



IECEX Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification System for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: **IECEX DEK 22.0078X** Page 1 of 3 [Certificate history:](#)
Status: **Current** Issue No: 0
Date of Issue: 2023-12-20
Applicant: **Alicat Scientific**
7641 N Business Park Drive
Tucson Az 85743
United States of America
Equipment: **Alicat IS-Max and Alicat IS-Pro Pressure and Flow Monitor Model Series: ISXXX-XX-XXX-XX-XX-X-X (where 'X' represents alphanumeric designations of part configuration)**
Optional accessory:
Type of Protection: **Intrinsic Safety**
Marking: Ex ia IIC T4 Ga

Approved for issue on behalf of the IECEx
Certification Body:

R. Schuller

Position:

Certification Manager

Signature:
(for printed version)

Date:
(for printed version)

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Netherlands





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Page 2 of 3

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locations: **Alicat Scientific**
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This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEX Quality system requirements. This certificate is granted subject to the conditions as set out in IECEX Scheme Rules, IECEX 02 and Operational Documents as amended

STANDARDS :

The equipment and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards

[IEC 60079-0:2017](#) Explosive atmospheres - Part 0: Equipment - General requirements
Edition:7.0

[IEC 60079-11:2011](#) Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
Edition:6.0

This Certificate **does not** indicate compliance with safety and performance requirements other than those expressly included in the Standards listed above.

TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in:

Test Report:

[NL/DEK/ExTR22.0070/00](#)

Quality Assessment Report:

[NL/DEK/QAR21.0015/00](#)



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Certificate No.: **IECEX DEK 22.0078X**

Page 3 of 3

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EQUIPMENT:

Equipment and systems covered by this Certificate are as follows:

The I.S. Pressure and Flow Monitor design requires one or more than one barrier in order to fulfil its purpose. Refer to Alicat IS-Max IS-Pro Control Drawing for Entity Parameters for details. The I.S. MAX has one or two valves for flow control, whereas the I.S. PRO has no valves. The MAIN board and DISPLAY board are unchanged between the two variants. The device measures one or more pressures and modulates an external valve in order to control a pressure or a flow rate through the device. Additional sensing is done with a thermistor (temperature) and optional humidity sensor and/or barometric pressure sensor for additional corrections. Multiple interfaces are available in the range of serial (RS485 or RS232), analog (4-20mA in/out) discrete inputs, as well as an optional display and keypad. Each of the interfaces require a barrier, except, potentially the discrete inputs, which could be serviced by a simply switch closure and no additional energy limitation.

Ambient Temperature Range: -20 °C to +70 °C

Electrical Data: See Annex 1.

SPECIFIC CONDITIONS OF USE: YES as shown below:

The black metal sections of the enclosure are anodized aluminum and are a potential impact ignition source. Protect the apparatus from impact and abrasion as appropriate for the installation zone.

Annex:

[382861600-ExTR22.0070.00-Annex 1.pdf](#)

Description

Alicat IS-MAX and IS-PRO pressure and flow gauges, meters, and controllers designated by model numbers ISXXX-XX-XXX-XX-XX-X-X (where X are alphanumeric designations of part configuration) require one or more than one barrier to function depending on configuration. Refer to the control drawing in DOC-MAN-SAFEINSTALL (recapitulated below) for individual entity parameters and other electrical information.

Model designations beginning with **ISMC, ISLC, and ISPC** include one or two control valves. All other model designations do not. The MAIN board is unchanged between all variants. Some Variants may, optionally, omit a display as noted in the type designation/part numbering system below.

All variants are intended to be connected to fluid processes. All devices measure the process pressure and ambient conditions. Some devices may additionally measure process humidity and temperature to provide additional information or provide additional corrections or control. Variants with control valves may modulate those valves to control the pressure of or flow rate through attached plumbing.

Multiple interfaces are available in the range of serial (RS485 or RS232), analog (4-20mA in/out) discrete inputs, as well as an optional display and keypad. Each of the interfaces require a barrier, except, potentially the discrete inputs, which may be serviced by a switch closure with no additional energy limitation.

Type designation

ISXXX-XX-XXX-XX-XX-X-X (where 'X' represents alphanumeric designations of part configuration). An extended description of the part numbering system and how model designations affect the installation of the device is included at the end of this document.

Thermal data

Rated ambient temperature range (°C): -20 °C to +70 °C
See drawing 510577 – IS enclosure Back Label

External sources of heating (process gas temperature) are considered in the temperature assessment. Installation instructions mandate that the process fluid cannot exceed the -20 to +70°C ambient temperature limits.

Refer to: DOC-MANUAL-IS-SAFEINSTALLATION

Electrical data

Refer to: DOC-MANUAL-IS-SAFEINSTALLATION

CONTROL DRAWING: RECAPITULATED FROM DOC-MANUAL-IS-SAFEINSTALLATION

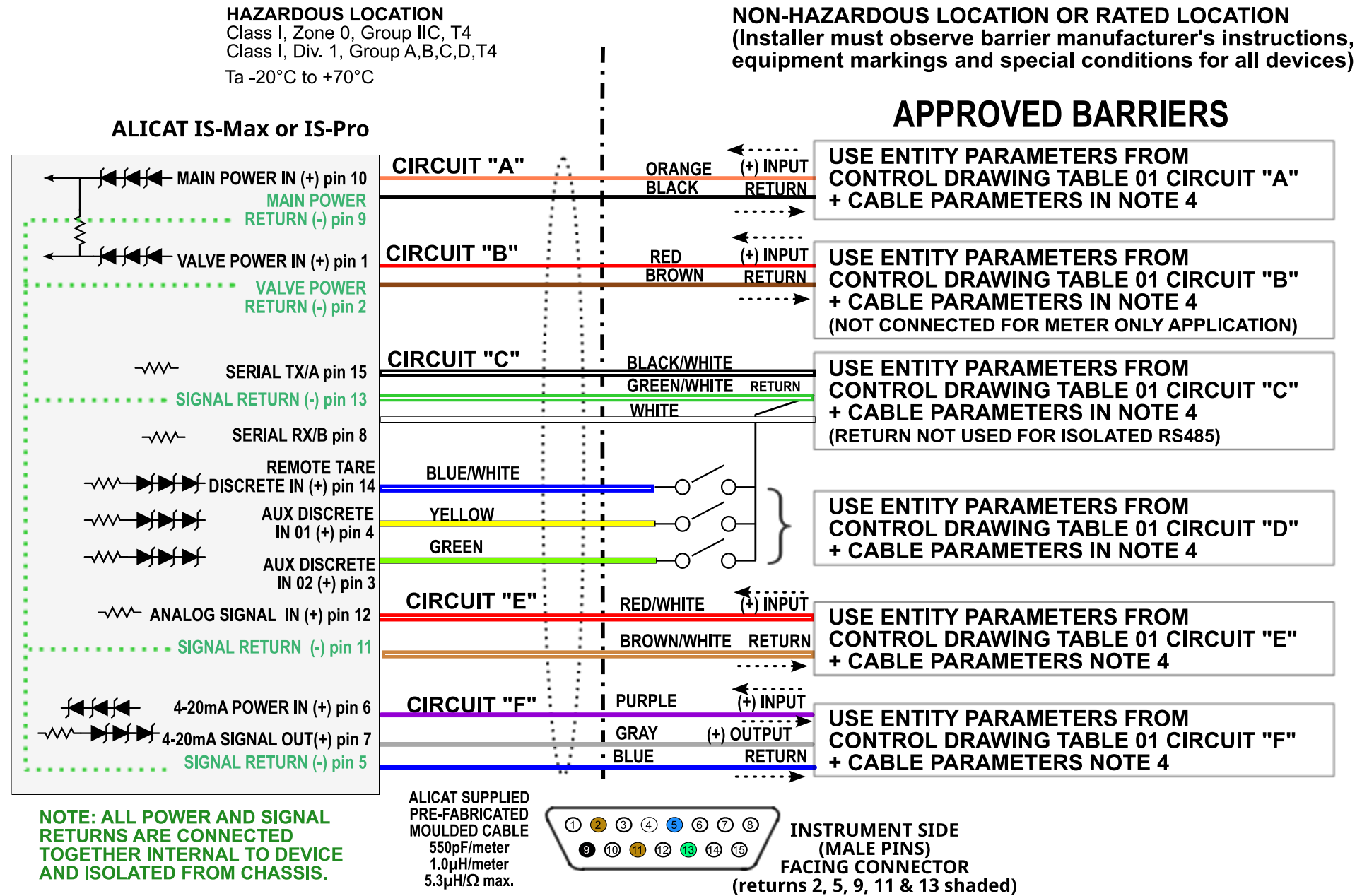


FIGURE 01 CONNECTION TO APPROVED BARRIERS



SIGNAL NAME	SIGNAL FUNCTION	CIRCUIT ON CONTROL DIAGRAM	IS-Max or IS-Pro CONNECTOR PIN	SIGNAL RETURN	Ui/Vmax	Pi	Ii	Ci	Li	Uo/Voc	Po	Io/Isc	Co	Lo
MAIN POWER IN	MAIN MODULE POWER INPUT	A	10	9	12.1V	INTERNALLY LIMITED	3.33A	0	0	N/A - BLOCKED WITH INFALLIBLE SERIES DIODES -★				
					13V		2.02A							
					14V		1.2A							
					15V		0.9A							
					15-28V		1.25W							
VALVE POWER IN	VALVE MODULE POWER INPUT	B	1	2	12.1V	INTERNALLY LIMITED	3.33A	0	0	N/A - BLOCKED WITH INFALLIBLE SERIES DIODES -★				
					13V		2.02A							
					14V		1.2A							
					15V		0.9A							
					15-28V		1.25W							
RS232RX, TX OR RS485A, B	SERIAL INTERFACE with respect to signal return	C★	8 & 15 together wrt return	13	28V	0.4W	0.12A	0	0	6.44V	490mW	656mA	25uF	68uH
					15V		0.9A							
RS485A, B	SERIAL INTERFACE to Isolated barrier	C⊕	8 wrt 15 or 15 wrt 8	none (isolated barrier)	28V	0.4W	0.12A	0	0	6.44V	285mW	177mA	25uF	1.135mH
					15V		0.9A							
REMOTE TARE	DISCRETE SWITCH INPUT (GND ACTIVE)	D	14	11	28V	N/A - BLOCKED WITH INFALLIBLE SERIES DIODES -★				6.44V	16mW	1mA	6.25uF	2.22uH
AUX DISCRETE 01			4								16mW	1mA	6.25uF	
AUX DISCRETE 02			3								16mW	1mA	6.25uF	
ANALOG SIGNAL IN	4-20mA, 0-5 OR 0-10V INPUT	E	12	11	28V	0.651W	93mA	0	0	6.44V	4mW	<1mA	6.5uF	2.22uH
4-20mA POWER IN	4-20mA POWER INPUT	F	6	5	28V	0.651W	93mA	0	0	N/A - BLOCKED WITH INFALLIBLE SERIES DIODES-★				
4-20mA SIGNAL OUT	4-20mA SIGNAL OUTPUT	F	7	5	28V	N/A - BLOCKED WITH INFALLIBLE SERIES DIODES				28V	0.651W	94mA	0.069uF	4.0239mH

* Each instrument is configured exclusively for RS232 or RS485 by internal jumpers. Use these parameters when using a barrier that is referenced to signal return.
 ⊕ Use these parameters for RS485 with a 2-wire an isolated barrier that is not referenced to signal return.
 ★ N/A - BLOCKED WITH INFALLIBLE SERIES DIODES: Three suitably rated series diodes are used internal to the device to only allow current in one direction and block all current in the other direction. In the case of an output, this means there is no Ui, Pi, Ii, Ci or Li. In the case of an input, this means there is no Uo, Po, Io, Co or Lo

TABLE 01 - SUMMARY OF INDIVIDUAL ENTITY PARAMETERS

THE USER IS PERMITTED TO UTILIZE THE SUMMARY OF INDIVIDUAL ENTITY PARAMETERS IN TABLE 05 OF THIS DOCUMENT TO INTERPRET ADDITIONAL CONFIGURATIONS OF BARRIERS NOT SHOWN IN THE EXAMPLE CONFIGURATIONS. THE ENTITY CONCEPT MUST BE FOLLOWED. THIS IS THE RESPONSIBILITY OF THE INSTALLER TO INVOLVE PERSONEL SKILLED IN MAKING THE ASSESSMENT. (REF IEC 60079-14 A.2)

THE IS-Max or IS-Pro DESIGN IS SUCH THAT THE INTERFACES MAY BE GROUPED INTO THREE (3) SEPARATE INTRINSICALLY SAFE CIRCUITS CONSISTING OF CIRCUIT A, CIRCUIT B AND THE SUM OF THE CIRCUITS C, D, E AND F. THE SEPARATE CIRCUITS MAY ALSO BE COMBINED WHERE THE ASSOCIATED BARRIER(S) FIT WITHIN THE ENTITY PARAMETER CALCULATIONS.

THE ENTITY PARAMETERS FOR THE POWER CONNECTIONS ARE DEFINED IN TABLE 1, CIRCUITS A AND B. MAIN POWER (CIRCUIT A) IS ALWAYS NECESSARY. VALVE POWER (CIRCUIT B) IS OPTIONAL IN THE CASE OF A METER ONLY DEVICE. CIRCUIT A AND CIRCUIT B ARE SERVED BY SEPARATE BARRIERS OR CAN BE BOTH SUPPLIED BY A SINGLE BARRIER. FOR <15V, POWER IS INTERNALLY LIMITED PER THE SAFETY CONCEPT. FOR 15-28V, THE BARRIER POWER IS RESTRICTED TO 1.25W PER THE SAFETY CONCEPT.

12V MAXIMUM IS RECOMMENDED FOR BEST VALVE PERFORMANCE (NOT A SAFETY REQUIREMENT).

THE ENTITY PARAMETERS FOR THE SERIAL CONNECTIONS ARE DEFINED IN TABLE 1 CIRCUIT C. EACH INSTRUMENT IS FACTORY CONFIGURED EXCLUSIVELY FOR RS232 OR FOR RS485 BY INTERNAL JUMPERS.

WHEN THE BARRIER IS RS485 AND HAS NO COMMON RETURN (ISOLATED), THE ENTITY PARAMETERS ONLY APPLY BETWEEN THE SIGNAL CONDUCTORS AND NOT TO RETURN.

THE ENTITY PARAMETERS FOR THE DISCRETE INPUT CONNECTIONS ARE DEFINED IN TABLE 1, CIRCUIT D. THESE SIGNALS ARE NOT REQUIRED TO BE SEPARATE INTRINSICALLY SAFE CIRCUITS FROM ANY OTHER CIRCUIT ON THE SIGNAL CONNECTOR. SIGNALS ARE ACTIVATED BY CONNECTION TO RETURN. THIS COULD BE A SIMPLE SWITCH CONTACT OR AN INTRINSICALLY SAFE RELAY OR DISCRETE OUTPUT BARRIER. THE SIGNALS ARE DIODE BLOCKED AND THUS PROTECTED FROM AN EXTERNAL U_m . THESE SIGNALS MAY HAVE ENTITY PARAMETERS COMBINED WITH OTHER SIGNALS IN THE SAME DEVICE.

ENTITY PARAMETERS FOR THE ANALOG INPUT CONNECTION IS DEFINED IN TABLE 1, CIRCUIT E. THE 4-20mA/0-5V/0-10V INPUT IS SOFTWARE SELECTED FOR VOLTAGE OR CURRENT, HOWEVER THE SELECTION DOES NOT AFFECT THE ENTITY PARAMETERS.

THE 4-20mA POWER IN/SIGNAL OUT CIRCUIT (CIRCUIT F) ACCEPTS POWER FROM A BARRIER (PIN 6), PROVIDES DIODE ISOLATION, ADDS 4-20mA CONTROL, AND DELIVERS THE CURRENT BACK OUT ON PIN 7. FOR THE EVALUATION OF ENTITY PARAMETERS, THE OUTPUT U_o/V_{oc} , I_o/I_{sc} , P_o FROM PIN 7 IS \leq THE ENTITY PARAMETERS OF THE BARRIER CONNECTED TO PIN 6.

	SIGNAL	WIRE COLOR	CONNECTOR PIN
CIRCUIT A	MAIN POWER (+)	ORANGE	10
	MAIN POWER RETURN	BLACK	9
CIRCUIT B	VALVE POWER (+)	RED	1
	VALVE POWER RETURN	BROWN	2
CIRCUIT C	SERIAL Rx/B	WHITE	8
	SERIAL Tx/A	BLACK+WHITE STRIPE	15
	SERIAL/DISCRETE SIGNAL RETURN	BROWN+WHITE STRIPE	11
CIRCUIT D	REMOTE TARE DISCRETE (+)	BLUE+WHITE STRIPE	14
	AUX DISCRETE 01 (+)	YELLOW	4
	AUX DISCRETE 02 (+)	GREEN	3
CIRCUIT E	ANALOG IN SIGNAL RETURN	GREEN+WHITE STRIPE	13
	ANALOG SIGNAL IN (+)	RED+WHITE STRIPE	12
CIRCUIT F	4-20mA POWER IN (+)	PURPLE	6
	4-20mA SIGNAL OUT (+)	GRAY	7
	4-20mA POWER/SIGNAL RETURN	BLUE	5

TABLE 02 - ALICAT SUPPLIED CABLE PIN OUT AND COLOR CODES

MAXIMUM CABLE ENTITY VALUES OF 550pF/meter, 1µH/meter and 5.3µH/Ω

GENERAL NOTES:

1. CONTROL EQUIPMENT CONNECTED TO BARRIER MUST NOT USE OR GENERATE MORE THAN 250V
2. APPROVED BARRIERS MUST BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
3. THIS IMPLEMENTATION UTILIZES A CABLE CONTAINING MORE THAN ONE INTRINSICALLY SAFE CIRCUIT (REF IEC 60079-25 8.3). USE ONLY ALICAT SPECIFIED CABLE. THE ALICAT SPECIFIED CABLE IS IN ACCORDANCE WITH THE REQUIREMENTS OF A MULTI-CIRCUIT CABLE TYPE A OR TYPE B, AS SPECIFIED IN IEC 60079-14. THE ALICAT SUPPLIED CABLE IS CONSTRUCTED WITH SOLID INSULATION PER IEC 60079-11 EDITION 6 TABLE 5, FOR <30V, WHERE APPROPRIATE SEPARATION IS APPLIED IN ORDER TO FACILITATE CERTIFICATION WITH MULTIPLE INTRINSICALLY SAFE CIRCUITS IN ONE CABLE.
4. **THE ALICAT SUPPLIED CABLE FOLLOWS THE MAXIMUM ENTITY VALUES OF 550pF/meter, 1µH/meter and 5.3µH/Ω.**
WHERE A BARRIER OMITTS A PARAMETER, THAT PARAMETER IS NOT REQUIRED. FOR EXAMPLE, A CERTAIN IS POWER SUPPLY CERTIFICATE STATES A MAXIMUM VALUE FOR L/R WITHOUT STATING L. THIS MEANS THAT ONLY L/R NEEDS TO BE CONSIDERED AND AN EQUIVALENT L VALUE NEED NOT BE ASSUMED OR INFERRED. LIKewise, ANOTHER IS POWER SUPPLY CERTIFICATE STATES L WITHOUT STATING L/R. IN THIS CASE AN EQUIVALENT L/R VALUE NEED NOT BE ASSUMED OR INFERRED.
5. ALL SIGNAL RETURNS ARE CONNECTED TOGETHER INTERNAL TO THE IS-Max or IS-Pro. THE INTERNAL CONNECTIONS ARE ISOLATED FROM CHASSIS. AS A RESULT, EXTERNAL VOLTAGES DO NOT NEED TO BE SUMMED.
6. ALL WIRING MUST RUN SEPARATELY IN THE ALICAT SUPPLIED CABLE AND TERMINATED AT THE BARRIER(S). MODIFICATION OF THE CABLE (OTHER THAN LENGTH) IS NOT PERMITTED.
8. NON-GALVANICALLY ISOLATED BARRIERS MUST BE CO-LOCATED AND MUST TERMINATE SAFETY GROUNDS TO THE SAME PHYSICAL EARTHING CONNECTION OR GROUNDING ROD. SEPARATED GROUNDS ARE NOT PERMITTED.
9. WHERE GALVANICALLY NON-ISOLATED BARRIERS ARE USED, THE INSTALLER MUST CONSIDER THAT RETURN CURRENT MAY BE SUMMED FOR ALL NON-ISOLATED BARRIERS (REF IEC 60079-25 ANNEX B). THE SUM OF THE CURRENTS FOR 2 OR MORE NON-GALVANICALLY ISOLATED BARRIERS CANNOT NOT EXCEED IEC 60079-11 TABLE A.2 AT THE VOLTAGE FOR THE HIGHER OR HIGHEST OF THE BARRIERS IN USE. THIS IS THE RESPONSIBILITY OF THE INSTALLER TO INVOLVE PERSONEL SKILLED IN MAKING THE ASSESSMENT. (REF IEC 60079-14 A.2)
10. INSTALL PER EN 60079-14, IEC 60079-14, ANSI/ISA-RP12.6, ANSI/NFPA 70 (US NATIONAL ELECTRICAL CODE), CSA C22.1 (CANADIAN ELECTRICAL CODE) (AS APPLICABLE) AND APPLICABLE LOCAL INSTALLATION CODES.
11. THE USER IS PERMITTED TO UTILIZE THE SUMMARY OF INDIVIDUAL ENTITY PARAMETERS IN TABLE 01 OF THIS DOCUMENT TO INTERPRET ADDITIONAL CONFIGURATIONS OF BARRIERS NOT SHOWN IN THE EXAMPLE CONFIGURATIONS. THE ENTITY CONCEPT MUST BE FOLLOWED. THIS IS THE RESPONSIBILITY OF THE INSTALLER TO INVOLVE PERSONEL SKILLED IN MAKING THE ASSESSMENT. (REF IEC 60079-14 A.2)
12. REFER TO THE ALICAT SCIENTIFIC INSTRUCTION MANUAL FOR ADDITIONAL REQUIREMENTS AND APPLICATION EXAMPLES.
13. WARNING - SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.
AVERTISSEMENT: LA SUBSTITUTION DE COMPOSANTS PEUT COMPROMETTRE LA SÉCURITÉ INTRINSÈQUE.
14. WARNING: EXPLOSION HAZARD – DO NOT DISCONNECT EQUIPMENT UNLESS PRIMARY POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZAROUS



Alicat Intrinsically Safe “IS-Pro & IS-Max” part numbering system:

Example Part #	ISPC	-	N	E	-	F	N	B	-	2	D	-	X	X	-	000	-	P01
Description :	Model Designator	-	Native Range Magnitude	Native Range Units	-	Seal Material	Port Threads	Port Size (Dash Size)	-	Serial Protocol	Display	-	2nd Sensor	O ₂ Clean	-	Upstream Valve	-	Downstream Valve
Model #s	ISM = Mass flow meter ISMS = Mass flow meter, Media-isolated sensor ISMQ = High-pressure mass flow meter ISMW = Low-pressure-drop mass flow meter ISMC = Mass flow controller ISMCS = Mass flow controller, Media-isolated-sensor ISMCQ = High-pressure mass flow controller ISMCW = Low-pressure-drop mass flow controller ISL = Liquid flow meter ISLC = Liquid flow controller ISP = Pressure gauge ISPS = Pressure gauge, media-isolated sensor ISPC = Pressure controller ISPCS = Pressure controller, media-Isolated sensor ISPCD = Closed volume or Dual-Valve Pressure controller ISPCDS = Closed volume or Dual-Valve pressure controller, media-Isolated sensor	-	A = 0.5 B = 1 E = 2 F = 5 G = 10 H = 15 I = 20 J = 30 K = 40 L = 50 N = 100 O = 200 P = 250 Q = 500 R = 1000 T = 1500 W = 2000 Y = 3000 Z = 5000 X = None or External Sensor	A = SCCM B = SLPM C = CCM D = LPM E = PSIA F = PSIG G = PSID H = inH₂OG I = inH₂OD H = PSIA, remote port I = PSIG, remote Port J = inH₂OG, remote port L=inH₂O X = None or External Sensor	-	F = FKM K = FFKM E = EPDM A = Silicone	N = NPT D = NeSSI G = BSPP J = SAE R = VCR Q = VCO M = Metric S = Compression	A = 1/16" (1) B = 1/8" (2) C = 1/4" (4) D = 3/8" (6) E = 1/2" (8) F = 5/8" (10) G = 3/4" (12) H = 1" (16) I = 1 1/4" (20) J = 1 1/2" (24) K = 2" (32) L = NeSSI M = 5MM/M5 N = 6mm O = 10mm P = 12mm Q = 18mm	-	2 = RS232 4 = RS485	X = None D = LCD	-	X = None T = Temperature R = Humidity Y = Both	X = None U= O₂ Cleaned	-	000 = No Valve P01 = Brass/ FKM .003" P02 = Brass/ FKM .010" P03 = Brass/ FKM .030" P04 = Brass/ FKM .050" P05 = Brass/ FKM .065" P06 = Brass/ FKM .070" P07 = Brass/ FKM .200" S01 = Steel/ FFKM .003" S02 = Steel/ FFKM .010" S03 = Steel/ FFKM .030" S04 = Steel/ FFKM .050" S05 = Steel/ FFKM.065"	-	P01 See upstream

Example Part #s and interpretation:

ISM-NB-FJC-2D-XX-P07-000 = 100 SLPM Mass flow controller, FKM process Seals, 1/4" SAE4 Ports (7/16-20 thread), RS-232. 0.200" Orifice brass/FKM upstream valve.

ISPCD-JE-ANB-2D-TU-P04-P05 = 30PSIA dual valve pressure controller, silicone process seals, 1/8" NPT Ports, RS-232, Display, Secondary Temperature Sensor, O2 Cleaning service, 0.050" Brass/FKM upstream valve, 0.065" Brass/FKM downstream valve

DETAILED DESCRIPTION OF MODEL DIFFERENCES:

The model designation system for Alicat IS devices provides for hundreds of thousands of possible parts. Type testing was performed on subassemblies in the most onerous configurations for each to ensure that any possible model variations meet the minimum construction and ignition safety requirements of an intrinsically safe device. The descriptions below provide specific information on which model designations affect the way the device operates as is relevant for an installation.

1. Model Designation:

Part number example: ISPCD-JE-ANB-2D-TU-P04-P05

The model designation begins with the 2-character combination "IS" for all models.

The third character of the model designation is either "M", "P", or "L".

- "ISM" designates an IS-Max EUT. "M" models are gas mass-flow devices which use three sensors to calculate mass flow rates.
- "ISL" designates an IS-Max EUT. "L" models are liquid/volumetric flow meters. These use three media-isolated sensors ported to the process to calculate water flow rates. Media-isolated sensors are electrically separated from the process by a thin steel membrane which covers a silicone filled drum. Pressure on the membrane transmits pressure to a sensor element hydraulically.
- "ISP" designates an IS-Pro EUT. "P" models typically port a single pressure sensor to the process for pressure feedback or control.
 - P models may also be configured with no internal sensors, instead substituting an external 4-20mA current signal for the primary sensor signal.

The Model designation may have a fourth and fifth letter designating the presence of valves.

- A "C" indicates a controller with a single valve.
- A "C" followed by a "D" indicates a controller with two valves. This configuration is only valid for pressure controllers. It is only possible to energize one valve at a time by design.

An optional, final letter "W", "Q" or "S" designates special sensor configurations.

- "W" models are gas mass flow models which use less restrictive flow paths. They are otherwise mechanically identical to non- "W" models.
- "Q" models are gas mass flow models which use a sensor with a higher maximum rated pressure.
- "S" models are flow or pressure models which use media-isolated sensors. "ISMS" and "ISMCS" models are mechanically identical to "ISL" devices. "ISPS/ISPCS/ISPCDS" models use media isolated sensors which are rated for higher pressures (3000 psi/205bar)
- If "W", "Q" or "S" is not specified the part is constructed with sensors.

Model designation differences affect the installation of, and the intrinsic safety of the device as follows:

- Models with included valves require an additional barrier to power those valves as denoted by "CIRCUIT B" in Figure 01 of the control drawing.
- Models intended for use with external sensors will connect those sensors to the analog input denoted by circuit E in Figure 01 of the control drawing. These sensors must obey the entity parameters appropriate for circuit E/ Table 01 of the control drawing or use an intervening barrier which does.

2. Native Range/Unit Designation

Part number example: ISPCD-JE-FNB-2D-TU-P04-P05

The native range portion of the model number is 2 characters long. The first character designates a number ranging from 0.5 to 5000 and the second character designates the base unit of measure. Native range model designations vary in size and mounting options.

Model differences in native range do not change the intrinsically safe properties or installation requirements of the device.

3. Seal Material Designation

Part number example: ISPCD-JE-FNB-2D-TU-P04-P05

Seal material is designated by a single character in the part numbering scheme. EUT Models which have different seal material designations are built with different elastomer gasket material at the pressure boundary, but not for the enclosure. All elastomers used are rated for at least the same range of operating temperatures as the device.

Model differences in seal material do not change the intrinsically safe properties or installation requirements of the device.

4. Port type and port size Designation

Part number example: ISPCD-JE-FNB-2D-TU-P04-P05

The type and size of threaded process ports machined into the EUT is designated by these two letters in the part number. The first letter designates a style and the second a nominal fitting/pipe size. A dash size is included in parenthesis in the reference table as an alternative standard for denoting fitting size. Model designations with a port size larger than the safe dimensions of the flow body and mounting screws are not valid. Pressure EUT models which are designated with ports larger than 0.25 will use the high-flow variant of the flow body. High flow variants are limited to pressures below 305psi (21bar).

Model Port type and port size in native range do not change the intrinsically safe properties or installation requirements of the device.

5. Serial interface Designation

Part number example: ISPCD-JE-FNB-2D-TU-P04-P05

A 2 or a 4 at this location in the part number designates which serial protocol an EUT is configured for. Options are either RS-485 or RS-232. The serial protocol is selected by a combination of mechanical jumpers and software changes.

Models designations for different serial interfaces affect the installation of and intrinsic safety of the device as follows:

- Models denoted ISXXX-XX-XXX-2 are RS-232 capable devices. To use the RS-232 interface for digital communication with these devices requires the use of a barrier limited to the entity parameters denoted by C* in table 01 of the control drawing.
- Models denoted ISXXX-XX-XXX-4 are RS-485 capable devices. To use the RS-485 interface requires the use of a barrier which meets the entity parameters denoted by C❖ in table 01 of the control drawing.
- Use of a digital communication in a daisy-chain or Bus configuration is possible if the sum of all barrier and cable parameters does not exceed the entity parameters of any connected device and grounding requirements are considered as noted in the General Notes section of the control drawing.

- The serial interface may be disconnected if the end user does not intend to use serial communication by trimming the wires flush and capping or sealing the unused wires as appropriate for local installation practices.

6. Display Designation

Part number example: ISPCD-JE-FNB-2D-TU-P04-P05

An “X” or a “D” at this location designates an EUT model with or without an LCD display and front control panel. Devices without a display use a solid anodized aluminum plate in place of the display.

Model differences in the display do not change the intrinsically safe properties or installation requirements of the device.

7. Secondary sensor designation

Part number example: ISPCD-JE-FNB-2D-TU-P04-P05

This portion of the part number is a single character which may designate one or more secondary sensors for a device. A secondary sensor is either a temperature sensor (“T”), a humidity sensor (“H”), or both (“Y”). Not all combinations of sensors may be relevant to all models.

Secondary sensor designations do not change the intrinsically safe properties or installation requirements of the device.

8. Oxygen cleaning designation

Part number example: ISPCD-JE-FNB-2D-TU-P04-P05

Model numbers with a “U” in this position undergo a special cleaning process to prepare them for pressurized oxygen service but are otherwise mechanically identical to “X” designated non-oxygen-cleaned devices.

This designation affects part cleanliness only. It does not change the intrinsically safe properties or installation requirements of the device.

9. Valve Selection designation

Part number example: ISPCD-JE-FNB-2D-TU-P04-P05

The type and location of valves is designated by two 3-character sequences at the end of the part number. The first sequence refers to valves on the left/upstream side of the device, and the second to valves on the right/downstream side of the device. Dual valve pressure controllers (ISPCD models) designate valves at both locations. Software settings are minorly affected by the valve location but not in a way that affects safety functions.

- EUT models with valve designations P01-P05 and S01-S05 use Parker brand “MDPro” series small pneumatic proportional control valves with orifice sizes ranging from 0.003” to 0.065”.
- EUT models with the valve designation P06 use Parker “HFPro” series valves, which otherwise have the same external dimensions/form factor as the MDPro valve.

- EUT models with the valve designation P07 use a parker VSO Max high flow valve which has a slightly larger form factor than the other valves.

Valve selection do not change the intrinsically safe properties or installation requirements of the device beyond what is described in the “Model designation” section for controllers which must use a separate barrier.

10. Adder Codes/Software configuration codes:

Part number example: ISPCD-JE-FNB-2D-TU-P04-P05 / GAS: XXX, HC, SENIN, RTL, RANGE: XXX...

P1/P2 ETC...

All EUTs use a second string of characters after the part number, separated by a forward slash. These are “adder codes”. Adder codes designate software configuration options such as calibration and control loop tuning instructions or default configuration settings so that a device is pre-configured for a user’s application.

Adder codes are separate from the model designation and do not affect the mechanical construction of or safety of any device.