Installation Instruction for
MK-Safe Key Controlled Isolator

Operating Instructions: MK-Safe ISOL-Range

Description	ISOL-Range
MK-Safe is the easy-to-configure trapped key interlocking system. It is suitable for various industrial safety applications. The casing of MK-Safe is stainless steel 316 which is designed and built to withstand harsh operating environments. The coding system has 15,000+ different key codes available. The master coding system can be provided as an option. ISOL key controlled isolator is designed to work for power isolation. Mechan offers different isolators from 20A AC up to 100A AC. The contact arrangement is 3 pole, 4 pole with or without the 1NO & 1NC auxiliary contacts to suit various applications. ISOL1 is the single lock barrel option. ISOL2-ISOL4 are the multiple lock barrel options.	

Technical Specification: ISOL-Range

Lock Housing Material	316 Stainless Steel
Locking Mechanism Material	Full Stainless Steel
Mounting Plate Material	Full Stainless Steel
Operating Temperature	0ºC - 40ºC
Mechanical Lifetime of Lock Barrels	400,000 Operations
Electrical Lifetime of isolator	See Below

Safety Standards	
Standards	EN ISO 14119:2013 EN ISO 13849-1:2015 EN ISO 13849-2:2012 EN IEC 62061:2021
Certifications	CE Complies with all relevant sections of the CE Marking Directive

Safety Related Data	
B10d	200,000
SIL up to	SIL 2 acc. to EN 62061
Performance Level (PL) up to	PL-d acc. to EN ISO 13849-1
Coding	Type 2 acc. to EN ISO 14119

The information is designed to help suitably qualified personnel install and operate Mechan Controls safety equipment. Before using this product, read this guide thoroughly along with any relevant European and/or National Standards E.g. Machinery Directive 2006/42/EC and its Amendments, Provision and Use of Work Equipment Regulations. Further information can be obtained from Mechan Controls Ltd.
Mechan Controls Ltd accepts no responsibility for managing key codes for the customers. It is the customer's responsibility to implement a proper key code management system and means to prevent unintentional duplication of key codes. If an organization decides to keep spare or master keys then they shall be under management control and this shall be taken into account in the risk assessment. For further information, please refer to ISO/TS 19837.

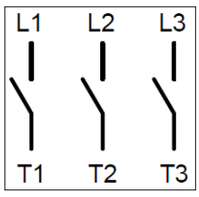
Operation

ISOL1 key controlled isolator with single lock barrel

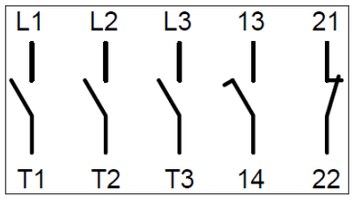
The operation of releasing the key:

When the isolator knob is turned to an OFF position, the key can be released from the lock. Once the key is released, the switch knob is locked in the OFF position. The status of the switch contacts is as follows:

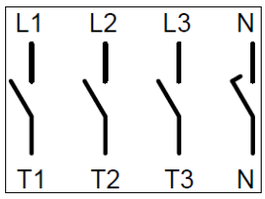
3 Pole contact



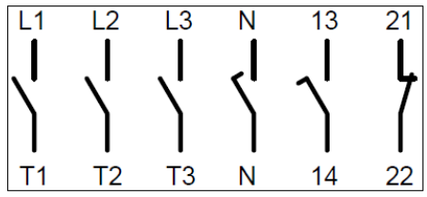
3 Pole + Auxiliary contact



4 Pole contact



4 Pole + Auxiliary contact



The operation of trapping the key:

When the key is inserted in the lock barrel and turned to the trapped position, the isolator knob can be turned to the ON position.
Once the isolator knob is in the ON position, the key will be trapped in the unit.
The status of the switch contacts are as follows:

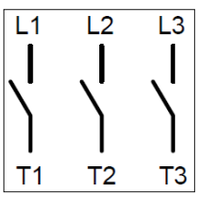
3 pole option: 3 poles are closed
3 pole + 1NO & 1NC Auxiliary option: 3 poles are closed, Auxiliary contact 13-14 is closed, Auxiliary contact 21-22 is open.
4 pole option: 4 poles are closed
4 pole + 1NO & 1NC Auxiliary option: 4 poles are closed, Auxiliary contact 13-14 is closed, Auxiliary contact 21-22 is open.

ISOLn n=2-4 key controlled isolator with multiple lock barrels

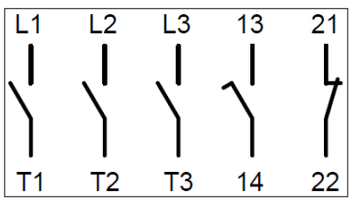
The operation of releasing the keys:

When the isolator knob is turned to the OFF position, the keys can be released from the unit sequentially.
Once one of the keys is released, the switch knob is locked in the OFF position.
The status of the switch contacts is as follows:

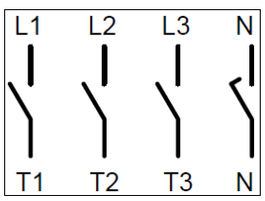
3 Pole contact



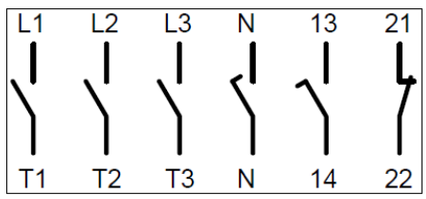
3 Pole + Auxiliary contact



4 Pole contact



4 Pole + Auxiliary contact



The operation of trapping the keys:

When all keys are inserted in the lock barrels and turned to the trapped position, the isolator knob can be turned to the ON position.
Once the isolator knob is in the ON position, all keys will be trapped in the unit.
The status of the switch contacts are as follows:

3 pole option: 3 poles are closed
3 pole + 1NO & 1NC Auxiliary option: 3 poles are closed, Auxiliary contact 13-14 is closed, Auxiliary contact 21-22 is open
4 pole option: 4 poles are closed
4 pole + 1NO & 1NC Auxiliary option: 4 poles are closed, Auxiliary contact 13-14 is closed, Auxiliary contact 21-22 is open

Mechanical Lifetime and Electrical Lifetime: ISOL-Range

Please refer to the following table for the mechanical and electrical lifetime of the ISOL product. If further information or clarification is required, please contact Mechan Controls.

Current Value Specified in the ISOL Part Number	B10 Mechanical Life (Operations) of the Isolator	B10 Electrical Lifetime@ Max Rating AC-23A, 380-440V (Operations)
20A	200,000	100,000
32A	200,000	100,000
40A	150,000	100,000
63A	150,000	100,000
80A	100,000	100,000
100A	100,000	100,000

Rated operational current Ie

Please refer to the following table for the rated operational current Ie of the ISOL product. If further information or clarification is required, please contact Mechan Controls.

Current Value Specified in the ISOL Part Number	Utilization Category	Voltage(V)	Current(A)
20A	AC-32A	20-400	20
	AC-22A	220-500	20
32A	AC-32A	20-400	32
	AC-22A	220-500	32
40A	AC-32A	20-400	40
	AC-22A	220-500	40
63A	AC-32A	20-400	63
	AC-22A	220-500	63
80A	AC-32A	20-400	80
	AC-22A	220-500	80
100A	AC-32A	20-400	100
	AC-22A	220-500	100
Auxiliary Contact for 20A and 32A Isolator	AC-15	110-240	2.5
Auxiliary Contact for 40A, 63A, 80A and 100A Isolator	AC-15	110-240	6

Rated operational Power

Please refer to the following table for the rated operational power of the ISOL product. If further information or clarification is required, please contact Mechan Controls.

Current Value Specified in the ISOL Part Number	Utilizaton Category	Voltage (V)	No. of Phases	No. of poles	Power (kW)
20A	AC-3	220-240	3	3	4
	AC-3	380-440	3	3	5.5
	AC-23A	220-240	3	3	5.5
	AC-23A	380-440	3	3	7.5
32A	AC-3	220-240	3	3	5.5
	AC-3	380-440	3	3	7.5
	AC-23A	220-240	3	3	5.5
	AC-23A	380-440	3	3	11
40A	AC-3	220-240	3	3	7.5
	AC-3	380-440	3	3	11
	AC-23A	220-240	3	3	7.5
	AC-23A	380-440	3	3	15
63A	AC-3	220-240	3	3	11
	AC-3	380-440	3	3	18.5
	AC-23A	220-240	3	3	11
	AC-23A	380-440	3	3	22
80A	AC-3	220-240	3	3	15
	AC-3	380-440	3	3	22
	AC-23A	220-240	3	3	18.5
	AC-23A	380-440	3	3	30
100A	AC-3	220-240	3	3	18.5
	AC-3	380-440	3	3	30
	AC-23A	220-240	3	3	22
	AC-23A	380-440	3	3	37

Max. Permissible Wire Gage - Use copper wire only

Please refer to the following table for Max. Permissible Wire Gage of the ISOL product. If further information or clarification is required, please contact Mechan Controls.

Current Value Specified in the ISOL Part Number	Wire Type	No. of conductor per terminal	Max. Cross section (mm ²)	Max. Cross section (AWG)
20A	Single-core or stranded wire	1	6mm²	AWG 10
	Flexible wire without sleeve	1	4mm²	AWG 10
32A	Single-core or stranded wire	1	6mm²	AWG 10
	Flexible wire without sleeve	1	4mm²	AWG 10
40A	Single-core or stranded wire	1	16mm²	AWG 6
	Flexible wire without sleeve	1	10mm²	AWG 6
63A	Single-core or stranded wire	1	16mm²	AWG 6
	Flexible wire without sleeve	1	10mm²	AWG 6
80A	Single-core or stranded wire	1	50mm²	AWG 1/0
	Flexible wire without sleeve	1	35mm²	AWG 2
100A	Single-core or stranded wire	1	50mm²	AWG 1/0
	Flexible wire without sleeve	1	35mm²	AWG 2
Auxiliary contact for 20A and 32A isolator	Single-core or stranded wire	1	1.5mm²	AWG 14
	Flexible wire without sleeve	1	1.5mm²	AWG 16
Auxiliary contact for 40A, 63A, 80A and 100A Isolator	Single-core or stranded wire	1	2.5mm²	AWG 12
	Flexible wire without sleeve	1	2.5mm²	AWG 14

Mounting of the key controlled isolator

1. The unit should be mounted in its correct assembly condition.
2. The user must comply with the relevant safety standards.
3. After mounting the unit, it must be commissioned and tested by a qualified person to ensure the correct operation and safety function of the unit.
4. The user must comply with the relevant electrical standards.

Recommended Fixing Required from the User:
ISOL1, ISOL2 key controlled isolator:
4 x M6 Hex socket head cap screws / minimum screw length = 16mm + panel thickness
4 x M6 Spring washer, 4 x M6 Flat washer, 4 x M6 Nut.
ISOL3, ISOL4 key controlled isolator:
6 x M6 Hex socket head cap screws / minimum screw length = 16mm + panel thickness
6 x M6 Spring washer, 6 x M6 Flat washer, 6 x M6 Nut.
The recommended torque to tighten the M6 fixing screw is 8 to 10Nm.
Ensure that all the fixing screws cannot be removed due to the vibration.
The tamper-proof security screws are recommended so that the personnel on site cannot remove the unit using standard tools. All fixing positions must be used.

The user should consider the weight of the ISOL unit which requires the proper support of the unit. The user should ensure the ISOL unit is mounted securely.

Please refer to the following table for tightening torque of screw terminals for the main switch contacts 3 pole / 4 pole.

Current Value Specified in the ISOL Part Number	Tightening Torque of the main contacts 3 pole / 4 pole	Tightening Torque of the auxiliary contact screw terminal
20A	1.25Nm	0.6Nm max
32A	1.25Nm	0.6Nm max
40A	1.8Nm	0.6Nm max
63A	1.8Nm	0.6Nm max
80A	3Nm	0.6Nm max
100A	3Nm	0.6Nm max

Product Selection

MK-ISOLn-STC-N-20A-3P-NA

Product Type	
MK-Safe	Mechan Key Exchange

Product Type	
ISOLn	Key Controlled Isolator with switch knob, n=1-4

Code Type	
STC	Standard Code System
MAC	Master Code System

Dust Cover	
N	No Dustcover
DC	With Dustcover

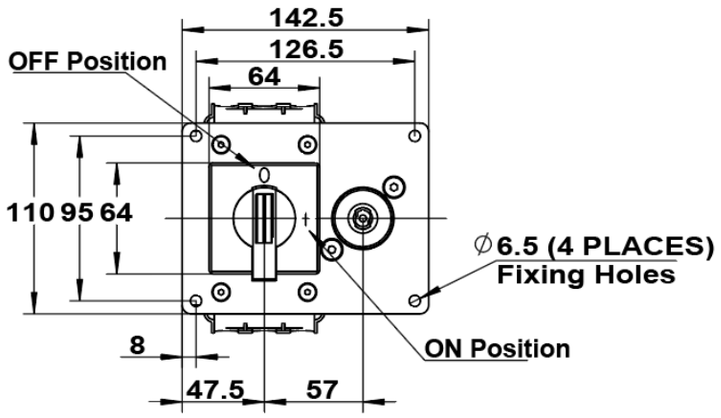
Current	
20A	20A AC see detail electrical specification
32A	32A AC see detail electrical specification
40A	40A AC see detail electrical specification
63A	63A AC see detail electrical specification
80A	80A AC see detail electrical specification
100A	100A AC see detail electrical specification

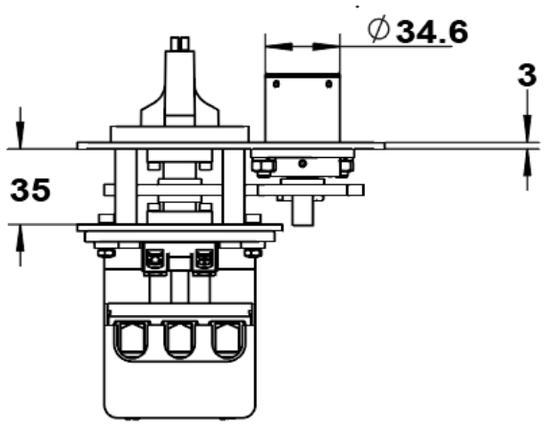
Main Contact	
3P	3 Pole ON/OFF
4P	4 Pole ON/OFF, 3 Phase + Neutral

Aux Contact	
NA	No Auxiliary Contact
AUX11	1NO & 1NC Auxiliary Contact

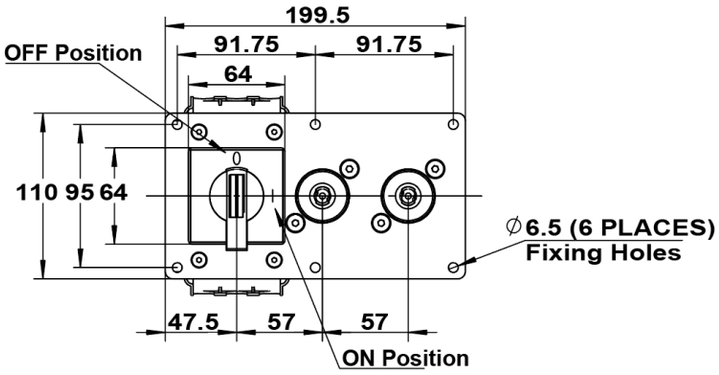
Dimensions

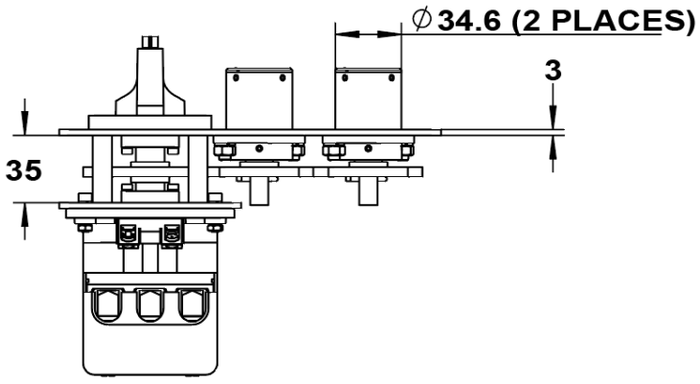
ISOL1 key controlled isolator with single lock barrel:



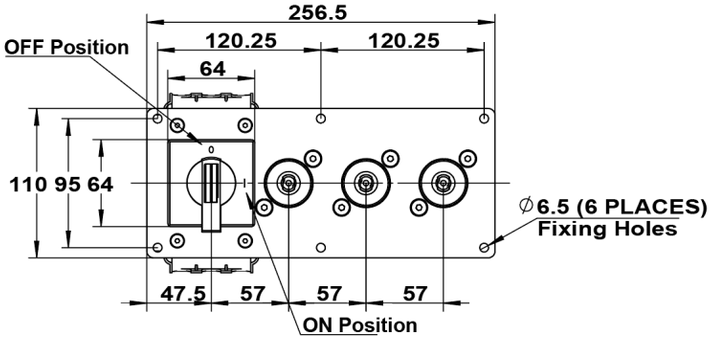


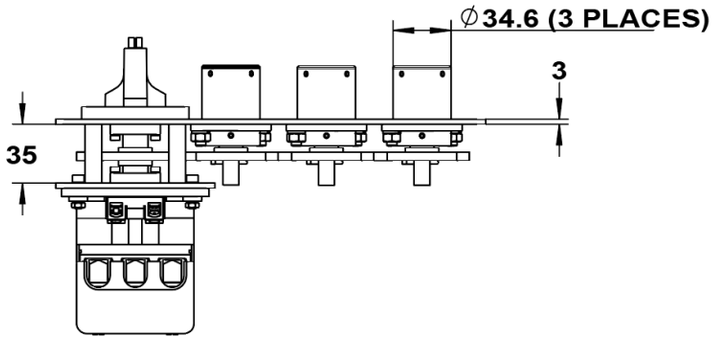
ISOL2 key controlled isolator with double lock barrel:



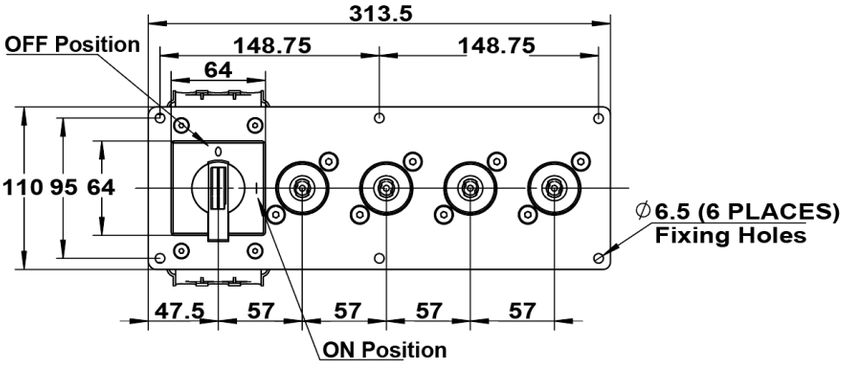


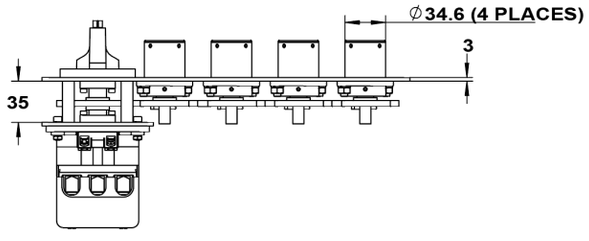
ISOL3 key controlled isolator with three lock barrels:





ISOL4 key controlled isolator with four lock barrels:





All dimensions are in MM

Safety Assessment

A risk assessment should take place to establish that the specifications of the MK-Safe product are suitable for the application required. See Technical Specifications below or contact Mechan Controls for further information.

The products may only be installed, commissioned, operated and maintained by competent persons.
A competent person is a qualified and knowledgeable person who, because of their training, experience and current professional activity, has the specialist knowledge required. An understanding of European and International laws, directives and standards is recommended.

Maintenance

It is recommended to check the unit every week regarding the following aspects:
1. the correct safety function of the unit
2. the correct operation of the unit
3. Look for signs of damage or excessive wear

Damaged units should be replaced or returned to the manufacturer for repair where practical.
For lubrication or cleaning, use WD40. The unit should be lubricated at a reasonable frequency depending on the operating environment.

Disclaimer

In the interest of product development specifications are subject to change without notice. It is the responsibility of the user to ensure compliance with any acts or by-laws in place. All information regarding Mechan equipment is believed to be accurate at the time of printing. Responsibility cannot be accepted for errors or omissions.

Warranty

Warranty will be void if the following points are true:

- The product was not used for its intended purpose
- Damaged was caused by usage not stated in the manual
- Modifications have been made to the products (e.g exchanging components)
- Operating personnel are not suitably qualified

Warning!

The MK-Safe trapped key system should not be manipulated or overridden. Removing the actuator from the guard may lead to loss of safety resulting in serious injury or death.