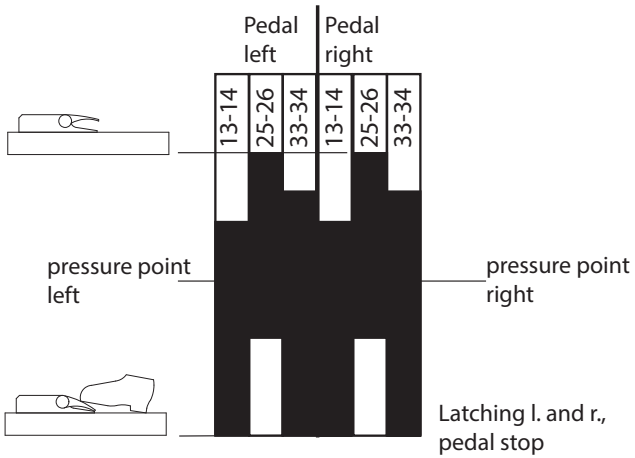
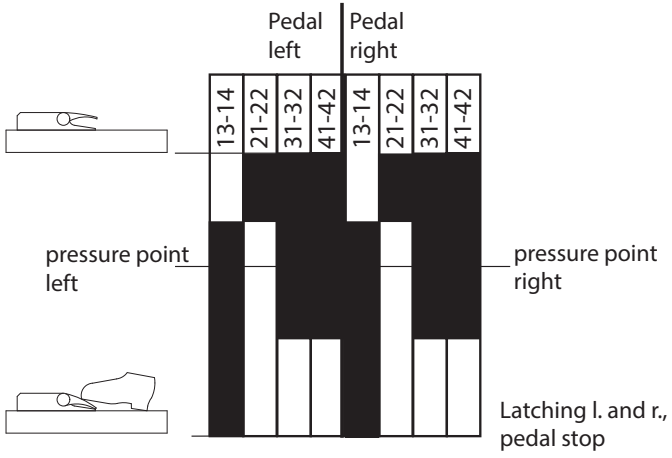


6162000338



6162000709



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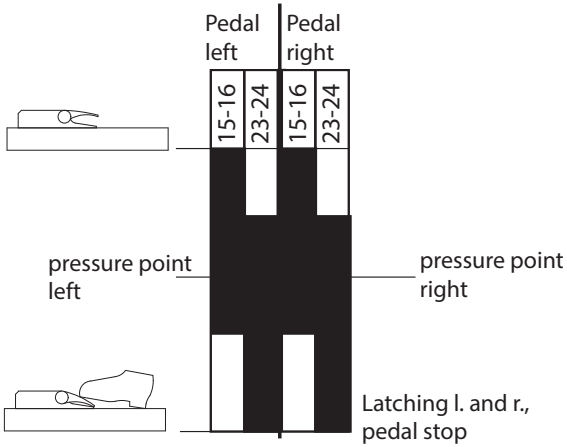

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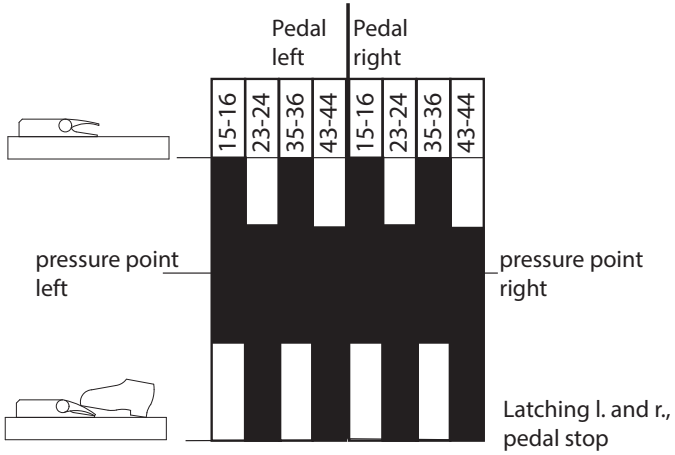
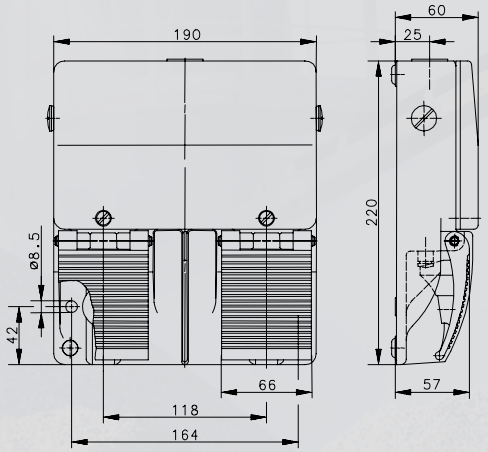


Foot switches
Heavy-duty

These foot switches are designed for use in very rough environments and therefore have foot pedals made of aluminium with additional wear-resistant surface finishing.
In addition, the shock bolt under the pedal is made of NIRO.



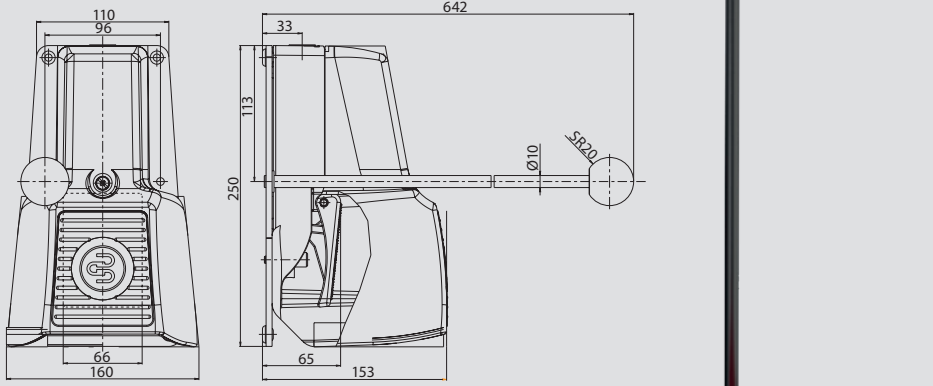
Images and drawings are examples only

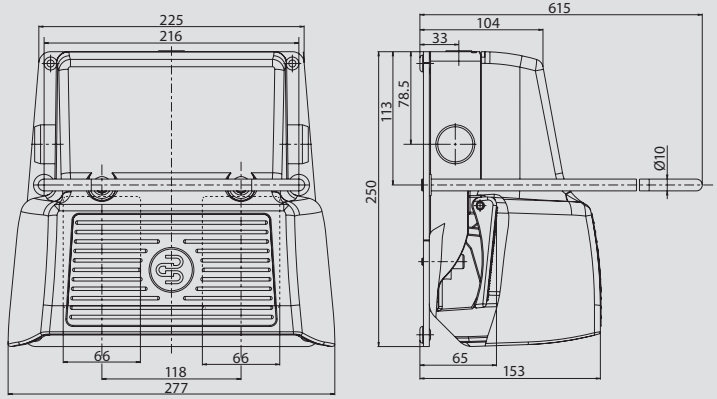
Two-pedal foot switch F2				
Article number	**Designation**	**Switching contacts**		**Special feature**
		Pedal 1 (l.)	Pedal 2 (r.)	
6162220125	F2-U2Z/U2Z	2NC / 2NO	2NC / 2NO	Foot pedal and shock bolt made of aluminium
6162610693	F2-U1Z/U1Z UN	1NC / 1NO	1NC / 1NO	Foot pedal and shock bolt made of aluminium, protective shroud UN

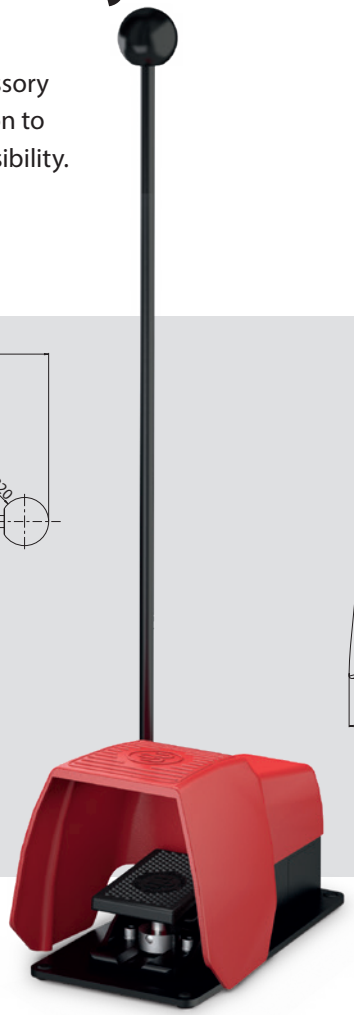
Three-pedal foot switch F3					
Article number	**Designation**	**Switching contacts**			**Special feature**
		Pedal 1 (l.)	Pedal 2 (m.)	Pedal 3 (r.)	
6163222647	F3-U2Z/U2Z/U2Z	2NC / 2NO	2NC / 2NO	2NC / 2NO	Foot pedal made of aluminium

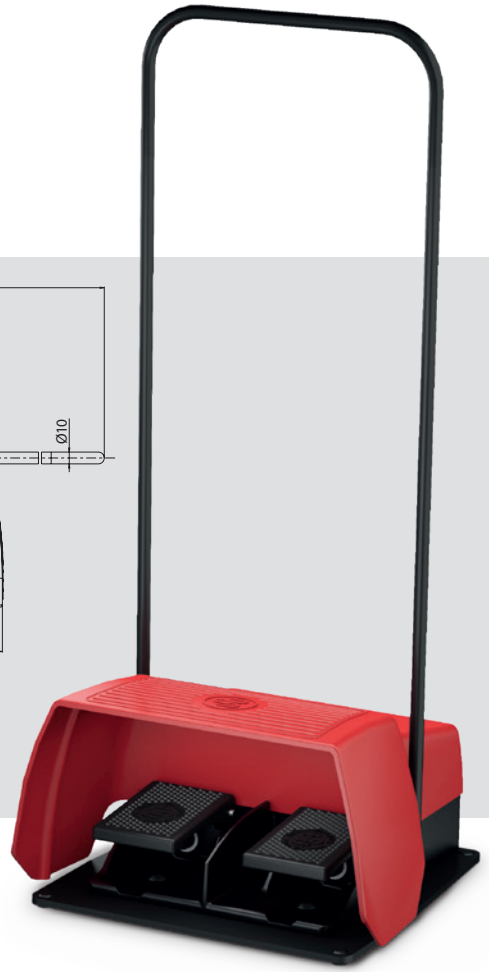
Foot switches
supplemented by mobility handling

The mobility handling option is a complementary accessory for the one (F1) and two (F2) pedal versions. Modification to the foot switch is not required and has retro fitting possibility.









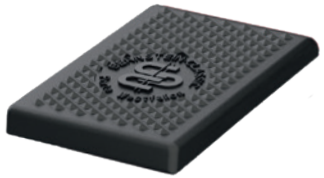
Mobility handling for foot switches		
Article number	**Designation**	**Description**
3996000229	F1-TV	Transport device for foot switch 1-pedal
3996000230	F2-TV	Transport device for foot switch 2-pedal

Spare parts

Cover	
Article number	**Designation**
3906010475	F1-cover incl. seal and screw

Cover	
Article number	**Designation**
3906020501	F2-cover incl. seal and screw

Foot pedal	
Article number	**Designation**
3996000283	Foot pedal set incl. spindle and half rings



Protective shroud	
Article number	**Designation**
3906010719	F1-PROTECTIVE SHROUD UN incl. seal and screw

Protective shroud	
Article number	**Designation**
3906020720	F2-PROTECTIVE SHROUD UN incl. seal and screw

Spare parts

Pressure point	
Article number	**Designation**
3996000271	Pressure point 200N SET
3996000272	Pressure point 460N SET

Shock insert	
Article number	**Designation**
3996000273	Shock insert 25N SET
3996000274	Shock insert Metal 78N SET

Emergency stop protective shroud	
Article number	**Designation**
3996000275	Emergency stop protective shroud set

Switch inserts	
Article number	**Designation**
3996000276	C74-EB-U1Z SET
3996000277	C74-EB-SU1Z SET
3996000278	C74-EB-U2Z SET

Switch inserts	
Article number	**Designation**
3996000279	C74-EB-SU2Z SET
3996000280	C74-EB-U2ZD SET
3996000281	C74-EB-SU2ZD SET

AT Pedal lock	
Article number	**Designation**
3996000282	AT Pedal lock set

Technical data

Electrical data		
Rated insulation voltage	U_i	400 V AC
		250 V AC (in type designation "ZS", "EX")
Rated impulse strength	U_{imp}	4 kV *
		2.5 kV (in type designation "C", "ZS", "EX") *
Conventional thermal current	I_{the}	10 A
		5 A (in type designation "ZS", "EX")
Utilization category		AC-15, U_e / I_e 240 V / 3 A
		AC-15, U_e / I_e 240 V / 1.5 A (in type designation "ZS")
Positive opening		according to IEC/EN 60947-5-1, Addendum K (when reaching the pedal stop)
Overvoltage category (switch-in contact with enabling function)		III (according to IEC 60664-1)
Protection class		I

* does not apply to "MI" and "MI RG" in article designation

Standard values for safety technology	
B10d	20×10^6
	6×10^6 Restrictions in article designation "C" *
	2×10^6 Restrictions in article designation "D" *
	1×10^5 Restrictions in article designation "ZS" *

* Once a restriction exists, the lowest value needs to be applied

This technical data is generic to our standard foot switch range, please refer to individual technical data sheets for exact product information as the technical data above may vary.

Mechanical data	
Enclosure	Aluminium die-casting (powder-coated)
Cover, Protective shroud UN	Cast aluminium (powder-coated)
Foot pedal	Thermoplastic
Operating temperature (no icing / no condensation)	-30 °C to +80 °C (-20 °C to +65 °C in type designation "EX")
Storage temperature	-30 °C to +80 °C (-20 °C to +65 °C in type designation "EX")
Mechanical service life	> 1 × 10^6 switching cycles when using switches with potentiometer 5 x 10^4
Switching frequency	50 min^{-1}, when using switches with potentiometer 20 min^{-1}
Type of connection	Screw connections (M3.5)
Conductor cross sections	Single-wire 0.5 – 1.5 mm^2 or stranded wire with ferrule 0.5 – 1.5 mm^2
Cable entry	M20 × 1.5
Weight with cover	F1 ≈ 0.6 kg, F2 ≈ 1.7 kg, F3 ≈ 3.0 kg
Weight with protective shroud UN	F1 ≈ 1.5 kg, F2 ≈ 2.6 kg, F3 ≈ 5.4 kg
Protection class	Protection class depends on type. Standard is IP65.

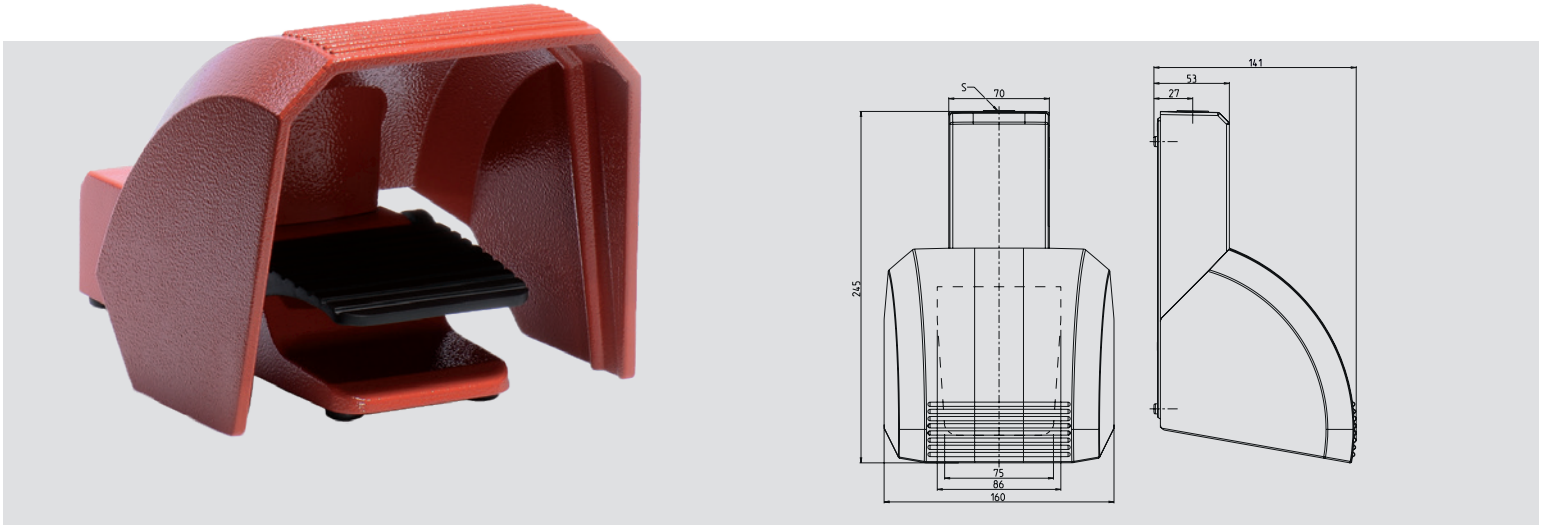
Standards
VDE 0660 T100, DIN EN 60947-1, IEC 60947-1
VDE 0660 T200, DIN EN 60947-5-1, IEC 60947-5-1

Approvals*
CCSAUS A300, Q300 (same polarity)
$_cUL_{US}$ B300 (in type designation "ZS")
DGUV (Only switches that have an appropriate label)

* Approvals depend on type.
More information can be found in the data sheet.

Foot switches
for design-oriented applications

The BERNSTEIN switch division have developed a new ergonomically designed footswitch – function finds form with this new product, especially with its new easy cleaning characteristics. These advancements further enhance the already successful BERNSTEIN footswitch range.



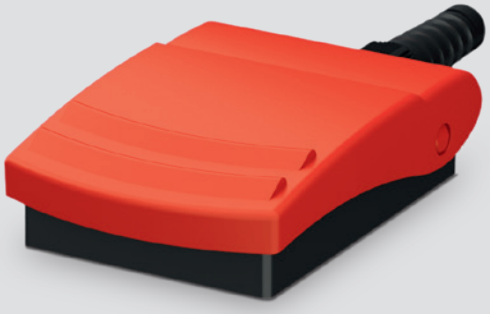
Foot switches FS			
Article number	**Designation**	**Switching contacts**	**Special feature**
6060600026	FS1-500-UN-0 N	1NC / 1NO	Protective shroud UN

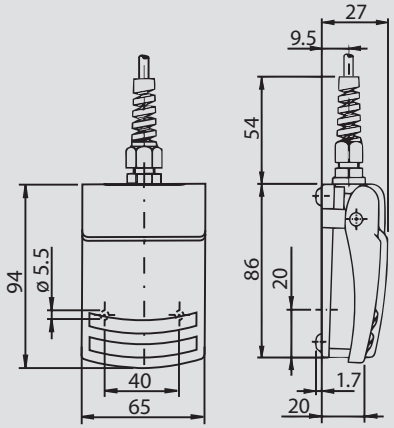
Product features

- Improved ergonomic features
- Modular expandability
- Protection class IP67
- Easy to clean

Foot switches
with insulating encapsulation

As the perfect complement to the metal foot switches, the product range impresses with its modern design. This is only a brief overview of the series. Contact us for detailed product information.





Images and drawings are examples only

Product features

- Multi-pedal version possible
- Different colored pedals (Black, Grey, Blue, Yellow, Red)
- Other colors available on request

Technical data

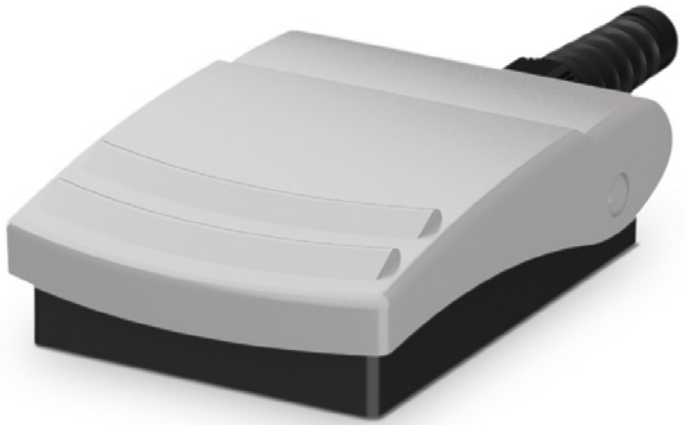
- Enclosure: Thermoplastic (fiber glass-reinforced)
- Actuator element: Thermoplastic (fiber glass-reinforced)
- Ambient temperature: -20 °C to +80 °C
- Protection class IP65

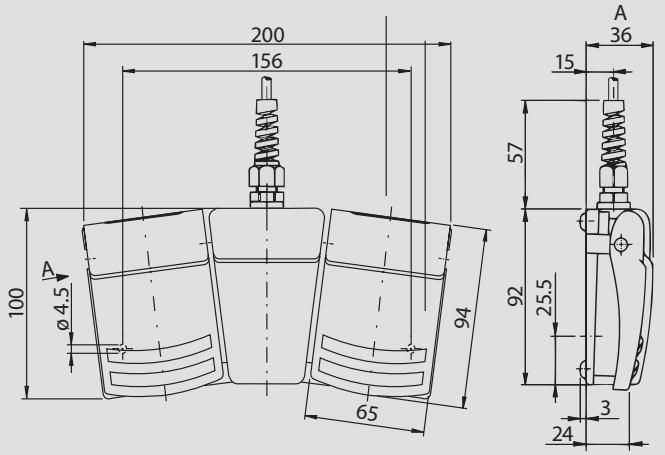
Accessories

- 2 m single-ended cord set

Single-pedal foot switch F1

Article number	Designation	Switching contacts	Pedal color
6069100004	KFM1-SU1 SW	1NC / 1NO	black
6069100005	KFM1-SU2 SW	2NC / 2NO	black
6069100008	KFM1-SU1 RT	1NC / 1NO	red
6069100009	KFM1-SU1 BL	1NC / 1NO	blue
6069100010	KFM1-SU1 GE	1NC / 1NO	yellow
6069100012	KFM1-SU1 GR	1NC / 1NO	grey





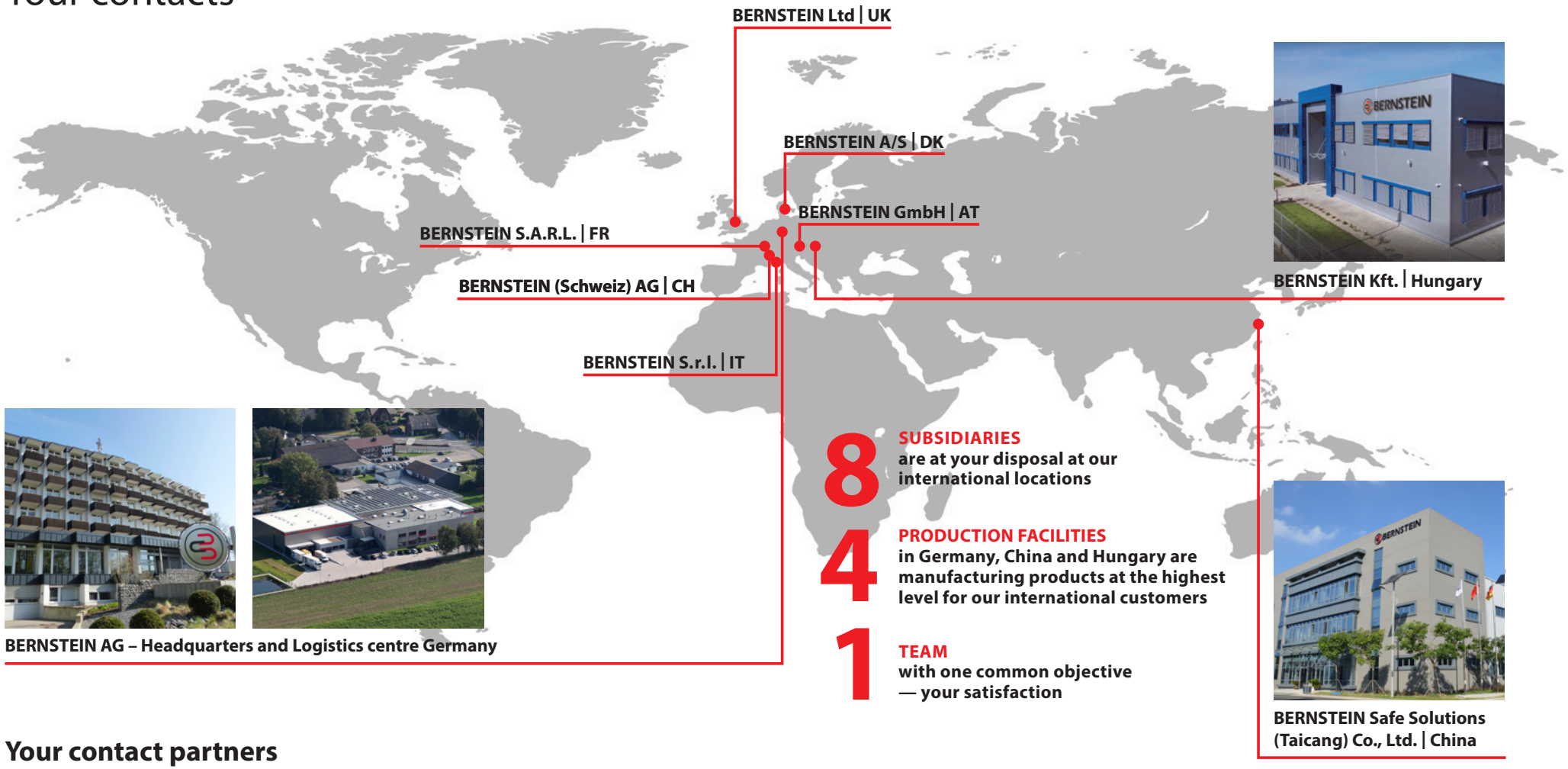
Images and drawings are examples only

Two-pedal foot switch F2

Article number	Designation	Switching contacts		Pedal color
		Pedal 1 (l.)	Pedal 2 (r.)	
6069200006	KFM2-SU1/SU1 SW	1NC / 1NO	1NC / 1NO	black
6069200007	KFM2-SU2/SU2 SW	2NC / 2NO	2NC / 2NO	black

BERNSTEIN WORLDWIDE

Your contacts



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