GIFAS
ELECTRIC

System and maintenance switches
(Safety switches)

ELECTRIC SOLUTIONS

V0625

Content

Introduction

Basic information

In production and technical operative systems, all measures must be taken to prevent accidents at work in line with art. 82 of the Law on Accident Prevention. This regulation is intended (to help do prevent) accidents at work.

Laws, regulations, standards

Detailed information on this subject are given in the following laws, regulations and standards:

– EG-Machines Directive 2006/42/EG, Appendix I, point 1.6.3;
– EN ISO 12100:2010, Safety of machinery, points 6.3.2.4 and 6.3.5.4;
– EN 60204-1:2018, Safety of machinery – Electrical equipment, point 5.4;
– EN ISO 14118:2018, avoiding accidental starts;
– Ordinance on the prevention of accidents and work-related illnesses, SR 832.30, Art. 30;
– SN 411000:2020, Low-voltage installation standard (NIN 2020), points 4.6.4 and 5.3.7.3.2.
– SUVA, the maintenance switch CE93-9.d, 18.5.2020
– EN 62626-1:2014, Low-voltage switchgear and controlgear enclosed equipment
– EN 60947-5-1:2018 Low-voltage switchgear and controlgear, control circuit devices and switching elements
– EN 60947-3:2012 Low-voltage switchgear and controlgear, switches, disconnectors, switch-disconnectors and fuse-combination units

Safety concept

Very different requirements for the safety concept can arise depending on the operating mode of a system. Safety should be guaranteed both in normal operation and special operating modes. In addition to the safety measures against electrical dangers (due to the flow of electrical energy), measures should also be taken against non-electrical risks (e.g. due to movements).

Integrating the maintenance switch into an overall system (created from functional units)

The system should be divided into groups of functional units for a specific operating purpose.
A technical system or a complex production machine should be divided up into appropriate functional units at the planning stage, and one maintenance switch should be assigned to each unit. This means that operational and safety requirements for the machine are met (e.g. with parallel production lines the option to shut off individual lines without impairing the overall production as otherwise there would be a risk of the maintenance switch not being used). This means that in the event of a fault or a repair, limited production can be maintained on another parallel path, or parts of the system can continue to be operated.
It must be possible to switch off each functional unit using a separate maintenance switch (VUV, Art. 30).
With extensive functional units the maintenance switches must be fitted so that one maintenance switch can be found in the immediate vicinity of every intervention point.

The safety shut-down

Safety shut-down devices must interrupt the flow of power so that no dangerous changes in operating condition can be initiated either through incorrectly entered or faulty control signals.
The safety shut-down device permits persons who need to intervene in the non-electrical danger areas of the system to prevent unintentional changes in the operating status (e.g. initiating a dangerous movement). With simple systems, the system switch can be used to shut down the power supply. However, very often the entire power supply must not be shut down because for example safety devices and control or checking devices must remain in operation or because with the intervention to be carried out, it must be possible to carry out changes in the operating status intentionally with the special operating control. When designing safety shut-down devices, it is essential to ensure that all power sources are shut off and all stored energy is dissipated that might cause a dangerous change in operating condition. The safety shut-down can carry out the shut-down, depending on the conditions, either directly using a maintenance switch that shuts down all pole lines or with an indirect shut-down procedure.
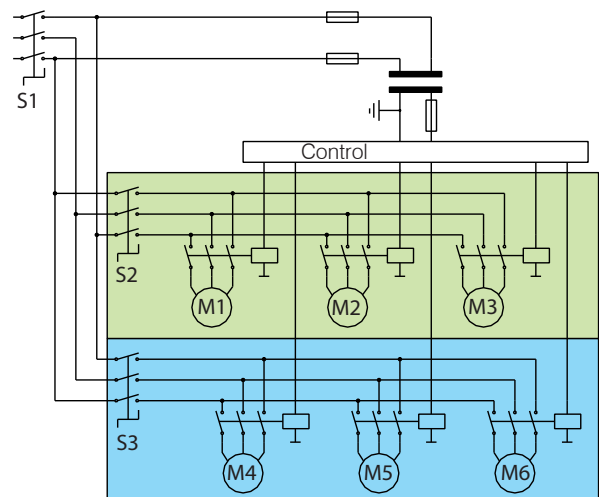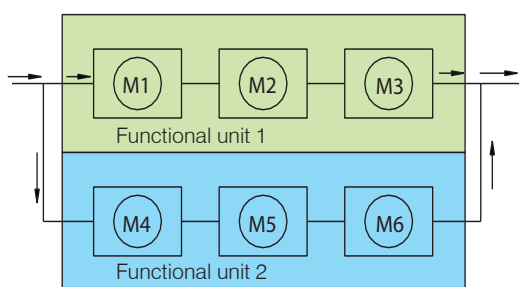
S1	Main switch / system switch
S2	Safety switch for functional unit 1
S3	Safety switch for functional unit 2

The inspection switch

With an issue date of May 2020, the SUVA / CNA / INSAI permits a revised regulation which describes which basic requirements a maintenance switch must fulfil. In Germany the relevant regulations VDE 01-1996 apply.

Basic requirements

In technical devices representing a risk in special operating modes (troubleshooting, repairs, maintenance, cleaning, etc.), a maintenance switch must be installed close to each functional unit.

The maintenance switch must meet the following requirements: It must...

– have priority over the switching devices in all operating modes,
– interrupt the supply of all dangerous power sources to the system,
– dissipate the dangerous stored power in the system (e.g. vent pneumatics) or store it safely (EN 1037, point 5.3.1.2),
– be labelled (a diagram must be given, for example, showing which area of the system is rendered inactive by the safety switch),
– have a positive effect and have forced opening contacts,
– normally have two switch positions, e.g. «0» (OFF) and «I» (ON),
– be possible to secure it against unintentional and accidental re-actuation in the OFF positions using multiple (at least 3) personal padlocks,
– be easily accessible without causing danger,
– be positioned so that the part of the system shut down can be viewed,
– always be fitted in immediate proximity to the intervention point (in other words, on site),
– with extensive systems or systems distributed across multiple rooms, be fitted at multiple points and wherever interventions are carried out on the system,
– be designed in black or light grey (exception: if the safety switch is also being used as an emergency stop switch, it must have a red handle and a yellow background),
– if the inspection switch also has the «Emergency-Stop» function, no unexpected start-up may be triggered by it being switched on again. This means that switching off the inspection switch must reset the control commands saved by the control system,
– if the return of the power supply after an interruption or after switching on the inspection switch again can lead to a dangerous situation, an unexpected start-up must be prevented. The controller must therefore be informed about the inspection switch being switched off so that saved movement commands are deleted,
– be designed to prevent re-actuation in the shut-down OFF position. This must be observed in particular for the design of the inspection switch with a detachable switch unit.

With the indirect shut-down, the following conditions must be met:

– The actual shut-down must be indicated (e.g. using a white indicator light, identified with «0» or «OFF»).
– This display must be safe (e.g. use contactors with forced contacts).
– When the maintenance switch is shut down, it must not be possible to actuate the indirectly actuated switching elements via manual intervention or another other outside influence.
– Short circuits in the supply line to the switch must be prevented where mechanical or other hazards exist. This can, for example, be achieved with one of the following measures:
  – Protected routing of the switch supply line (e.g. armoured steel tube),
  – Use of separately routed, shielded lines (shield earthed),
  – Use of cables in which each wire is separately shielded and earthed,
  – Use of a short-circuit monitoring system
– The functioning of the inspection switch must have priority over all other functions. Therefore, the inspection switch must act as closely as possible to the element which disconnects the power, i.e. directly on the contactor coil and not via a bus system or a PLC.

Direct and indirect shut-down

Direct shut-down

With direct shut-down the supply line to a motor or a system is shut down on all poles directly in the main power circuit. This is achieved with a switch with the two defined positions «0-I», which conforms to the requirements for a maintenance switch (see left).
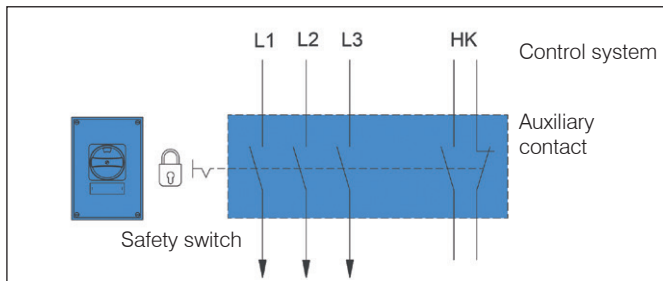
Indirect shut-down with short-cirquit monitoring

With indirect shut-down the main power source is switched via a contactor, for example. The indirect shut-down consists of a maintenance switch (as a control switch) and a safety contactor. The special requirements both for the safety switch and for the safety contactor must be fulfilled.
Safety shut-down devices must have a clearly detectable shut-down which may only be displayed when the power supply has been shut down reliably. When the indirect shut-down device, the actual safety shut-down is carried out via the safety contactor. A feedback lamp fitted directly onto the safety shut-down device actuator must therefore indicate (by lighting up) that the contacts on the safety contactor are actually open.
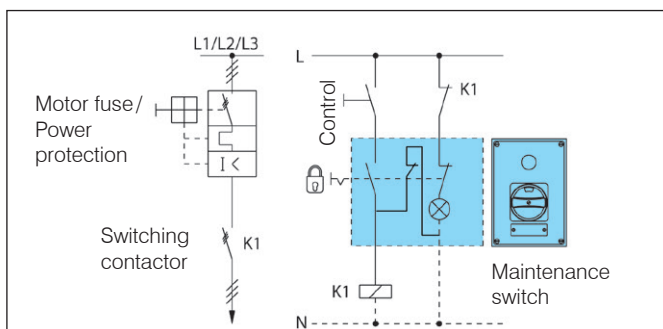
Specifications

Solid rubber enclosure

Material
Hard rubber casing are made out of a special butyl rubber mixture, and the cover from polycarbonate. More information on the casings, such as dimensions, assembly holes, etc., can be found in the brochure 01 «Power distribution boxes».

UV resistance
The light grey or black designs as well as the varnished rubber casings are permanently UV-resistant.

Halogen-free
Completely halogen-free and not contaminated with silicone materials.

Behaviour in fire
Self-extinguishing.

Resistance to chemical materials
The hard rubber is in general resistant to alkalis and acids used in industry.

Further housing materials
In addition to the GIFAS hard rubber casings, switch casings in steel plate, stainless steel A2/A4 and in polyester are also available.

Signs for switches
We label according to your scheme.

Housing colour
Standard grey RAL 7035, also available in black on request.

Wiring
We supply the on-site combinations wired to terminals according to your diagram.

Further specifications

Switching and display elements
We assemble the products specified by the customer in the relevant designs, outputs and voltages. Our standard products are Sälzer, Kraus & Naimer switches, and main system switches (0-1) also from the manufacturer ABB. As display elements we use Télémécanique (LED).

Terminals
The fitting is carried out according to the diagram with the required terminals, e.g. series or cage tension spring terminals. Our standard products are Wago, Woertz and Phönix terminals.
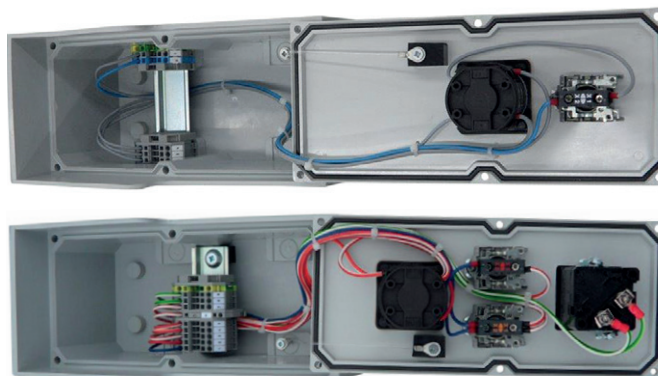
Cable glands
High quality screwed cable glands used and assembled individually according to the diagrams / drawings.

Assembly fitting types
The screw canals in the casing are outside the sealed area to ensure correct seal and safety insulation. The assembly is made even easier using the rust-free fitting brackets or plates to match the casing.

Corrosion protection
The cover screws are made from stainless steel V4A. Assembly accessories such as brackets are made from zinc-plated, A2 or A4 steel, according to the customer's requirements.

Labelling
With our engraving machine we label the combinations according to your specifications and permanently affix the engraved signs.
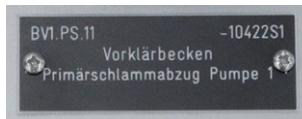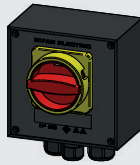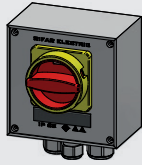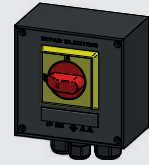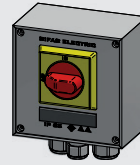
Protection category
Seal groove, sealing part and rubber seal guarantee protection category IP65 on the casing. Depending on the product used with the switch and display elements, the protection categories vary from IP54 to IP65.

Main system switches

3-pole

Item no.	050630 (grey) 033302 (black)
Housing type	1212
Housing material	hard rubber
Dimensions	125×125×76 mm
Protection category	IP65
Operating power rating	5.5 kW (at 50-60 Hz)
AC21 400 V	3-16 A
AC23 415 V	3-16 A
Input	1×M16 below 2×M20 below
Remarks	– 3-pole and N+PE terminals – with auxiliary contacts 1NC+1NO – 4 internal mounting channels

Item no.	053988 (grey) 053615 (black)
Housing type	1212
Housing material	hard rubber
Dimensions	125×125×76 mm
Protection category	IP65
Operating power rating	7.5 kW (at 50-60 Hz)
AC21 400 V	3-16 A
AC23 415 V	3-16 A
Input	1×M16 below 2×M20 below
Remarks	– 3-pole and N+PE terminals – with auxiliary contacts 1NC+1NO – 4 internal mounting channels

Item no.	050632 (grey) 033304 (black)
Housing type	1812
Housing material	hard rubber
Dimensions	125×180×90 mm
Protection category	IP65
Operating power rating	11 kW (at 50-60 Hz)
AC21 400 V	3-40 A
AC23 415 V	3-23 A
Input	1×M16 below 2×M20 below
Remarks	– 3-pole and N+PE terminals – with auxiliary contacts 1NC+1NO – 4 internal mounting channels

Item no.	050633 (grey) 033305 (black)
Housing type	1812
Housing material	hard rubber
Dimensions	125×180×90 mm
Protection category	IP65
Operating power rating	11 kW (at 50-60 Hz)
AC21 400 V	3-40 A
AC23 415 V	3-23 A
Input	1×M16 below 2×M25 below
Remarks	– 3-pole and N+PE terminals – with auxiliary contacts 1NC+1NO – 4 internal mounting channels

– ✓ = from stock, offer subject to prior sale
– further versions on request
– various accessories and spare parts available

Main system switches

Item no.	050634 (grey) 033308 (black)
Housing type	1616
Housing material	hard rubber
Dimensions	160×160×90 mm
Protection category	IP65
Operating power rating	22 kW (at 50-60 Hz)
AC21 400 V	3-63 A
AC23 415 V	3-63 A
Input	1×M16 below 2×M32 below
Remarks	– 3-pole and N+PE terminals – with auxiliary contacts 1NC+1NO – 4 internal mounting channels

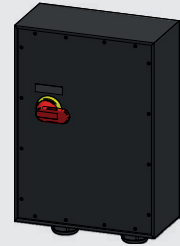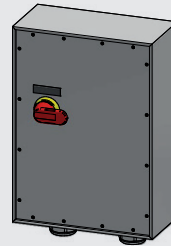| Item no.	050635 (grey) 033310 (black)
Housing type	2516
Housing material	hard rubber
Dimensions	161×251×90 mm
Protection category	IP65
Operating power rating	22 kW (at 50-60 Hz)
AC21 400 V	3-63 A
AC23 415 V	3-63 A
Input	1×M16 below 2×M32 below
Remarks	– 3-pole and N+PE terminals – with auxiliary contacts 1NC+1NO – 4 internal mounting channels

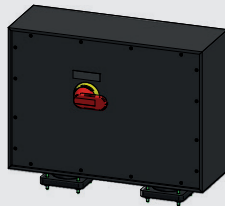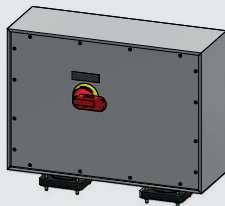| Item no.	050637 (grey) 033315 (black)
Housing type	3020
Housing material	hard rubber
Dimensions	202×302×110 mm
Protection category	IP65
Operating power rating	45 kW (at 50-60 Hz)
AC21 400 V	3-125 A
AC23 415 V	3-90 A
Input	1×M16 below 2×M40 below
Remarks	– 3-pole and N+PE terminals – with auxiliary contacts 1NC+1NO – 4 internal mounting channels

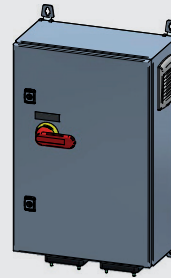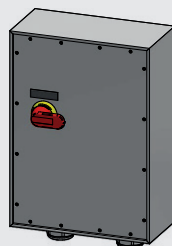| Item no.	050638 ✓ (grey) 033316 (black)
Housing type	3800
Housing material	hard rubber
Dimensions	252×362×133 mm
Protection category	IP65
Operating power rating	45 kW (at 50-60 Hz)
AC21 400 V	3-125 A
AC23 415 V	3-90 A
Input	1×M16 below 2×M40 below
Remarks	– 3-pole and N+PE terminals – with auxiliary contacts 1NC+1NO – 4 internal mounting channels

Main system switches

Item no.	056213 (grey)
	056216 (black)
Housing type	3800
Housing material	hard rubber
Dimensions	252×362×133 mm
Protection category	IP65
Operating power rating	75 kW (at 50-60 Hz)
AC21 400 V	3-160 A
AC23 415 V	3-160 A
Input	1×M16 below
	2×M50 below
Remarks	– 3-pole and N+PE terminals
	– with auxiliary contacts 1NC+1NO
	– 4 internal mounting channels

Item no.	145006 ✓ (grey)
	145010 (black)
Housing type	7900
Housing material	hard rubber
Dimensions	362×503×173 mm
Protection category	IP65
Operating power rating	110 kW (at 50-60 Hz)
AC21 400 V	3-200 A
AC23 415 V	3-200 A
Input	1×M16 below
	2×M63 below
Remarks	– 3-pole and N+PE terminals
	– with auxiliary contacts 1NC+1NO
	– 4 internal mounting channels

Item no.	145019 (grey)
	145021 (black)
Housing type	7900
Housing material	hard rubber
Dimensions	503×362×173 mm
Protection category	IP55
Operating power rating	140 kW (at 50-60 Hz)
AC21 400 V	3-250 A
AC23 415 V	3-250 A
Input	1×M16 below
	2×46-56 mm below
Remarks	– 3-pole and N+PE terminals
	– with auxiliary contacts 1NC+1NO
	– 4 internal mounting channels

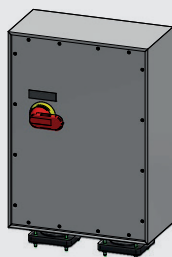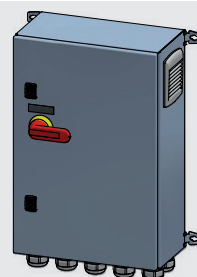| Item no.	251488 (metal grey)
Housing type	stainless steel V2A
Housing material	metal
Dimensions	400×600×210 mm
Protection category	IP65
Operating power rating	200 kW (at 50-60 Hz)
AC21 400 V	3-400 A
AC23 415 V	3-400 A
Input	1×M16 below
	2×55-65 mm below
Remarks	– 3-pole and N+PE terminals
	– with auxiliary contacts 1NC+1NO
	– 4 Wall mounting brackets
	– Side ventilation grilles
	– Door with two 3 mm double-bit locks

Main system switches

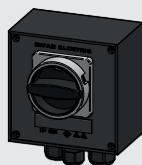| Item no.	251491 (grey)
Housing type	3800
Housing material	hard rubber
Dimensions	252×362×133 mm
Protection category	IP65
Operating power rating	45 kW (at 50-60 Hz)
AC21 400 V	4-125 A
AC23 415 V	4-90 A
Input	1×M16 below 2×M50 below
Remarks	– 4-pole and N+PE terminals – with auxiliary contacts 1NC+1NO – 4 internal mounting channels

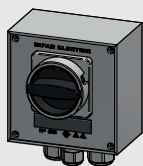| Item no.	247504 (grey)
Housing type	7900
Housing material	hard rubber
Dimensions	362×503×173 mm
Protection category	IP65
Operating power rating	75 kW (at 50-60 Hz)
AC21 400 V	4-160 A
AC23 415 V	4-160 A
Input	1×M16 below 2×M63 below
Remarks	– 4-pole and N+PE terminals – with auxiliary contacts 1NC+1NO – 4 internal mounting channels

Item no.	247505 (grey)
Housing type	7900
Housing material	hard rubber
Dimensions	362×503×173 mm
Protection category	IP55
Operating power rating	140 kW (at 50-60 Hz)
AC21 400 V	4-250 A
AC23 415 V	4-250 A
Input	1×M16 below 2×46-56 mm below
Remarks	– 4-pole and N+PE terminals – with auxiliary contacts 1NC+1NO – 4 internal mounting channels

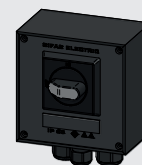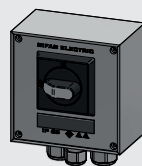| Item no.	247508 (metal grey)
Housing type	Stainless steel V2A
Housing material	metal
Dimensions	400×600×210 mm
Protection category	IP65
Operating power rating	220 kW (at 50-60 Hz)
AC21 400 V	4-400 A
AC23 415 V	4-400 A
Input	1×M16 below 10×M40 below
Remarks	– 4-pole and N+PE terminals – with auxiliary contacts 1NC+1NO – 4 Wall mounting brackets – Side ventilation grilles – Door with two 3 mm double-bit locks

400 V		OT16	OT25	OT40	OT63	OT100	OT125	OT160	OT200	OT250	OT315	OT400
Switching of resistive load, + little overload	AC21	16 A	25 A	40 A	63 A	100 A	125 A	160 A	200 A	250 A	315 A	400 A
Switching inductive loads (e.g. motors)	AC23	16 A	20 A	23 A	63 A	80 A	90 A	160 A	200 A	250 A	315 A	400 A
	kW	7.5	9	11	22	37	45	75	110	140	160	220

Maintenance switches direct «immediate»

3-pole

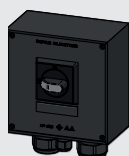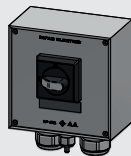| Item no.	050643 ✓ (grey) 033320 ✓ (black)
Housing type	1212
Housing material	hard rubber
Dimensions	125×125×76 mm
Protection category	IP65
Operating power rating	5.5 kW (at 50-60 Hz)
AC21 400 V	3-16 A
AC23 415 V	3-16 A
Input	1×M16 below 2×M20 below
Remarks	– 3-pole and N+PE terminals – with auxiliary contacts 1NC+1NO – 4 internal mounting channels

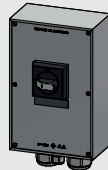| Item no.	054025 ✓ (grey) 054024 (black)
Housing type	1212
Housing material	hard rubber
Dimensions	125×125×76 mm
Protection category	IP65
Operating power rating	7.5 kW (at 50-60 Hz)
AC21 400 V	3-16 A
AC23 415 V	3-16 A
Input	1×M16 below 2×M20 below
Remarks	– 3-pole and N+PE terminals – with auxiliary contacts 1NC+1NO – 4 internal mounting channels

Item no.	050645 (grey) 033324 (black)
Housing type	1812
Housing material	hard rubber
Dimensions	125×180×90 mm
Protection category	IP65
Operating power rating	11 kW (at 50-60 Hz)
AC21 400 V	3-40 A
AC23 415 V	3-23 A
Input	1×M16 below 2×M20 below
Remarks	– 3-pole and N+PE terminals – with auxiliary contacts 1NC+1NO – 4 internal mounting channels

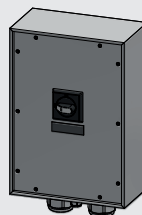| Item no.	050648 (grey) 033326 (black)
Housing type	1812
Housing material	hard rubber
Dimensions	125×180×90 mm
Protection category	IP65
Operating power rating	11 kW (at 50-60 Hz)
AC21 400 V	3-40 A
AC23 415 V	3-23 A
Input	1×M16 below 2×M25 below
Remarks	– 3-pole and N+PE terminals – with auxiliary contacts 1NC+1NO – 4 internal mounting channels

Maintenance switches direct «immediate»

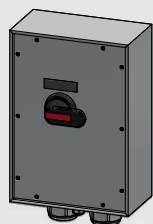| Item no.	050649 (grey) 033328 (black)
Housing type	1616
Housing material	hard rubber
Dimensions	160×160×90 mm
Protection category	IP65
Operating power rating	22 kW (at 50-60 Hz)
AC21 400 V	3-63 A
AC23 415 V	3-63 A
Input	1×M16 below 2×M32 below
Remarks	– 3-pole and N+PE terminals – with auxiliary contacts 1NC+1NO – 4 internal mounting channels

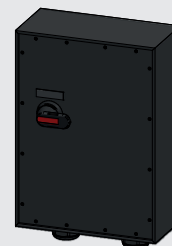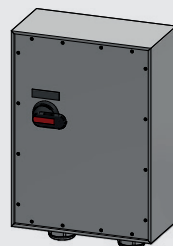| Item no.	050651 (grey) 033330 (black)
Housing type	2516
Housing material	hard rubber
Dimensions	161×251×90 mm
Protection category	IP65
Operating power rating	22 kW (at 50-60 Hz)
AC21 400 V	3-63 A
AC23 415 V	3-63 A
Input	1×M16 below 2×M32 below
Remarks	– 3-pole and N+PE terminals – with auxiliary contacts 1NC+1NO – 4 internal mounting channels

Item no.	050653 (grey) 033335 (black)
Housing type	3020
Housing material	hard rubber
Dimensions	202×302×110 mm
Protection category	IP65
Operating power rating	45 kW (at 50-60 Hz)
AC21 400 V	3-125 A
AC23 415 V	3-90 A
Input	1×M16 below 2×M40 below
Remarks	– 3-pole and N+PE terminals – with auxiliary contacts 1NC+1NO – 4 internal mounting channels

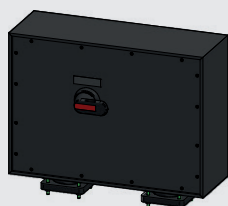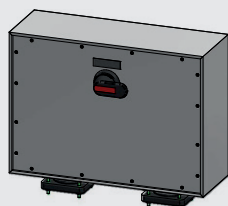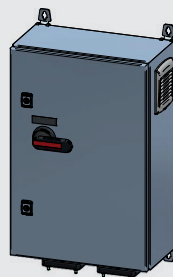| Item no.	050654 (grey) 033336 (black)
Housing type	3800
Housing material	hard rubber
Dimensions	252×362×133 mm
Protection category	IP65
Operating power rating	45 kW (at 50-60 Hz)
AC21 400 V	3-125 A
AC23 415 V	3-90 A
Input	1×M16 below 2×M40 below
Remarks	– 3-pole and N+PE terminals – with auxiliary contacts 1NC+1NO – 4 internal mounting channels

Maintenance switches direct «immediate»

Item no.	058602 (grey) 058603 (black)
Housing type	3800
Housing material	hard rubber
Dimensions	252×362×133 mm
Protection category	IP65
Operating power rating	75 kW (at 50-60 Hz)
AC21 400 V	3-160 A
AC23 415 V	3-160 A
Input	1×M16 below 2×M50 below
Remarks	– 3-pole and N+PE terminals – with auxiliary contacts 1NC+1NO – 4 internal mounting channels

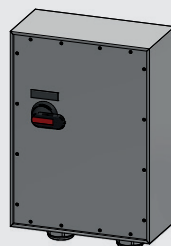| Item no.	145008 ✓ (grey) 145012 (black)
Housing type	7900
Housing material	hard rubber
Dimensions	362×503×173 mm
Protection category	IP55
Operating power rating	110 kW (at 50-60 Hz)
AC21 400 V	3-200 A
AC23 415 V	3-200 A
Input	1×M16 below 2×M63 below
Remarks	– 3-pole and N+PE terminals – with auxiliary contacts 1NC+1NO – 4 internal mounting channels

Item no.	145022 (grey) 145023 (black)
Housing type	7900
Housing material	hard rubber
Dimensions	503×362×173 mm
Protection category	IP65
Operating power rating	140 kW (at 50-60 Hz)
AC21 400 V	3-250 A
AC23 415 V	3-250 A
Input	1×M16 below 2×46-56 mm below
Remarks	– 3-pole and N+PE terminals – with auxiliary contacts 1NC+1NO – 4 internal mounting channels

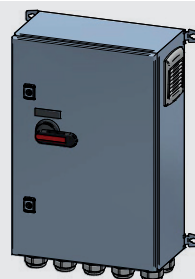| Item no.	251489 (metal grey)
Housing type	Stainless steel V2A
Housing material	metal
Dimensions	400×600×210 mm
Protection category	IP65
Operating power rating	220 kW (at 50-60 Hz)
AC21 400 V	3-400 A
AC23 415 V	3-400 A
Input	1×M16 below 2×55-65 mm below
Remarks	– 3-pole and N+PE terminals – with auxiliary contacts 1NC+1NO – 4 Wall mounting brackets – Side ventilation grilles – Door with two 3 mm double-bit locks

Maintenance switches direct «immediate»

4-pole

Item no.	251492 (grey)
Housing type	3800
Housing material	hard rubber
Dimensions	252×362×132 mm
Protection category	IP65
Operating power rating	45 kW (at 50-60 Hz)
AC21 400 V	4-125 A
AC23 415 V	4-90 A
Input	1×M16 below 2×M50 below
Remarks	– 4-pole and N+PE terminals – with auxiliary contacts 1NC+1NO – 4 internal mounting channels

Item no.	226441 (grey)
Housing type	7900
Housing material	hard rubber
Dimensions	362×503×173 mm
Protection category	IP65
Operating power rating	75 kW (at 50-60 Hz)
AC21 400 V	4-160 A
AC23 415 V	4-160 A
Input	1×M16 below 2×M63 below
Remarks	– 4-pole and N+PE terminals – with auxiliary contacts 1NC+1NO – 4 internal mounting channels

Item no.	245991 ✓ (grey)
Housing type	7900
Housing material	hard rubber
Dimensions	362×503×173 mm
Protection category	IP55
Operating power rating	140 kW (at 50-60 Hz)
AC21 400 V	4-250 A
AC23 415 V	4-250 A
Input	1×M16 below 2×46-56 mm below
Remarks	– 4-pole and N+PE terminals – with auxiliary contacts 1NC+1NO – 4 internal mounting channels

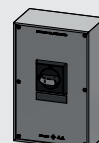| Item no.	245992 (metal grey)
Housing type	Stainless steel V2A
Housing material	metal
Dimensions	400×600×210 mm
Protection category	IP65
Operating power rating	220 kW (at 50-60 Hz)
AC21 400 V	4-400 A
AC23 415 V	4-400 A
Input	1×M16 below 10×M40 below
Remarks	– 4-pole and N+PE terminals – with auxiliary contacts 1NC+1NO – 4 Wall mounting brackets – Side ventilation grilles – Door with two 3 mm double-bit locks

	400 V	OT16	OT25	OT40	OT63	OT100	OT125	OT160	OT200	OT250	OT315	OT400
Switching of resistive load, + little overload	AC21	16 A	25 A	40 A	63 A	100 A	125 A	160 A	200 A	250 A	315 A	400 A
Switching inductive loads (e.g. motors)	AC23	16 A	20 A	23 A	63 A	80 A	90 A	160 A	200 A	250 A	315 A	400 A
	kW	7.5	9	11	22	37	45	75	110	140	160	220

Maintenance switches direct «immediate»

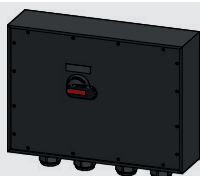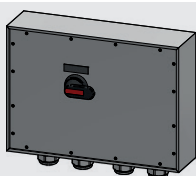| Item no.	145384 (grey) 145385 (black)
Housing type	1812
Housing material	hard rubber
Dimensions	125×180×90 mm
Protection category	IP65
Operating power rating	11 kW (at 50-60 Hz)
AC21 400 V	6-40 A
AC23 415 V	6-23 A
Input	1×M16 below 2×M20 below
Remarks	– 6-pole and N+PE terminals – with auxiliary contacts 1NC+1NO – 4 internal mounting channels

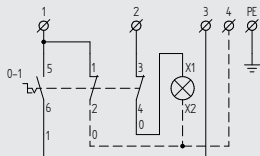| Item no.	145386 (grey) 145387 (black)
Housing type	2516
Housing material	hard rubber
Dimensions	161×251×90 mm
Protection category	IP55
Operating power rating	11 kW (at 50-60 Hz)
AC21 400 V	6-40 A
AC23 415 V	6-23 A
Input	1×M16 below 2×M25 below
Remarks	– 6-pole and N+PE terminals – with auxiliary contacts 1NC+1NO – 4 internal mounting channels

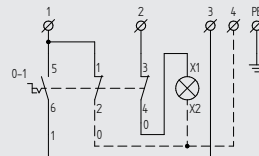| Item no.	145453 (grey) 145456 (black)
Housing type	3020
Housing material	hard rubber
Dimensions	202×302×110 mm
Protection category	IP65
Operating power rating	22 kW (at 50-60 Hz)
AC21 400 V	6-63 A
AC23 415 V	6-63 A
Input	1×M16 below 2×M40 below
Remarks	– 6-pole and N+PE terminals – with auxiliary contacts 1NC+1NO – 4 internal mounting channels
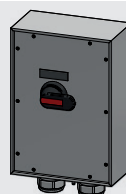
Item no.	145461 (grey) 145462 (black)
Housing type	3800
Housing material	hard rubber
Dimensions	252×362×133 mm
Protection category	IP55
Operating power rating	37 kW (at 50-60 Hz)
AC21 400 V	6-100 A
AC23 415 V	6-80 A
Input	1×M16 below 2×M50 below
Remarks	– 6-pole and N+PE terminals – with auxiliary contacts 1NC+1NO – 4 internal mounting channels

Item no.	145463 (grey) 145466 (black)
Housing type	7800
Housing material	hard rubber
Dimensions	503×362×133 mm
Protection category	IP65
Operating power rating	45 kW
AC21 400 V	6-125 A
AC23 415 V	6-90 A
Input	1×M16 below 4×M40 below
Remarks	– 6-pole and N+PE terminals – with auxiliary contacts 1NC+1NO – 4 internal mounting channels

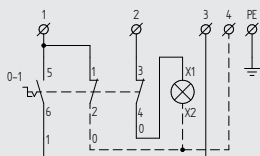# «Direct» maintenance emergency switches

with locking rim

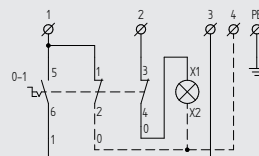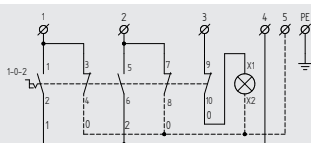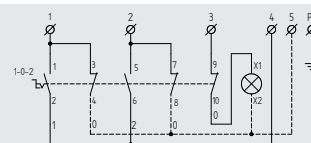|	
Item no.	**052693** ✓
Housing type	1812
Housing material	hard rubber
Housing colour	grey
Dimensions	125×180×90 mm
Protection category	IP65
Input	1×M20 below
Switch	1×0-I, lockable
Signal lamp	1×24 V white
Terminals	2.5 mm^2
Remarks	– 4 internal mounting channels – without protruding protective roof

Item no.	**049164** ✓
Housing type	1812
Housing material	hard rubber
Housing colour	grey
Dimensions	125×180×90 mm
Protection category	IP55
Input	1×M20 below
Switch	1×0-I, lockable
Signal lamp	1×230 V white
Terminals	2.5 mm^2
Remarks	– 4 internal mounting channels – without protruding protective roof

Item no.	**029206**
Housing type	1812
Housing material	hard rubber
Housing colour	grey
Dimensions	125×180×90 mm
Protection category	IP55
Input	1×M20 below
Switch	1×I-0-II, lockable
Signal lamp	1×24 V white
Terminals	2.5 mm^2
Remarks	– 4 internal mounting channels – without protruding protective roof

with handle lock

Item no.	**058605**
Housing type	1812
Housing material	hard rubber
Housing colour	grey
Dimensions	125×180×90 mm
Protection category	IP55
Input	1×M20 below
Switch	1×0-I, lockable
Signal lamp	1×24 V white
Terminals	2.5 mm^2
Remarks	– 4 internal mounting channels – without protruding protective roof

Item no.	**058606** ✓
Housing type	1812
Housing material	hard rubber
Housing colour	grey
Dimensions	125×180×90 mm
Protection category	IP65
Input	1×M20 below
Switch	1×0-I, lockable
Signal lamp	1×230 V white
Terminals	2.5 mm^2
Remarks	– 4 internal mounting channels – without protruding protective roof

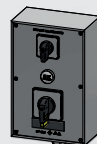|	
Item no.	**029208**
Housing type	1812
Housing material	hard rubber
Housing colour	grey
Dimensions	125×180×90 mm
Protection category	IP55
Input	1×M20 below
Switch	1×I-0-II, lockable
Signal lamp	1×24 V white
Terminals	2.5 mm^2
Remarks	– 4 internal mounting channels – without protruding protective roof

«Direct» maintenance emergency switches

with locking rim

Item no.	029207
Housing type	1812
Housing material	hard rubber
Housing colour	grey
Dimensions	125×180×90 mm
Protection category	IP65
Input	1×M20 below
Switch	1×I-0-II, lockable
Signal lamp	1×230 V white
Terminals	2.5 mm²
Remarks	– 4 internal mounting channels – without protruding protective roof

with handle lock

Item no.	029209
Housing type	1812
Housing material	hard rubber
Housing colour	grey
Dimensions	125×180×90 mm
Protection category	IP65
Input	1×M20 below
Switch	1×I-0-II, lockable
Signal lamp	1×230 V white
Terminals	2.5 mm²
Remarks	– 4 internal mounting channels – without protruding protective roof

Item no.	150843
Housing type	2516
Housing material	hard rubber
Housing colour	grey
Dimensions	161×251×90 mm
Protection category	IP55
Input	1×M20 below
Switch	1×I-0-II, 1×I-0-II, lockable
Signal lamp	1×24 V white
Terminals	2.5 mm²
Remarks	– 4 internal mounting channels – without protruding protective roof

Item no.	044841
Housing type	2516
Housing material	hard rubber
Housing colour	grey
Dimensions	161×251×90 mm
Protection category	IP55
Input	1×M20 below
Switch	1×I-0-II, 1×I-0-II, lockable
Signal lamp	1×230 V white
Terminals	2.5 mm²
Remarks	– 4 internal mounting channels – without protruding protective roof

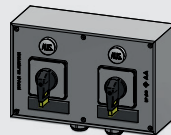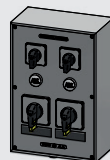| Item no.	145541
Housing type	2516
Housing material	hard rubber
Housing colour	grey
Dimensions	161×251×90 mm
Protection category	IP55
Input	1×M20 below
Switch	1×I-0-II, 1×I-0-II, lockable
Signal lamp	1×230 V white
Terminals	2.5 mm²
Remarks	– 4 internal mounting channels – without protruding protective roof

«Direct» maintenance emergency switches

with locking rim

pre-wired according to your circuit diagram

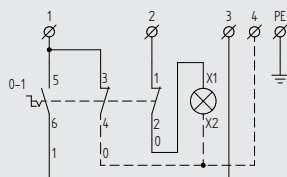|	
Item no.	**145545**
Housing type	2516
Housing material	hard rubber
Housing colour	grey
Dimensions	251×161×90 mm
Protection category	IP55
Input	2×M20 below
Switch	2×I-0-II, lockable
Signal lamp	2×230 V white
Terminals	2.5 mm²
Remarks	– 4 internal mounting channels – without protruding protective roof

with handle lock

pre-wired according to your circuit diagram

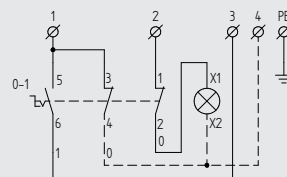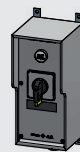|	
Item no.	**145547**
Housing type	2516
Housing material	hard rubber
Housing colour	grey
Dimensions	251×161×90 mm
Protection category	IP65
Input	2×M20 below
Switch	2×I-0-II, lockable
Signal lamp	2×230 V white
Terminals	2.5 mm²
Remarks	– 4 internal mounting channels – without protruding protective roof

pre-wired according to your circuit diagram

Item no.	**145549**
Housing type	3020
Housing material	hard rubber
Housing colour	grey
Dimensions	202×302×110 mm
Protection category	IP65
Input	2×M20 below
Switch	2×I-0-II, 2×I-0-II, lockable
Signal lamp	2×230 V white
Terminals	2.5 mm²
Remarks	– 4 internal mounting channels – without protruding protective roof

pre-wired according to your circuit diagram

Item no.	**145550**
Housing type	3020
Housing material	hard rubber
Housing colour	grey
Dimensions	202×302×110 mm
Protection category	IP65
Input	2×M20 below
Switch	2×I-0-II 2×I-0-II, lockable
Signal lamp	2×230 V white
Terminals	2.5 mm²
Remarks	– 4 internal mounting channels – without protruding protective roof

«Direct» maintenance emergency switches
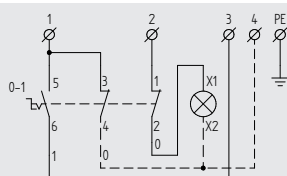
with locking rim

Item no.	049663
Housing type	2812
Housing material	hard rubber
Housing colour	grey
Dimensions	120×269×133 mm
Protection category	IP65
Input	1×M20 below
Switch	1×I-0-II, lockable
Signal lamp	24 V white
Terminals	2.5 mm²
Remarks	– incl. mounting brackets V4A
	– without protruding protective roof

Item no.	049666
Housing type	2812
Housing material	hard rubber
Housing colour	grey
Dimensions	120×269×133 mm
Protection category	IP65
Input	1×M20 below
Switch	1×0-I, lockable
Signal lamp	230 V white
Terminals	2.5 mm²
Remarks	– incl. mounting brackets V4A
	– without protruding protective roof

pre-wired according to your circuit diagram

Item no.	049652
Housing type	2812
Housing material	hard rubber
Housing colour	grey
Dimensions	120×269×133 mm
Protection category	IP65
Input	1×M20 below
Switch	1×I-0-II, lockable
Signal lamp	24 V white
Terminals	2.5 mm²
Remarks	– incl. mounting brackets V4A
	– without protruding protective roof

with handle lock

Item no.	058610
Housing type	2812
Housing material	hard rubber
Housing colour	grey
Dimensions	120×269×133 mm
Protection category	IP65
Input	1×M20 below
Switch	1×I-0-II, lockable
Signal lamp	24 V white
Terminals	2.5 mm²
Remarks	– incl. mounting brackets V4A
	– without protruding protective roof

Item no.	058611
Housing type	2812
Housing material	hard rubber
Housing colour	grey
Dimensions	120×269×133 mm
Protection category	IP55
Input	1×M20 below
Switch	1×0-I, lockable
Signal lamp	230 V white
Terminals	2.5 mm²
Remarks	– incl. mounting brackets V4A
	– without protruding protective roof

pre-wired according to your circuit diagram

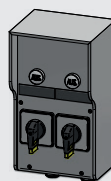| Item no.	058612
Housing type	2812
Housing material	hard rubber
Housing colour	grey
Dimensions	120×269×133 mm
Protection category	IP65
Input	1×M20 below
Switch	1×I-0-II, lockable
Signal lamp	24 V white
Terminals	2.5 mm²
Remarks	– incl. mounting brackets V4A
	– without protruding protective roof

«Direct» maintenance emergency switches

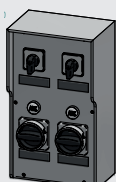## with locking rim

pre-wired according to your circuit diagram

Item no.	049657
Housing type	2812
Housing material	hard rubber
Housing colour	grey
Dimensions	120×269×133 mm
Protection category	IP55
Input	1×M20 below
Switch	1×I-0-II, lockable
Signal lamp	230 V white
Terminals	2.5 mm²
Remarks	– incl. mounting brackets V4A – without protruding protective roof

pre-wired according to your circuit diagram

Item no.	145623
Housing type	2812
Housing material	hard rubber
Housing colour	grey
Dimensions	120×269×133 mm
Protection category	IP55
Input	1×M20 below
Switch	1×I-0-II 1×I-0-II, lockable
Signal lamp	230 V white
Terminals	2.5 mm²
Remarks	– incl. mounting brackets V4A – without protruding protective roof

with handle lock

pre-wired according to your circuit diagram

Item no.	058616
Housing type	2812
Housing material	hard rubber
Housing colour	grey
Dimensions	120×269×133 mm
Protection category	IP55
Input	1×M20 below
Switch	1×I-0-II, lockable
Signal lamp	230 V white
Terminals	2.5 mm²
Remarks	– incl. mounting brackets V4A – without protruding protective roof

pre-wired according to your circuit diagram

Item no.	145624
Housing type	2812
Housing material	hard rubber
Housing colour	grey
Dimensions	120×269×133 mm
Protection category	IP65
Input	1×M20 below
Switch	1×I-0-II 1×I-0-II, lockable
Signal lamp	230 V white
Terminals	2.5 mm²
Remarks	– incl. mounting brackets V4A – without protruding protective roof

«Direct» maintenance emergency switches

with locking rim	with handle lock

pre-wired according to your circuit diagram

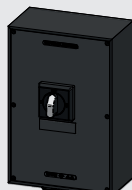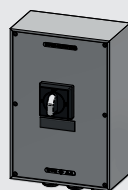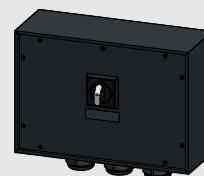| Item no.	145626
Housing type	7250
Housing material	hard rubber
Housing colour	grey
Dimensions	160×280×132 mm
Protection category	IP65
Input	2×M20 below
Switch	2×I-0-II, lockable
Signal lamp	2×230 V white
Terminals	2.5 mm²
Remarks	– 4 internal mounting channels – without protruding protective roof

pre-wired according to your circuit diagram

Item no.	145629
Housing type	7250
Housing material	hard rubber
Housing colour	grey
Dimensions	160×280×132 mm
Protection category	IP65
Input	2×M20 below
Switch	2×I-0-II, lockable
Signal lamp	2×230 V white
Terminals	2.5 mm²
Remarks	– 4 internal mounting channels – without protruding protective roof

pre-wired according to your circuit diagram

Item no.	145630
Housing type	7250
Housing material	hard rubber
Housing colour	grey
Dimensions	160×280×132 mm
Protection category	IP65
Input	2×M20 below
Switch	2×I-0-II 2×I-0-II, lockable
Signal lamp	2×230 V white
Terminals	2.5 mm²
Remarks	– 4 internal mounting channels – without protruding protective roof

pre-wired according to your circuit diagram

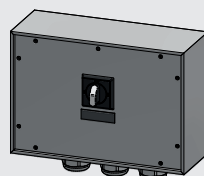| Item no.	145631
Housing type	7250
Housing material	hard rubber
Housing colour	grey
Dimensions	160×280×132 mm
Protection category	IP65
Input	2×M20 below
Switch	2×I-0-II 2×I-0-II, lockable
Signal lamp	2×230 V white
Terminals	2.5 mm²
Remarks	– 4 internal mounting channels – without protruding protective roof

Selector switch

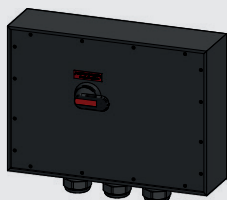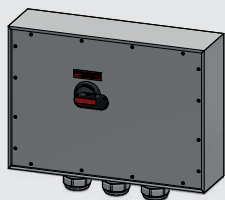| Item no.	145646 (grey) 145647 (black)
Housing type	2516
Housing material	hard rubber
Dimensions	161×251×90 mm
Protection category	IP65
Operating power rating	7.5 kW (at 50-60 Hz)
AC21 400 V	4-16 A
AC23 415 V	4-16 A
Input	3×M20 below
Remarks	– 1-0-2 4-pole and N+PE terminals – without auxiliary contacts – 4 internal mounting channels

Item no.	145075 (grey) 145076 (black)
Housing type	2516
Housing material	hard rubber
Dimensions	161×251×90 mm
Protection category	IP65
Operating power rating	11 kW (at 50-60 Hz)
AC21 400 V	4-40 A
AC23 415 V	4-23 A
Input	3×M20 below
Remarks	– 1-0-2 4-pole and N+PE terminals – without auxiliary contacts – 4 internal mounting channels

Item no.	145077 (grey) 145079 (black)
Housing type	3020
Housing material	hard rubber
Dimensions	202×302×110 mm
Protection category	IP65
Operating power rating	22 kW (at 50-60 Hz)
AC21 400 V	4-63 A
AC23 415 V	4-63 A
Input	3×M25 below
Remarks	– 1-0-2 4-pole and N+PE terminals – without auxiliary contacts – 4 internal mounting channels

Item no.	145080 (grey) 145082 (black)
Housing type	3800
Housing material	hard rubber
Dimensions	362×252×133 mm
Protection category	IP65
Operating power rating	37 kW (at 50-60 Hz)
AC21 400 V	4-80 A
AC23 415 V	4-75 A
Input	3×M40 below
Remarks	– 1-0-2 4-pole and N+PE terminals – without auxiliary contacts – 4 internal mounting channels

Selector switch

Item no.	145084 (grey) 145087 (black)
Housing type	7800
Housing material	hard rubber
Dimensions	503×362×133 mm
Protection category	IP65
Operating power rating	45 kW (at 50-60 Hz)
AC21 400 V	4-125 A
AC23 415 V	4-90 A
Input	3×M50 below
Remarks	– 1-0-2 4-pole and N+PE terminals – without auxiliary contacts – 4 internal mounting channels

Maintenance and control switch combinations

Direct switch-off

pre-wired according to your circuit diagram

| Item no.	103246
Housing type	2516
Housing material	hard rubber
Housing colour	grey
Dimensions	161×251×90 mm
Protection category	IP65
Input	2×M16 below 2×M20 below
Switch	1×I-0-II 1×3P - 16 A, lockable
Terminals	2.5 mm²
Remarks	– 4 internal mounting channels – without protruding protective roof

pre-wired according to your circuit diagram

Item no.	103248
Housing type	3020
Housing material	hard rubber
Housing colour	grey
Dimensions	202×302×110 mm
Protection category	IP65
Input	2×M16 below 2×M25 below
Switch	1×I-0-II 1×3P - 25 A, lockable
Terminals	2.5 mm²
Remarks	– 4 internal mounting channels – without protruding protective roof

pre-wired according to your circuit diagram

Item no.	145673
Housing type	3020
Housing material	hard rubber
Housing colour	grey
Dimensions	202×302×110 mm
Protection category	IP65
Input	2×M16 below 2×M25 below
Switch	1×I-0-II 1×3P - 32 A, lockable
Terminals	2.5 mm²
Remarks	– 4 internal mounting channels – without protruding protective roof

pre-wired according to your circuit diagram

Item no.	103249
Housing type	3020
Housing material	hard rubber
Housing colour	grey
Dimensions	202×302×110 mm
Protection category	IP65
Input	2×M16 below 2×M32 below
Switch	1×I-0-II 1×3P - 45 A, lockable
Terminals	2.5 mm²
Remarks	– 4 internal mounting channels – without protruding protective roof

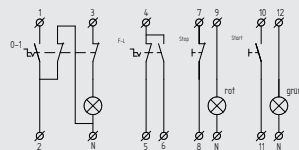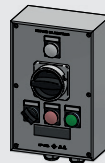# Maintenance and control switch combinations

Indirect switch-off
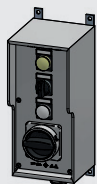
pre-wired according to your circuit diagram

Item no.	145732
Housing type	2812
Housing material	hard rubber
Housing colour	grey
Dimensions	120×269×133 mm
Protection category	IP65
Input	1×M25 below
Switch	1×I-0-II 1×0-I, lockable
Signal lamp	1×24 V white 1×24 V yellow
Terminals	2.5 mm²
Remarks	– inkl. mounting brackets – without protruding protective roof

Item no.	132103
Housing type	2516
Housing material	hard rubber
Housing colour	grey
Dimensions	161×251×90 mm
Protection category	IP65
Input	2×M20 below
Switch	1×I-0-II 1×0-I, lockable
Illuminated push-button	1×230 V green 1×230 V red
Signal lamp	1×230 V white
Terminals	2.5 mm²
Remarks	– 4 internal mounting channels – without protruding protective roof

pre-wired according to your circuit diagram

Item no.	050669
Housing type	7250
Housing material	hard rubber
Housing colour	grey
Dimensions	160×280×132 mm
Protection category	IP65
Input	2×M20 below 2×M32 below
Switch	1×0-I, lockable 1×key switch 0-I KABA
Pushbutton	1×230 V green 1×230 V red
Terminals	2.5 mm²
Remarks	– 4 internal mounting channels – without protruding protective roof
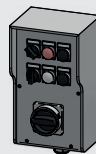
pre-wired according to your circuit diagram

| Item no.	142844
Housing type	7250
Housing material	hard rubber
Housing colour	grey
Dimensions	160×280×132 mm
Protection category	IP65
Input	1×M25 below
Switch	1×0-I 1×I-0-II 1×0-I, lockable
Pushbutton	2×black
Signal lamp	1×24 V white 1×24 V red
Terminals	2.5 mm²
Remarks	– 4 internal mounting channels – without protruding protective roof

Combinations of multiple maintenance switches, Special combinations
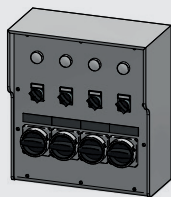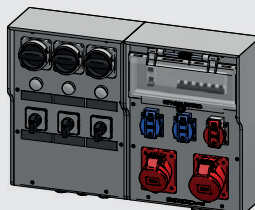
Indirect switch-off
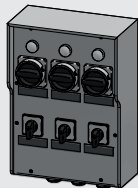
pre-wired according to your circuit diagram

Item no.	058640
Housing type	7450
Housing material	hard rubber
Housing colour	grey
Dimensions	267×371×133 mm
Protection category	IP65
Input	3×M25 below
Switch	3×I-0-II, lockable 3×I-0-II
Signal lamp	3×230 V white
Terminals	2.5 mm²
Remarks	– 4 internal mounting channels – without protruding protective roof

pre-wired according to your circuit diagram

Item no.	058645
Housing type	7750
Housing material	hard rubber
Housing colour	grey
Dimensions	336×370×163 mm
Protection category	IP65
Input	4×M25 below
Switch	4×I-0-II 4×I-0-II, lockable
Signal lamp	4×24 V white
Terminals	2.5 mm²
Remarks	– 4 internal mounting channels – without protruding protective roof
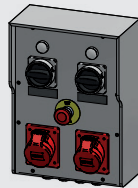
pre-wired according to your circuit diagram

| Item no.	050710
Housing type	7450
Housing material	hard rubber
Housing colour	grey
Dimensions	267×371×133 mm
Protection category	IP44
Output	2×CEE 16/5
Input	1×M16 below 4×M20 below
Switch	2×I-0-II, lockable
Signal lamp	2×230 V white
Snapping-in switch	1×EMERGENCY OFF with rotary release
Terminals	2.5 mm²
Remarks	– 4 internal mounting channels – without protruding protective roof
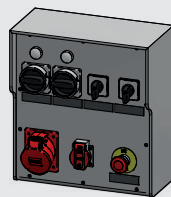
pre-wired according to your circuit diagram

Item no.	050711
Housing type	7750
Housing material	hard rubber
Housing colour	grey
Dimensions	336×370×163 mm
Protection category	IP44
Output	1×T25 2×CEE 32/5
Input	3×M20 below 1×M25 below
Switch	2×0-I, lockable 1×0-I 1×0-I-II-III
Signal lamp	2×230 V white
Snapping-in switch	1×EMERGENCY OFF with rotary release
Terminals	2.5 mm²
Remarks	– 4 internal mounting channels – without protruding protective roof

Combinations of multiple maintenance switches, Special combinations

Indirect switch-off

pre-wired according to your circuit diagram

Item no.	145274
Housing type	7800
Housing material	hard rubber
Housing colour	grey
Dimensions	503×362×133 mm
Protection category	IP55
Switch	9×I-0-II, lockable 1×I-0-II
Signal lamp	9×230 V white
Snapping-in switch	1×EMERGENCY OFF with rotary release
Terminals	2.5 mm²
Remarks	– 4 internal mounting channels – without protruding protective roof

pre-wired according to your circuit diagram

Item no.	058639
Housing type	7400 / 7450
Housing material	hard rubber
Housing colour	grey
Dimensions	534×371×133 mm
Protection category	IP44
Output	2×T23 1×T25 1×CEE 16 / 5 1×CEE 32 / 5
Input	3×M20 1×M25
Max. pre-fuse	32 A
Switch	3×0-I, lockable 3×I-0-II
Signal lamp	3×230 V white
Terminals	2.5 mm²
Remarks	– 8 internal mounting channels – without protruding protective roof

Supports

With supports in different designs, the on-site combinations can be installed at the correct location as well as being protected against mechanical damage and the effects of the weather. The steel constructions are powder-coated, zinc-plated or manufactured from rust-free material in V2A or V4A. .

Type GE

example

Type DE

example

Type KA

example
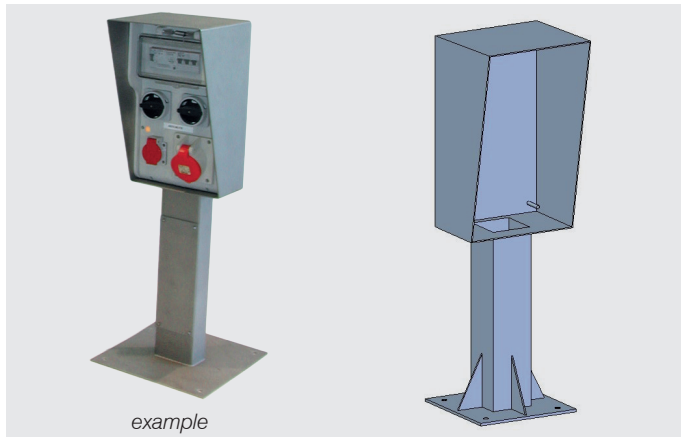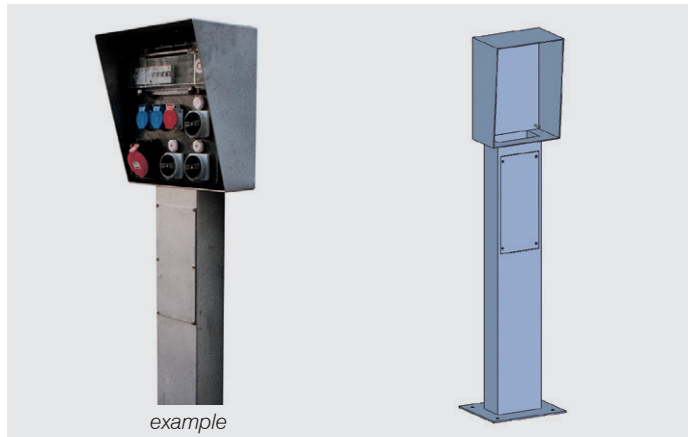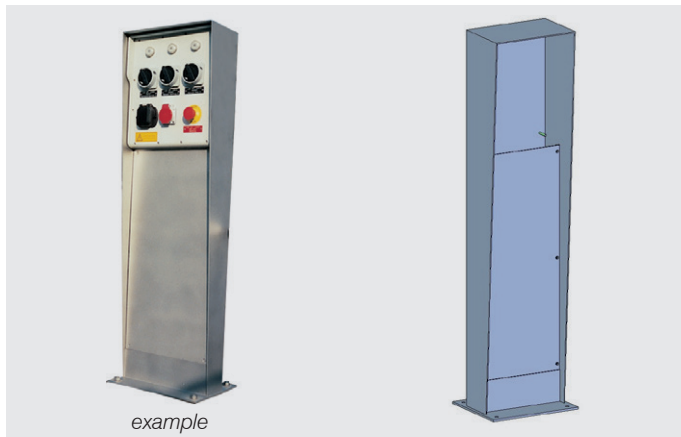
Type APFE

example
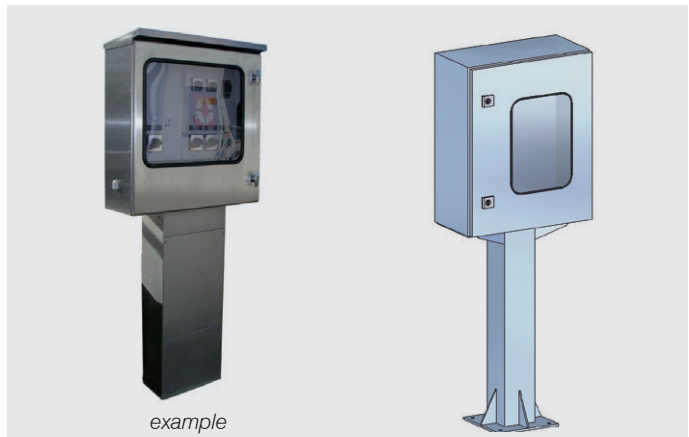
Button/Switch

Emergency-Stop/Emergency-Off button

Emergency-Stop/Emergency-Off button, tamper-proof, with mechanical detent in hard rubber housing

Type 1010, 100×100×65 mm, IP55, 1×M16
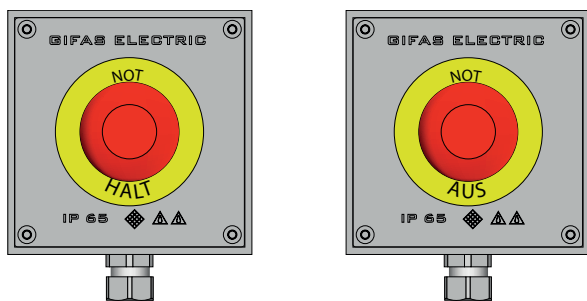
In case of an Emergency Off, the system must be deenergised immediately.
In case of an Emergency Stop, a movement must be stopped as quickly as possible (part of system).

Emergency-Stop	Emergency-Off button				
Item no.	Item no.	Colour	Release Function	Auxiliary switch	
050729	146593	grey	pull release	1NC	1NO
030130	146594	black	pull release	1NC	1NO
050731	146595	grey	twist-release	1NC	1NO
030136	146597	black	twist-release	1NC	1NO
146545	146598	grey	twist-release		2NO
146547	146599	black	twist-release		2NO
146546	146600	grey	twist-release	1NC	2NO
146548	146601	black	twist-release	1NC	2NO
146549	146602	grey	key-release	1NC	2NO
036735	146604	black	key-release	1NC	1NO

The mushroom push-button and Emergency-Stop/Emergency-Off button with a tamper-proof design and with a mechanical detent comply with standard EN/IEC 60204-1.

Button diameter:	standard 40 mm red
Emergency-Stop/ Emergency-Off sign:	diameter 60 mm yellow
Key-release :	Supplied with 2 keys
Control devices:	in metal design

Motor protection switch with thermal-magnetic tripping

Rated output of three phase current motors 50/60Hz according to usage categories AC-3, in solid rubber enclosure

Type 1616, 160×160×90 mm, IP55, 2×M20
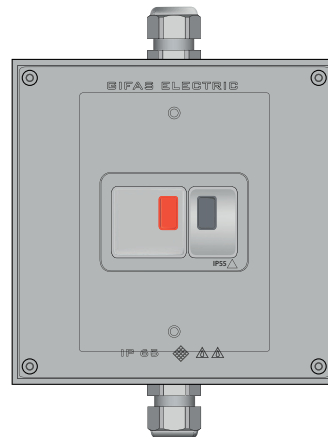
| Item no.	Colour	400 V / kW	Setting range of therm. activation	Activation current
146490	grey	0.25 - 0.37	0.63 - 1.00 A	13 A
146491	grey	0.37 - 0.55	1.00 - 1.60 A	22 A
146492	grey	0.75	1.60 - 2.50 A	33 A
146493	grey	1.10 - 1.50	2.50 - 4.00 A	51 A
146494	grey	2.2	4.00 - 6.30 A	78 A
146495	grey	3.00 - 4.00	6.00 - 10.0 A	138 A
146496	grey	5.5	9.00 - 14.0 A	170 A

Additional modules

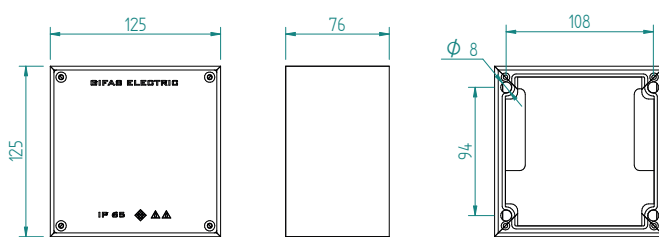|	
049710	Auxiliary switch, no delay, side 1NC+1NO
049711	Locking device for padlocks in «O» switch position

Dimensions

Type 1010
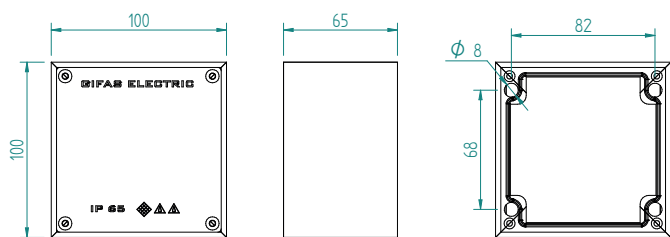
Type 1212

Type 1616
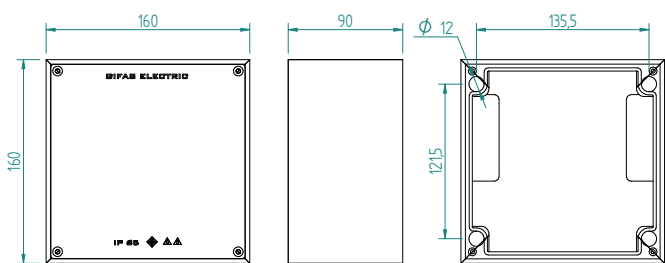
Type 1812
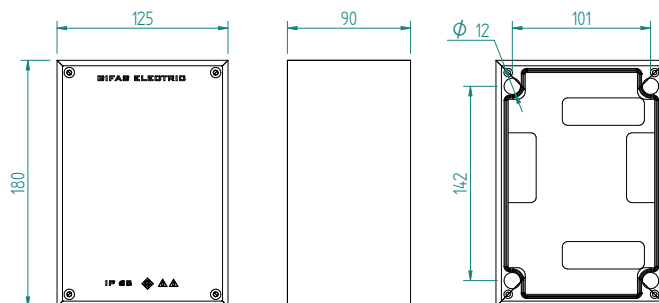
Type 2516
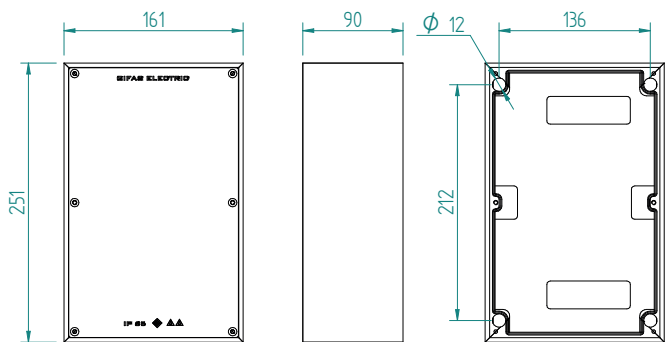
Type 2812
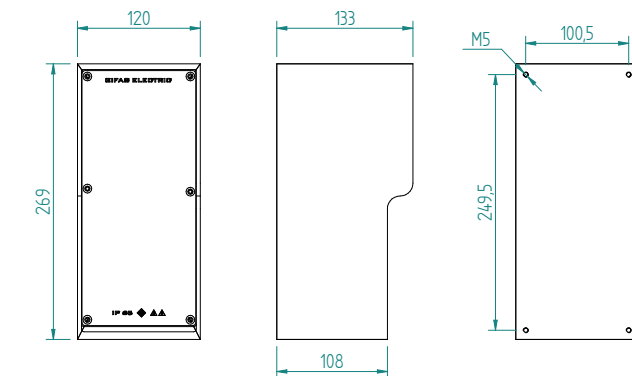
Type 3020
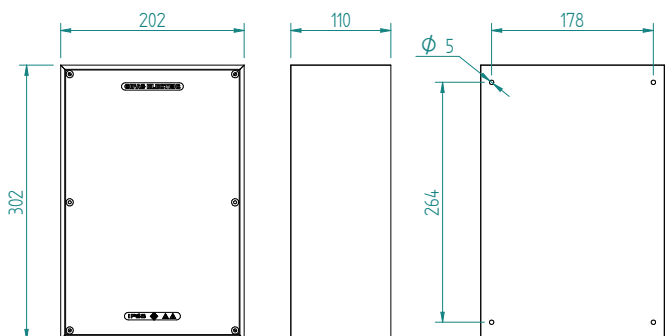
Type 3800
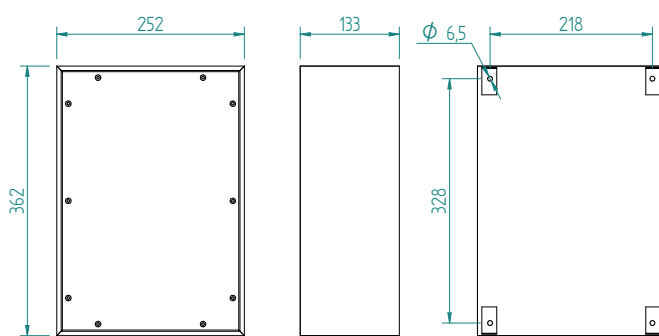
Dimensions

Type 7250
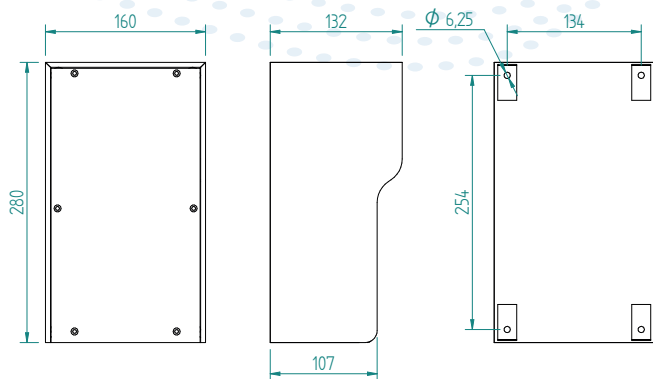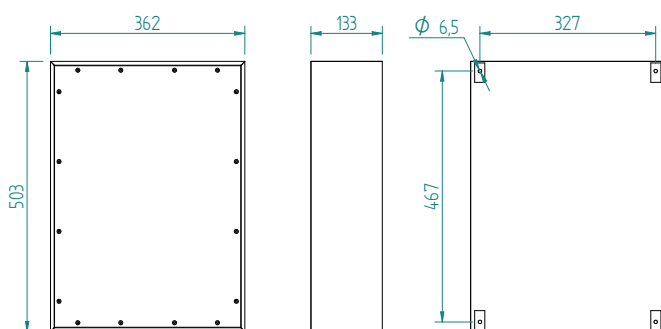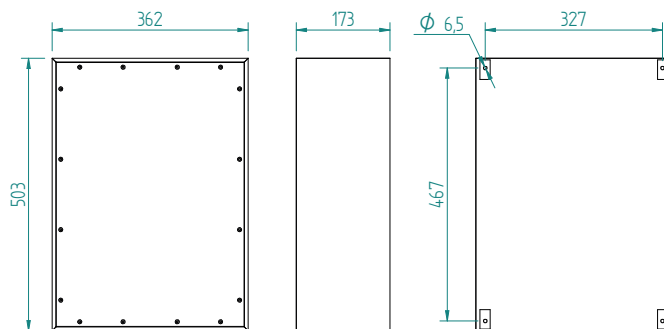

Type 7350
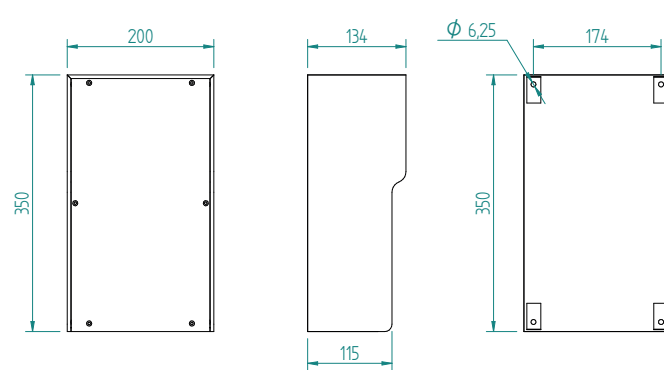
Type 7450
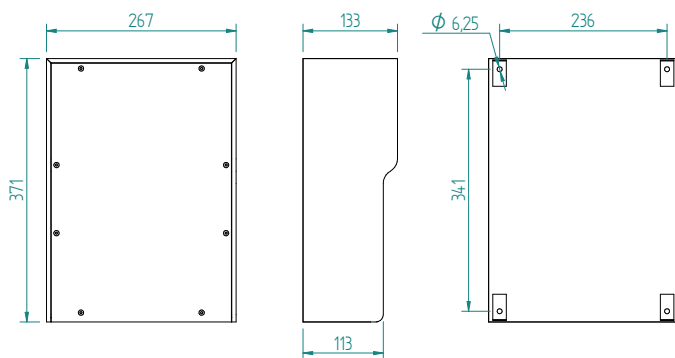
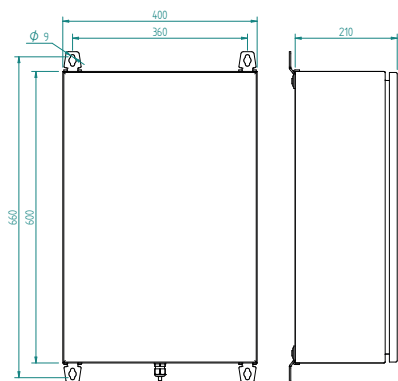
Type 7750
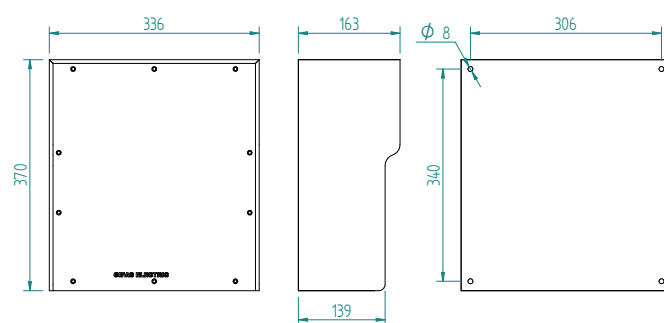
Type 7800

Type 7900

Surface mounted cabinet V2A

GIFAS ELECTRIC

THE
SOLUTION
PARTNER

GIFAS-ELECTRIC GmbH
Dietrichstrasse 2
CH-9424 Rheineck

+41 71 886 44 44
info@gifas.ch
www.gifas.ch