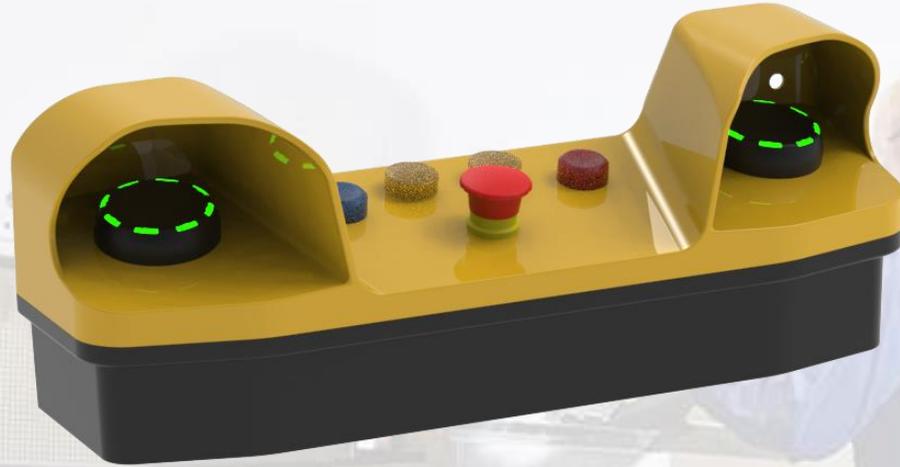




IDEM SAFETY

Making Industry Safer



IDEM Safety Switches

Two-Hand Control Training Document

What are two hand control switches?

Safety two hand control switches are used to safeguard the hands of an operator in industrial situations where machine operation may be hazardous. In order to operate the machine, both hands must be used. This means machinery will not start until both hands are confirmed to be in a safe position, and the operator at a safe distance.



Introduction to TouchSafe - Two-hand Control Stations

IDEM's TouchSafe Two-Hand Control panels are designed to provide reliable protection by ensuring the machine operators hands are located on the control station when the signal for machine operation is issued.

TouchSafe Two-hand Control stations are generally used for setting-up work, such as press applications. Other uses include single-stroke operations for feed and removal processes.

TouchSafe has been designed in accordance with ISO 13851.



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Änderungen vorbehalten

Understanding the part numbers



240000

Two Hand Control – Housing Only



240001

Two Hand Control – Fitted with x 2
ZF Buttons (Zero Force)



240002

Two Hand Control – Fitted with x 2
MF Buttons (Mechanical Force)



240021

Two Hand Control Button Only –
Type ZF (Zero Force)



240022

Two Hand Control Button Only –
Type MF (Mechanical Force)

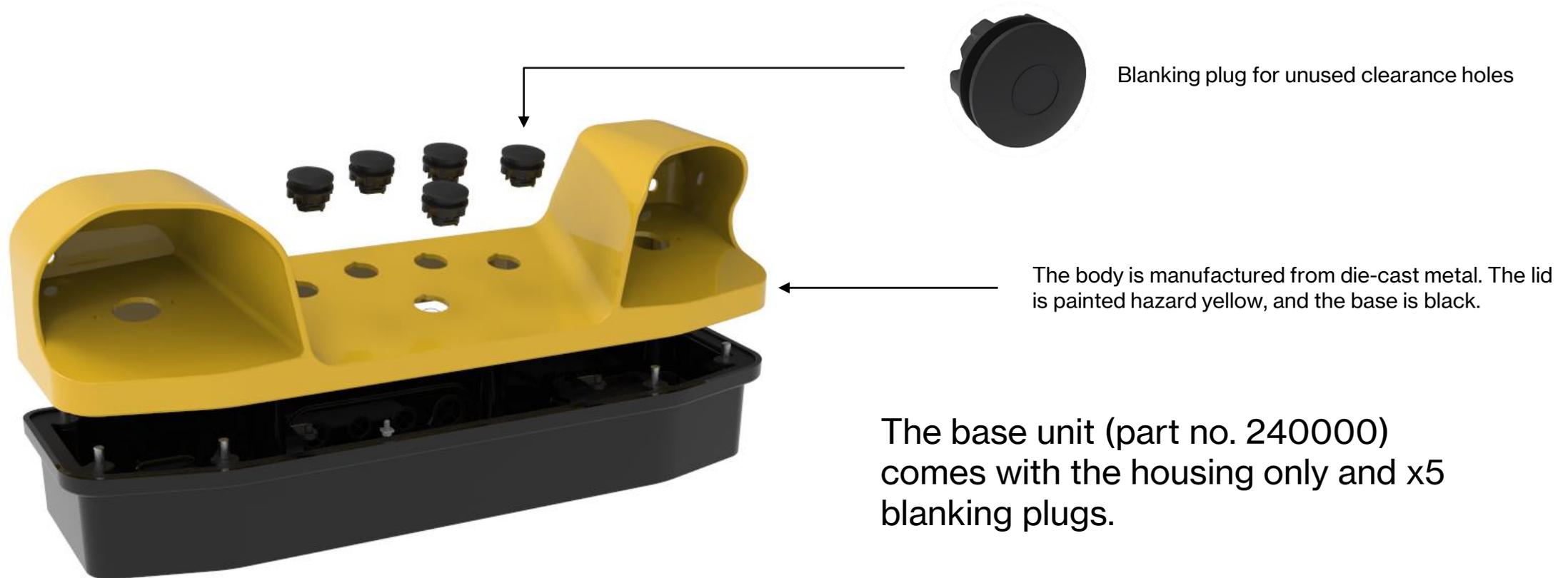


240050

Adjustable Two Hand Floor Mount
Stand

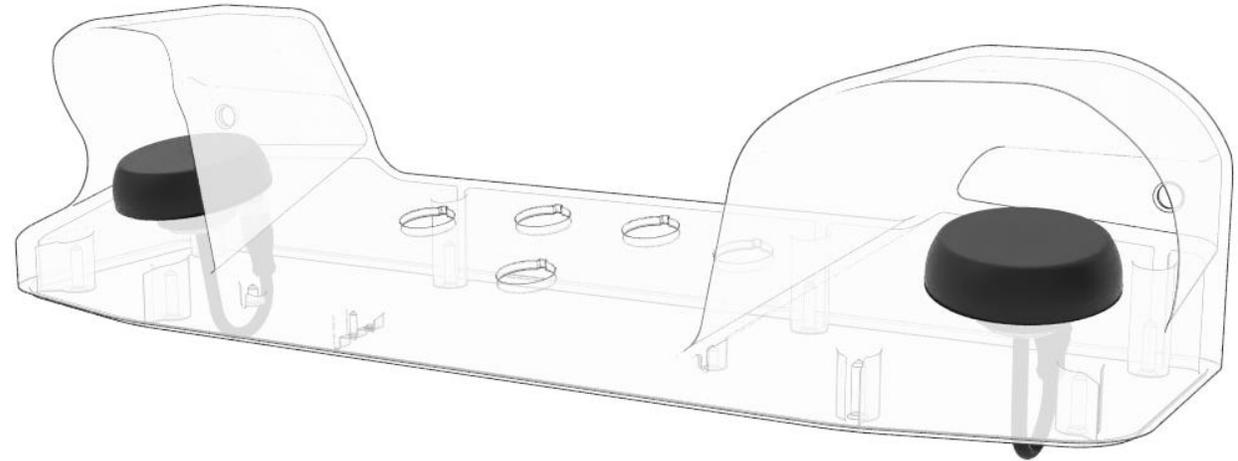
How to Configure your TouchSafe Two-Hand Control Station

TouchSafe is fully configurable – providing the operator with an ergonomic solution that is both easy to use and packed with functionality. The base unit comes with five dia' 22.5mm clearance holes for pilot devices. Unused slots comes with blanking plugs.



Choose your Button Type

TouchSafe is available with 2 button types that are simple to install via a M12 connector.



Zero Force (ZF)

- Ergonomic Design
- Dual Colour LED
- 100% replaceable with plug and play M12 connector.



Mechanical Force (MF)

- Industry Standard Design
- High Mechanical Life Cycle
- 100% replaceable with plug and play M12 connector.

Choose your Control Functions



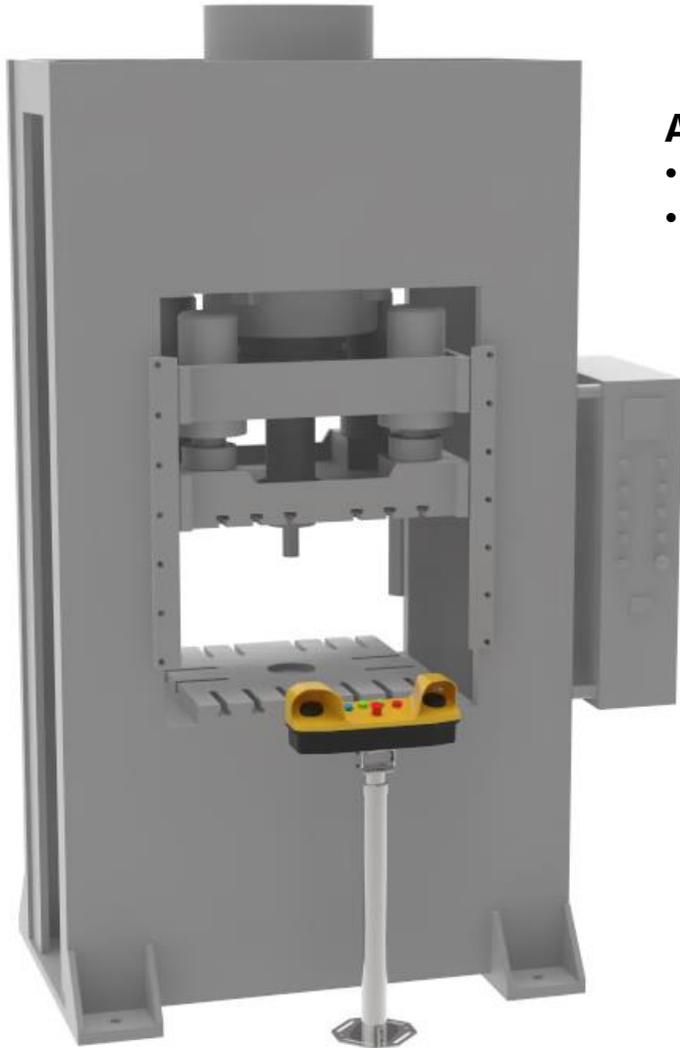
Every TouchSafe unit comes with five dia' 22.5mm clearance holes. IDEM offers a range of pilot devices suitable for use with TouchSafe. **Note:** These are installed by the end user.



Part Number	Part Description
522201	E-Stop 2NC 30mm Head
522202	E-Stop 1NC + 1NO 30mm Head
522203	E-Stop 2NC 30mm Head with Reset Key
522204	E-Stop 1NC + 1NO 30mm Head with Reset Key

Part Number	Part Description
522401	Pilot Device Illuminated Yellow +24V. ac/dc
522402	Pilot Device Illuminated Red +24V. ac/dc
522403	Pilot Device Illuminated Green +24V. ac/dc
522404	Pilot Device Illuminated Blue +24V. ac/dc

Simple to Install, Easy to Connect

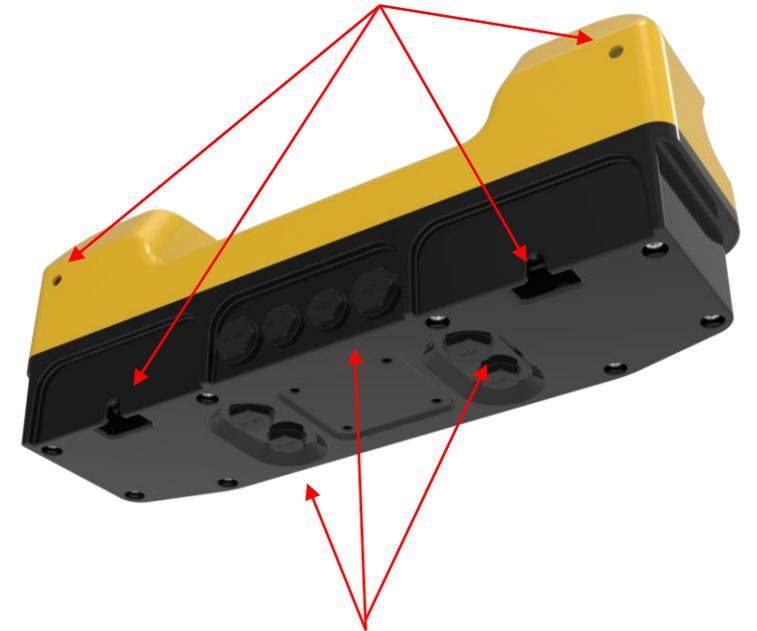


Adjustable Mounting Stand:

- Stainless Steel Construction
- 830mm to 1150mm Adjustable Height



External mounting points for fixing directly to the machine.



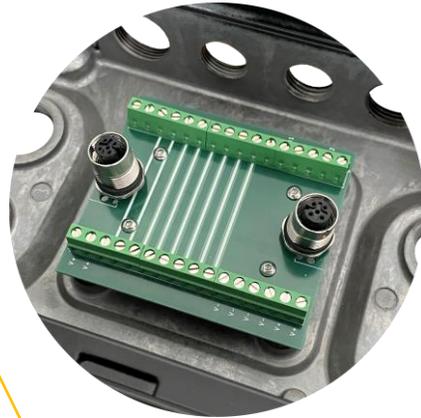
TouchSafe base units feature 8 conduit entries. These include two of each:

M20, 1/2" NPT, M25 and 3/4" NPT

What's inside?

Connection Plate

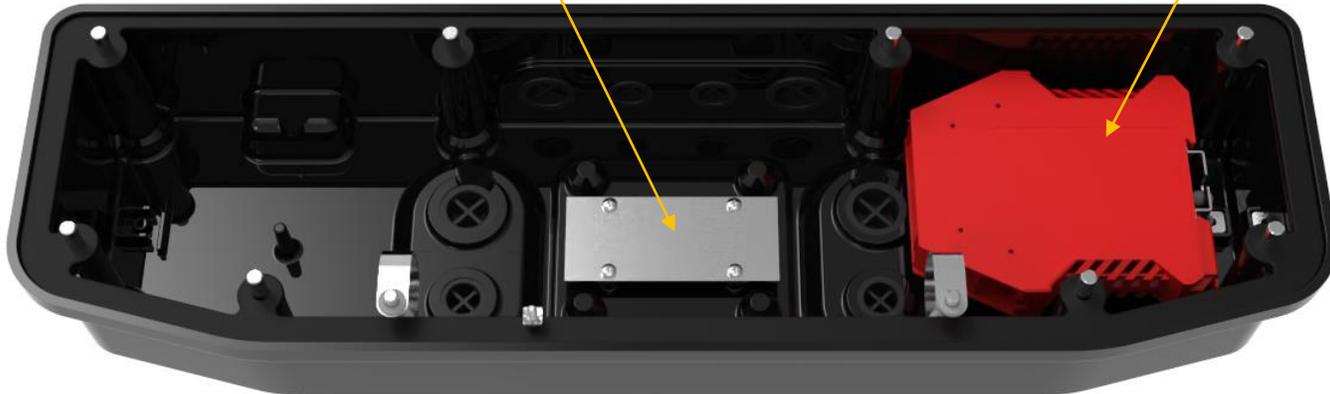
Features two M12 plugs for connecting your buttons and a pre-wired terminal block for external wiring.



SCR-2H Safety Relay

Can be used externally or installed internally for space saving.

Part Number	Part Description
180030	SCR-2H 24V Screw Terminals
180030-P	SCR-2H 24V Pluggable Terminals
180032	SCR-2H 110V Screw Terminals
180032-P	SCR-2H 110V Pluggable Terminals
180031	SCR-2H 230V Screw Terminals
180031-P	SCR-2H 230V Pluggable Terminals



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Änderungen vorbehalten

Where Would you Find a Two Hand Control Switch?

Two hand safety modules are used in many applications. Some examples include preferred protection devices for use in setting-up work and single-stroke operations for feed and removal processes:



Can Manufacturing



Paper Manufacturing



Rubber Manufacturing



Plastic Manufacturing



Sheet Metal Processing



Automotive



Powder Metallurgy

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Änderungen vorbehalten



2 Hand Control Stations - Type TouchSafe

Operating Instructions



DESCRIPTION:

IDEM two-hand control stations are designed to satisfy the requirements of ISO 13851. The TouchSafe stations are intended for use as part of a two-hand control system for powered machinery. The two-hand control station is permanently situated a specified distance away from the hazard and confirms the operators position such that the machine function will stop before the operator could reach the hazard.

- Robust die-cast metal construction.
- IP65 construction.
- Facility to fit 22mm auxiliary Emergency Stop buttons or diagnostic lamps.
- Various wiring entry points.
- Adjustable floor-mounted stand available.

They can be fitted with either:

Type ZF buttons.

Touch-activated devices (zero force needed).



Designed to eliminate hand or wrist stresses associated with frequent repetitive machine operations. They are solid state construction and benefit from LED indication of status.

Type MF buttons.

Spring loaded button – snap action contacts.



Designed for applications with less frequent operational use.



IDEM SCR-2H Control Relay.

The buttons will connect to most recognised two-hand safety control relays to achieve type IIIC safety to ISO 13851.

The MF and ZF buttons are designed to be operated by hand to maintain electrical outputs to a control circuit whilst direct hand contact is maintained. The MF version is a spring loaded button requiring mechanical operation by depressing and holding down the button. The ZF version is electronic and senses an operators hand for proximity.

When fitted to the control housing and monitored by an external controller they satisfy the requirements to detect an operator's position relative to a machine control function, (see ISO 13851) i.e.

Prevention of **defeat using one hand** - the separation of the control actuating devices by at least 260 mm (internal dimension).

Prevention of **defeat using the hand and elbow of the same arm** –the shielding and separation of the control actuating devices by at least 550 mm (internal dimension).

When used with the floor stand it satisfies the measures to prevent **defeat by using other parts of the body (e.g. knee, hip) in conjunction with one hand**. The control actuating devices (buttons) should be on a horizontal or nearly horizontal surface which is at least 1100 mm above the floor or level of access.

INSTALLATION: Installation must only be carried out by competent personnel and in accordance with these instructions.

IMPORTANT – When using a two hand control to safeguard a hazard zone, the **minimum allowed safety distance** between the hazardous machines must be calculated in order to ensure that the hazardous machine motion will be stopped before it can be reached.

The minimum safety distance is calculated according to the formula: **S = (K x T) + C** (See ISO 13855).

- Where:
- S** = minimum safety distance (mm)
 - K** = approach speed of a human body; 1600 mm/s
 - T** = the total time from opening of the guard until the hazardous machine movement has stopped, i.e. including control system reaction times and other delays (s)
 - C** = an additional safety distance (mm) taken from ISO 13855, if it is possible to push fingers or hand towards the hazard before a stop signal is generated. At least 250mm minimum.

IMPORTANT – The two hand control device must be mounted horizontal or nearly horizontal on a surface which is at least 1100 mm above the floor or level of access. This is intended to prevent actuation by the hip or knee.

IMPORTANT – Synchronous actuation (ISO 13851). For type IIIC safety, the buttons shall be actuated with a tolerance on the simultaneity of actuation less than or equal to 0,5 s between the actuation of one button and the actuation of the second button. This is considered to be synchronous operation. To achieve Type IIIC safety the buttons **MUST be connected** to a certified safety controller marked for Type IIIC and shall comply with the PL e / Cat.4 performance level according to ISO 13849-1.

IMPORTANT: After installation and during use, the system shall be verified according to ISO 13851 (Table 2).

IMPORTANT: To achieve the IP seal it is required ensure all unused cable entries are securely sealed.

Disconnect electrical supply before any cleaning or hose down.

MAINTENANCE:

Every month: Check all circuits for correct function. If the buttons or housing display signs of mechanical damage then remove and replace. IDEM will not accept responsibility for failure of the switch functions if the installation and maintenance requirements are not implemented.

THESE INSTRUCTIONS FORM PART OF THE PRODUCT WARRANTY.

2 Hand Control Stations - Type TouchSafe

TECHNICAL SPECIFICATION:

Type MF buttons (Spring Return Loaded)



Quick Connect (QC) M12 5-pin Male Plug on 250mm flying lead	
Pin view from Switch	
1	Not used
2 (White)	NC Contact
3	Not used
4 (Black)	NO Contact
5 (Grey)	Common

NC - Terminals 11/12
NO - Terminals 23/24

Specification Type MF:

Insulating housing: Polyester
Operating Temperature: -20C. to +40C.
Mechanical Life (B10d): 1,000,000 cycles
Output Contacts: Rated 240V. 3A. (A300)
Operating Force: 20N.
IP65 capability when fitted to 2 Hand Control Housing (see below)

Information with regard to UL Standards:

Type 1 enclosure. Maximum temperature 40°C.
Intended for same polarity use. A300 Pilot Duty. 240V. 3A. PF 0.38 or greater, tested for 6,000 cycle's endurance.
Use 16-28AWG stranded copper conductors (rated 90°C).
Terminal tightening torque 7lbs ins (0.8Nm).
Intended for same polarity use.
For Use on a Flat Surface of a Type 1 Enclosure or equivalent.

Type ZF buttons (Zero Force Actuation)



Quick Connect (QC) M12 5-pin Male Plug on 250mm flying lead	
Pin view from Switch	
1	+24V.dc
2	NC Contact
3	0V.dc
4	NO Contact
5	Common

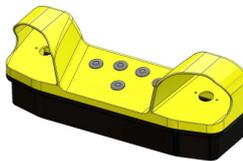
Specification Type ZF:

Insulating housing: Polyester
Operating Temperature: -20C. to +40C.
Operating Voltage: 24V.dc (+/- 10%)
Use SELV / PELV Power Supply.
Output Circuits: Rated 24V.dc 0.1A.
Operating Force: Zero
LED: Green – activated Red – waiting.
IP65 capability when fitted to 2 Hand Control Housing (see below)

Information with regard to UL Standards:

Type 1 enclosure. Maximum temperature 40°C.
Use Class 2 Supply. 24V.dc only.
Output Circuits: Rated 24V.dc 0.1A.
For use in NFPA 79 Applications only (or equivalent).

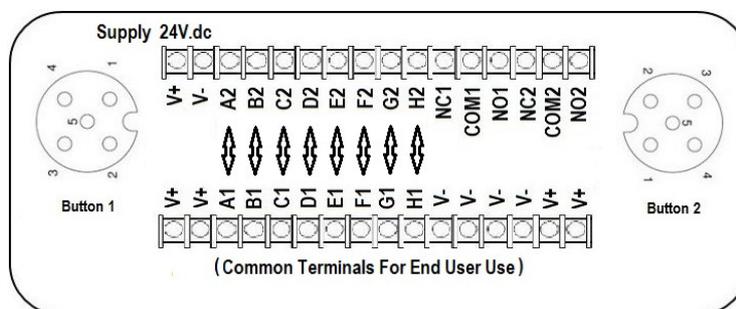
2 Hand Control Housing



Specification:

Housing: Die-Cast painted yellow.
Conduit Entries: 2 x M20 2 x M25 2 x 1/2" NPT 2 x 3/4" NPT.
Control Lamps / Buttons: 5 x 22.5mm holes provided.
IP65 – ensure all entry seals are tightened at least 1Nm (9 inch/lbs).

INTERNAL CONNECTION PCB:



NC1 Button 1 Normally Closed Circuit.
NO1 Button 1 Normally Open Circuit.
C1 Button 1 Common.

NC2 Button 2 Normally Closed Circuit.
NO2 Button 2 Normally Open Circuit.
C2 Button 2 Common.

V+ D.C. Supply - required when using ZF type buttons.
V- D.C. Supply - required when using ZF type buttons.

All other V+ V- are common for end user use.

Notes:

- 1) NC / NO represented in button released condition.
- 2) **The housing must be earthed using the internal earth terminal.**

Adjustable 2 Hand Control Floor Stand

Specification:

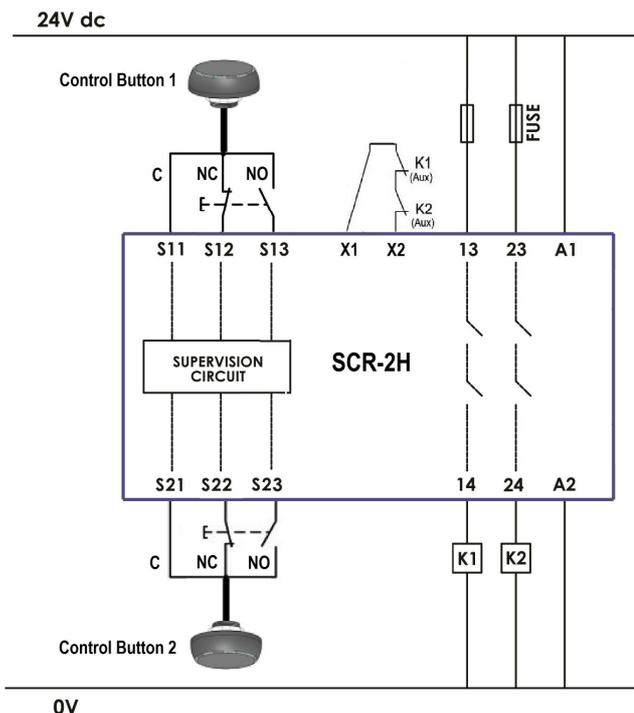
Housing: Stainless Steel
Floor Mounting Holes: 11mm diameter (M10 clearance)
Adjustable height: 830mm to 1150mm



A1 through A2 - common link connection for end user use.
B1 through B2 - common link connection for end user use.
C1 through C2 - common link connection for end user use.
D1 through D2 - common link connection for end user use.
E1 through E2 - common link connection for end user use.
F1 through F2 - common link connection for end user use.
G1 through G2 - common link connection for end user use.
H1 through H2 - common link connection for end user use.

2 Hand Control Stations - Type TouchSafe

SCHEMATIC / CONNECTION EXAMPLE – shown with IDEM SCR-2H:



The IDEM two-hand safety relay SCR-2H is suitable for setting up and monitoring two-hand control buttons.

Dangerous work steps can only be triggered when both two-hand buttons are operated simultaneously, i.e. within 0.5s.

It is ensured a single fault or a malfunction does not result in the loss of the safety function and every fault is detected by the cyclic self-monitoring at the latest prior to the next actuation.

When the operating voltage is applied to A1-A2 and the feedback loop X1-X2 is closed, the SCR-2H is ready for use.

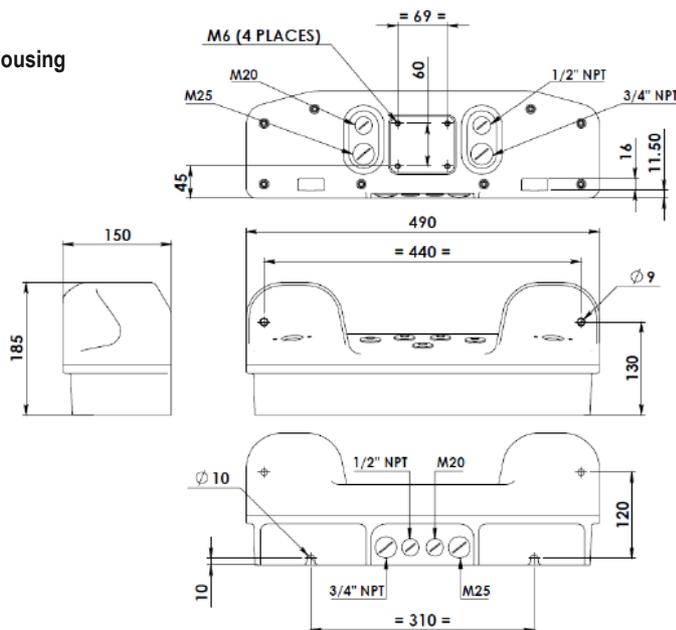
To be able to initiate a switching operation, the SCR-2H output relays must be de-energized. The SCR-2H output relays only switch to the energized position when the two-hand buttons are operated simultaneously, i.e. within 0.5s.

The circuit is shown ready to initiate the SCR-2H. The feedback circuit (X1-X2) is connected closed through the series connection of auxiliary contacts of both machine contactors K1 and K2.

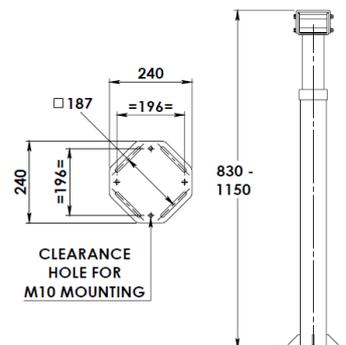
Once actuated the SCR-2H contacts 13/14 and 23/24 will energise and enable the machine to run.

DIMENSIONS (mm):

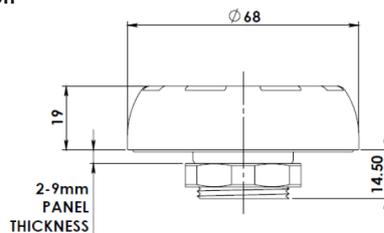
Control Housing



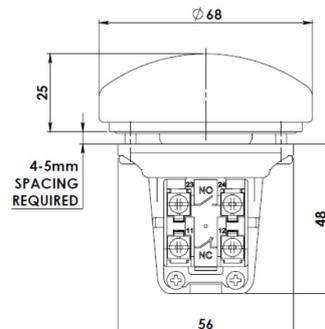
Floor Mount Stand



ZF button



MF button



WARNING:

DO NOT DEFEAT, TAMPER, OR BYPASS THE SAFETY FUNCTION. FAILURE TO DO SO CAN RESULT IN DEATH OR SERIOUS INJURY.

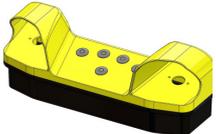
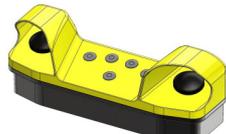
AVERTISSEMENT:

NE PAS DESACTIVER, MODIFIER, RETIRER, OU CONTOURNER CETI INTERVERROUILLAGE IL PEUT EN RESULTER DES BLESSURES GRAVES DU PERSONNEL UTILISATEUR

Original Instructions

To request this datasheet in other languages please contact info@idemsafety.com
 Um dieses Datenblatt in Deutscher Sprache wenden Sie sich bitte anfordern info@idemsafety.com
 Pour obtenir cette fiche en Francais, veuillez contacter info@idemsafety.com
 Para solicitar esta hoja de datos en Espanol, por contacto con info@idemsafety.com

2 Hand Control Stations - Type TouchSafe

Sales Number	Description	
240000	Two-hand control - housing only (Die-Cast painted yellow)	 
240001	Two-hand control station (Die-Cast painted yellow) fitted with 2 x ZF buttons	 
240002	Two-hand control station (Die-Cast painted yellow) fitted with 2 x MF buttons	 
240021	Two-hand control button only - Type ZF	  
240022	Two-hand control button only - Type MF	  
240050	Adjustable Two-hand control floor mount stand	 
180030	SCR2H Control relay Type IIIC 24V.dc supply (for use with ZF or MF control buttons) DIN rail mounting 22.5mm wide	   
180031	SCR2H Control relay Type IIIC 230V.ac supply (for use with MF control buttons) DIN rail mounting 22.5mm wide	
180032	SCR2H Control relay Type IIIC 110V.ac supply (for use with MF control buttons) DIN rail mounting 22.5mm wide	
522401	Pilot light Yellow 24V. ac/dc (fit at installation)	 
522402	Pilot light Red 24V. ac/dc (fit at installation)	
522403	Pilot light Green 24V. ac/dc (fit at installation)	
522404	Pilot light Blue 24V. ac/dc (fit at installation)	
522201	Compact E Stop 2NC 30mm mushroom head (fit at installation)	     (120V. 1.5A. 240V. 1.0A.)
522202	Compact E Stop 1NC 1NO 30mm mushroom head (fit at installation)	
522203	Compact E Stop 2NC 30mm mushroom head with reset key (fit at installation)	
522204	Compact E Stop 1NC 1NO 30mm mushroom head with reset key (fit at installation)	

READ AND UNDERSTAND THESE INSTRUCTIONS BEFORE INSTALLING, OPERATING, OR MAINTAINING THIS EQUIPMENT.

The product is designed to be a component of a customized safety oriented control system. It is the responsibility of the user to ensure the correct overall functionality of its systems and machines. IDEM, its subsidiaries and affiliates, are not in a position to guarantee all of the characteristics of a given system or product not designed by IDEM.

IDEM Zero Force Touch Switch For Two-Hand Control



IDEM Zero Force Touch Switch	
Part Number	2H-240021
Description	IDEM touch switch, IP65, 30mm, zero force, LED illuminated, (1) N.O./ (1) N.C. contact(s), black, mushroom, 68mm, round.
Mounting Diameter	30mm [1.18 in]
Actuating Stroke	Zero stroke (touch sensitive)
Pushbutton Material	Polyester
Front Panel Thickness	2 to 9 mm [0.08 to 0.35 in]
Weight	139g [0.31 lb]
Mounting Screws Tightening Torque	1.0 N•m [0.74 lb•ft]
Ambient Temperature	-20°C to +40°C [-4°F to +104°F]
Ingress Protection Rating	IP65
Standards	ISO 13851; UL File E258676
Drawing	PDF

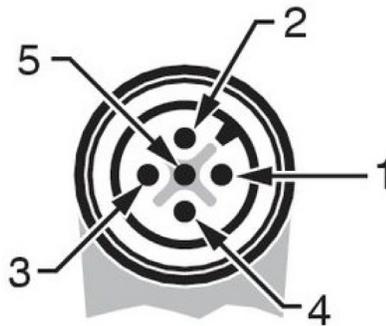
The IDEM Zero Force Touch Switch is activated when touched. The switch does not require any force to activate. It was designed to eliminate hand or wrist stresses associated with frequent repetitive machine operations. It features solid state construction as well as high-visibility LED status indication (red when the button is not being touched, as shown at left, or green when the button is being touched).

This touch switch is supplied with a 250mm [9.84 in] flying lead with a 5-pin M12 male plug. The plug makes it easy to connect to the PCB connection board which is part of IDEM's two-hand control stations.

Note that if gloves must be worn by the operator, mechanical pushbuttons (such as 2H-240022) should be used instead.

Cable Connections

5-Pin M12 Connections	
1	+24VDC
2	NC contact
3	0 VDC
4	NO contact
5	Common



Safety Electrical Components

IDEM TouchSafe Two-Hand Control Panels – Connections



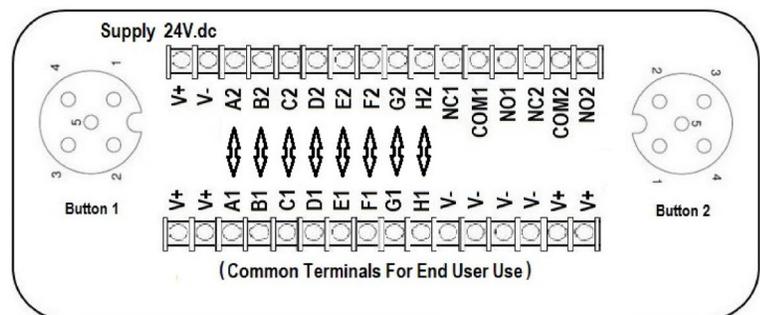
The enclosure features an internal connection PCB. This board makes it very simple to change out a pushbutton or a light, reducing the overall cost of ownership. The PCB has two M12 5-pin connectors for connection to either of IDEM's pushbuttons (the 2H-240021 Zero Force pushbutton or the 2H-240022 mechanically activated pushbutton) for two-hand control. In addition, the board provides four V+ terminals, four V- terminals, and eight pairs of pass-through terminals for end-user use.

PCB Connections

IDEM TouchSafe Two Hand Control Panels PCB Terminals Wiring Connections		
<i>Top-Row Terminals</i>		
<i>Terminal</i>	<i>Connects to</i>	<i>Description</i>
V+	DC supply	Required when using Zero Force type buttons
V-	DC supply	Required when using Zero Force type buttons
NC1	Button 1	Normally closed (NC) circuit
COM1	Button 1	Common
NO1	Button 1	Normally open (NO) circuit
NC2	Button 2	Normally closed (NC) circuit
COM2	Button 2	Common
NO2	Button 2	Normally open (NO) circuit

<i>Pass-Through Terminals</i>		
<i>Terminal</i>	<i>Connects to</i>	<i>Description</i>
A1	A2	Common connection for end user use
B1	B2	Common connection for end user use
C1	C2	Common connection for end user use
D1	D2	Common connection for end user use
E1	E2	Common connection for end user use
F1	F2	Common connection for end user use
G1	G2	Common connection for end user use
H1	H2	Common connection for end user use

<i>Bottom-Row Common Terminals</i>		
<i>Terminal</i>	<i>Connects to</i>	<i>Description</i>
All V+	Internally connected	Common connection for end user use
All V-	Internally connected	Common connection for end user use



Safety Electrical Components

IDEM SCR-2H Dual Channel Two-Hand Control Safety Relays



SCR2H-180030

The IDEM Two-Hand Control Safety Relay is designed in a compact housing. Two-Hand Control monitoring protects operators and machinery during tasks that require the machine to be clear. It is intended for use in safety Circuits that are designed in accordance with EN 60204-1 for example on presses, punches, and bending tools. This safety relay is designed to achieve Type IIIc Two-Hand Control Device (THCD) per ISO 13851.

Features

- Cyclical monitoring of the output contacts
- Feedback loop for monitoring downstream contactors or expansion modules
- Short circuit and ground fault monitoring
- 22.5 mm DIN rail mounting
- Two NC output contacts

Safety Data per EN 13849-1

Category	4
Performance level	Ple
MTTF_d	High (100 years)
DC_{avg}	High (99%)

Safety Data per IEC/EN 62061

Sil	SIL3
HFT	1
DC_{avg}	>90%
SFF	95%
PHD_{avg} (T=20a)	>3x10 ⁻⁸

SCR-2H Dual Channel Safety Relays

Part Number	Type	Voltage	Outputs	Connection	Drawing
SCR2H-180030	Two-hand control	24V AC/DC	2 NO	Fixed screw terminals	PDF



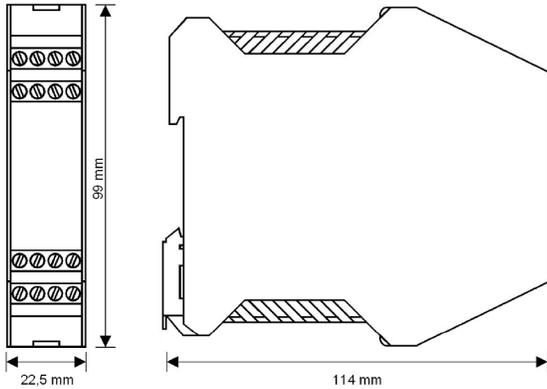
SCR21 Series Specifications

General Specifications	
Temperature	-20° to +55°C [-4° to +131°F]
Altitude	<2000m [6562ft]
Degree Of Protection	IP20
Housing	UL94 V-0 thermoplastic
Weight	160g (5.64 oz)
Agency Approvals and Standard	cULus, CE, TUV
Terminal Designation per EN 50 005	0.15 to 2.5 mm ² [26 to 14 AWG]
Input Specifications	
Nominal Voltage	24V AC/DC
Voltage Range	90-110%
Maximum Consumption	1.5 W (24V AC/DC)
Nominal Frequency	50Hz-60Hz
Control Voltage	24VDC
Control Current	<100mA
Short Circuit Protection	Internal PTC (Positive Temperature Coefficient) resistor
Over Voltage Protection	Internal VDR (Voltage Dependent Resistor)
Output Specifications	
Mechanical Life	10 x 10 ⁶
Contact Type	2 NC positively driven contacts
Operate Delay	<20ms
Release Delay	<20ms
Maximum Switching Voltage	250V
Thermal Current (I_{tf})	Max. 12A
Short Circuit Strength	Minimum Contact Fuses - 6A slow blow, 8A fast blow, or 10A gG
Switching Capacity	AC-15 230VAC, 3A; DC-13 24VDC, 3A
Switching Frequency	Max. 360 switching cycles/hr

IDEM SCR-2H Dual Channel Two-Hand Control Safety Relays

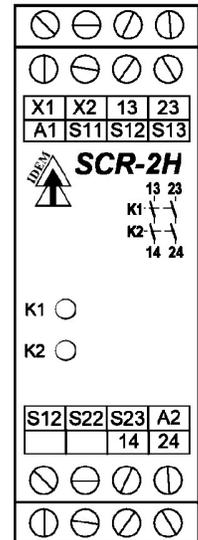


Dimensions



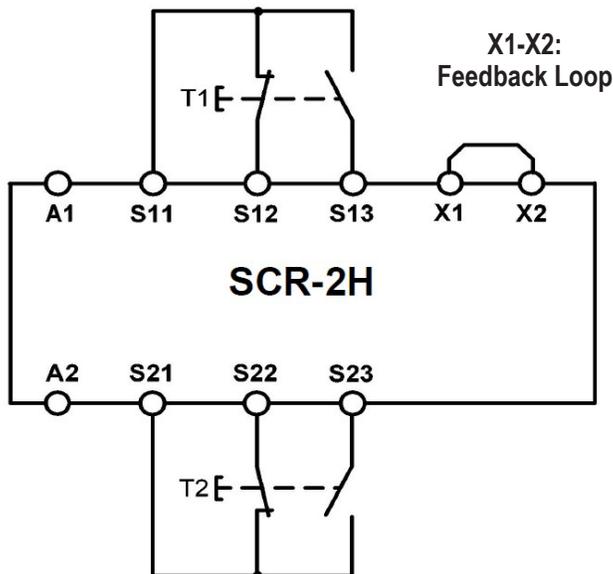
LED Diagnostics

When Safety Relay In Operation	
Power	Power applied to device
K1	Internal relay safety output contacts closed
K2	Internal relay safety output contacts closed

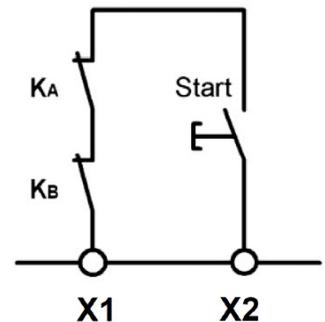


Applications

Wiring of the SCR-2H with two-hand pushbuttons



Feedback wiring



Contactor Manual Feedback

Safety Products



Warning: Safety products sold by AutomationDirect are Safety components only. The purchaser/installer is solely responsible for the application of these components and ensuring all necessary steps have been taken to assure each application and use meets all performance and applicable safety requirements and/or local, national and/or international safety codes as required by the application. AutomationDirect cannot certify that our products, used solely or in conjunction with other AutomationDirect or other vendors' products, will assure safety for any application. Any person using or applying any products sold by AutomationDirect is responsible for learning the safety requirements for their individual application and applying them, and therefore assumes all risks, and accepts full and complete responsibility, for the selection and suitability of the product for their respective application.

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