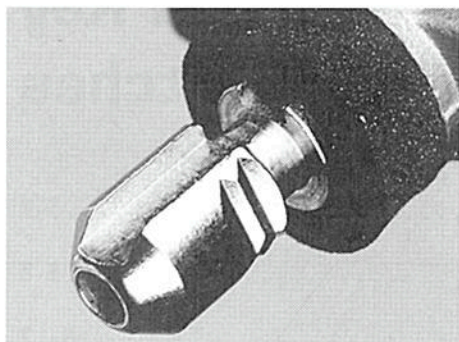


Prosafe Trapped Key Interlock Switches

Overview



CNC precision cut keys

Interlocking and Control Solutions

Trapped Key Interlocks—Why Use Them?

Based upon the premise that no one key can be in two places at once, key interlock systems can be configured to ensure a predetermined sequence of events takes place or that hazards have been reduced before operators can become exposed to them.

It is a mechanical system and is therefore widely used in applications including those where the location of plant, environment or explosive atmospheres make the use of electrical interlock systems unsuitable or expensive to install. In addition, unique coding can be provided, lending to a greater degree of security and tamper-resistance.

Why Prosafe?

In order to derive the full benefits from a trapped key interlocking system its components must be totally practical, easily maintainable and readily available. Prosafe's unique key and code barrel gives the ability for even complicated interlocking systems and spare parts to be ordered from our worldwide network of distributors—fast! A first for trapped key interlocks.

5 Unique Prosafe Benefits

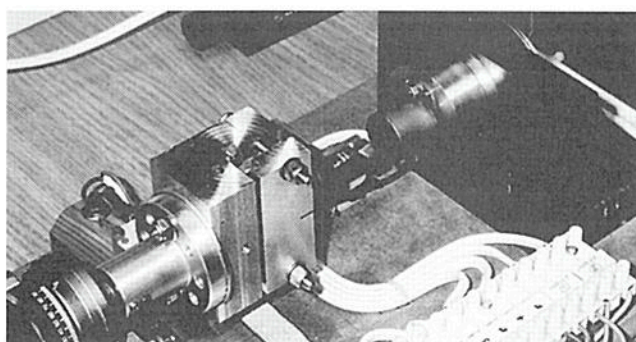
Compare the following to other trapped key manufacturers:

1. All stainless interlocking and coded parts—including the code barrel and internal components at no extra cost.
2. Weather cap as standard—no extra charge for dust caps and seals.
3. Standard red colour-coded key and ID tags—at no extra charge.

The Prosafe Advantage



Stainless steel construction.



Tested to 100,000 operations

4. Custom colour/text keys and ID tags—nominal extra charge.
5. A complete range of isolators, key exchange, miniature valve interlocks and gate interlocks—all using the same key principle.

CE Marking—Tested and Approved

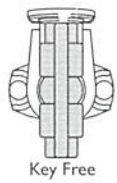
Only Prosafe products carry the prestigious BG mark. A sign of safety, independently tested by the German Berufsgenossenschaftliches Institut für Arbeitssicherheit, 'BIA'. Additional tests for valve interlocks include Lloyds Certificate for fire test and salt-mist resistance. Switches and sensors carry the necessary 'BASEEFA' approvals while isolator switches carry UL, CSA and TUV approvals.

Over 100,000 Operations

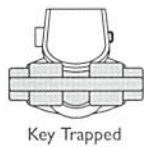
Prosafe products have been subjected to independent, exhaustive testing. With only a small amount of lubricant added infrequently, keys were inserted, rotated and removed at a rate of 12 times per minute. After 100,000 operations (at 10 operations a day this is equivalent to 27 years) the unit was functioning satisfactorily and most importantly would 'pass' only the original or equivalent new key. No incorrect keys could operate the lock, underlining the unit's integrity as well as longevity.

The Advantage

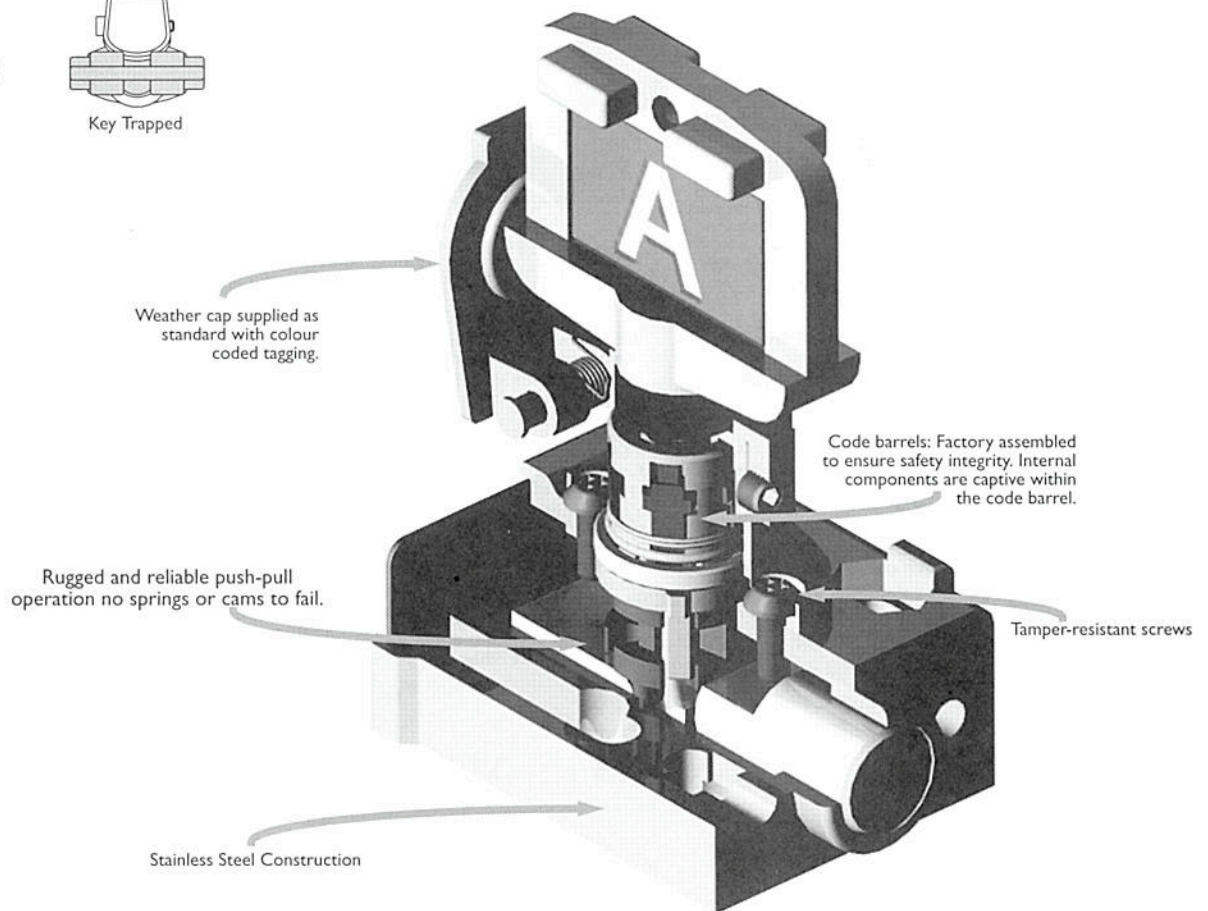
90° Key Operation



Key Free



Key Trapped



Weather cap supplied as standard with colour coded tagging.

Code barrels: Factory assembled to ensure safety integrity. Internal components are captive within the code barrel.

Rugged and reliable push-pull operation no springs or cams to fail.

Tamper-resistant screws

Stainless Steel Construction

Prosafe Keys

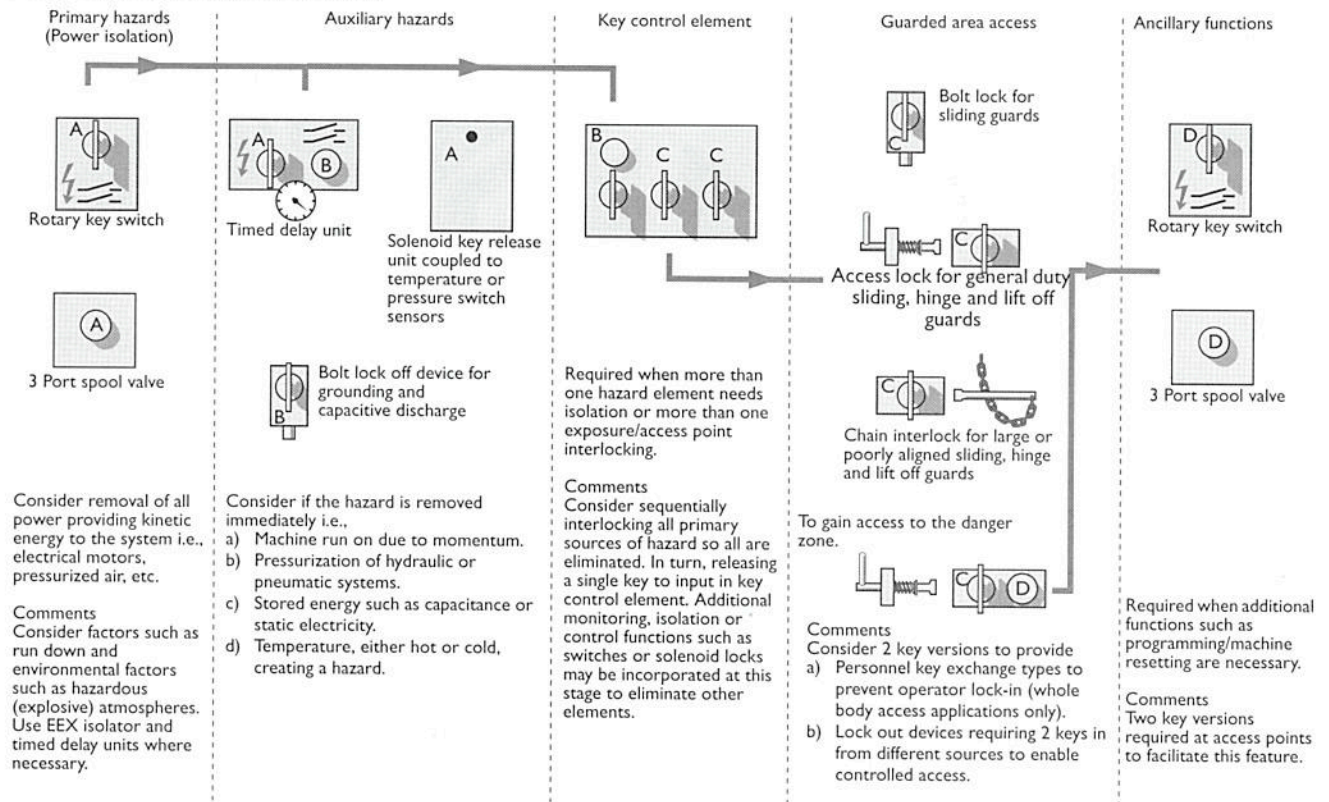
Compact, solid and sturdy keys supplied with dust seals and coded tagging. Optional colours/text are available.



Prosafe Trapped Key Interlock Switches Overview

Designing an Interlocking System

Plant and Machinery Interlocking



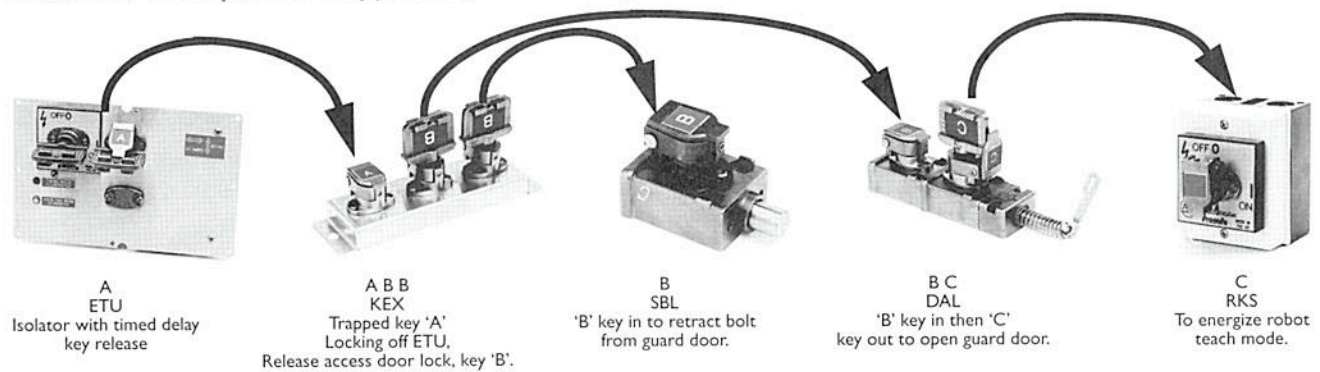
5-Prosafetm Trapped
Key Interlock Switches

The Prosafe Advantage



Stainless steel
construction.

Illustrated Principles of Trapped Key Interlocking



Sequence of Operation

1. The ETU isolator has two keys. One is a non removable key. The other key (a 'A' coded key) can be removed after a timed duration, which is set by a potentiometer inside the ETU isolator. Turn the non removable key to turn the hazardous machine motion off and start the timer. When the time expires, the Key Free LED turns ON. Remove the 'A' key.
2. Insert the 'A' key into the Key Exchange Unit (KEX) and turn it 90°.
3. Turn one of the 'B' keys 90° and remove it from the KEX. This traps the 'A' key in the KEX and prevents the restarting of the machine.
4. Insert the 'B' key into the Single-key Bolt Lock (SBL) and turn it 90° to gain partial body access to the machine.
5. Turn the second 'B' key 90° and remove it from the KEX. Removal of this key also traps the 'A' key in the KEX and prevents the restarting of the machine.
6. Insert the 'B' key into the Dual-key Access Lock (DAL) and turn it 90°.
7. Turn the 'C' key 90° and remove the 'C' key. Rotate the access handle to allow full body entry into the hazard zone.
8. Take the 'C' key into the hazard zone, insert it into the rotary key switch (RKS) and turn it 90° to send a signal to the machine control system, to allow the machine to operate in a slow or teach mode.
9. Reverse the process to return the machine to full operational mode.

Bill of Materials

Item	Quantity	Description	Catalogue Number
1	1	Single Key Time Delayed with an B Primary Key	440T-MSTUE110A
2	1	Key Exchange Unit, A Primary Key, Two B Secondary Keys Trapped (included)	440T-MKEXE110A0B0B
3	1	Single Bolt Lock, B Primary Key	440T-MSBLE100B
4	1	Dual Access Lock, B Primary Key, C Secondary Key Trapped (included)	440T-MDALE100B0C
5	1	Rotary Key Switch, C Primary Code Barrel	440T-MRKSE100C
6	1	A Key	440T-AKEYE100A

Note: Primary keys must be ordered separately, when not provided for by a previous sequential trapped key.
In the example above, only one primary key must be ordered separately. The remaining primary keys are provided by a previous sequential secondary (trapped) key.

Prosafe Trapped Key Interlock Switches

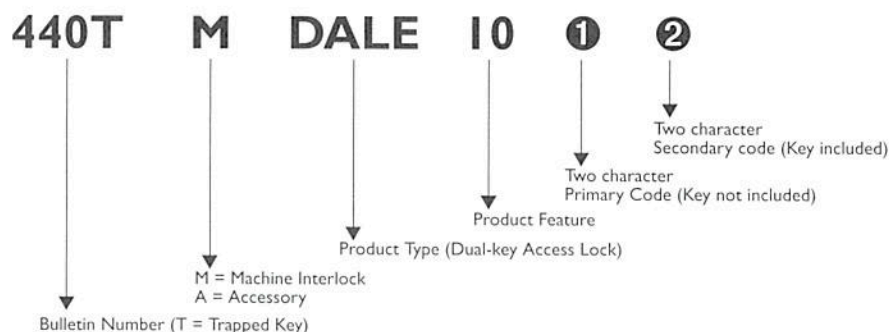
Overview

Code Selection

Ordering Prosafe trapped key products requires codes to be included in the catalogue number.

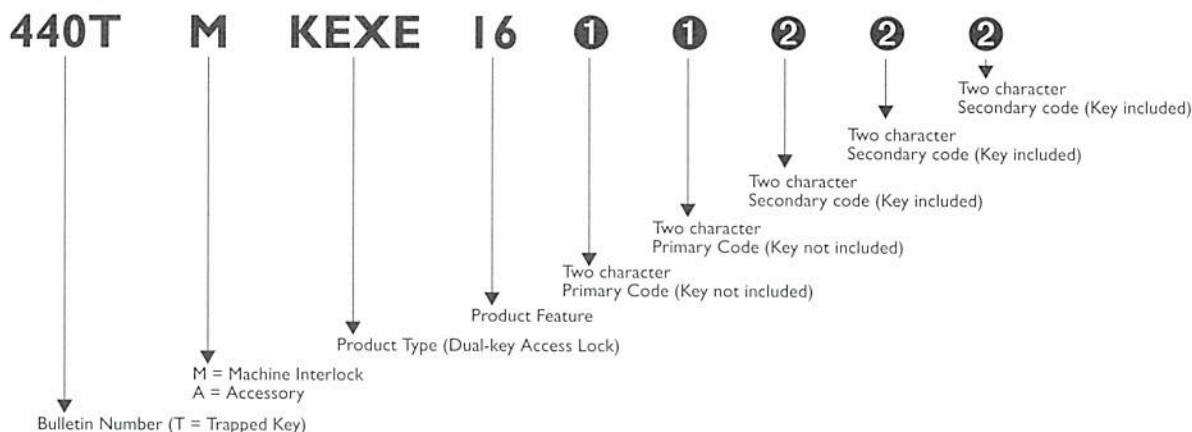
- The codes are added to the end of the catalogue number.
- Each code must be two characters in length.
- Single letter codes must be preceded by a 0 (zero).
- The first code(s) is the primary code and the last code(s), if necessary, are the secondary code(s).
- Primary codes do not include the key. The key must be ordered separately or must come from a previous operation.
- Secondary codes come complete with a key, as the key is trapped in the code barrel.
- Use the table on page 5-7 to select and track codes.

Ordering Example 1:



Order catalogue number 440TMDALE100A0B to get a Dual key Access Lock with an "A" primary code and a "B" secondary code, with a "B" key included.

Ordering Example #2:



Order catalogue number 440TMKEXE160A0B0C0C0C to get a key exchange unit with "A" and "B" primary codes and three "C" secondary codes. The "A" and "B" keys are not included. The three "C" keys, which are trapped in the secondary code barrels, are included.

5-Prosafe™ Trapped
Key Interlock Switches

The Prosafe Advantage



Stainless steel
construction.

Key Coding

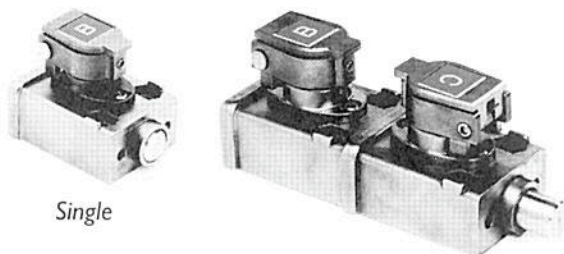
Below is an example reference guide that is useful in selecting and tracking codes. Start down the 0A column as the lower codes (typically 0A to ZA) are stocked. The chart continues on to ZZ. Note that there only 25 letters used—Q is not used.

Codes are ordered with upper case letters. Labels with two letter codes will show the first letter in upper case and the second letter in lower case.

	Code	Application & Date	Code	Application & Date	Code	Appli & Da
Start Down	0A	granulator machine #472 24/3/01 inc 67	Aa		Ab	
	0B		Ba		Bb	
	0C		Ca		Cb	
	0D		Da		Db	

	Code	Application & date	Code	Application & date	Code	Application & date	Code	Application & date	Code	Application & date	Code	Application & date	Code	Application & date
Start Down ↓	0A		Aa		Ab		Ac		Ad		Ae		Af	
	0B		Ba		Bb		Bc		Bd		Be		Bf	
	0C		Ca		Cb		Cc		Cd		Ce		Cf	
	0D		Da		Db		Dc		Dd		De		Df	
	0E		Ea		Eb		Ec		Ed		Ee		Ef	
	0F		Fa		Fb		Fc		Fd		Fe		Ff	
	0G		Ga		Gb		Gc		Gd		Ge		Gf	
	0H		Ha		Hb		Hc		Hd		He		Hf	
	0I		Ia		Ib		Ic		Id		Ie		If	
	0J		Ja		Jb		Jc		Jd		Je		Jf	
	0K		Ka		Kb		Kc		Kd		Ke		Kf	
	0L		La		Lb		Lc		Ld		Le		Lf	
	0M		Ma		Mb		Mc		Md		Me		Mf	
	0N		Na		Nb		Nc		Nd		Ne		Nf	
	0O		Oa		Ob		Oc		Od		Oe		Of	
	0P		Pa		Pb		Pc		Pd		Pe		Pf	
	0R		Ra		Rb		Rc		Rd		Re		Rf	
	0S		Sa		Sb		Sc		Sd		Se		Sf	
	0T		Ta		Tb		Tc		Td		Te		Tf	
	0U		Ua		Ub		Uc		Ud		Ue		Uf	
	0V		Va		Vb		Vc		Vd		Ve		Vf	
	0W		Wa		Wb		Wc		Wd		We		Wf	
	0X		Xa		Xb		Xc		Xd		Xe		Xf	
	0Y		Ya		Yb		Yc		Yd		Ye		Yf	
	0Z		Za		Zb		Zc		Zd		Ze		Zf	

Prosafe Trapped Key Interlock Switches Bolt Interlocks



Single

Dual



Description

The bolt interlocks are designed to allow access to hazardous areas when an appropriate key is inserted into the interlock. These bolt interlocks are manufactured in 316L stainless steel to provide a rugged, industrial grade method of helping prevent access through gates.

One advantage of the bolt interlocks is that there is no need to run power wires to the gate. Power is disconnected by a trapped key rotary switch on a control panel and the key is then hand-carried to the gate by the operator.

The Single Bolt interlock (SBL) is designed to be used to access hazardous areas where partial body exposure is required. The SBL is not shipped with a key. If two keys are needed for partial body access, select the Dual Bolt interlock (DBL) that requires both keys to be trapped to operate. This version of the DBL does not include the keys.

When whole body access is needed, the DBL, with one primary key and one secondary trapped key (included) should be used. The secondary key serves the function of a personnel key. This DBL allows the operator to carry the personnel key into the hazardous area. When the operator returns from the hazardous area and returns the personnel key to the DBL, the locking sequence can be reversed and the process re-started.

Features

- 316L Stainless steel construction
- Single or dual key units
- Various extensions of bolt
- Direct drive push/pull operation
- Replaceable code barrel assembly
- Fitted with tamper resistant screws
- Weatherproof stainless steel dust cap as standard

The Prosafe Advantage



Stainless steel construction.

Specifications

Standards	EN292-1&2, EN1088, ISO12100-1&2, ISO14119, AS4024.1
Category	Cat. 1 per EN 954-1 (ISO 13849-1) Suitable for Cat. 2, 3, or 4 systems
Approvals	BG, CE marked for all applicable directives and C-Tick not required
Operating Temperature	-40°C to +200°C (-40°F to +392°F)
Mechanical Operations	100,000
Max. Shear Force to Key	15.1kN (3398lbs)
Max. Torque to Key	14Nm (124lb•in)
Humidity	95% RH
Weight	(SBL) 0.60kg (1.32lbs) (DBL) 1.10kg (2.43lbs)
Material	316L Stainless Steel
Mounting	SBL 2 x M5 Counterbored from Top or 2 x M5 from Underside with M5 Nuts DBL 4 x M5 Counterbored from Top or 4 x M5 from Underside with M5 Nuts
Bolt	15mm (0.59in) Ø

Product Selection

Type	Trapped Condition	Bolt Retracted—mm (inches)	Bolt Extended—mm (inches)	Catalogue Number
Single Key	Key Trapped to Bolt Retract	0	14 (0.55)	440T-MSBLE100
		3 (0.11)	17 (0.66)	440T-MSBLE110
		6 (0.23)	20 (0.78)	440T-MSBLE120
		12 (0.47)	27 (1.06)	440T-MSBLE130
Dual Key	Both Keys Trapped to Retract Bolt	0	14 (0.55)	440T-MDBLE1000
		3 (0.11)	17 (0.66)	440T-MDBLE1100
		6 (0.23)	20 (0.78)	440T-MDBLE1200
		13 (0.51)	27 (1.06)	440T-MDBLE1300
	Primary Key Trapped, Secondary Key Free to Retract Bolt	0mm	14 (0.55)	440T-MDBLE1400
		3 (0.11)	17 (0.66)	440T-MDBLE1500
		6 (0.23)	20 (0.78)	440T-MDBLE1600
		13 (0.51)	27 (1.06)	440T-MDBLE1700

① Substitute the desired primary code for this symbol (key not included). See page 5-6 for code selection.

② Substitute the desired secondary code for this symbol (key included). See page 5-6 for code selection.

Accessories

Description	Page Number	Catalogue Number
Replacement Key	5-33	440T-AKEYE100
Replacement Code Barrel		440T-ASCBE140
Replacement Dust Cap		440T-ASFC100

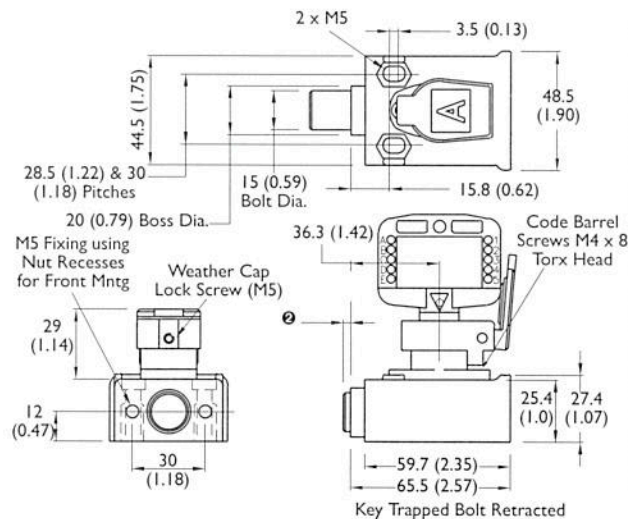
① Substitute the desired primary code for this symbol (key not included). See page 5-6 for code selection.

⊗ Substitute the desired code for this symbol. See page 5-6 for code selection.

Approximate Dimensions—mm (inches)

Dimensions are not intended to be used for installation purposes.

Single Key Bolt Interlock



② Standard Retracted Projections 0, 3, 6 & 13 (0, 0.11, 0.23 & 0.51) Extension 14 (0.55)

Dual Key Bolt Interlock

