

Maxseal ICO2S

Certificate No SIRA 00ATEX2113

Installation, Operation and Maintenance Instructions (MI0201 Rev.3)

READ ALL THE INSTRUCTIONS CAREFULLY BEFORE USING THIS PRODUCT.

INSTALLATION, OPERATION AND MAINTENANCE OF THIS EQUIPMENT SHALL BE CARRIED OUT IN ACCORDANCE WITH THE HEALTH & SAFETY REQUIREMENTS OF ATEX DIRECTIVE 137, OR EQUIVALENT CODE OF PRACTICE.

ALL USERS SHALL BE TRAINED IN THE I.S. (INTRINSICALLY SAFE) CONCEPT AND WORK TO THE RELEVANT CODE OF PRACTICE (E.G. EN 60079-14).

REPAIR AND OVERHAUL OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH THE RELEVANT CODE OF PRACTICE (E.G. IEC 60079-19).

THE ICO2S SHALL ONLY BE USED IN ACCORDANCE WITH REQUIREMENTS OF THIS DOCUMENT AND INSTALLED AS PER THE I.S. SYSTEMS DRAWING.

DO NOT MODIFY, RECLAIM OR CHANGE ANY COMPONENTS.

Description

The ICO2S is an intrinsically safe solenoid valve used to control a pressurised media (liquid or gas).

A typical basic installation would consist of a 24V DC power supply, control switch or relay and an EExia 300Ω 28V barrier. (eg. MTL 7028 zener barrier or MTL 3021 galvanic isolator or Stahl 9475/12-04-21).

Always refer to barrier manufacturers instructions. (Typical barrier manufacturers are MTL, P&F, Stahl).

Maxseal sales

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Maxseal products are manufactured by:

FC^x Thompson Valves Ltd

17 Balena Close, Creekmoor,

Poole, Dorset, England. BH17 7EF

Marking indicator

MARKINGS	DESCRIPTION
II 1 G	EQUIPMENT IS SUITABLE FOR USE IN EXPLOSIVE ATMOSPHERES WHERE GAS/VAPOURS OCCUR CONTINUOUSLY OR FREQUENTLY.
EEx ia II C	EQUIPMENT RELIES ON I.S. PROTECTION AND IS SUITABLE FOR USE IN IIC ENVIRONMENTS. (SEE SYSTEMS DRAWING).
T6 Ta (64°C)	T-CLASSIFIED EQUIPMENT SHOULD NOT BE EXPOSED TO TEMP GREATER THAN THE SPECIFIED AMBIENT TEMPERATURE (Ta).
Y2H23AA1SA10300	WORKING CONDITIONS SHOULD NOT EXCEED THE CAPABILITIES OF COMPONENTS/MATERIALS DETAILED IN CONSTRUCTION.
WP 0-20 BAR	THE SPECIFIED MEDIA PRESSURE SHOULD NOT BE EXCEEDED OR THE CONSTRUCTION ALTERED TO WORK AT HIGHER PRESSURES.
INLET, OUTLET, VENT	PIPEWORK SHOULD BE CONNECTED SUCH THAT IT FUNCTIONS AS INDICATED ON THE PORT MARKINGS.
li: 300mA Li: 0 Pi: 1.3 W Ui: 28Vdc Ci: 0	THE SAFETY DESCRIPTION OF THE I.S. BARRIER OR ISOLATOR SHOULD NOT EXCEED 28Vdc OR 300mA AND 1.3W.
SERIAL No	FOR YEAR OF MANUFACTURE SEE ATTACHED CERTIFICATE OF CONFORMITY

Expected duty

The ICO2S should not be used in circumstances that exceed the limits of the expected duty shown below. If the user is unsure of the limits they should contact Maxseal sales.

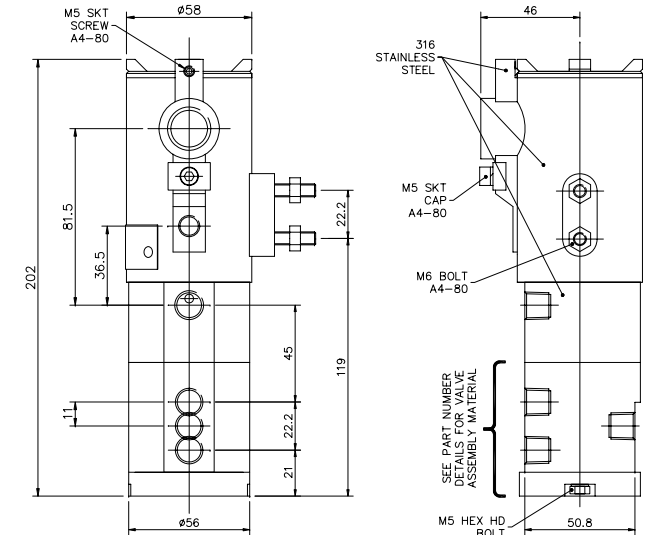
CONDITIONS	LIMITS
FUNCTION	THE WORKING PRESSURE SHALL NOT EXCEED THAT MARKED ON THE PRESSURE BOUNDARY. THE WORKING TEMPERATURE SHALL NOT EXCEED THE CAPABILITIES OF ANY ICO2S COMPONENTS (SEE PART NUMBER).
ENVIRONMENT	EXTERNAL CONDITIONS, INCLUDING AGGRESSIVE SUBSTANCES, SHALL NOT DEGRADE THE PRESSURE BOUNDARY. ALL EXTERNAL CONDITIONS SHALL NOT EXCEED IP66.
LIFE	10,000 CYCLES OR 5 YEARS (WHICH EVER COMES FIRST). DO NOT ACTIVATE > 6 CYCLES/MIN.

In special applications that exceed the expected duty, the user should contact Maxseal sales before installing / operating an ICO2S.

Part number details

RESET OPERATION	NOTE														
AUTOMATIC A	IF THE PART NUMBER DIFFERS FROM THE OPTIONS SHOWN OPPOSITE AND THE FUNCTION IS UNKNOWN CONTACT MAXSEAL SALES.														
LEVER MANUAL RESET L															
PUSH BUTTON MANUAL RESET P															
TAMPERPROOF MANUAL RESET T															
AUTOMATIC LATCHING LEVER B															
JACKSCREW MANUAL OVERRIDE S															
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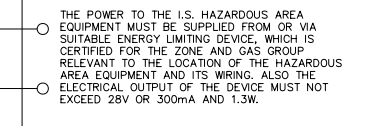
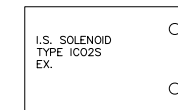
Construction and installation dimensions



ICO2S Standard variant 3/2 auto 20 bar

HAZARDOUS AREA

SAFE AREA



NOTE: - INSTALLATION MUST COMPLY WITH THE INSTALLATION REQUIREMENTS AS SPECIFIED IN BS EN 60079-10 1996 & BS EN 60079-14 1997 (OR EQUIVALENT).

NOTE: - ANY SUITABLY CERTIFIED SHUNT ZENER DIODE BARRIER OR GALVANIC ISOLATOR MAY BE USED (TO Ex ia, Ex ib, EEx ia OR EEx ib AS PER APPLICABLE ZONE), PROVIDED THE SAFETY DESCRIPTION OF THE BARRIER OR ISOLATOR DOES NOT EXCEED 28V OR 300mA AND 1.3W.

REFER TO THE DOCUMENTATION OF THE BARRIER OR ISOLATOR FOR THE RESTRICTIONS ON CABLE CAPACITANCE AND INDUCTANCE. THE ICO2S HAS Ci=0 AND Li=0. THE BARRIER OR ISOLATOR MUST BE INSTALLED AND USED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.

ICO2S I.S. systems drawing

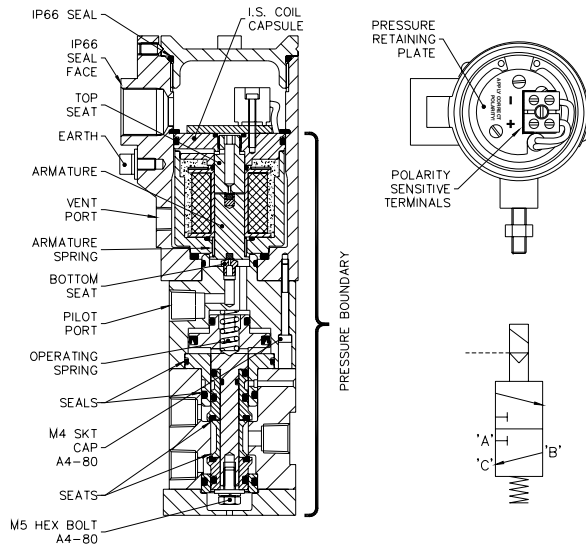
Storage and handling

The ICO2S should not be stored in a corrosive environment. All ports should remain sealed and the valve markings made visible.

Due attention should be paid to personal protection during handling.

Operation

The I.S. cartridge contains an epoxy-potted coil and diodes. This part must not be compromised by any application condition and is a non-serviceable item. The coil is polarity sensitive. Reversal of the terminal connections will cause the valve to cease to function.



The pressurised media is retained within the valve assembly (pressure boundary) by the mechanical strength of all its metal parts, seats and seals. Degradation of any of these components will cause the valve to leak.

The flow path of the media is altered by moving the spool assembly and engaging / disengaging the seats. The spool assembly can be moved by either.

- Energising the coil & applying pressure to the piston.
- Energising the coil. (ICO2S pilot version only).
- Applying a pressure to a piston.
- Applying a mechanical force to a linkage.
- Compressing a mechanical spring.

Restricting the spool movement or allowing the seats to degrade, will not allow the flow to be re-directed.

The ICO2S has an IP66 rating. Degradation of the IP66 seals / gaskets / sealing faces or failure to tighten all sealing joints, will allow water to leak inside the enclosure.

For best practice, the valve should ideally be exercised at least once a month.

Removing an existing valve

Tools

Electrical 3mm Screw driver
Allen Keys: 2.5mm, 3mm, 4mm & 8mm.
A/F sockets: 8mm & 10mm. 5mm.

1. Obtain work permit and check area for hazards.
2. Isolate valve from all pipeline and electrical supplies.
3. Loosen M5 locking screw and unscrew cover.
4. Disconnect supply cable and remove.
5. Remove pipe connections from valve assembly.
6. Unscrew M6 mounting nuts and remove the valve.

Installing a valve

General requirements

- Remove all bungs and packaging.
- Pipe work and media must be clean.
- Inlet filters are recommended (e.g. 20 microns).
- Prevent pipe sealant from entering the system.
- Use only correct tools.
- Do not use valve as a lever.
- Earth equipment to prevent the build up of an electrostatic charge.
- Ensure all interfacing equipment is rated to the expected duty conditions and will not degrade the integrity of the ICO2S.

Mounting

An ICO2S will function satisfactorily when mounted inclined from the vertical. However for maximum life and efficiency mount vertically. The ICO2S is not designed for use in vibration applications. Do not invert. Do not mechanically stress the equipment.

High temperature applications

The ICO2S should not be used in environments > 64°C. Ensure all associated parts, including cable glands and cabling, are fit for rated duty.

Low temperature applications

Contact Maxseal sales for special operating conditions.

Procedure

1. Make connections to the valve ports as required. DO NOT OVERTIGHTEN.
2. A pilot vent plug is supplied. But if the application is liable to blockage, (i.e. ice or dirt), use alternative vent methods. DO NOT BLOCK THIS VENT, AS THE PRODUCT WILL CEASE TO FUNCTION. THE VENT PORT MUST BE EXPOSED TO ATMOSPHERIC PRESSURE.
3. Loosen M5 locking screw and remove solenoid cover.
4. Install cable using an appropriate gland fit for duty.
5. Make terminal connections as labelled. All terminals must be tightened before commissioning.
6. Replace solenoid cover and lock M5 locking screw.

Maintenance

It is recommended that all products be returned to Thompson Valves for refurbishment.

Spares

Only Maxseal spares kits should be used.
Main valve kits includes all soft parts and operating spring.

Lubrication

-20°C to 64°C: Molykote 111 grease.
-40°C to 50°C: Molykote 33 medium grease.

Part A. Disassembling a valve

Note: the main valve can be maintained independently of the pilot valve section.

1. Remove the Hex Head Bolts at the base of the valve body and remove valve body assembly.
2. Using spanner and 8 mm Allen Key remove bolt at base of piston.
3. Separate all valve body assembly components, noting orientation, sequence and position of parts.
4. Remove two M4 Socket Cap Screws to release pilot body assembly.

Part B. Examining a valve's components

Examine and replace all worn or damaged parts. Replace all seals and operating springs with Maxseal spare parts kit. All seals should be lubricated and have no deformation. All seating and sealing faces should be free from contaminant, marks, scratches, etc.

Part C. Assembling a valve

Smear all seals with recommended grease. Build assemblies in reverse order shown in part A. Torque M5 bolts to 5 Nm and M4 bolts to 3 Nm.

Part D. Adjusting & testing a valve

1. Remove pressure retaining plate.
2. Gently screw top seat down until both seats on armature are sealed.
3. Back off top seat half a turn.
4. Make connections to valve ports as per markings.
5. Make terminal connections as labelled.
6. Test main valve at full working pressure, 5-7 bar at pilot valve and 10 volts DC at solenoid.
7. Replace pressure retaining plate.

Part E. Problems

If the ICO2S does not function as intended, do not install valve. Repeat the maintenance procedures Parts A to D. If the problem persists contact Maxseal Sales.

If you are not sure about any application, maintenance or technical issue, contact Maxseal Sales for advice.