Honeywell Analytics Asia Pacific Co., Ltd.

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Wireless Certification Agency and Relevant National Officer

c.c.
UL Verification Services Inc. (formerly UL CCS)
Certification Division
47173 Benicia Street
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To whom it may concern:

Honeywell Analytics Asia Pacific Co., Ltd. is applying the wireless certificate of gas detector, whose product name is Sensepoint XCL. In this letter, I would like to explain the EMC test samples, part number format of Sensepoint XCL and the engineering rationale for EMC test sample.

Introduction to Sensepoint XCL

Sensepoint XCL is a single sensor fixed gas detector, which supports the following interfaces dependent on the model – Analogue output (4-20 mA), Digital output (Modbus RTU), Relay output and Mobile output (Bluetooth Low Energy). Sensepoint XCL is available for the detection of the following gases:

- Oxygen (O2)
- Toxic gases
  – Ammonia (NH3)
  – Carbon dioxide (CO2)
  – Carbon monoxide (CO)
  – Hydrogen (H2)
  – Hydrogen sulfide (H2S)
  – Nitrogen dioxide (NO2)
- Combustible gases

Hardware Configuration of Sensepoint XCL

Sensepoint XCL has only one PCB Assembly but there are 4 kinds of PCB Assemblies per the gas sensor types and interfaces:

NO	Gas Sensor Types	Possible interfaces	PCB BOM (Honeywell Part Number)	Schematic (Honeywell Part Number)
1	Electro Chemical Cell (O2 and Toxic)	4-20 mA, Relay and Bluetooth	3017B0564 (BOM Toxic) 3017B0565 (BOM O2)	3017C0500
2	Electro Chemical Cell (O2 and Toxic)	Modbus, Relay and Bluetooth	3017B0566 (BOM Toxic) 3017B0567 (BOM O2)	3017C0501
3	Flammable Catalytic and Infrared	4-20 mA, Relay and Bluetooth	3017B0568 (BOM FL/IR)	3017C0502
4	Flammable Catalytic and Infrared	Modbus, Relay and Bluetooth	3017B0569 (BOM FL/IR)	3017C0503

Part Number Format of Sensepoint XCL

Sensepoint XCL has 14 digits part number to identify detail configuration. The following shows the detail description of part number format per each digit:

	Name	Type	Gas	Bluetooth	Output	Relay	Color	Entry	Certification	Buffer1	Buffer2
Digit	3	1	2	1	1	1	1	1	1	1	1

		EMC Concerns
Name:	1) SPL	NA (just product name)
Type:	1) L: Compliance version 2) C: Commercial version	NA (Compliance version and Commercial are only SW difference for display)
Gas:	1) O1: O2 2) C1: CO 3) H1: H2S (L) 4) H2: H2S (H) 5) G1: H2 6) N1: NO2 7) A1: NH3 (L) 8) F6: CH4 (CAT) 9) FR: CH4 (IR) 10) B1: CO2 (IR ppm) 11) B2: CO2 (IR Vol) 12) FP: C3H8 (IR)	Three difference sensors for EMC concern 1) Electro-chemical cell 2) Flammable catalytic sensor 3) Infrared sensor
Bluetooth:	1) B: Bluetooth	Bluetooth as a full load condition
Output:	A: mA M: Modbus	Each model of mA and Modbus should be tested separately for EMC
Relay:	X: No Relay R: Relay	Relay as a full load condition

Color:	C: Charcoal (All) W: White (For Compliance & Commercial)	NA (Enclosure color)
Entry:	X: N/A	NA
Certification:	N: General	NA
Buffer 1:	Z	NA
Buffer 2:	Z	NA

Part Number Example:

SPLCO1BMRWXNZZ:
Sensepoint XCL/Commercial Version/O2 Gas/Bluetooth/Modbus Output/Relay/White enclosure

Rationale of EMC Test Sample

Based on the part number format of Sensepoint XCL, EMC concerns for each part number category is summarized in the above table. As a full load condition and communication options, Bluetooth and Relay are picked for EMC test sample. In addition, Gas sensors are important in EMC concerns as there are three different sensor types in Sensepoint XCL. Finally, output option (mA or Modbus) is one of key difference because we have different PCB model for each mA and Modbus output.

Detail of gas sensor types:
1. Electro-chemical cell (ECC)
Basically, ECC is chemical type that reacts to the target gas. When ECC is exposed to the target gas, an oxidation-reduction reaction happens in ECC and finally ECC generates the current signal. This current signal is usually uA or nA, so this current signal is amplified in gas detector's PCB by proper resistance. In conclusion, ECC is chemical so ECC is not a source of EMC noise and/or is not affected by external EMC noise. In Sensepoint XCL, we have 7 kinds of ECC: O2, CO, H2S(L), H2S(H), H2, NO2 and NH3(L). We will test O2 and CO model because these two models are the most widely used in gas detector business.

2. Flammable catalytic sensor (FL-CAT)
There is a thin filament in FL-CAT sensor. The filament is burning very slightly in the normal ambient air by reacting with the catalytic surrounding the filament. When the flammable gas exist, the filament burns more which results in more voltage output from FL-CAT sensor. In Sensepoint XCL, we have only 1 type of FL-CAT sensor – this sensor is tested for EMC

3. Infrared sensor (IR sensor)
There is an Infrared signal source and receiver in IR sensor. When the target gas exists, the spectrum of infrared signal is changed so infrared signal receiver can monitor the difference of infrared spectrum. In Sensepoint XCL, there are 4 kinds of IR sensor: CH4 IR, CO2 IR ppm, CO2 IR Vol and C3H8 IR. The operation principal is exactly same but the software of each IR sensor is different to focus on target gas. This change does not impact on EMC so Honeywell picked CH4 IR as a representative of IR sensor, which is the most widely used in gas detector industry.

EMC Test Samples

As described in part number format of Sensepoint XCL, there are so many configuration in Sensepoint XCL. In terms of EMC test, there could be 96 models, e.g. 2(Type) X 12(Gas) X 1(Bluetooth) X 2(Output) X 2(Relay) = 96. Due to the limited resources, it is impossible to test all 96 models for EMC. Therefore, Honeywell Analytics has reviewed the design of Sensepoint XCL and picked below samples as a representative of EMC test sample:

1) SPLCO1BMRWXNZZ: O2 gas/Bluetooth/Modbus/Relay/White enclosure
2) SPLCC1BARCXNZZ: CO gas/Bluetooth/mA/Relay/Charcoal enclosure
3) SPLCF6BMRWXNZZ: CH4 (CAT)/Bluetooth/Modbus/Relay/White enclosure
4) SPLCF6BARCXNZZ: CH4 (CAT)/Bluetooth/mA/Relay/Charcoal enclosure
5) SPLCFRBMRWXNZZ: CH4 (IR)/Bluetooth/Modbus/Relay/White enclosure
6) SPLCFRBARCXNZZ: CH4 (IR)/Bluetooth/mA/Relay/Charcoal enclosure

We believe these EMC test samples can cover the entire models of Sensepoint XCL.

Sincerely Yours,

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