DEPARTMENT OF PUBLIC WORKS

STANDARD SPECIFICATION

FOR

SECURITY EQUIPMENT

OFFICE OF THE DIRECTOR
MECHANICAL ENGINEERING SERVICES

REVISED: SEPTEMBER 1995
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S100 CARD READERS

S101 Single Reader System (Off-line)

The card reader shall be of the sweep-through type and shall be suitable to operate with the sweep-slot in the vertical plane when mounted on a vertical surface or with the slot in the direction of flow of traffic when mounted on a horizontal surface. Also refer to clauses S111 and S112 hereof for mounting of readers. Where the reader is mounted with the slot in the vertical position it shall be mounted to allow sweep-through of the card from top to bottom. The reader shall also be manufactured so that, when mounted, the slot faces towards the right hand side or the card user when facing the reader, in order that it should not be necessary for the users to twist his/her wrist to sweep the card.

The reader shall also be fitted with LED lamps, indicating the "ready" status of the reader(YELLOW), acceptance of a card(GREEN) or rejection of the card(RED). A buzzer fitted to or at the reader shall, in conjunction with the GREEN lamp, sound a short, muffled yet clearly audible tone when a card is accepted, or shall, in conjunction with the RED lamp, sound an intermittent, equally audible double alarm tone when the card is rejected.

The sensing and pulse transmission equipment of the reader shall be of solid state design and mechanical or electromechanical readers will not be acceptable. Readers may be combined with the memory and processing equipment as a unit or supplied separately with remotely placed memory and processing equipment.

The reader shall be suitable for the off-line mode operation i.e. stand-alone operation, or as a reader, which can communicate, with other readers or with a central computer system. In such a case the processing section of the reader shall have an RS 232 input/output port for ASCII serial data transmission.

The card reader and memory/processor combination shall be suitable to accommodate the data of at least 300 cards in the off-line mode.

The card reader shall further be of a type which operates in conjunction with the card technology specified in the Supplementary Specification.

The housing of the card reader shall be manufactured from cast alloy or impact resistant non-metallic material and the housing shall be fixed to the mounting base of the reader by means of tamper-proof screws or similar methods of fixing.

The slot of the reader shall be manufactured from smooth hard-wearing material which shall not damage cards even over long periods of operation. Should excessive wear of the slot start affecting the accuracy of the reader, it shall further be possible to easily replace the slot section

only.

The card reader and/or its associated equipment shall preferably be manufactured in modular form to simplify maintenance and all in/out terminals for wiring shall be clearly marked to indicate the function thereof.

The reader shall be supplied with switching facilities for an electrically operated door lock, and shall be able to switch 24 VAC or 24 VDC, 5 Amp, continuous duty.

The memory and processor section of the reader shall only be programmable either by means of an external processor unit via plug-in facilities or by means of installed factory programmed EPROMS only. All installation equipment and programming device shall be removed from site after the system has been installed and all data loaded. The memory of the system shall preferably be non-volatile that will not be damaged by power failures, or shall alternatively be backed up by lithium or other acceptable types of batteries to ensure maintenance of the system memory for a period of at least 24 hours, unless otherwise specified, in case of power failures.

Preference will be given to permanent memories in stand-alone reader applications and to standard CPU components.

The data system for a particular reader and cards shall not be suitable for operation with foreign cards or with cards of the same type which may be in use in another project or similar project or with a card system employed in the same . project for another application,* unless specified as such.

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The data system shall not be re-programmable with a "Master Card" to allow input of additional information into the system, once the system has been programmed for the card requirements specified originally.

Also refer to clause S121 for power supplies to card readers and to drawing range S300/2/... and S300/3/... hereof for further details for the mounting of readers and power supplies to reader power packs.

S102 Multiple Reader System (Off-line)

The card readers shall not only comply fully with clause S101 above, but the various card readers in the system shall also be able to communicate with one another to allow for a total number of 300 cards to be used on all card readers.

Memory and processor equipment for data handling can be either incorporated in each reader or placed in the vicinity of each reader or may be centrally located.

In all the above-mentioned cases, communication between readers shall be by means of an RS 232 input/output on a minimum wire data network.

All card readers of multi-card reader systems shall be able to communicate with all cards on the system.

The installation requirements described in clause S101 hereof, as well as all details shown on the enclosed drawings, shall also apply to off-line multiple reader systems.

S103 Multiple Reader System (On-line)

Card readers shall not only comply fully with clause S101, but each shall also have full interface facilities complete with any field processor units, pro-processor or interface equipment for coupling the reader to a centrally placed computer. Each reader shall also be equipped with a RS 232 or RS 422 serial output/input port, and be suitable to transmit and receive ASCII serial data.

All card readers, with peripherals thereto, used in the project shall be interconnected with each other and with the computer by means of a minimum wire data network.

The installed memory and data handling facilities for readers, as specified in clause S101 above shall also be provided in this case to allow readers to operate in the off-line mode in case of loss of data transmission facilities between readers and computer equipment or interface equipment and shall be capable of storing at least 200 card transactions should the card reader not be able to communicate with the computer for any reason whatsoever.

The reader shall also be fitted with LED lamps, indicating the "ready" status of the reader (YELLOW), acceptance of a card (GREEN) or rejection of the card (RED). A buzzer fitted to or at the reader shall, in conjunction with the GREEN lamp, sound a short, muffled yet clearly audible alarm tone when the card is accepted, or shall, in conjunction with the RED lamp, sound an intermittent, equally audible double alarm tone when the card is rejected.

The reader shall still have off-line mode facilities to handle the particular number of cards envisaged to work with the particular reader. The card handling capacity of this type of reader shall be in accordance with the requirements of the Department.

The installation requirements described in clause S101 hereof, as well as all details shown on the enclosed drawings, shall apply to on-line multiple reader systems.

S110 CARD READER MOUNTING

S111 Card Reader (Surface Mounting)

The card reader shall be supplied complete with its own wall outlet box, where applicable, or shall be suitable for mounting over a standard 100mm x 50mm x 50mm pressed steel switch box. Special mounting boxes shall have 20mm∅ or 25mm∅ screwed electrical conduit connections.

The reader shall cover the wall outlet box in both the above cases or shall be supplied with a back plate accessory to cover the outlet box. Tamper-proof fixing screws or other approved fixing methods shall be employed to hold the reader in position.

Readers mounted on surface of hollow metal structures such as door frames, mullions or partitions shall be fixed by means of special clamp devices, which form part of the reader, or by means of drilled and tapped tamper-proof fixings.

Cables leaving readers through back plates or hollow metal enclosures shall be protected with properly fitting grommets or other approved chafe protecting devices.

Card readers shall be installed at a maximum height of 1200mm above finished floor level when mounted on a vertical surface.

Card readers shall be mounted in the immediate vicinity of the strike position of single doors in compliance with drawing range S300/2/... and in a position next to double doors, on the strike side leaf of the double doors, in compliance with the drawing range S300/3/...

The final mounting position of card readers must, however, be determined on site, taking site conditions into consideration.

S112 Card Reader (Flush Mounting)

NOTE : *This paragraph shall not apply when sweep-through card readers are specified and is only applicable where insert readers are specifically required.*

Card readers mounted flush or semi-flush in hollow structural elements shall be suitably manufactured for such purposes and shall have suitable finishing surrounds to ensure a neat finish between the reader and the surrounding structure.

Readers who are manufactured for semi-flush mounting in walls shall be supplied complete with a purpose-made mounting box, which shall be complete with a 20mm0 or 25mm0 electrical screw conduit entry. Fixings shall also be tamper-proof and readers shall be mounted at a maximum height of 1 200mm above the finished floor level when mounted on a vertical surface.

Card readers shall be mounted in the immediate vicinity of the strike position of single doors in compliance with drawing S300/2/... and in a position next to double doors, on the strike side leaf of the double doors, in compliance with drawing range S300/3/...

The final mounting position of card readers must, however, be determined on site, taking site conditions into consideration.

S120 POWER SUPPLIES

S121 Power Supplies of Card Readers

The power supplies of card readers referred to in clause S101 and S102 above, shall preferably be integral with the memory and processing equipment of the reader and the equipment shall be suitable to operate directly from a 230 Volt, 50 Hz single phase supply.

If separate memory, CPU and processing equipment are offered, these units shall be installed on the secure side of doors in general compliance with drawing range S300/2/... for single door situation, and drawing range S300/3/... for double door situations.

The power supply for card readers referred to in clause S103 above, shall be in the form of low voltage supplies, if required, from a centrally placed power pack at the Computer system. Separate 230 Volt or other supplies will not by available at the reader positions of card readers specified under clause S103 above. The power supplies (item 10 on drawings) refer to 230 Volt supplies from building power sources.

S200 SECURITY CARDS

S201 Passive Cards (Pre-programmed by Manufacturer)

Security cards shall be of the flexible, hard-wearing, plastic laminate type and shall have the approximate dimensions of a normal credit card.

The card shall be suitable for the pre-programming of data therein by the manufacturer, to be read later by the card readers specified in clause S100 hereof, in which case the cards and card readers shall be supplied by the same manufacturer.

Cards shall have a slot punched in the top portion of the card for fitting a clip, enabling the user of such a card to attach it to his/her clothing. The clip assembly shall comprise a crocodile clip attached to an appropriate strip of tough plastic or other durable material fitted with a press stud for fastening the clip to the card. Cards shall be supplied complete with clip assemblies.

The data storage elements of the card shall not be visible through the card material or on the surface of the card and the data storage elements shall further preferably be masked against copying by means of X-rays or other means.

The card encoding technology to be used is specified in the Supplementary Specification.

Opening the card for whatsoever reason shall totally destroy the card and shall render the card unsuitable for further use.

The card shall further be suitable for laminating with a layer of transparent material containing the personal information and a photograph (I.D. size) of the user. If so required, cards shall be laminated by the supplier with this layer of material and shall be complete with a photograph of the user of the card.

The personal information to be laminated onto the card, if so required, shall basically be as follows:

Name of user.
Initials of user.
Rank of user.
Citizen's I.D. number
Official I.D. number (if any)
Department or section where employed (if any)
Card number of Department (if any)

The manufacturer's serial number or departmental number indicated on the outside of the card shall in no way whatsoever refer to the coding of data contained in the card.

The number of cards required shall be specified in the Supplementary Specification.

S202 Passive Cards (Programmed by User Department)

This type of card shall not only comply with clause S201 in all respects, but shall also be suitable for on site programming by the User Department, or organisation appointed by the Department.

The supplier of cards shall supply coding equipment on a permanent or rental basis for the programming, as specified by the Department.

The making available of such programming equipment shall include for the training of personnel, who will be made available by the User Department or nominated by the Department, for programming of cards.

S300 ELECTROMECHANICAL AND ELECTRONIC SECURITY LOCKS

This section describes the types, assembly, operation, materials and components used, finishes and performance requirements of the electromechanical and electronic security locks as used by the Department.

S300.1 Scope

This specification covers the requirements for the materials, essential dimensions, assembly, finish, operation, performance and tests of alarm escape locks, time delay alarm escape locks, monitored double bolt mortise locks and double bolt mortise dead locks, latch bolt locks and combinations of these locks and also the requirements with regard to the associated power supplies and electromechanical furniture for each lock.

S300.2 Definitions

For the purpose of this specification, the following definitions shall apply:

Acceptable

Acceptable not only to the Department of Public Works, but also acceptable to the South African Bureau of Standards in relation to standardisation marks and to inspections carried out by the Bureau, where applicable.

Alarm

The activation of a loud audible alarm and a visible LED light source when specified, or if an attempt is made to open the lock or power supply to the lock under abnormal circumstances by unauthorised persons.

Alarm escape lock

A combined lock comprising a monitored, double spring-loaded bolt mortise lock, a surface mounted housing equipped with a hinged manually operated push handle and electronic circuitry to provide controlled exit from a secure area, while audible and visible local and remote alarms are activated.

Audible alarm

An audible signal of at least 75 dB(A) and not more than 95 dB(A) sound pressure level measured at one(l) metre distance from the sound source.

Card reader

The reader head which reads the data captured in an encoded security card and transmits that data to a processor, which in turn will verify the validity of such card.

Controlled access

The authorised and controlled entry and exit via a door fitted with an alarm escape lock, by means of a key to the lock. The muted alarm is sounded when the door is used in this way.

Cylinder assembly

A separate key-operated pin-tumbler type lock unit fitted to, and operated in conjunction with, the locking mechanism of a security- and/or monitored lock.

Cylinder mortise lock

A mortise lock fitted with a double-ended cylinder assembly, key operated from either end of the cylinder, or a lock fitted with a single-ended cylinder assembly, key operated from the outside of the cylinder only and fitted with a thumb-turn or knob on the inside to operated the lock bolt assembly.

Dead lock

A lock having a dead bolt mechanism which can be locked and un-locked from either side of a door by means of a key, or from the inside by means of a thumb-turn. The dead bolt shall not be spring-loaded.

Defective

A unit which fails to comply with the relevant specification requirements in one or more respects.

Electrically operated

The unlocking of a lock by means of a solenoid, which withdraws the spring-loaded bolt of the lock out of the striking plate, or which releases the spring-loaded jaw of a striking plate allowing, the door to be opened.

Electric striking plate

An electrically operated striking plate installed in or on the doorframe of a single door or the fixed leaf of a double door (Refer to the definition of Striking Plate).

Emergency escape

The escape of a person under threat via an emergency exit.

Face of lock

The elevation of the lock which faces the user of the lock when it is approached from the secure side of the door.

Fixed leaf (Double door)

The one leaf of a double swing door normally not used for access and which is normally kept in the "CLOSED" position by means of flush bolts recessed into the top and bottom edges of the door leaf front end (bolt end of lock) in such a way that they are concealed when the other door leaf of the swing door is closed.

The slides of the flush bolts fit into appropriate recesses in the door frame at the top and floor surface at the bottom, and can be operated either manually or automatically, the required method of operation of which will be specified by the client.

Fore-end (Single)

A plate permanently attached to the front end (bolt side) of a lock, and through which the lock bolts pass to enter the striking plate in the door frame.

Fore-end (Double)

Two plates, one of which complies with the single fore-end plate, being permanently attached to the front of the lock, and the other superimposed on the first plate and attached to the front of the lock by means of screws. The bolts of the lock pass through both plates to enter the striking plate in the door frame.

Furniture

A generic term for any or all of the following items supplied separately, or in sets, or as part of a lockset, namely lever handles, escutcheons, spindles, screws and any other ancillary components.

Latch bolt (Dead locking)

The spring-loaded bolt of a double bolt mortise lock, which does not enter the striking plate on closing the door but rides on the striking plate. The latch bolt thus remains pushed back into the lock, thereby locking the main lock bolt internally when the lock bolt is in position in the striking plate, thus preventing it from being pushed back into the lock when inserting a foreign object between the striking plate and the lock fore-end.

LED

A solid state high-temperature epoxy encapsulated GaAsP light emitting diode lamp, with a maximum diameter of 5mm and with a total maximum power dissipation of 180mW at a maximum forward DC current of 100mA at 25°C.

Lever handle

An anodised cast aluminium handle with a steel insert running in a spring-loaded pressed stainless steel plate, operating the spring bolt mechanism of a lock by means of a steel spindle of square cross-section.

Microswitch

A miniature, low voltage, moulded, actuating lever operated switch with miniature contacts, which close and open with a snap action in accordance with the position of the actuating lever. The microswitch shall be of highest quality.

Monitored bolt

A mortise lock bolt assembly, operated by means of a handle and/or cylinder key fitted with a microswitch in which the contacts close to complete and electric circuit when the bolts of the lock are withdrawn from the striking plate, thereby activating alarms.

Power supply

A combined battery charger, voltage stabiliser and battery bank, all enclosed in cabinets, for the purpose of converting mains alternating current to stabilised, uninterrupted direct current of a predetermined fixed value as power supply to alarm locks or other DC consuming devices.

Striking plate

A plate fitted to the locking edge of a door frame, and having appropriate openings into which the bolts of a mortise lock engage,

Tamper-proof screws

Special countersunk head screws which can be removed only by means of a special tool. Standard screwdriver, POZIDRIV, SUPADRIV or PHILLIPS-head screws are not considered to be tamper-proof.

Time delay

The predetermined time that lapses from the instant the lock bolt mechanism of a time delay alarm escape lock is activated by means of a lever handle or push handle until the lock unlocks automatically to allow escape. The time delay is adjustable either in the lock mechanism or in the control unit.

S300.3 General Requirements

S300.3.1 *Types and Sets*

Security locks shall comprise the following lock types and lock sets only, and shall be left-handed and/or right-handed as specified in the Supplementary Specification or to suit the door swings indicated on the plant drawings. The suffix "MS" denotes that the appropriate microswitche(es) must be fitted to the lock for monitoring functions.

(a) PWD Sample 23 MS : Monitored double bolt mortise lock
A lock type comprising a mortise lock fitted with double spring-loaded bolts, one bolt (normally the smaller bolt) being a latch bolt for the main bolt. Both bolts and the key cylinder assembly shall be monitored by means of microswitches. The lock shall be complete with all appropriate furniture and keys.

(b) PWD Sample 24 MS : Monitored single bolt mortise dead lock
A lock type comprising a mortise lock fitted with a single spring-loaded bolt and a key cylinder operated dead bolt with the key cylinder monitored by means of a microswitch. The lock shall be complete with all appropriate furniture and keys.

(c) PWD Sample 127 : Alarm escape lock set
A lock set comprising a Sample 23 MS lock, an extended double key cylinder and a push lever on the secure side of the lock set for controlled exit purposes. Visual and audible signals to monitor the power supply to the lock, alarm status, key status and battery status, where a local power supply is used, shall be given. The lock set shall be complete with all appropriate furniture and keys.

(d) PWD Sample 127-E : Electrically operated alarm escape lock set
A Sample 127 lock set, but fitted internally with a solenoid to enable remote operation of the main bolt of the lock by means of a keypad, card reader or push button. The lock set shall be complete with all appropriate furniture and keys.

(e) PWD Sample 127-G : Alarm escape lock set for emergency or controlled access to, and emergency exit from, gas protected areas A Sample 127 lock set, but fitted with a Sample 24 MS lock and to operate in combination with an electrically operated striking plate to enable remote operation of the lock by means of a card reader, keypad, pushbutton or other acceptable external means. Status monitoring of the door leading to the gas protected area is also a function of the lock set. The lock set shall be complete with all appropriate furniture and keys.

(f) PW Sample 128 : Time delay alarm escape lock set
A Sample 127 lock set connected electrically to an electromagnet (see S300.3.3.4) to hold the door, to which the lock set is fitted, in the closed position for a predetermined adjustable period of time after activating the push handle or lever handle. The lock set shall be complete with appropriate furniture and keys.

(g) PWD Sample 128-E : Electrically operated time delay alarm escape lock set
A Sample 128 lock set, but fitted internally with a solenoid to enable remote operation of the main bolt of the lock by means of a card reader, keypad or other acceptable external means to provide safe exit by means of the electromagnet action as described under (f) above. The power to the electromagnet shall be disabled when power is applied to the solenoid. The lock set shall be complete with appropriate furniture and keys.

(h) Code lock

An electronic lock system comprising of

- an acceptable lock type PWD 23 MS or 24 MS, or lock set PWD 127 or 128, fitted internally with a solenoid or operating in combination with an electrically operated striking plate;

- a standard numeric type keypad mounted at the door at a maximum height of 1 200mm from the finished floor level;

- a pre-programmed electronic control unit mounted on the secure side of the door;

- a power unit mounted on the secure side of the door.

Controlled access to, or exit from, the secure area is obtained by typing in a code on the keypad and the automatic unlocking of the door lock by the system upon receipt of a signal from the control unit when the keyed- in code corresponds to the pre-programmed code in the control unit.

S3003.2 ***Assembly and Operation***

S300.3.2.1 ***Assembly - PWD Sample 127 ana PWD Sample 128***

S3003.2.1.1 General

The lock set assembly shall have approximate overall dimensions of 220mm high x 150mm wide x 80mm deep. These serve as a guide only.

The lock set shall not have any sharp edges or protrusions which can damage a person's clothing, hands or arms.

No components or pan of the lock set shall be held in position by means of epoxy or contact adhesives.

Samples of PWD lock types 23 MS, 24 MS and lock sets 127 and 128 shall be submitted to the Department for analysis, testing and acceptance at least four (4) months **PRIOR** to the manufacture of any of these lock sets for a project. Only written acceptance by the Department will be valid.

Failure to submit samples may result in rejection of equipment.

S3003.2.1.2 Lock set housing

The housing shall be of robust construction, consisting of welded or pressed steel of adequate thickness.

A lock set housing, constructed and intended for surface mounting on the door, shall be fixed to the door is such a way that the fixing bolts are not accessible for unauthorised removal of the lock.

If a front cover plate is incorporated in the lock set housing construction, the cover shall be fixed to the lock set base plate by means of tamper-proof screws. The cover plate shall also be monitored by means of an internal microswitch, which shall activate an alarm upon removal of the cover plate whilst the lock is in service.

The LED functions shall be in accordance with S300.3.2.2(f) and marked as per S300.4.3.

S300.3.2.1.3 Operating lever (for PWD Sample 127)

The operating lever shall be of robust steel construction and shall have a smooth face with dimensions of at least 50mm x 100mm and shall further have a finish similar to the lock casing where applicable.

The lever shall be manufactured from at least 1.6mm thick steel and shall hinge on, and form part of, the front casing plate where the cover plate is supplied. The operating lever shall hinge on tamper-proof steel hinge or hinges. The hinge(s) shall be fixed and appropriately supported on the front casing or door and shall not be removable without using a special method or equipment.

The lever shall be spring-loaded to return it to the normal position after being depressed and released.

The lever and operating mechanisms of the lock set shall not contain any , components of plastic, Nylon or other material that could cause the lever or lock mechanisms to be rendered inactive in case of a fire.

The lever shall operate smoothly and shall operate the mechanism of the mortise lock via a single lever action. Multiple pivot points or complex lever actions will not be acceptable in escape lock sets.

It shall be possible to withdraw the lock bolts by means of the key to the lock in case of an operating lever mechanism failure.

S300.3.2.1.4 Monitored lock

The monitored lock mechanism fitted in the Sample 127 lock set shall be of the type as

described in S300.3.1(a) or (b) above and shall comply with section S300.3.3 hereof. Any bolt in the locking mechanism of a lock mounted in an alarm lock set shall withdraw so that the nose of the bolt does not protrude more than 1mm beyond the fore-end plate on the door.

The lock shall have an extended double cylinder of sufficient length so that the lock can be key operated from both sides of a standard door.

The withdrawing action of any bolt in a locking device, whilst being operated by means of a lever described in S300.3.2.1.3, shall not be dependent on any spring-loaded device.

Monitored locks shall be monitored on a panel as described in clause S330.

S300.3.2.1.5 Electronic components and circuits

Electronic components such as LED's, integrated circuits, transistors, voltage stabilisers, carbon resistors, capacitors and wiring terminals shall be robustly mounted. The quality of components shall comply in general with S300.3.3.3.

The tracks of printed circuit boards shall be plated and treated to prevent corrosion and moulding of the tracks, and the boards shall be of sufficient thickness for the size and mass of components mounted therein.

Printed circuit boards shall in general comply with the requirements of BS 4025 or an equivalent specification and double sided boards shall comply with the requirements of BS 4597 in as far as throughplating of holes are concerned.

Component identification is very important and printed circuit boards shall be marked by means of silkscreen printing or other positive means of identification, so that the number and the type of components which are mounted on the board are also clearly indicated on the printed pattern, together with the polarity of terminals where multi-terminal components are mounted. Each printed circuit board shall contain the following data:-

(a) The name or the purpose of the printed circuit board.

(b) The drawing number or type number of the printed circuit board.

(c) Component identification congruent with the identification of the particular circuit diagram.

All current and voltage stabilising components in locks shall be of the solid state type.

Integrated circuits used shall be locally available and shall be marked with an acceptable standard code number such as CD 4011, LM 721, 7000, etc. No "in-house" numbers shall appear on integrated circuits.

LED's shall be mounted in chromium plated or matt black bezels. Integrated circuits driving LED's shall be suitably rated for the LED load.

Printed circuit boards shall be mounted on insulated mountings inside the casing so that the movement of the lock components does not touch electronic components or circuit boards, or that the components and boards cannot be dislodged due to continuous operation of the lock.

The alarm sounder (audio alarm) unit shall be installed and mounted in the lock set or local to the door in such a way that it is clearly audible, yet adequately protected against damage.

The electrical and electronic parts of the lock or lock set shall be insulated from the casing so that any electrical signals present on the building electrical earth system cannot influence the operation of the lock.

All adjustable electronic and electrical components in the lock set shall be clearly labelled to indicate the function of such equipment.

The lock circuits shall provide for the extension of the indication facilities of the lock set to a remote position.

S300.3.2.1.6 Wiring

The wiring in the lock set shall be neatly grouped and bound with spiral wiring harness binding and harness straps.

Loose wiring or wiring which can be disturbed when the casing is opened, is not acceptable.'

Wiring in the lock shall be of the PVC covered multi-core (automotive) type and shall comply with SABS 150 and shall be of 0,5mm^2 minimum core size. Solid core wires are not acceptable.

The wiring tails which exit from the lock set shall be terminated in male crimping lug and shrouded ends so that wires on site can be terminated in female shrouded crimping lugs, so as to avoid the cutting of wires when a lock set is removed for maintenance purposes.

Wire ends shall be numbered with ring labels and a legend card fixed to the lock set shall define the function of each wire.

The operating voltage of the lock set shall be clearly marked on the legend card.

S300.3.2.1.7 Power supply

(a) The power supply unit of the lock set shall be a separate unit mounted near the door.

(b) The power supply shall be of the 230V.AC/24V.DC type. It shall supply 24 V.DC continuously to the lock set from the batteries and not from the 230V/charger direct. Disconnection or reconnection of the 230V.AC supply shall not cause a direct alarm.

(c) The batteries of the power supply shall be of the sealed lead-acid type ensuring a DC supply to the lock for a minimum period of 24 hours in the case of a 230V.AC power failure.

(d) The charger shall be able to deliver the full charging current to discharged batteries and thereafter the charger shall automatically reduce the charging current to trickle charge to ensure fully charged batteries at all times.

(e) An alarm signal shall be generated if the battery power drops below ±85% of nominal battery voltage. See S300.3.2.2 (f) (iii).

(f) The power supply shall further contain overvoltage protection equipment to prevent malfunction or damage to its internal components or to lock components due to power line surges such as lightning spikes etc.

(g) The power supply shall be filtered and screened to ensure that radio frequencies are not radiated from the supply and that harmonics are not generated back onto the 230 V.AC power line. The battery charging circuit shall further incorporate the necessary filtering components to ensure that harmonics do not shorten the life of batteries.

(h) The batteries and the electrical or electronic components shall not be housed in the same compartment. The compartments, if adjacent or part of the same unit construction, shall be divided by means of a solid division. The compartment covers or doors, shall open separately and shall be sealed so that battery fumes cannot reach the electrical or electronic components. The compartment containing the electrical or electronic components shall always be mounted above the battery compartment in a unit construction.

(i) Heat generating components such as stabilised power supply components or components for local supply stabilisation at printed circuit boards shall be fitted on suitably sized heat sinks and shall not be mounted directly onto printed circuit boards and shall not use the copper lamination of the circuit board as a heat sink. Sufficiently long component terminals shall be used in such cases and no other component, which is temperature sensitive, or which can deteriorate due to high ambient temperatures, shall be used in close proximity of such heat generating components.

Printed circuit boards shall also not be subjected to abnormal temperatures or temperatures which may influence the bonding of the copper lamination.

(j) No unmarked or properly shielded mains voltage (230 Volt) equipment shall be mounted on printed circuit boards. All mains power equipment shall be terminated in shielded compartments or power supplies so that normal maintenance can be carried out in safety.

(k) No mains power equipment or terminals thereof shall be in close proximity to, or come into contact with, low voltage carrying equipment (±24 Volt) or digital supply voltage (±15 Volt) components.

(l) Systems which require unnecessary large battery capacities to function, will not be acceptable.

S300.3.2.2 ***Operation - PWD Sample 127***

The lock set shall operate as follows:

(a) The lock LED indication, alarm function and control function shall be powered from an external 24 Volt DC. power supply unit comprising batteries, battery charging equipment and voltage stabilising circuits. See S300.3.2.1.7.

(b) The lock set shall be fitted with an adjustable audible alarm unit emitting an audible signal of between 65 and 95dB(A) sound pressure level at one(1) meter for full (loud) alarm conditions and a clearly visible red LED indication on, or local to, the lock set. The sound output level shall be adjustable on the printed circuit board.

A further alarm shall be available to deliver a muted tone of not less than 35dB(A) sound pressure level for controlled exit purposes. See table in (f) below.

(c) The main bolt of the lock shall be in the strike and the latch bolt(dead locking) shall be on the striking plate under normal circumstances and both bolts shall be spring-loaded to allow relocking when the door swings into the strike. See S300.3.1(a) and S300.2 under "Latchbolt".

(d) The main bolt shall be retracted when the lock set operating lever is operated for escape purposes. Both bolts shall relock after the door has swung back into the strike by door closer action. Operation of the lock operating lever to allow a person to escape shall cause a visual and audible alarm at the lock set. It shall be possible to reset the alarm condition of the lock set with the key at the lock.

(e) The main bolt shall be retracted when the lock is opened by means of a key. The lock shall lock and reset itself to dead lock state when the key is removed and when the door is closed by means of a door closer. The necessary indication in this case shall be given as specified further herein.

(f) The necessary alarms and indication to be provided on, or local to, the lock set, shall be by means of an audible alarm unit or units and five(5) LED's which shall function as follows:

CONDITION	ACTION AT LOCK	LED	AUDIBLE ALARM
(i) System "ON"	Lock locked and c closed	Green	-
(ii) Main alarm (escape)	When lever is activated	Red	Loud alarm
(iii) Battery voltage lower t 85% of nominal voltage	-	Red (Flickering)	Muted alarm
(iv) Controlled exit	Lock unlocked with key	Yellow	Muted alarm
(v) Exit lock latched but c still open		Amber	Muted alarm

(g) The lock set casing, where supplied, and the power supply door or cover shall be monitored so that unauthorised tampering with the lock set shall activate a main alarm. These monitor switches may be connected in series with the main alarm monitor switches.

(h) Refer S300.3.1(d) for the operation of the PWD Sample 127-E, electrically operated alarm escape lock set with internal solenoid, S300.3.1(e) for the operation of the PWD Sample 127-G, alarm escape lock set in gas protected areas and S300.3.2.1.4. for monitored lock.

S300.3.2.3 ***Operation - PWD Sample 128***

The lock set shall operate as follows:

(a) The requirements of S300.2.2(a) to (c) above shall apply.

(b) The lock set shall supply permanent power to an electromagnet fitted to the door frame at the top of the door on the lock side of the door frame. The electromagnet shall exert pull on a steel plate fixed to the door leaf so that the door is held firmly closed by the electromagnet for an adjustable time delay.

(c) The main bolt of the lock shall retract when the lock lever handle is operated for escape purposes. The electromagnet shall, however, hold the door for the predetermined time delay and then release the door. After .door release and escape actions have been completed, both bolts of the lock shall relock when the door has swung into the strike by door closer action.

(d) The time delay shall be adjustable internally in the lock set case only by a person using the proper tools to open the lock set case and who has knowledge of the adjustment procedures.

(e) Operation of the lock lever handle shall immediately cause a visual and audible alarm at the lock set. It shall be possible to reset the alarm condition of the lock with the key at the lock.

(f) The main bolt shall be retracted and the electromagnet shall be de-energised when the lock is opened by means of a key. The lock shall lock and reset itself to dead lock state when the key is removed and when the door is closed by means of a door closer.

The necessary indication in this case shall be given as specified further herein.

(g) Alarms and indication must be provided as described in the table in S300.3 2.2(f)

(h) The Sample 128-E lock shall be fitted internally with a solenoid which shall operate at the lock set supply voltage. The solenoid shall be suitable to withdraw the main bolt mechanism of the lock to within 1mm of the fore-end plate so as to unlock the lock remotely by means of an external switch device such as a card reader, or other

acceptable device, etc. The electromagnet holding the door in the closed position shall be de-energised simultaneously with the activation of the solenoid in the lock.

S300.3.3 ***Materials and Components***

S300.3.3.1 ***Pin tumbler cylinders***

The pin tumbler cylinder mechanism used in the mortice lock Samples 23 MS and 24 MS shall comply with SABS 4-1979, section 3.1.4.(b).

S300.3.3.2 ***Keys***

The keys for pin tumbler cylinders shall comply with SABS 4-1979, section 3.4.1(a) and 3.4.2.

S300.3.3.3 ***Electrical and electronic component assemblies***

The electronic equipment circuit boards shall preferably be manufactured in the RSA and replacement units shall be available off the shelf in the RSA. Equipment of which only a single unit has been imported or manufactured, will not be acceptable.

Equipment must be assembled in such a way that maintenance can be undertaken easily.

S300.3.3.4 ***Electromagnet***

The electromagnet shall be of the continuous-rated type and shall be suitable for operation at the voltage rating of the lock set and within the limits of ± 10% of nominal supply voltage to the lock set.

S300.3.4 ***Finish***

S300.3.4.1 The casing and back plates, where supplied, or mounting plates of Sample 127 and Sample 128 shall have a powder coated finish or similar quality. The finish shall further comply with SABS 4-1979, par. 3.6.3 and 6.2.13.

S300.3.4.2 The finish of Sample 23 MS and Sample 24 MS mortice locks shall comply with SABS 4-1979, par. 3.6.1, 3.6.2 and 3.6.3

S300.3.4.3 Lock casing and the power supply unit shall be vermin-proof.

S300.3.5 ***Fixing of Locks to Building Elements***

S300.3.5.1 Locks shall be suitable for fixing to the surface of, or mortised into, standard, security and fire resistant doors. It shall not be possible to remove the lock from the door without first removing the front portion or cover plate of the lock set casing.

S300.3.5.2 Fixings shall be robust and it shall be possible to remove the lock only with proper tools, after the lock has been isolated at the control panel. Any forced removal of the lock or lock set shall set off the alarm circuit and/or damage the lock beyond repair.

S300.3.5.3 Locks and auxiliary equipment on single security doors shall be mounted as shown on Drawing Nos. S300/2/1 to S300/2/7 and on double doors as shown on Drawing Nos. S300/3/1 to S300/3/7. Where monitor facilities are required on site for the monitoring of remotely placed locks, the necessary conduits and wiring shall be installed from the lock position to the particular monitor panel as detailed, in principle, on the drawings.

S300.3.5.4 The Department will determine the quantities and types of keys for the locks and lock sets on site to enable the Authorised User of the system to unlock alarm escape locks, and also to allow the Authorised User of the system to cancel any alarms, as specified earlier herein.

Each lock is normally supplied with one set of keys but master key facilities shall be available.

S300.3.5.5 Where PWD Sample 23 MS, 24 MS locks, 127 and 128 lock sets are specified by the Department, the lock sets and any auxiliary equipment for the locks shall be fitted to the doors concerned strictly to the Specification of the lock and lock set supplier.

S300.3.6 ***Performance Requirements***

S300.3.6.1 ***General Requirement***

When submitted to the relevant tests given in S300.6.2.2 to S300. 6.2.8 inclusive, locks and components of lock sets and furniture sets shall not jam or break, and after testing, shall still be capable of correctly performing the functions related to the test conducted.

S300.3.6.2 ***Durability of Lever Handle (Sample 23 MS and Sample 24 MS)***

When tested in accordance with S300.6.2.5, a lever handle and its plate or rose shall, on completion of the test, be intact and shall operate the spring-bolt mechanism of the lock without undue difficulty. Minor sagging of the lever handle shall be permitted provided that the correct operation of the spring-bolt mechanism is not affected.

S300.3.6.3 ***Accuracy of Follower (Sample 23 MS and Sample 24 MS)***

When a lock is tested in accordance with S300.6.2.9, the follower shall be capable of being turned sufficiently to withdraw the bolt completely. Upon release of the follower, the bolt shall be returned to its original position by it's own spring pressure.

S300.3.6.4 ***Strength of Spring-Bolt Spring (Sample 23 MS and Sample 24 MS)***

The force required to depress a spring bolt to within 1mm of the fore-end, determined in accordance with S300.6.2.10, shall be 11,5N± 2,5N.

S300.3.6.5 ***Security of Dead Bolt***

When the dead bolt of a lock is tested in accordance with S300.6.2.3,

a) it shall be possible, by turning the key, to throw out the dead bolt to the locked position while it supports the test load;

b) there shall be no tendency for he dead bolt to drop back into the withdrawn.position while the key remains in the locked position; and

c) it shall be possible to withdraw the bolt to the unlocked position while it still supports the test load.

S300.4 **Markings**

S300.4.1 The name .of the manufacturer shall be engraved or embossed in a prominent position on the front face in of the casings on all Sample 127 and Sample 128 lock sets.

S300.4.2 The operating lever on Sample 127 series of lock sets shall be engraved with the wording "EMERGENCY EXIT' in at least 8mm high white, clearly legible, letters as well as the wording "STRIKE".

S300.43 The functions of the LED's on all Sample 127 and Sample 128 lock sets shall be marked by means of engraved or silk-screened 6mm high, clearly legible, white letters on the front of the casing.

S300.4.4 All lock sets shall be marked permanently on the lock set housing with the following information:

(a) Serial number
(b) Year of manufacture

The supply voltage rating shall be marked on the circuit terminal legend card inside the lock set casing.

S300.5 Sampling and compliance with specification

The Department reserves the right to request the supplier of any lock or lock set to submit any sample selected by the Department to the SABS for evaluation and testing.

The Department further reserves the right to submit any lock or lock set sample handed to it by a supplier to the SABS for testing in terms of this specification.

S300.6 Inspection and methods of test

S300.6.1 *Inspection*

Visually examine and, where relevant, measure each unit in the sample taken in accordance with S300.5 for compliance with the requirements of S300.3.3, 3.4 and S300.4 and the other requirements of the Specification, compliance with which is not assessed by the tests given in S300.6.2.2 to 6.2.12.

S300.6.2 *Methods of Test*

S300.6.2.1 *Test conditions and Mounting of Units for Testing*

Test the sample in the "as received" condition and fully assembled.

Do not dismantle, lubricate, or otherwise precondition the lock mechanism before testing a unit. Firmly mount the lock or lock set (with ifs associated furniture and power supply) in a jig resembling the true application of the lock or lock set and so designed as to ensure accurate alignment of the various components of a lock set with each other.

S300.6.2.2 *Strength of Mechanism*

Mount the lock under test as described in S300.6.2.1. Insert a follower spindle into the follower, apply a torque of 10 N.m to the spindle for a period of 30s, and then check for compliance with General Requirement S300.3.6.1.

S300.6.2.3 *Dead Bolt Mechanism Durability Test*

Mount the lock under test described in S300.6.2.1 with the fore-end vertical and the key (when applicable) inserted in the lock. Position the bow of the key in a loose-fitting chuck, which is so arranged that, when turned, only a pure torque is applied to the key. Turn the key through an angle of not less than 180 "and not more than 360°. Then, returning the thumb-turn/knob or the key through the same angle, operate the dead lock mechanism for 5 000 cycles at a rate of 60±5 cycles per minute.

NOTE: ***Throwing the bolt fully out to the extended position and then fully withdrawing it, constitutes one complete cycle.***

If, in the case of a mortise lock, either the dead lock mechanism or key fails during the test, consider the unit to be defective. On completion of the test, check for compliance with Geneal Requirement S300.3.6.1. and Security of Dead Bolt S300.3.6.5.

S300.6.2.4 *Cylinder Assembly Durability Test*

Mount the cylinder mortise lock (Sample 23 MS and Sample 24 MS) under test as described in S300.6.2.1 with the fore-end vertical. Conduct the test as follows:

a) **Cylinder mortise dead locks (Sample 24 MS)**

Insert the key into the cylinder to operate the dead lock mechanism. By turning the key, throw the dead bolt into the locked position and then into the unlocked position. Withdraw the key, thus completing one cycle.

b) **Cylinder mortise locks (Sample 23 MS)**

Insert the key into the cylinder to operate both the main bolt and the latch bolt rnechamsm(simultaneously). By turning the key, withdraw the main bolt to within 1mm of the fore-end and then release the bolt. Withdraw the key, thus completing one cycle.

Carry out the relevant test(a) or (b) above for a total of 5 000 cycles at a rate of 60±5 cycles per minute. If, during the test, either the key or the cylinder mechanism fails, consider the unit to be defective. On completion of the appropriate test, check the lock for compliance with General Requirement S300.3.6.1.

NOTE: ***Test (a) may be conducted in conjunction with the test on cylinder mortise locks given in S3 00.6.2.3.***

S300.6.2.5 ***Durability Test for Spring-bolt Mechanism. Knobs and Lever Handles (Sample 23 MS and Sample 24 MS)***

Mount the lock under test as described in S300.6.2.1 with the fore-end of the lock vertical. By using a suitable mechanism, and by applying normal hand pressure only, operate the lever handle so that the latch follower withdraws the spring-loaded bolt to within 1mm of the fore-end and then release the lever handle, allowing the spring-loaded bolt to return completely to its reset position. This completes one cycle. Repeat this sequence of operation for 10 000 cycles at a rate of 60±5 cycles per minute.

Then, if the unit under test is

(a) a lock set, check the lock for compliance with General Requirement S300.3.6.1;

(b) a lock set or a furniture set, check the knob or lever handle and its plate or rose for compliance with Durability of Lever Handle S300.3.6.2.

S300.6.2.6 ***Durability Test for Latch Mechanisms (Sample 23 MS and Sample 24 MS)***

Mount the lock under test as described in S300.6.2.1 with the fore-end vertical. By means of a suitable rotating cam, depress the latch bolt to within 1mm of the fore-end and then release it, allowing the latch bolt to return completely to the reset position, thus completing one cycle. Repeat this sequence of operations for 10 000 cycles at a rate of 60±5 cycles per minute. On completion of the test, check for compliance with General Requirement S300.3.6.1.

S300.6.2.7 ***Strength of Lock Case and Bolts (Sample 23 MS and Sample 24 MS)***

Mount the lock under test as described m S300.6.2.1. Apply, without shock, a static force of 1 600N to the bolt (s) in the unit under test as follows:

Using a steel bearer having a rounded edge, which is so positioned that it bears against the bolt 3mm from, and parallel to, the fore-end, apply the force in a direction perpendicular to the securing face of a bolt and to each of the locking faces of a dead bolt. Check for compliance with General Requirement S300.3.6.1.

S300.6.2.8 ***Strength of Staples (Sample 23 MS and Sample 24 MS)***

With the staple under test mounted in the normal manner (using the screws supplied) apply, without shock, a static force of 1 600N in a direction perpendicular to the inner face of the staple against which the bolt(s) would bear. Apply the force by a means that simulates the position(s) and width(s) of the bolt(s) of the lock or latch. In case of a staple for a two-bolt lock, apply the force twice, once to each bolt position. Then check for compliance with General Requirement

S300.3.6.1.

S300.6.2.9 ***Accuracy of Follower (Sample 23 MS and Sample 24 MS)***

Mount the lock under test as described in S300.6.2.1 Turn the lever handle or knob first in one direction as far as possible and release it, then turn it in the opposite direction (if the unit allows it) as far as is possible and release it. Check for compliance with Accuracy of Follower S300.3.6.3.

S300.6.2.10 ***Strength of Spring'Bolt Spring (Sample 23 MS and Sample 24 MS)***

Supporting the lock in a suitable manner, apply a force to the end of the spring-loaded bolt and determine the minimum force required to depress the bolt to within 1mm of the fore-end. Check for compliance with Strength of Spring-bolt Spring S300.3.6.4.

S300.6.2.11 ***Plating Test***

(a) Zinc plating
Use the relevant method given in BS 1706 to determine the thickness of the zinc coating.

(b) Nickel plating
Use either or (in cases of doubt) both of the relevant methods given in .ISO 1458 to test the adhesion of the coating, and use the relevant method in ISO 1458 to determine its thickness.

(c) Chromium on nickel plating
Use the relevant methods given in SABS 728 to test the adhesion of the coatings and to determine their thicknesses.

S300.6.2.12 ***Corrosion Resistance of Paint Coatinss***

Use the apparatus and procedure, given in SABS Method 155, to test painted units or components in the "as received" condition. Examine for compliance with S300.3.4.2.

S301 ELECTRICALLY OPERATED STRIKING PLATES

Electrically operated striking plates shall comprise an electromagnetic plunger and mechanical mechanism housed in a plated steel enclosure. The mechanism shall operate a stainless steel bolt retaining jaw.

The above-mentioned mechanism shall be integrally mounted on a strike lip and face plate combination and the whole assembly shall be suitable for mounting in a narrow hollow metal style, door jamb or edge of a hardwood door, in accordance with site requirements.

The electric striking plate shall be slim in construction and shall be fitted with a solenoid at one end on its long axis. The solenoid shall operate with a low voltage supply and the jaw of the striking plate shall be released when power is supplied to the solenoid, allowing the bolt of the lock to move freely out of the striking plate when the door is opened.

The jaw of the striking plate shall revert to its locked position when the power to it is removed.

The striking plate shall be suitable for 6/24V.DC intermittent operation and shall be supplied complete with a 230/24V transformer as power supply. The power supply to the striking plate shall be switched by some accepted means of control equipment.

The 230V supply to the transformer shall not be switched for this purpose. The transformer shall be suitable for continuous operation.

The striking plate shall be supplied complete with stainless steel face plate, face plate screws, mounting brackets, adhesive shims machine screws, etc. to suit all mounting possibilities on site.

The transformer for the power supply to the striking plate shall be mounted in a suitable steel box in a position as close as possible to the striking plate position, but not more than 10 metres away from the striking plate position. The 24V supply between the transformer position and the striking plate shall consist of 4mm^2 PVC conductors plus an earth wire housed in 20mm conduit. The transformer shall always be mounted on the secure side of any door controlled by the striking plate.

A steel box shall be used behind striking plate positions at door jambs to enable the fitting of striking plates after door jambs have been built in. Door jambs shall be milled out in accordance with the template data of the manufacturers of the striking plate to ensure the neat fitting of the striking plate. The box behind the door jamb, for the fitting of the striking plate, shall be in accordance with the detailed drawing S300/1.

The lock mounted in the door shall always be fitted after the striking plate has been positioned to ensure perfect lining up of the lock bolt with the strike jaw.

The details of drawing S300/2/2, 2/3, 2/4, 2/6, 2/7, as issued by the Department, shall be applicable where a striking plate is to be mounted on single doors, whereas drawing S300/3/2, 3/3, 3/4, 3/6 and 3/7 shall be applicable for the mounting of an electric striking plate on double doors.

Striking plates and locks shall always be fitted to ensure a minimum of play between the lock bolt and the strike jaw upon completion of the installation.

Refer to clause S302 for monitored striking plates, clause S310 for push button operation, clause S100 for card readers and clause S300.3.1(h) for code locks.

Electrically operated striking plates are operated in combination with push buttons, card readers and keypads, all as indicated on drawings S300/2/2, S300/2/3, S300/2/4, S300/3/2, S300/3/3 and S300/3/4.

S302 MONITORED STRIKING PLATES

When required by the Department, the electrically operated striking plates as specified in clause S301 hereof, shall be fitted with microswitches for monitoring purposes.

The microswitch(es) shall monitor the following minimum functions:

(a) The strike jaw to determine whether the lock bolt is in position in the jaw.

(b) The plunger or mechanism which actually releases the strike jaw.

The microswitch(es) shall be mounted as integral equipment in the striking plate and shall be inaccessible and tamper-proof when the striking plate is mounted in position at a door frame. Wiring of microswitches shall be brought out and shall be clearly marked to indicate the purpose thereof.

S310 PUSH BUTTONS

When required by the Department, a push button shall be installed on the secure side of a door or in an approved position to allow the Authorised User of the system to release an electric striking plate by pressing such a button.

Push buttons next to doors shall be installed at 1 400mm above finished floor level in standard 100mm x 50mm x 50mm draw boxes and the buttons shall be of robust construction.

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Push buttons shall be suitable for long life operation, low contact bounce and low contact resistance.

Terminals of push buttons shall be suitable for conductor sizes used and the contact duty shall be suitable for operation at the voltage in use on the button. Wiping contacts shall be used for the push buttons and contacts shall be constructed of high quality material such as silver-tipped or gold-laminated contacts.

Push buttons shall further be mounted in satin chrome cover plates on the draw boxes.

S320 WIRING LOOPS

The electrical wiring between the lock or lock set on the door and the end box on the wall adjacent to the door frame shall run in a wiring loop of flexible steel tubing.

The one end of the wiring loop shall be suitably terminated for attaching it by means of screws to the surface of the door, over the opening where the lock or lock set electrical wiring emerges from the door.

The other end of the wiring loop shall terminate in a standard 65mm∅ end box, which shall be either surface mounted on, or mounted flush with the wall adjacent to the door frame.

Refer drawing range S300/2/4 to S300/3/7.

The electrical wiring from the lock or lock set shall be without joints, shall run inside the wiring loop, and shall terminate in a suitably sized connection block in the 65mm∅ end box.

A concealed type wiring loop between the hinged edge of the door and the inside edge of the door frame may be used. In this case the 65mm∅ end box shall be mounted flush with the wall.

The wiring loop type, the method of termination of the loop on or in the wall and the door, and the connection block in the end box shall all be acceptable to the Department.

S330 ALARM ESCAPE LOCK MONITOR PANEL

The lock monitor panel shall consist of a metal wall mounted cabinet containing a power supply unit, main panel module with indication and power supply monitor facilities, and lock monitor modules as required by site circumstances.

Modules shall be self contained and the cabinet offered shall contain the power unit, main module and the quantity of monitor modules for locks as specified, as well as at least 25% space capacity for adding lock modules when required.

S330.1 General panel construction

The panel shall be of the wall-mounted type and shall consist of the modern type of anodized aluminium modular cabinet unit with modular add-on units and faceplates. All faceplates shall be pre-manufactured and prepared to accept all controls and lamps flush-mounted behind the faceplates.

The panel shall be as shallow as possible but shall have sufficient space to house all batteries and equipment as specified further herein. The panel shall have fixing facilities for surface mounting on a wall by means of small masonry bolts.

Panels shall further have sufficient stiffness to exclude drumming and distortion and cut-outs shall fit neatly around face plat or chassis mounted equipment.

The faceplates which cover equipment, which must receive regular attention or maintenance, shall be mounted on acceptable metal hinges. All wiring leading to equipment mounted to the face plates shall be contained in spiral PVC harness tubing and the harness shall be installed and fixed in such a position that doors can be opened through 150° without damage to wiring. Suitably fixed ribbon cable will also be acceptable for this purpose.

Equipment of different types and functions shall be housed in separate compartments and compartments containing heat generating equipment shall be suitably ventilated by means of natural ventilation.

Batteries and charging equipment shall be mounted in a separate cubicle, with the batteries mounted in the bottom of the cubicle and charging equipment preferably mounted in the top of the cubicle.

The battery and charger cubicle shall be mounted below the monitor panel, thereby forming a unit construction with the monitor panel to render a neat overall appearance. Batteries shall be mounted in such a way that these can be easily replaced and maintained.

Power pack heat generating equipment, such as rectifiers and thyristors, shall be mounted on suitably sized heat sinks, which in turn shall be mounted in such positions that the heat generated by such equipment ins not detrimental to other components.

Mains voltage equipment shall be shielded to prevent accidental contact.

The power cord of the panel shall be of the heavy duty three-core PVC insulated type. The power cord entry into the panel shall be at the bottom of the panel and the cord shall be suitably clamped inside the panel to eliminate physical stress on wiring terminals inside the panel.

All outgoing monitor wiring terminals shall preferably be mounted at the top of the panel behind a separate removable cover. Terminals shall be clearly grouped and marked to simplify installation and connection of wires on site by installation personnel. All outgoing and incoming terminals and all other equipment in the panel shall be suitably labelled to simplify installation and maintenance and all panel-mounted equipment shall like wise be labelled. The wording for labelling shall fully describe the function of each item.

Indication equipment shall preferably be mounted on the left-hand side of the panel so that extendibility of the panel is possible from left to right.

All panels shall be locked in position by means of "DZUS" or similar screwdriver catches. Studs, self-tapping screws and dome nuts will not be acceptable as means of fixing for panels.

A painted sheet steel cabinet may be offered in place of the modular unit described above, but all other requirements stipulated above shall still be applicable for the panel.

All printed circuit boards shall be of the modular plug-in type. All contacts shall be of the gold-plated type and shall ensure proper contact for digital data handling.

The panel shall have provision to terminate a 20mm∅ electrical conduit for each outgoing monitor circuit in the top plate of the panel. Site conditions, though, may finally determine whether less conduiting or even wiring trunking may be used for incoming wiring. Further holes, which are required on site, shall be made with a chassis punch.

S330.2 **Power supply unit**

The power pack of the panel shall be able to accept the incoming 230Volt supply, shall transform and rectify the supply and shall charge sealed lead-acid batteries to ensure an uninterrupted power supply to the system, including all monitor circuits, for a minimum period of 72 hours.

N.B. *No dry cell batteries shall be fitted in alarm locks in the case of systems in which the locks are supplied with power from the monitor panel. The red flickering LED and the muted alarm for indication of battery depletion shall then not be connected.* ,

The monitor circuits shall operate at a voltage not exceeding 50 Volt D.C.

The charger shall be able to deliver the full charging current to discharged batteries and shall thereafter automatically reduce the charging current to trickle charge to ensure fully charged batteries at all times. The charging circuit shall also ensure that batteries do not build up "memories". Further circuitry in the form of timer controlled, voltage comparator and thyristor controlled discharging will be considered an added advantage to cycle the battery charge to ensure longer battery life. The charging and discharging cycle of such equipment shall, however be such as to ensure that the output voltage to monitor circuits shall still remain at an acceptable level at all times and shall maintain monitor functions of all outgoing circuits for the period as specified previously, in the event of a power failure at the end of a discharge cycle.

Upon loss of mains power, the power supply unit shall automatically revert to battery power, and the system shall remain fully operational. The panel shall automatically revert back to mains power upon mains power restoration and manual resetting of the panel shall not be necessary.

A signal shall be generated when the system is operating under battery power only i.e. loss of mains power.

A further signal shall be generated if the battery power drops below ±85% of nominal battery voltage or if the charger fails. The necessary indication and audio signals shall be provided from the power supply unit on the main module panel as specified further herein.

The power supply unit shall contain overvoltage protection equipment to prevent malfunction or damage due to power line surges such as lightning spikes, etc. Stabilisation of the supply to monitor circuits shall also be provided on the power supply unit to safeguard monitor circuits against overvoltage damage.

Battery pack and charger circuits shall further incorporate the necessary filtering components to ensure that radio frequency interference is not present on the mains supply to the panel or on outgoing monitor wiring.

S330.3 Main panel module

The main panel module shall contain the following controls and equipment, accessible form the front of the panel:

-	Mains circuit breaker or withdrawable fuse	
-	Mains "On"	- green LED
-	Power supply charger healthy	- green LED
-	Power supply DC output	- green LED
-	Battery voltage below 85% of nominal voltage	- amber LED (buzzer to operate)
-	Mains supply failure	- red LED (buzzer to operate)
-	Power supply output withdrawable fuse (in-line in front of battery and DC output LED)	
-	Lamp test button	- to test all lamps on panel, including lock module lamps
-	Alarm accept button	- to silence buzzer (LED's to stay on till condition is cleared)
-	Key switch	- to isolate all modules when panel is undergoing service

S330.4 Lock monitor modules

The panel shall contain lock monitor modules in accordance with the number of outgoing circuits as stipulated by the Department or as required by site circumstance. The lock modules shall monitor emergency escape lock normally closed contacts, on a continuous basis to ensure alarm conditions when a lock is activated or when circuit wiring is broken.

The following equipment shall be mounted on each module:

- Lock main alarm (when lock is used for emergency escape)	- red LED (buzzer to operate)
- Lock opened by key	- yellow LED (buzzer to operate)
- Door closed (latched)	- amber LED
- Switch or button to isolate lock circuit in case of service	
- Indication of isolation of circuit	- red LED

Each lock module outgoing circuit shall end in clearly marked pairs of screw-type terminals in the top of the panel. The terminals shall be marked to indicate the purpose of the terminals i.e. "Lock 1", "Lock 2", etc., and all the pairs of terminals shall be grouped together in a row and shall be large enough to accept $1mm^2$ wiring.

Connection cables between lock modules and the panel terminals shall preferably be of the flat multiwire cable which shall terminate in press-in edge connector type terminals, so that modules can be kept in service stock by the Department for ease of replacement, if necessary.

S330.5 **Components**

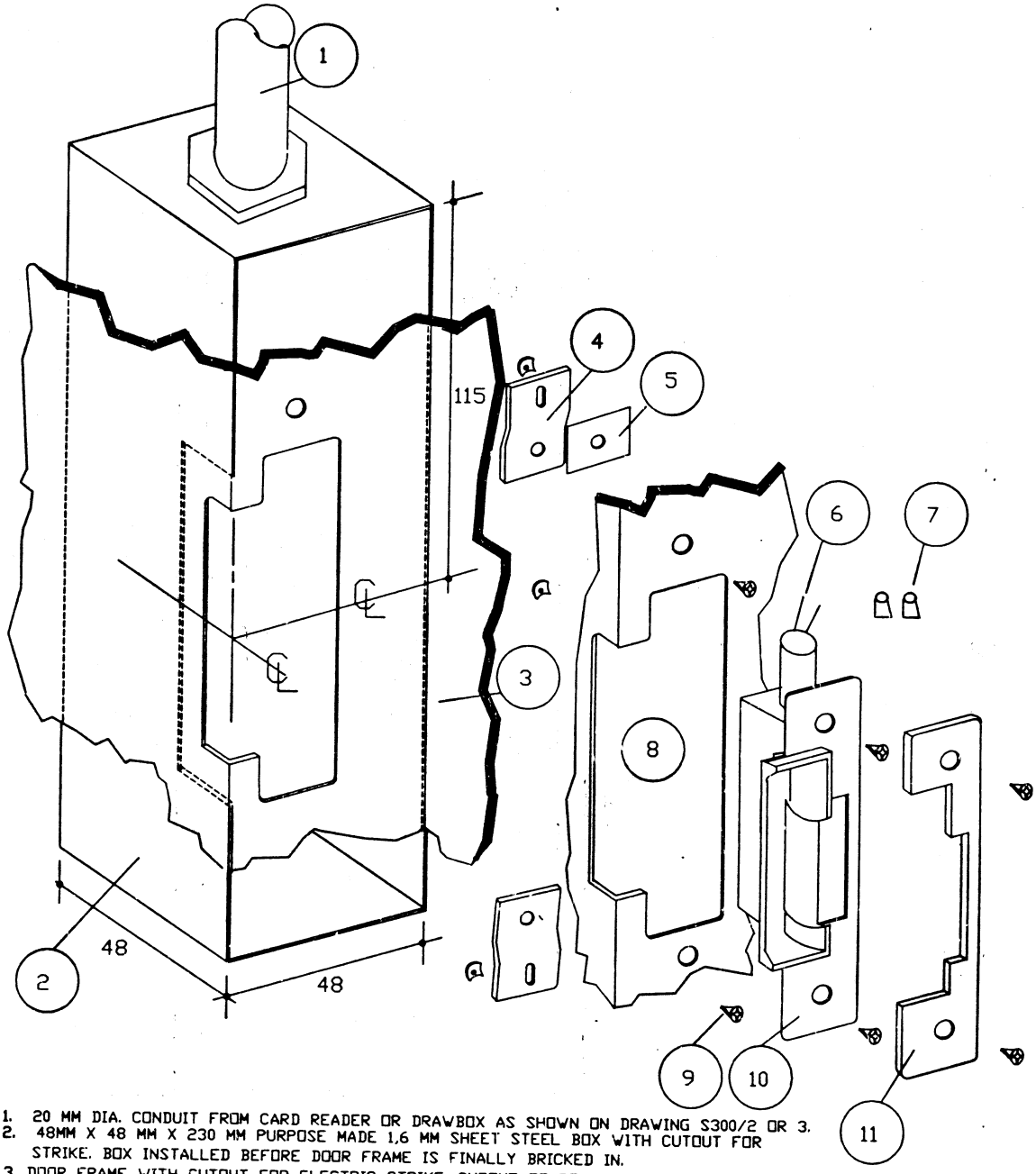
The panel shall be designed and built with solid state high quality components throughout and the use of relays shall be avoided. Commercially available components shall be used and ICs shall preferably be mounted by means of plug-in IC bases. Normal incandescent lamps for indication will not be acceptable.

LEGEND OF ITEM NUMBERS ON DRAWINGS

REFERENCE NUMBER	DESCRIPTION
1	PWD acceptable door closer.
2	PWD Sample 23 MS lock as per Clause S300.3.1(a)
3	PWD acceptable door.
4	Electrically operated striking plate as per Clause S301.
5	Push button on secure side of the door as per Clause S310.
6	Conduit and wire or cable, as required by equipment.
7	Power supply equipment in flush box on secure side of door for electrically operated striking plate, as per clause S301.
8	Separate processor, memory and power supply for card readers, as per Clause S120.
9	Card reader as per Clause S101 and S102, S103 and S111.
10	230V mains power supply.
11	Control unit and power supply for code lock system,as specified in Clause S300.3.2.1.7
12	Code lock keypad as specified. Keypad, controls and/or card reader must be placed on site indicated on the layout drawings or as required by the Department. Sample 127 - E or 128 - E
13.	PWD Sample 127 (or 127 - E or 127 - G) as specified in Clause S300.3.1(c), (d) or (e).
14.	PWD acceptable flexible wiring loop as per Clause S320.
15.	Wireway routed into door edge and sealed after installation of wires with hardwood strip if lock is electrically controlled.
16.	Control equipment such as push button, card reader or keypad, as specified in Clause S330.
17.	Electromagnet for PWD Sample 128 lock set as specified in Clause S300.3.3.4.
18.	Notices as per details on Drawing no's. S300/2/5 and S300/3/5.
19.	Alarm monitor panel in security area or other approved position. Alarmpanel is specified in Clause S330.
20.	Power supply to lock set, as specified in Clause S300.3.2.1.7.
21.	Break glass unit as required.
22.	Notices for two-way escape as per details on drawing S300/2/6 and S300/3/6.
23.	Gas control panel as per specification for gas installations.
24.	Micro-switch as required.
25.	Flush bolts, acceptable to the Department.
26.	PWD Sample 128 lock set as per Clause S300.3.1(f) or (g).
27.	PWD Sample 24 MS lock as per Clause S300.3.1.(b)

ELECTRIC STRIKING PLATE - MOUNTING DETAILS

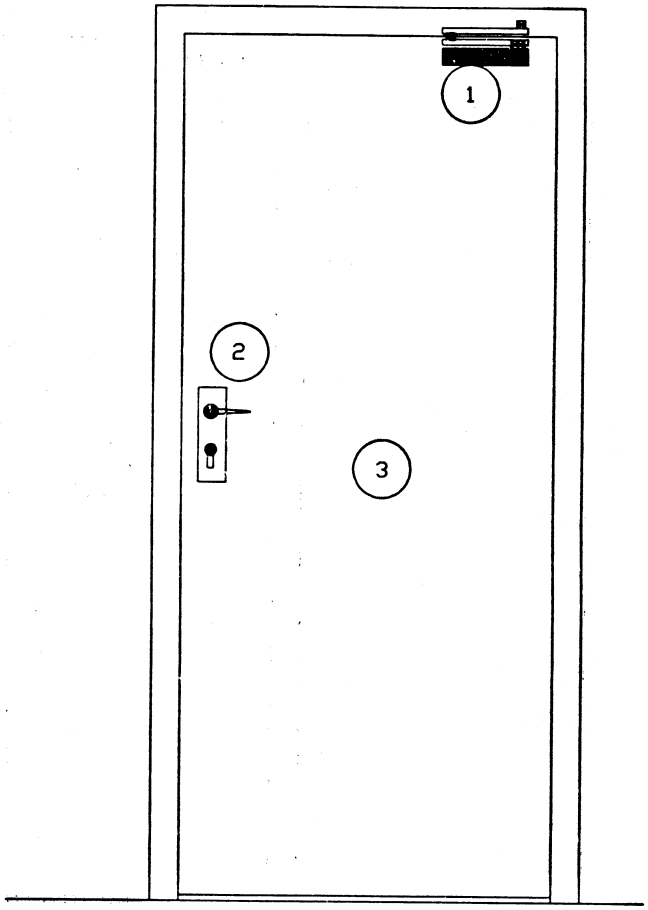
S300/1



1. 20 MM DIA. CONDUIT FROM CARD READER OR DRAWBOX AS SHOWN ON DRAWING S300/2 OR 3.
2. 48MM X 48 MM X 230 MM PURPOSE MADE 1,6 MM SHEET STEEL BOX WITH CUTOUT FOR STRIKE. BOX INSTALLED BEFORE DOOR FRAME IS FINALLY BRICKED IN.
3. DOOR FRAME WITH CUTOUT FOR ELECTRIC STRIKE. CUTOUT TO BE IN ACCORDANCE WITH SUPPLIERS DETAIL.
4. MOUNTING BRACKETS BY SUPPLIER.
5 ADHESIVE SHIM BY SUPPLIER.
6. 24 VOLT LEADS.
7. WIRE CONNECTORS BY SUPPLIER.
8. CUTOUT IN DOOR FRAME FOR ELECTRIC STRIKE.
9. FIXING SCREWS BY SUPPLIER.
10. ELECTRIC RELEASE STRIKE AS PER CLAUSE S301 OF STANDARD SPECIFICATION.
11. FACE PLATE FOR STRIKE BY SUPPLIER.

SINGLE DOOR WITH DOOR CLOSER AND SAMPLE 23 MS LOCK	S 300/2/1

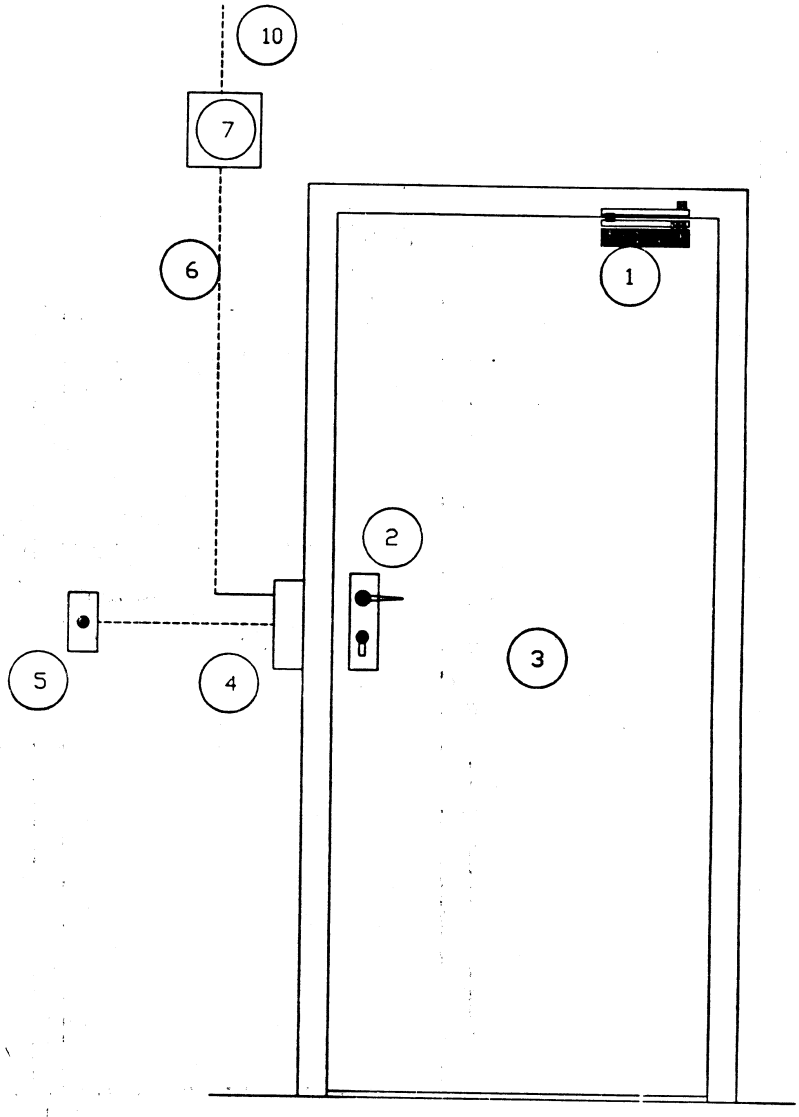
NOTE : THE MONITOR FACILITY OF THE SAMPLE 23 MS CAN BE USED IF REQUIRED



CLAUSES APPLICABLE TO THIS DRAWING :
S300.3.1 (SAMPLE 23 MS. -2)

SINGLE DOOR WITH DOOR CLOSER, SAMPLE 23 MS LOCK, ELECTRICALLY OPERATED STRIKING PLATE AND PUSH BUTTON.	S 300/2/2

NOTE : THE MONITOR FACILITY OF THE SAMPLE 23 MS CAN BE USED IF REQUIRED

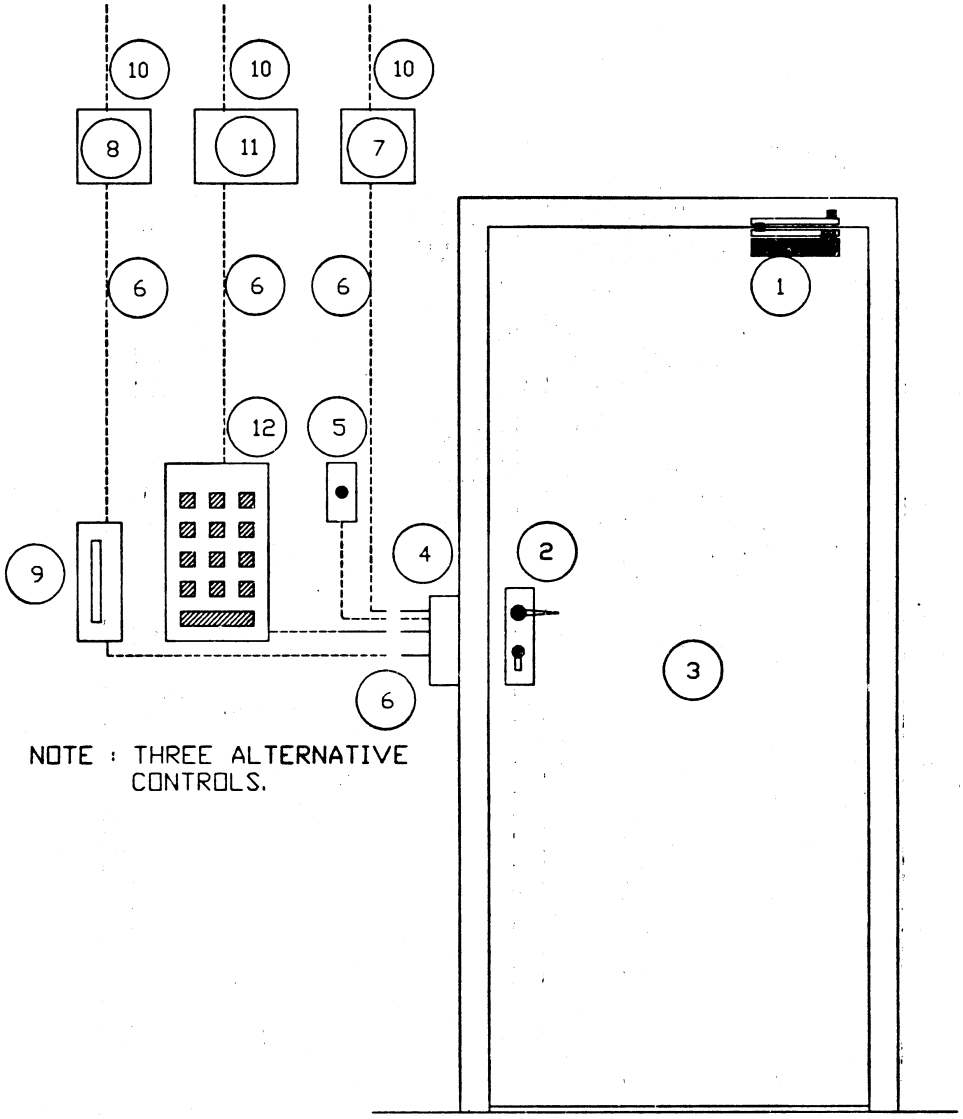


CLAUSE APPLICABLE TO THIS DRAWING :

S300.3.1 (SAMPLE 23 MS LOCK - 2)
S301 (ELEC. OPERATED STRIKING PLATE - 4)
S301 (POWER SUPPLY TO ELEC. OP. STRIKE PLATE - 7)
S310 (PUSH BUTTON - 5)
(230 V MAINS POWER SUPPLY - 10)

SINGLE DOOR WITH DOOR CLOSER, SAMPLE 23 MS LOCK, ELECTRICALLY OPERATED STRIKING PLATE, KEYPAD, CARD READER OR OTHER CONTROLS.	S 300/2/3

NOTE : 1. THE MONITOR FACILITY OF THE SAMPLE 23 MS CAN BE USED IF REQUIRED
2. CONTROL ITEMS 5(BUTTON), 9(CARD READER) AND 12(CODE LOCK) ALL HAVE THE SAME FUNCTION AND THE ITEMS USED MUST BE SELECTED DURING THE DETAIL DESIGN OF SYSTEMS.
3. THE CODE LOCK SYSTEM CAN EQUALLY OPERATE WITH A SAMPLE 24 MS LOCK OR 127 OR 128 LOCK SETS - SEE S300.3.1(h)

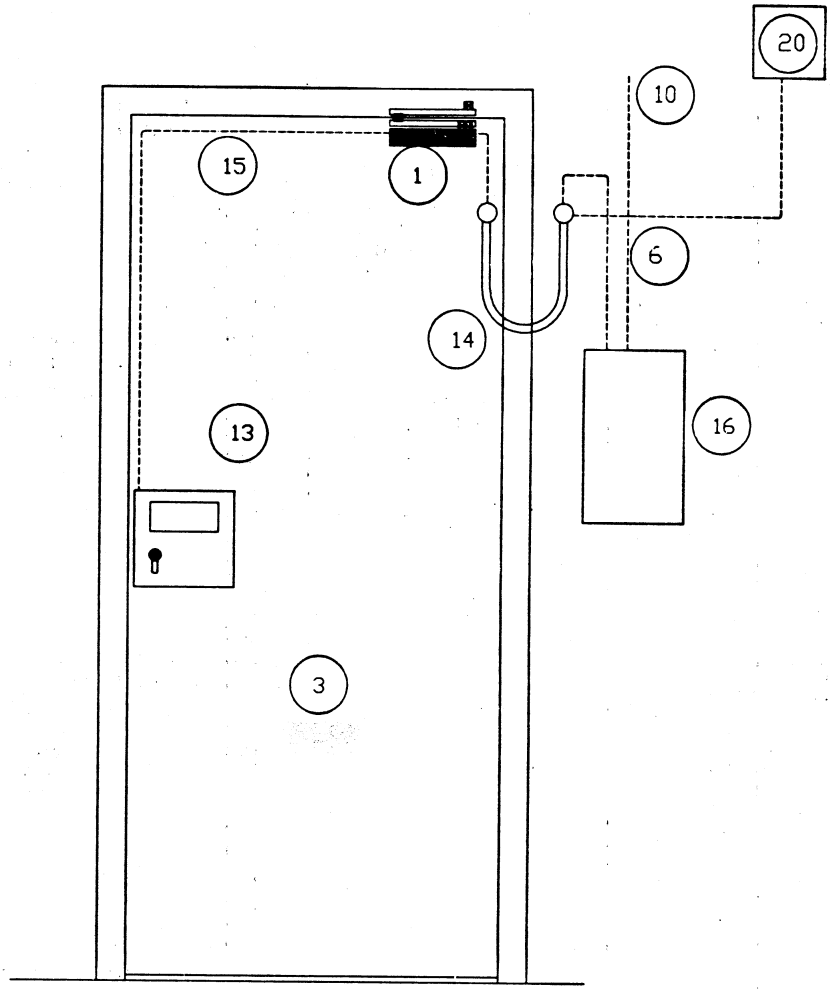


NOTE : THREE ALTERNATIVE CONTROLS.

CLAUSE APPLICABLE TO THIS DRAWING :
S300.3.1 (CODE LOCK SYSTEM, COMPRISING SAMPLE 23 MS LOCK - 2, AND KEYPAD - 12)
S301 (ELEC. OPERATED STRIKING PLATE - 4)
S301 (POWER SUPPLY TO ELEC. OP. STRIKE PLATE - 7)
S310 (PUSH BUTTON - 5)
(230 V MAINS POWER SUPPLY - 10)
S101, 102 OR 103 (CARD READER - 9)
S111 (CARD READER ON NON-SECURE SIDE - 9)
S120 (POWER SUPPLY TO CARD READERS - 8)
S300.3.2.1(POWER SUPPLY FOR CODE LOCK SYSTEM - 11)

SINGLE DOOR WITH DOOR CLOSER AND ALARM ESCAPE LOCK SET SAMPLE 127 WITH CONTROL EQUIPMENT.	S 300/2/4

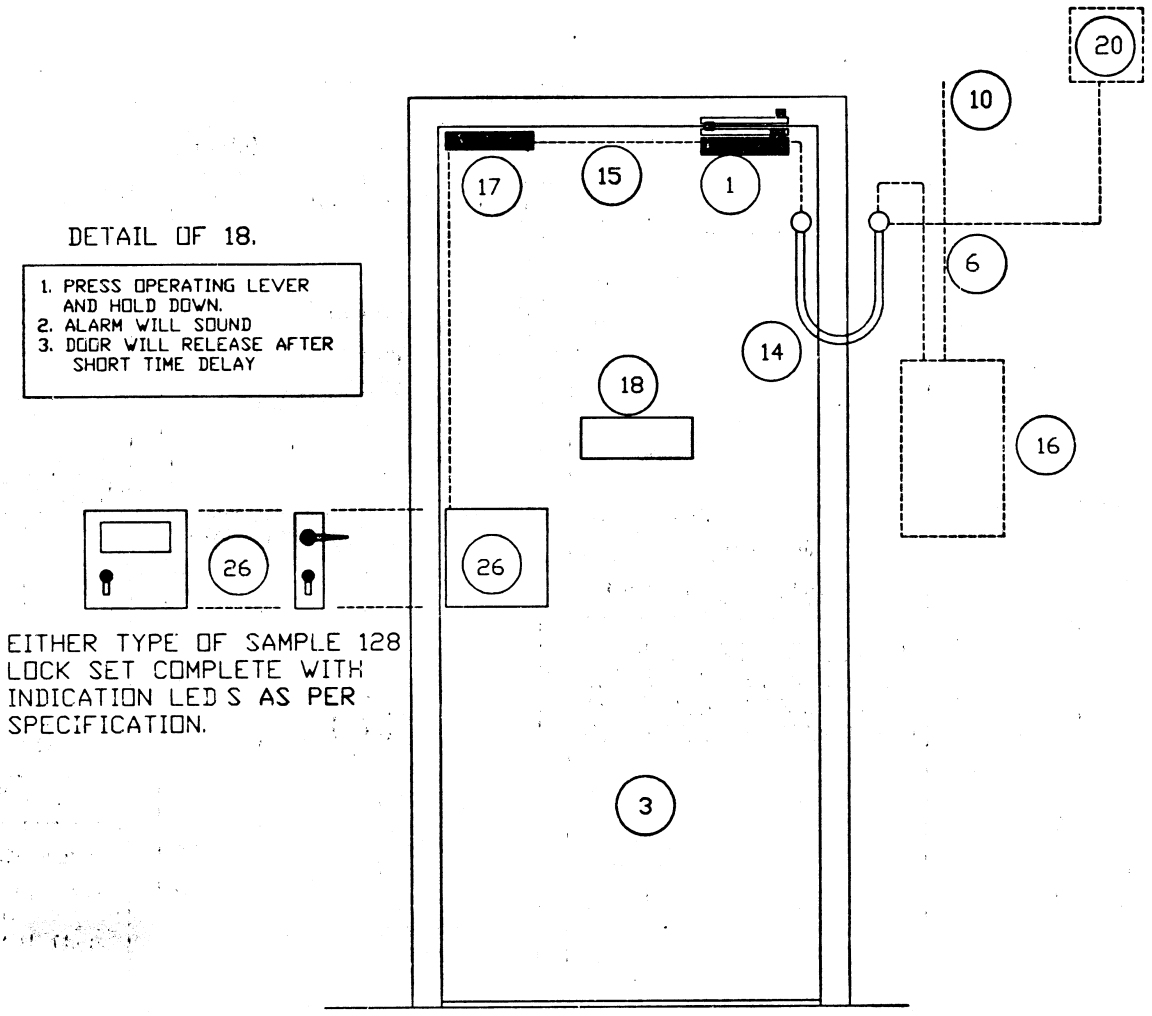
NOTE : 1. REMOTE DEVICES ARE TO BE SELECTED FOR THE SAMPLE 127-E WHEN THE DETAIL DESIGN OF A SYSTEM IS UNDERTAKEN. ITEM 16 CAN BE A PUSH BUTTON, CARD READER OR CODE LOCK AND/OR A MONITOR PANEL TO REMOTELY MONITOR THE STATUS OF THE LOCK.
2. THE POWER SUPPLY(20) IS ONLY USED WHEN THE SAMPLE 127 IS NOT SUPPLIED WITH POWER FROM A MONITOR PANEL. THE DETAIL SPECIFICATION MUST SPECIFY THE POWER SUPPLY REQUIREMENTS OF THE LOCK IN DETAIL.



CLAUSE APPLICABLE TO THIS DRAWING :
S300.3.1 (PWD SAMPLE 127 LOCK - 13)
S101, 102 OR 103 AS REQUIRED (CARD READER - 9)
S120 AS REQUIRED(POWER SUPPLY - 7)
S310 AS REQUIRED (PUSH BUTTON - 5)
S320 (WIRING LOOP - 14)
S330 AS REQUIRED(CONTROLS - 16)
S300.3.2.1(LOCK SET POWER SUPPLY - 20)
(230 V MAINS POWER SUPPLY - 10)

SINGLE DOOR WITH DOOR CLOSER AND TIME DELAY ALARM ESCAPE LOCK SET SAMPLE 128 WITH CONTROL EQUIPMENT AS REQUIRED.	S 300/2/5

NOTE : 1. REMOTE DEVICES ARE TO BE SELECTED FOR THE SAMPLE 128-E WHEN THE DETAIL DESIGN OF A SYSTEM IS UNDERTAKEN. ITEM 16 CAN BE A PUSH BUTTON, CARD READER OR CODE LOCK AND/OR A MONITOR PANEL TO REMOTELY MONITOR THE STATUS OF THE LOCK.
2. THE POWER SUPPLY(20) IS ONLY USED WHEN THE SAMPLE 128 IS NOT SUPPLIED WITH POWER FROM A MONITOR PANEL. THE DETAIL SPECIFICATION MUST SPECIFY THE POWER SUPPLY REQUIREMENTS OF THE LOCK IN DETAIL.



DETAIL OF 18.

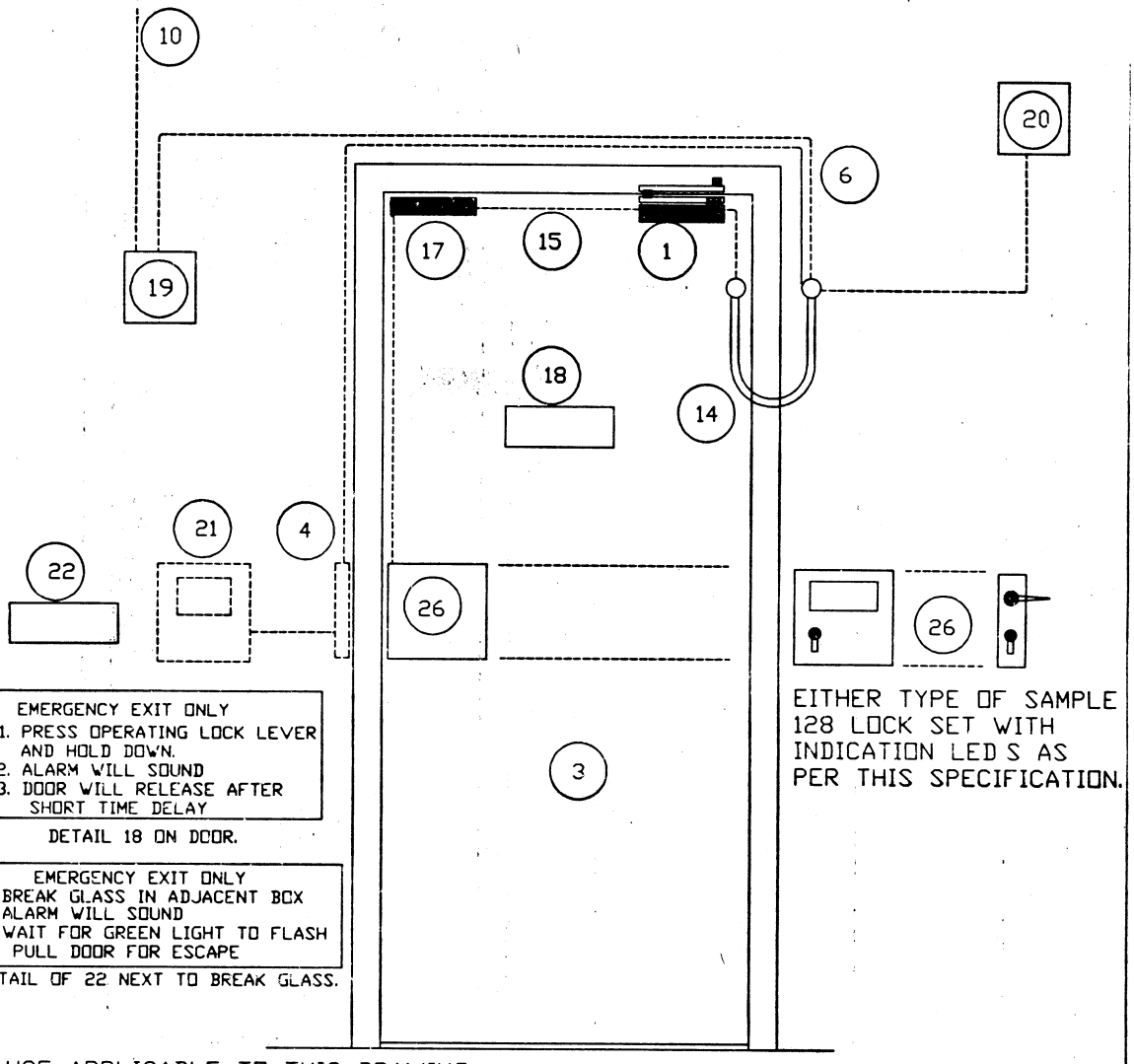
1. PRESS OPERATING LEVER AND HOLD DOWN.
2. ALARM WILL SOUND
3. DOOR WILL RELEASE AFTER SHORT TIME DELAY

EITHER TYPE OF SAMPLE 128 LOCK SET COMPLETE WITH INDICATION LEDS AS PER SPECIFICATION.

CLAUSE APPLICABLE TO THIS DRAWING :
S300.3.1 (PWD SAMPLE 128 LOCK - 26)
S320 (WIRING LOOP - 14)
S330 AS REQUIRED(CONTROLS - 16)
S300.3.2.1(LOCK SET POWER SUPPLY - 20)
S300.3.3.4(ELECTROMAGNET FOR SAMPLE 128 LOCK SET - 17)

SINGLE DOOR WITH DOOR CLOSER, TWO-WAY ESCAPE EQUIPMENT, CONTROLS AND MONITOR PANEL AS REQUIRED.	S 300/2/6

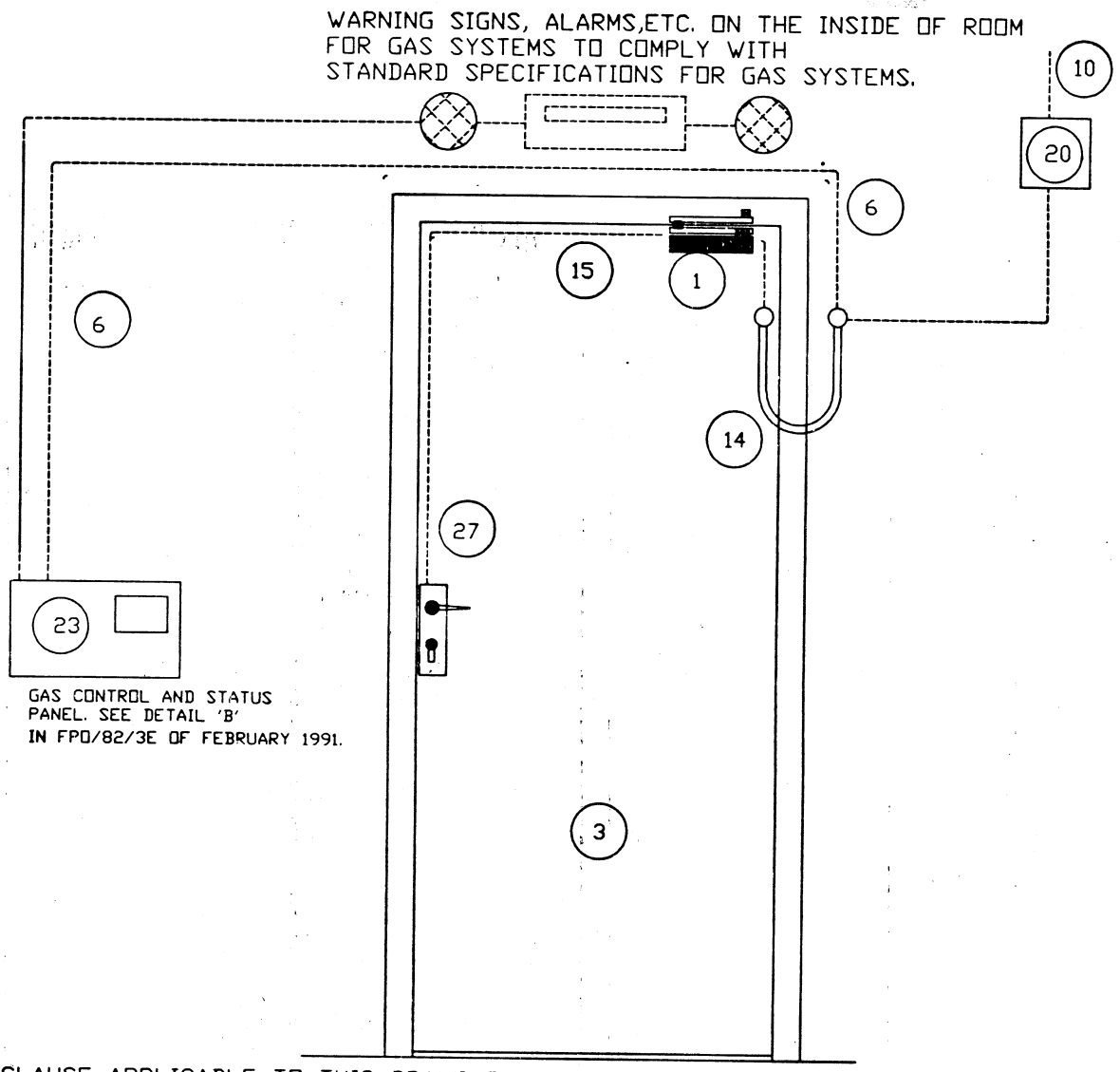
NOTE : 1. THE BREAK GLASS UNIT (21) IS NOT PLACED ON THE LOCK SIDE OF THE DOOR.
2. THE POWER SUPPLY(20) IS ONLY USED WHEN THE SAMPLE 128 IS NOT SUPPLIED WITH POWER FROM A MONITOR PANEL. THE DETAIL SPECIFICATION MUST SPECIFY THE POWER SUPPLY REQUIREMENTS OF THE LOCK IN DETAIL.



CLAUSE APPLICABLE TO THIS DRAWING :
S300.3.1 (PWD SAMPLE 128 OR 128-E LOCK SET - 26)
S320 (WIRING LOOP - 14)
S330 (MONITOR PANEL AS REQUIRED- 19)
S300.3.2.1(LOCK SET POWER SUPPLY - 20)
S300.3.3.4(ELECTROMAGNET - 17)
S301 (ELECTRICALLY OPERATED STRIKE - 4)
(BREAK GLASS UNIT - 21)

SINGLE DOOR WITH DOOR CLOSER WITH SAMPLE 24MS LOCK AND GAS CONTROL EQUIPMENT AS REQUIRED.	S 300/2/7

NOTE : 1. THE BREAK GLASS UNITS ARE REQUIRED ON BOTH SIDES OF THE DOOR.
2. THE SAMPLE 24 MS IS USED WHEN GAS PROTECTED AREAS ARE SUPPLIED WITH ACCESS CONTROL.

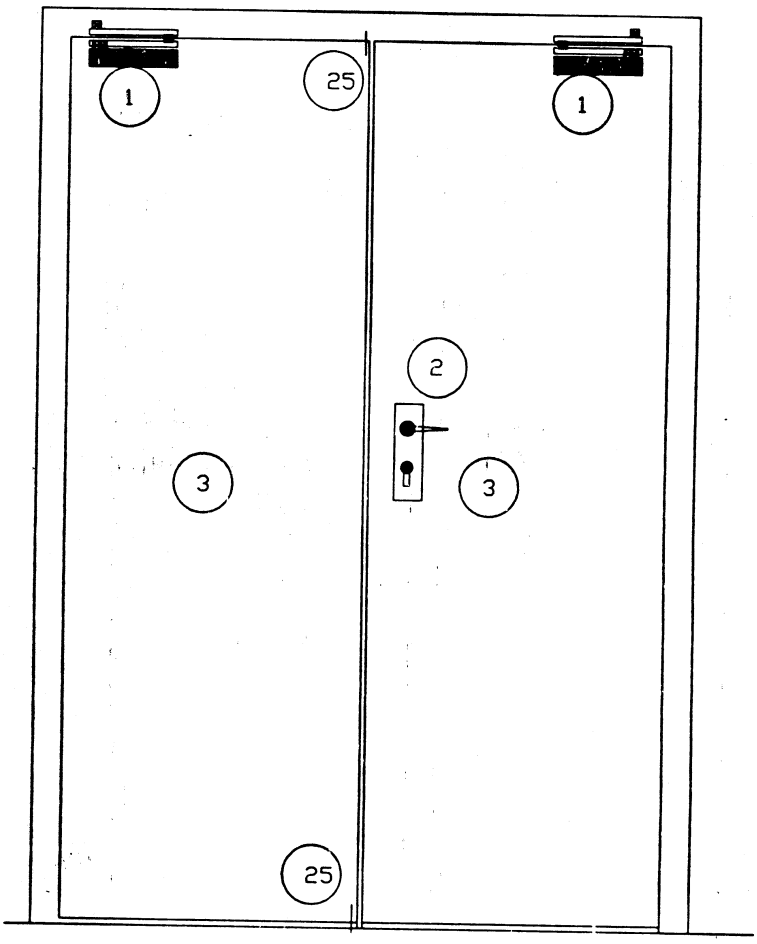


CLAUSE APPLICABLE TO THIS DRAWING :

S320 (WIRING LOOP - 14)
S300 (LOCK SET POWER SUPPLY - 20)(IF REQUIRED)
S300.3.1 (SAMPLE 24 MS - 27)
(GAS CONTROL AND STATUS PANEL - 23)

DOUBLE DOOR WITH DOOR CLOSERS AND SAMPLE 23 MS LOCK	S 300/3/1

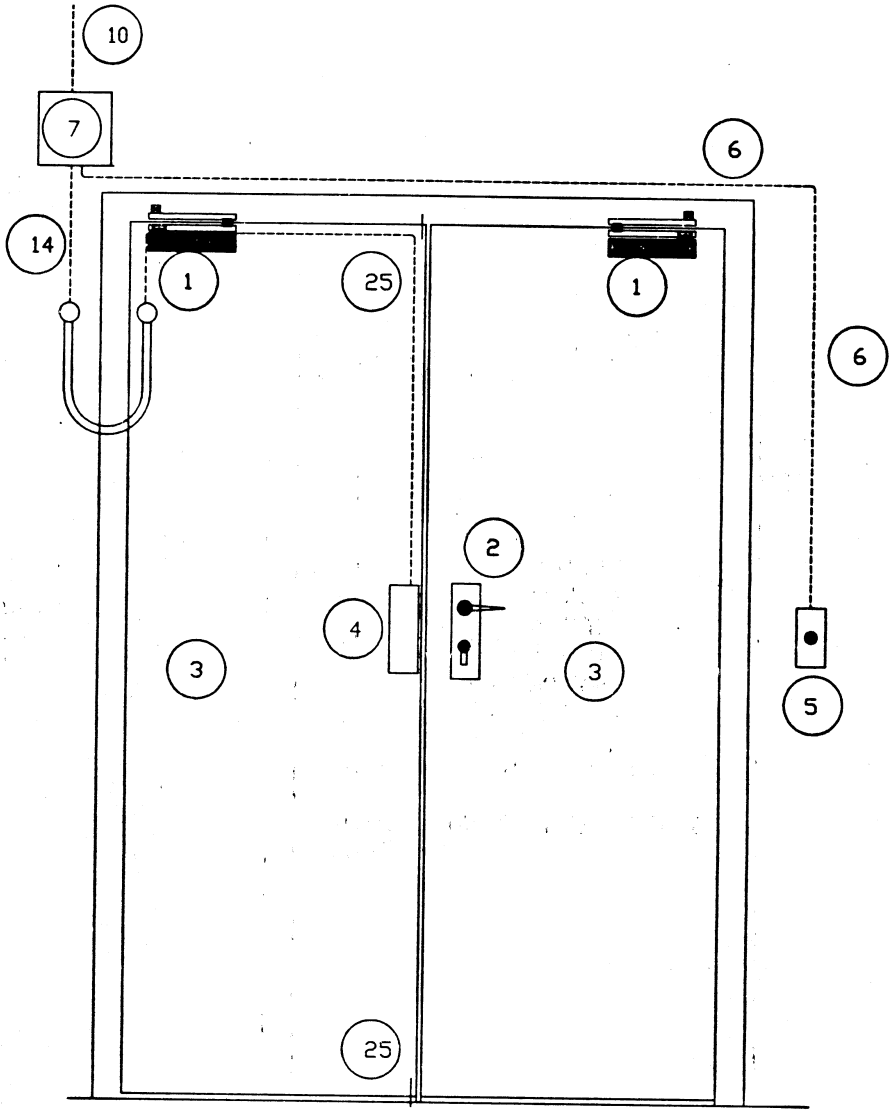
NOTE : THE MONITOR FACILITY OF THE SAMPLE 23 MS CAN BE USED IF REQUIRED



CLAUSES APPLICABLE TO THIS DRAWING :
S300.3.1 (SAMPLE 23 MS. -2)

DOUBLE DOOR WITH DOOR CLOSERS, SAMPLE 23 MS LOCK, ELECTRICALLY OPERATED STRIKING PLATE AND PUSH BUTTON.	S 300/3/2

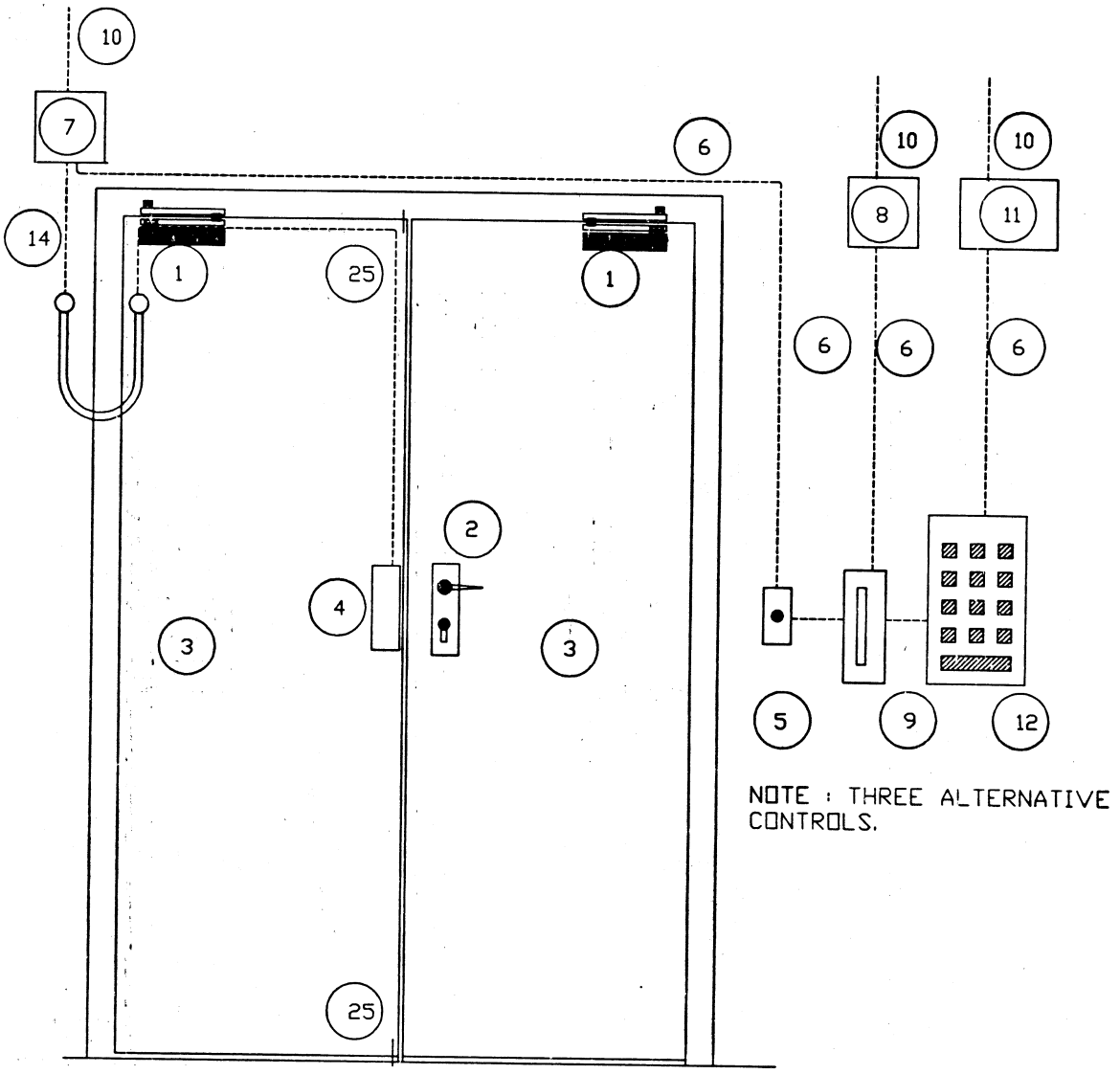
NOTE : THE MONITOR FACILITY OF THE SAMPLE 23 MS CAN BE USED IF REQUIRED



CLAUSES APPLICABLE TO THIS DRAWING :
S300.3.1 (SAMPLE 23 MS LOCK -2)
S301 (ELEC. OPERATED STRIKING PLATE - 4)
S301 (POWER SUPPLY TO ELEC. OP. STRIKE PLATE - 7)
S310 (PUSH BUTTON - 5)
S320 (WIRING LOOP - 14)
(230 V MAINS POWER SUPPLY - 10)

DOUBLE DOOR WITH DOOR CLOSERS, SAMPLE 23 MS LOCK, ELECTRICALLY OPERATED STRIKING PLATE, KEYPAD, CARD READER OR OTHER CONTROL.	S 300/3/3

NOTE : 1. THE MONITOR FACILITY OF THE SAMPLE 23 MS CAN BE USED IF REQUIRED
2. CONTROL ITEMS 5(BUTTON), 9(CARD READER) AND 12(CODE LOCK) ALL HAVE THE SAME FUNCTION AND THE ITEMS TO BE USED MUST BE SELECTED DURING THE DETAIL DESIGN OF SYSTEMS.
3. THE CODE LOCK SYSTEM CAN OPERATE EQUALLY WITH A SAMPLE 24 MS LOCK OR 127 OR 128 LOCK SETS - SEE S300.3.1(h)

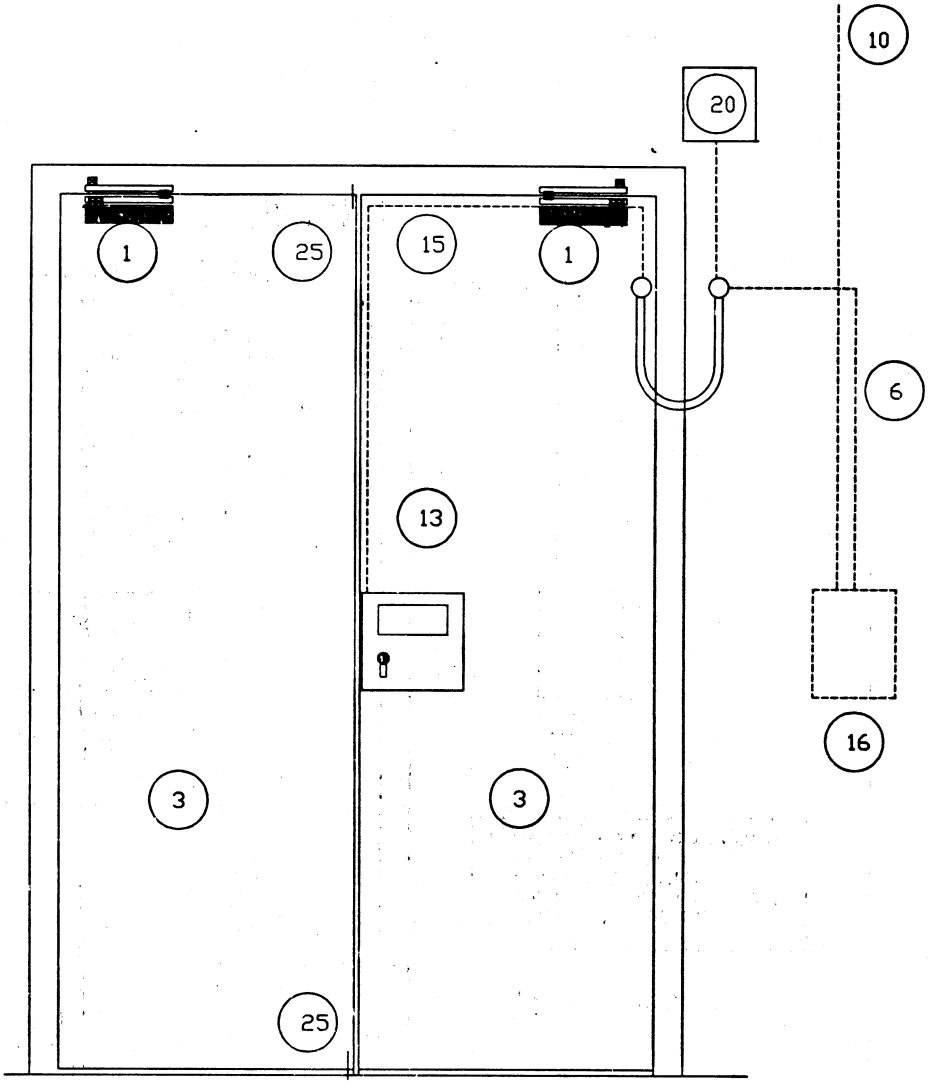


NOTE : THREE ALTERNATIVE CONTROLS.

CLAUSE APPLICABLE TO THIS DRAWING :
S300.3.1 (CODE LOCK SYSTEM, COMPRISING SAMPLE 23 MS LOCK - 2, AND KEYPAD - 12)
S301 (ELEC. OPERATED STRIKING PLATE - 4)
S301 (POWER SUPPLY TO ELEC. OP. STRIKE PLATE - 7)
S310 (PUSH BUTTON - 5)
(230 V MAINS POWER SUPPLY - 10)
S101, 102 OR 103 (CARD READER - 9)
S120 (POWER SUPPLY TO CARD READER - 8)
S300.3.2.1(POWER SUPPLY FOR CODE LOCK SYSTEM - 11)

DOUBLE DOOR WITH DOOR CLOSERS AND ALARM ESCAPE LOCK SET SAMPLE 127 WITH CONTROL EQUIPMENT.	S 300/3/4

NOTE : 1. REMOTE DEVICES ARE TO BE SELECTED FOR THE SAMPLE 127-E WHEN THE DETAIL DESIGN OF A SYSTEM IS UNDERTAKEN. ITEM 16 CAN BE A PUSH BUTTON, CARD READER OR CODE LOCK AND/OR A MONITOR PANEL TO REMOTELY MONITOR THE STATUS OF THE LOCK.
2. THE POWER SUPPLY(20) IS ONLY USED WHEN THE SAMPLE 127 IS NOT SUPPLIED WITH POWER FROM A MONITOR PANEL. THE DETAIL SPECIFICATION MUST SPECIFY THE POWER SUPPLY REQUIREMENTS OF THE LOCK IN DETAIL.

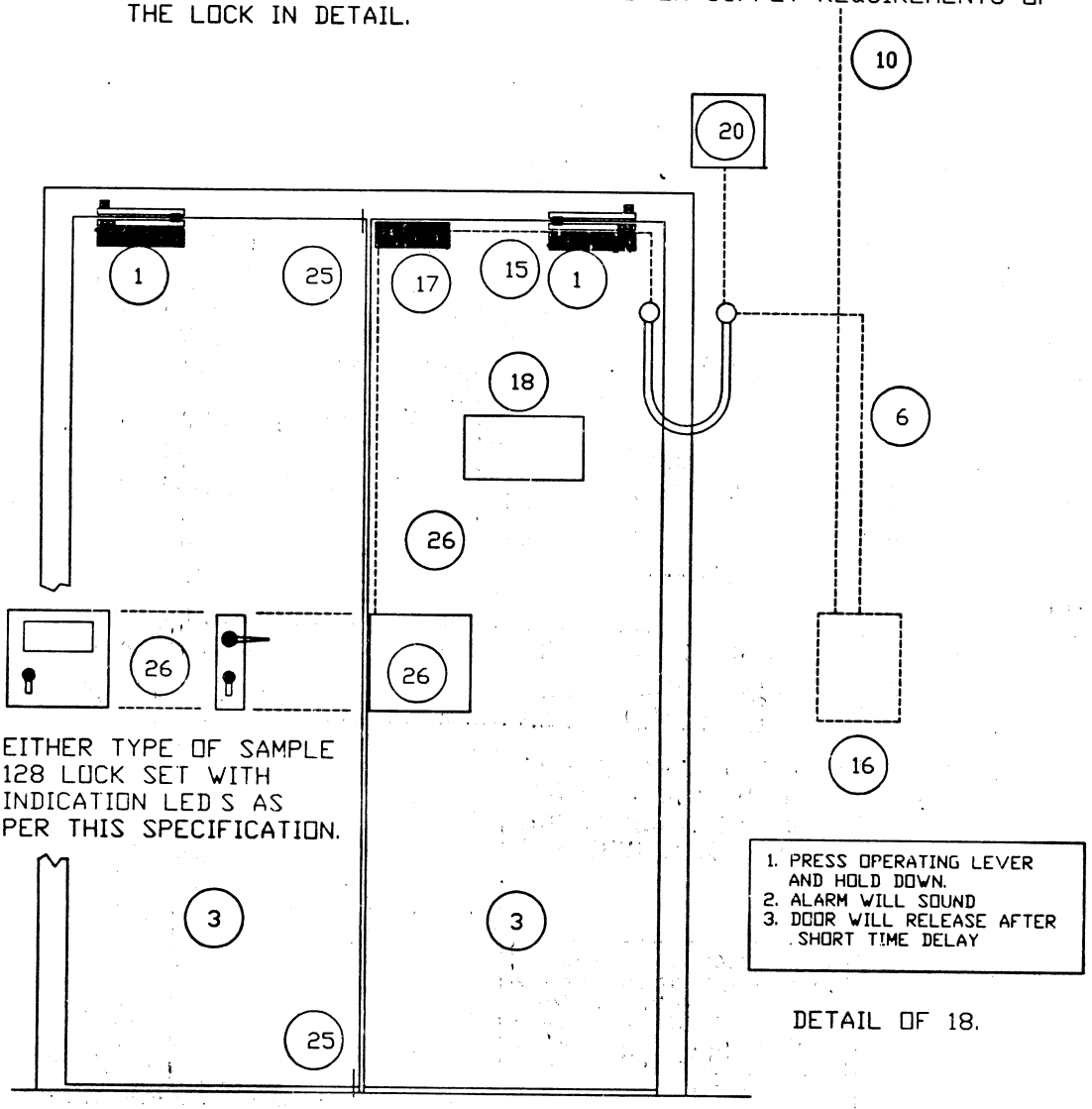


CLAUSE APPLICABLE TO THIS DRAWING :
S300.3.1 (PWD SAMPLE 127 LOCK - 13)
S101, 102 OR 103 AS REQUIRED (CARD READER - 9)
S120 AS REQUIRED(POWER SUPPLY - 7)
S310 AS REQUIRED (PUSH BUTTON - 5)
S320 (WIRING LOOP - 14)
S330 AS REQUIRED(CONTROLS - 16)
S300.3.2.1(LOCK SET POWER SUPPLY - 20)
(230 V MAINS POWER SUPPLY - 10)

DOUBLE DOOR WITH DOOR CLOSERS AND TIME DELAY ALARM ESCAPE LOCK SET SAMPLE 128 WITH CONTROL EQUIPMENT AS REQUIRED.	S 300/3/5

NOTE : 1. REMOTE DEVICES ARE TO BE SELECTED FOR THE SAMPLE 128-E WHEN THE DETAIL DESIGN OF A SYSTEM IS UNDERTAKEN. ITEM 16 CAN BE A PUSH BUTTON, CARD READER OR KEYPAD AND/OR A MONITOR PANEL TO REMOTELY MONITOR THE STATUS OF THE LOCK.

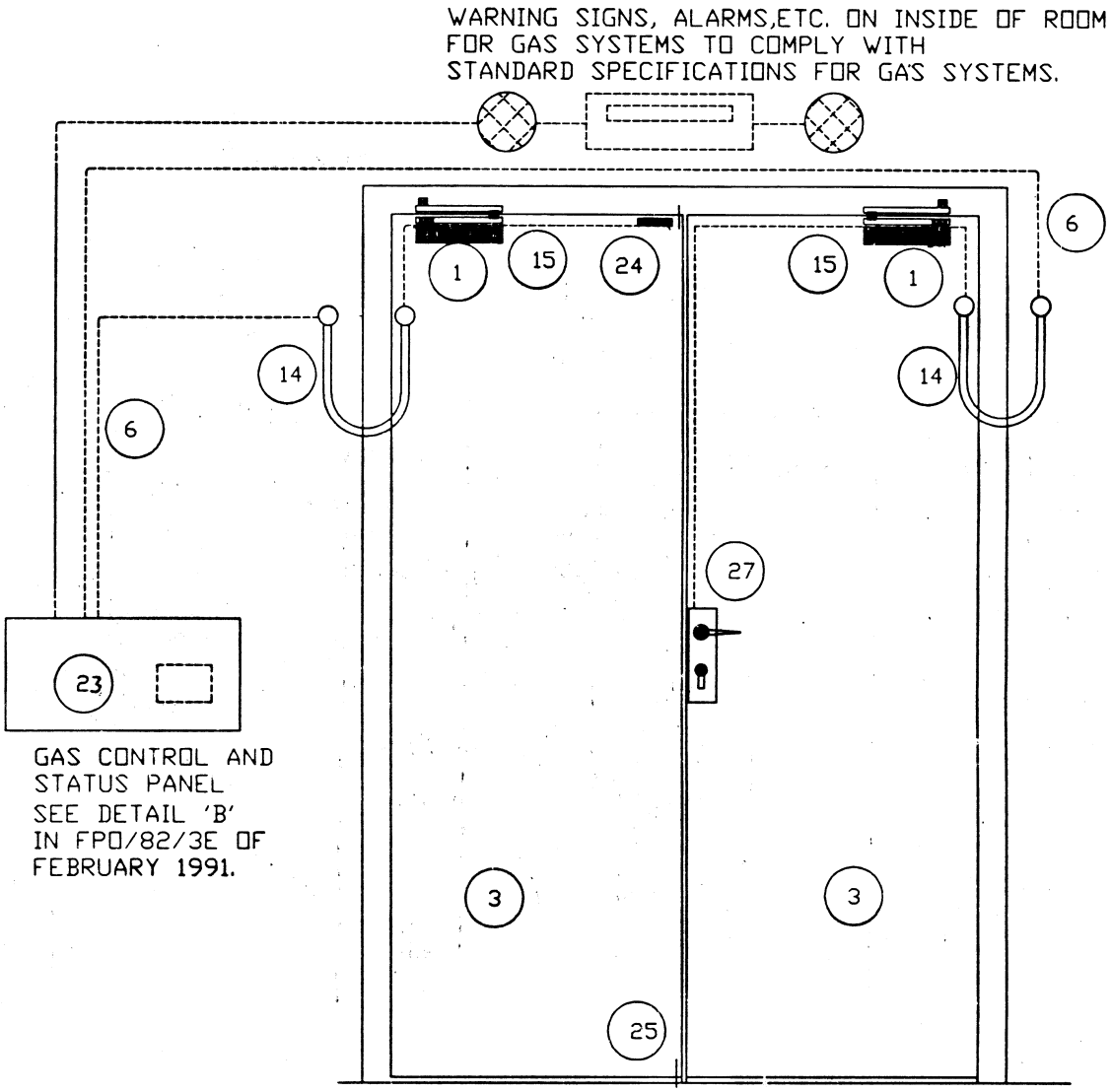
2. THE POWER SUPPLY(20) IS ONLY USED WHEN THE SAMPLE 128 IS NOT SUPPLIED WITH POWER FROM A MONITOR PANEL. THE DETAIL SPECIFICATION MUST SPECIFY THE POWER SUPPLY REQUIREMENTS OF THE LOCK IN DETAIL.



CLAUSE APPLICABLE TO THIS DRAWING :
S300.3.1 (PWD SAMPLE 128 LOCK - 26)
S320 (WIRING LOOP - 14)
S330 AS REQUIRED(CONTROLS - 16)
S300.3.2.1(LOCK SET POWER SUPPLY - 20)
S300.3.3.4(ELECTROMAGNET FOR SAMPLE 128 LOCK SET - 17)

DOUBLE DOOR WITH DOOR CLOSERS, SAMPLE 24 MS LOCK AND GAS CONTROL EQUIPMENT AS REQUIRED.	S 300/3/7

NOTE : 1. THE BREAK GLASS UNITS ARE REQUIRED ON BOTH SIDES OF THE DOOR.
2. THE SAMPLE 24 MS IS USED WHEN GAS PROTECTED AREAS ARE SUPPLIED WITH ACCESS CONTROL.

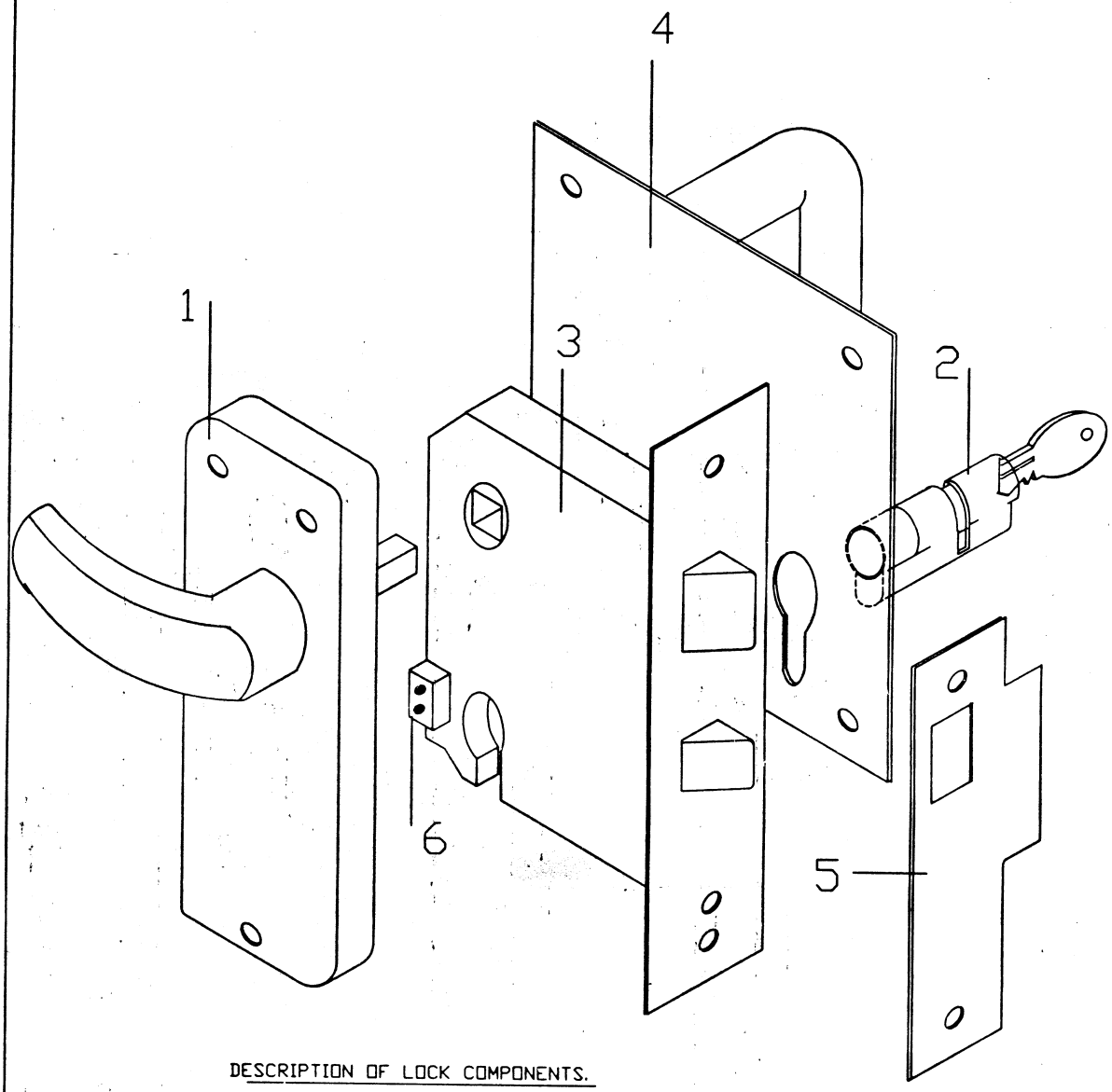


CLAUSE APPLICABLE TO THIS DRAWING :

S320 (WIRING LOOP - 14)
S300 (LOCK SET POWER SUPPLY - 20)(IF REQUIRED)
S300.3.1 (SAMPLE 24 MS - 27)

(MICRO SWITCH AS REQUIRED - 24)
(GAS CONTROL AND STATUS PANEL - 23)

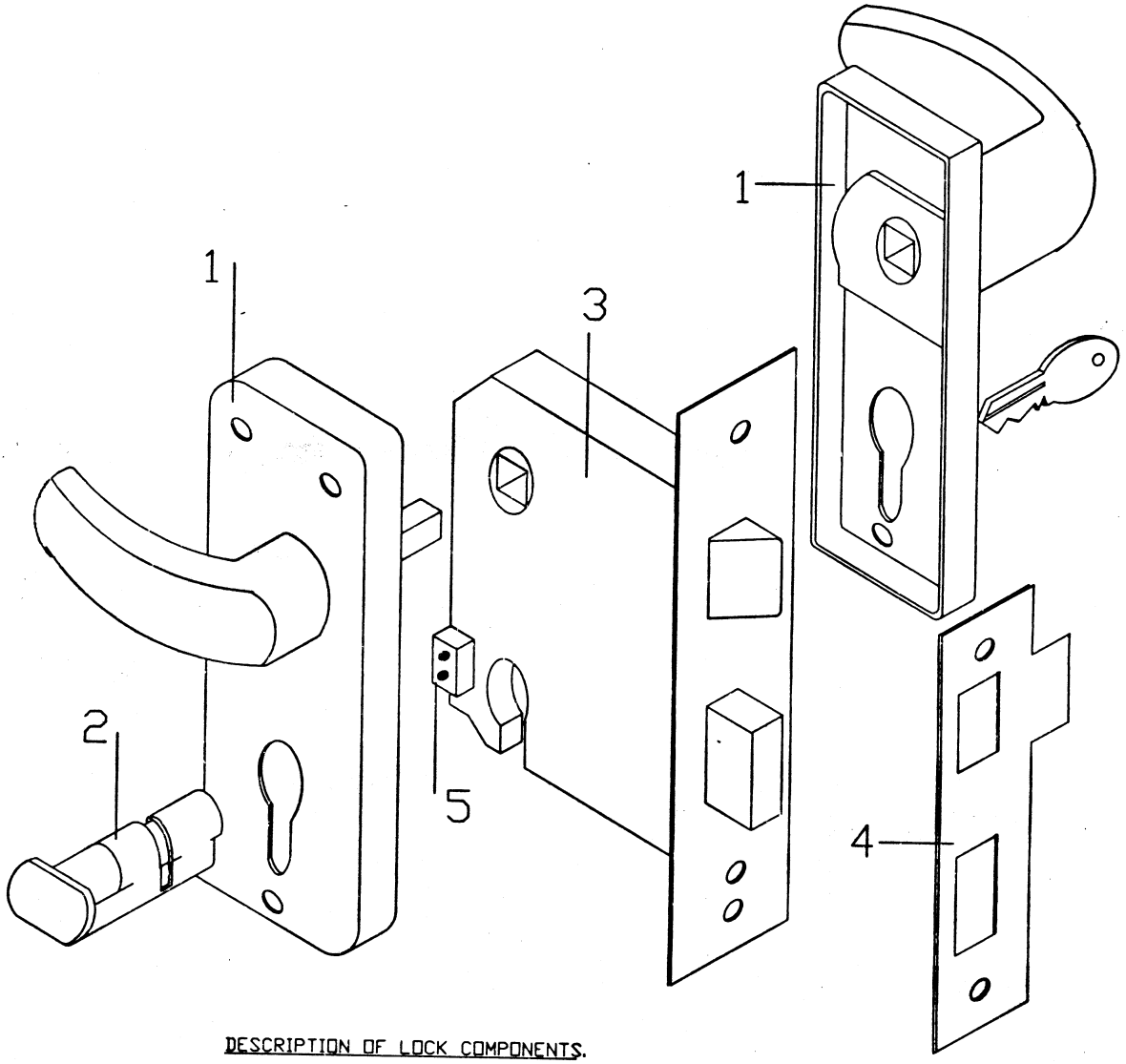
SAMPLE 23 MS LOCK	S 300/4



DESCRIPTION OF LOCK COMPONENTS.

1. LEVER HANDLE - RH
   LEVER HANDLE - LH
2. 5 PIN KNOB CYLINDER AND KEYS TO UNLOCK DOOR FROM OUTSIDE ONLY.
3. EMERGENCY EXIT LOCK SAMPLE 23 - RH
   EMERGENCY EXIT LOCK SAMPLE 23 - LH
4. PULL HANDLE - RH
   PULL HANDLE - LH
5. STRIKER PLATE
6. MICROSWITCH(ES) AS REQUIRED.

SAMPLE 24 MS LOCK	S 300/5



DESCRIPTION OF LOCK COMPONENTS.

1. LEVER HANDLE - RH
   LEVER HANDLE - LH
2. 5 PIN KNOB CYLINDER AND KEYS WITH THUMB TURN ON INSIDE OF LOCK.
3. CYLINDER DOORLOCK SAMPLE 24 - RH
   CYLINDER DOORLOCK SAMPLE 24 - LH
4. STRIKER PLATE
5. MICROSWITCH(ES) AS REQUIRED.