

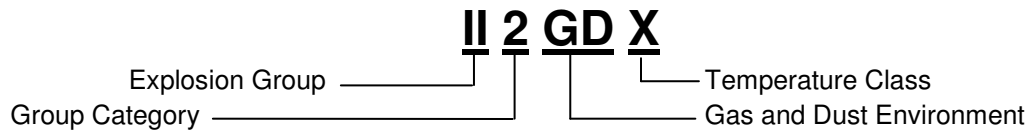
# Service Bulletin

CCN -

## ATEX Classification Air Operated Diaphragm Pumps

Release: 02-26-13  
Revision: 01  
Revised Date 04-08-13  
Bulletin: #1-13

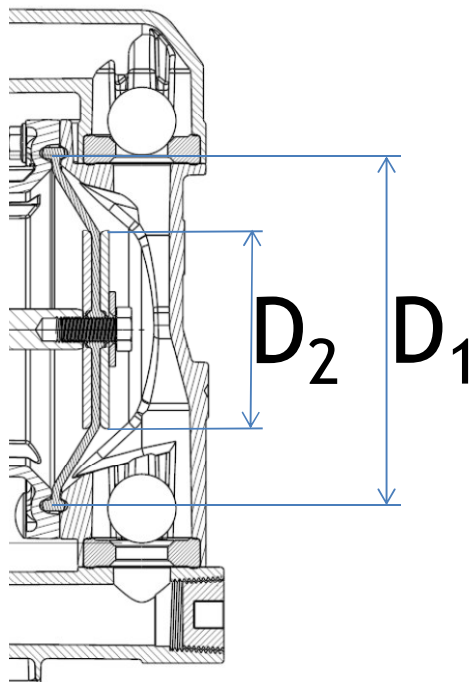
ARO diaphragm pumps conform to ATEX above noted directives and standards for environments Group II 2GD X per the declaration of conformity found in S-631(97999-623), current revision level RevAF.



The above noted directives and standards provide guidance for the product certification and is not manufacturing site specific for Group II applications.

Explosion groups are classified per section 4.2. Equipment without any group marking can be used in group IIA, IIB, IIC.

Diaphragms in all ARO diaphragm pumps are not made with an electrically conductive material. EN 13463-1; 2009, Section 6.7.5, Table 9 provides guidance which allows for use of non-conductive materials in Group II environments which are surrounded by earthed frames.



Non Conductive Material Section

$$\text{Area} = \pi/4 (D_1^2 - D_2^2)$$

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| EXP Pump Size | D1<br>(mm) | D2<br>(mm) | Area<br>(cm <sup>2</sup> ) |
|---------------|------------|------------|----------------------------|
| PD01x-x-x     | 77.2       | 0          | 46.9                       |
| PD02P-x-x     | 77.2       | 0          | 46.9                       |
| Px03x-x-x     | 80.5       | 37.3       | 40.0                       |
| Px05x-x-x-B   | 101.6      | 50.8       | 60.8                       |
| Px10x-x-x     | 158.8      | 92.1       | 131.4                      |
| Px10E-x-x     | 158.8      | 0          | 198.1                      |
| Px15x-x-x     | 214.0      | 138.1      | 209.7                      |
| Px15E-x-x     | 214.0      | 0          | 359.7                      |
| Px20x-x-x-B   | 276.2      | 180.9      | 342.1                      |
| Px20E-x-x     | 276.2      | 0          | 599.2                      |
| Px30x-x-x-C   | 352.4      | 228.6      | 564.5                      |

| Pro-Series Pump Size   | D1<br>(mm) | D2<br>(mm) | Area<br>(cm <sup>2</sup> ) |
|------------------------|------------|------------|----------------------------|
| 666056-x/66605H-x      | 101.6      | 0          | 81.1                       |
| 66x10x-x-C/666x12x-x-C | 155.6      | 92.1       | 123.5                      |
| 66x15x-x-C/66x17x-x-C  | 247.7      | 158.4      | 284.4                      |
| 66x25x-x-C             | 256.8      | 180.9      | 260.8                      |
| 66x-3x-x-C             | 326.3      | 228.6      | 425.9                      |

The table above provided that non-conductive material surface area for EXP and Pro-Series diaphragm pumps.

Section 6.7.5, Table 9 provides guidance for use of non-conductive materials which are surrounded by and earthed frame:

| Category 2                                                                    | IIA                 | IIB                 | IIC                |
|-------------------------------------------------------------------------------|---------------------|---------------------|--------------------|
| Allowable Area of Non-Conductive Material<br>When Surrounded by Earthed Frame | 400 cm <sup>2</sup> | 400 cm <sup>2</sup> | 80 cm <sup>2</sup> |

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Reviewing ARO's risk assessment per EN13463-1, the use of non-conductive materials has been recognized and determined that the risk is low based +30 years of pumping materials with low ignition energy in potentially explosive environments:

- ARO has pumps registered with Underwriters Laboratories for handling explosive hydrocarbons, UL-79, and there is no limitations to surface area of the non-conductive materials only that those material be bounded by earthed frames.
- National Fire Protection standard, NFPA 77, recognizes UL-79 as the leading standard for handling explosive hydrocarbons. NFPA 77 provides guidance on equipment for handling materials with low ignition energy.
- ARO has conducted electrostatic energy testing on non-conductive pumps and has an understanding that (+) ions are created during the pumping action on the surfaces of the non-conductive materials. Those (+) charges migrate towards and can only collect and accumulate on electrically conductive materials. If there can be collection of sufficient charge on a surface, a spark can jump a gap to earth but only if the charge contains sufficient energy to jump said gap. If the equipment is properly grounded, the charge cannot accumulate.

Based on our history of transferring low ignition materials and the above testing and certification, it has been concluded that ARO diaphragm pumps would be classified for all group II applications.

Temperature classification is listed as "X" as allowed by section 6.2.5 to inform the user of special situations. With the ARO product line, the special condition is the various materials of construction which are available. S-631 (97999-623), current revision level RevAF, contains temperature rating information for all the various materials which are used in ARO air operated diaphragm pumps. There is also a recommendation to the user to use the temperature rating of the lowest rated material. It is common practice that ARO distributors and customers re-configure pumps based on the application. The "X" classification allows for the re-configuration without a new marking for temperature classification.