



1 CONFORMITÉ EUROPÉENE

EU - TYPE EXAMINATION CERTIFICATE

2 Product or Protective System Intended for use in Potentially Explosive Atmospheres
Directive 2014/34/EU – Annex III

3 EU - Type Examination

Certificate No.:

ERO21ATEX0012X

4 Product: ARO EXP and Compact Diaphragm Pumps

Model Nos: PZ05X-XXX-XXX-BXX, PZ10X-XXX-XXX-AXX,

PZ15X-XXX-XXX-AXX, PZ20X-XXX-XXX-BXX, PZ30X-XXX-XXX-CXX

5 Manufacturer: Ingersoll-Rand Company

6 Address: 209 North Main Street, Bryan, Ohio 43506, United States of America

7 This product and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8 Element Materials Technology, Notified Body number 2812, in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive. The examination and test results are recorded in the confidential report **TRA-051480-33-00A**.

Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN IEC 60079-0:2018

EN ISO 80079-36:2016

EN ISO 80079-37:2016

Except in respect of those requirements listed at section 18 of the schedule.

- 10 If the sign "X" is placed after the certificate number, it indicates that the product is subject to specific conditions of use specified in the schedule to this certificate.
- 11 This EU TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.
- 12 The marking of this product shall include the following:



II 1 G Ex h IIC T4 Ga

II 1 D Ex h IIIC T135°C Da

See section 15 for Ambient Temperature limitations.

This certificate and its schedules may only be reproduced in its entirety and without change. This certificate is issued in accordance with the Element Materials Technology Ex Certification Scheme.

S.P. Wilson

S P Winsor, Certification Manager

Issue date: 2022-05-06 Page 1 of 13 CSF355-NL 5.0



13 SCHEDULE TO EU - TYPE EXAMINATION CERTIFICATE

14 CERTIFICATE NUMBER ERO21ATEX0012X

15 Description of Product

ARO EXP and Compact Diaphragm Pumps are non-electrical, air operated double diaphragm pumps. They are positive displacement pumps that use pressurized air to reciprocate the diaphragms. The volume change of the chambers from the diaphragms flexing flows light to medium viscosity fluids. The diaphragms can be made from various elastomers and polymers and are the barrier between the pressurized air and fluid being pumped. ARO pumps feature stall resistant design, modular air motor / fluid sections.

The pumps have metallic external components.

Pump cycling will begin as air pressure is applied and it will continue to pump and keep up with the demand. It will build and maintain line pressure and will stop cycling once maximum line pressure is reached (dispensing device closed) and will resume pumping as needed.

Basic design and operating principles are the same between models. The main difference is size. The two numbers in the first 5 digits indicate the pipe size of the pump: PZ05 is ½ inch, PZ10 is 1 inch, PZ15 is 1.5 inch, PZ20 is 2 inch, PZ30 is 3 inch.

All the air motors have a major valve and pilot valve that direct pneumatic signals that cause the diaphragms to reciprocate. The pilot valve has an actuator pin that is pushed that signals when the diaphragm is at the end of the fluid intake stroke. All have diaphragms that are connected through a connecting rod with support washers behind the diaphragms. The fluid chambers are opened and closed using check balls that seal against seats. All pumps have 2 diaphragms, 4 balls and 4 seats.

The material choices can vary for external components: centre body, fluid caps, inlet and outlet manifolds. For example, the PZ05 models can only have an aluminium centre body (exterior air motor case) while the PZ10, PZ15, PZ20 and PZ30 models have a stainless-steel option.

The material choices can also vary for internal components: check balls, seats and diaphragms. For example, the PZ30 models have 9 seat material options while the PZ05 models only have 3.

Manifolds starting with the PZ15 and larger can have additional flange options along with NPT and BSP.

There are some minor design differences, such as additional O-rings in slightly different locations, ribbed geometry instead of smooth wall, studs instead of bolt and nut fasteners.

The seat, ball and diaphragm materials for metallic pumps establish the ambient and pump temperature limitations.

Use the model code description chart for ball, seat, diaphragm material and the temperature limits table below to determine the temperature range for each pump model.

From the temperature limit table below:

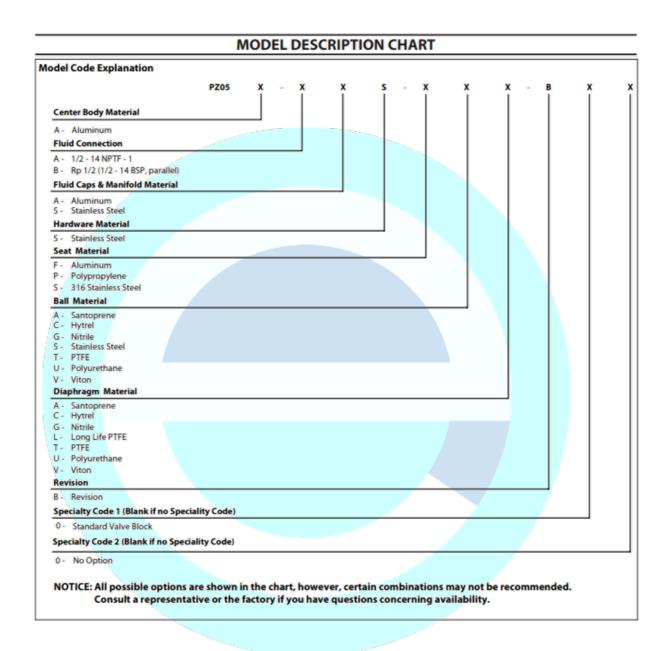
Example: PZ10X-XXX-AAA-AXX. AAA code is located in the first temperature range.

Result: -20°C to +40°C ambient temperature limit and -40°C to +78°C pump temperature limit.

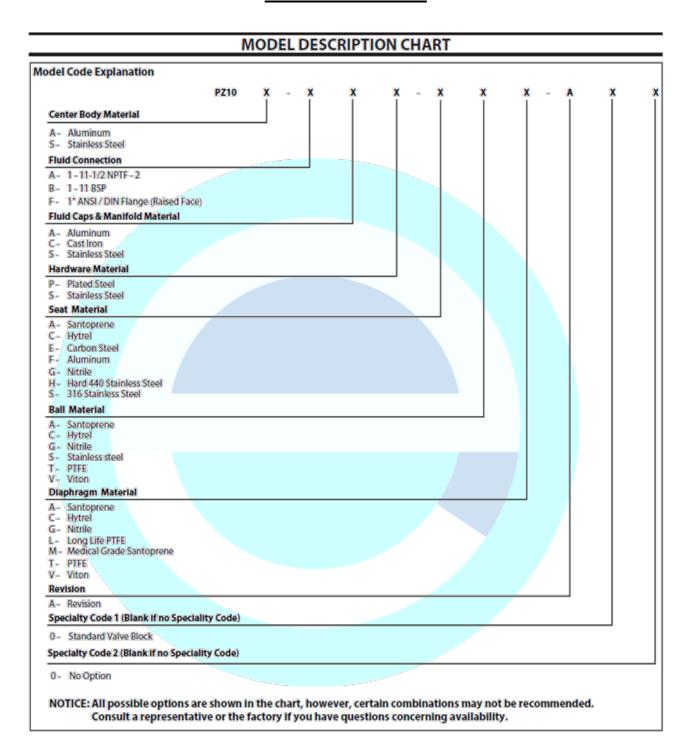
TEMPERATURE LIMITS

Ambient Temperature Limits	Air Inlet and Process Fluid Temperature Limits	Ball, Seat, Diaphragm Model Code Letters Example: PZ10X-XXX-XXX									
-20°C to +40°C -4°F to +104°F	Limits	AAA	AAB	AAM	AAV	ASA	ASB	ASM	ASV	AVA	AVB
		AVM	AVV	EAA	EAB	EAV	ESA	ESB	ESV	EVA	EVB
	-40°C to +78°C -40°F to +172°F	EVV	FAA	FAB	FAV	FSA	FSB	FSV	FVA	FVB	FVV
		HAA	HAB	HAV	HSA	HSB	HSV	HVA	HVB	HVV	SAA
		SAB	SAV	SSA	SSB	SSV	SVA	SVB	SVV		
-20°C to +40°C -4°F to +104°F	-29°C to +78°C -20°F to +174°F	AAC	ACA	ACB	ACC	ACM	ACV	ASC	AVC	CAA	CAB
		CAC	CAM	CAV	CCA	CCB	CCC	CCM	CCV	CSA	CSB
		CSC	CSM	CSV	CVA	CVB	CVC	CVM	CW	EAC	ECA
		ECB	ECC	ECV	ESC	EVC	FAC	FCA	FCB	FCC	FCV
		FSC	FVC	HAC	HCA	HCB	HCC	HCV	HSC	HVC	SAC
		SCA	SCB	SCC	SCV	SSC	SVC				
		AAG	ACG	AGA	AGB	AGC	AGG	AGM	AGV	ASG	AVG
		CAG	CCG	CGA	CGB	CGC	CGG	CGM	CGV	CSG	CVG
		EAG	ECG	EGA	EGB	EGC	EGG	EGV	ESG	EVG	FAG
		FCG	FGA	FGB	FGC	FGG	FGV	FSG	FVG	GAA	GAB
		GAC	GAG	GAM	GAV	GCA	GCB	GCC	GCG	GCM	GCV
-12°C to +40°C	-12°C to +78°C	GGA	GGB	GGC	GGG	GGM	GGV	GSA	GSB	GSC	GSG
+10°F to +104°F	+10°F to +174°F	GSM	GSV	GVA	GVB	GVC	GVG	GVM	GW	HAG	HCG
		HGA	HGB	HGC	HGG	HGV	HSG	HVG	KAA	KAB	KAC
		KAG	KAV	KCA	KCB	KCC	KCG	KCV	KGA	KGB	KGC
		KGG	KGV	KSA	KSB	KSC	KSG	KSV	KVA	KVB	KVC
		KVG	KVV	SAG	SCG	SGA	SGB	SGC	SGG	SGV	SSG
000 to 14000		SVG			DAY					DCA.	
0°C to +40°C	0°C to +78°C	PAA PGG	PAC PGV	PAG PSA	PAV PSC	PCA PSG	PCC PSV	PCG PVA	PCV	PGA PVG	PGC
+32°F to +104°F	+32°F to +174°F		AAT	ACL	ACT	AGL	AGT	ASL	AST	ATA	ATB
		AAL	ATG	ACL	ATM	AGL	ATV	AVL		CAL	
+4°C to +40°C +40°F to +104°F	+4°C to +78°C +40°F to +174°F	CCL	CCT	CGL	CGT	CSL	CST	CTA	AVT CTB	CTC	CAT
		CTL	CTM	CTT	CTV	CVL	CVT	EAL	EAM	EAT	ECL
		ECM	ECT	EGL	EGM	EGT	ESL	ESM	EST	ETA	ETB
		ETC	ETG	ETL	ETM	ETT	ETV	EVL	EVM	EVT	FAL
		FAM	FAT	FCL	FCM	FCT	FGL	FGM	FGT	FSL	FSM
		FST	FTA	FTB	FTC	FTG	FTL	FTM	FTT	FTV	FVL
		FVM	FVT	GAL	GAT	GCL	GCT	GGL	GGT	GSL	GST
		GTA	GTB	GTC	GTG	GTL	GTM	GTT	GTV	GVL	GVT
		HAL	HAM	HAT	HCL	HCM	HCT	HGL	HGM	HGT	HSL
		HSM	HST	HTA	HTB	HTC	HTG	HTL	HTM	HTT	HTV
		HVL	HVM	HVT	KAL	KAM	KAT	KCL	KCM	KCT	KGL
		KGM	KGT	KSL	KSM	KST	KTA	KTB	KTC	KTG	KTL
		KTM	KTT	KTV	KVL	KVM	KVT	PAL	PAT	PCL	PCT
		PGL	PGT	PSL	PST	PTA	PTC	PTG	PTL	PTT	PTV
		PVL	PVT	SAL	SAM	SAT	SCL	SCM	SCT	SGL	SGM
		SGT	SSL	SSM	SST	STA	STB	STC	STG	STL	STM
		STT	STV	SVL	SVM	SVT					
-20°C to +40°C	-23°C to +66°C	FAU	FCU	FSU	FUA	FUC	FUU	FUV	FVU	SAU	SCU
-4°F to +104°F	-9°F to +150°F	SSU	SUA	SUC	SUU	SUV	SVU				
-12°C to +35°C +10°F to +95°F	-12°C to +66°C +10°F to +150°F	FGU	FUG	SGU	SUG						
		FTU	FUL	FUT	PAU	PCU	PGU	PSU	PUA	PUC	PUG
0°C to +40°C +32°F to +104°F	0°C to +66°C +32°F to +150°F	PUU	PUV	PVU	FTU	FUL	FUT	PTU	PUL	PUT	STU
T32 F (U T 104 F	T32 F (0 +130 F	SUL	SUT								

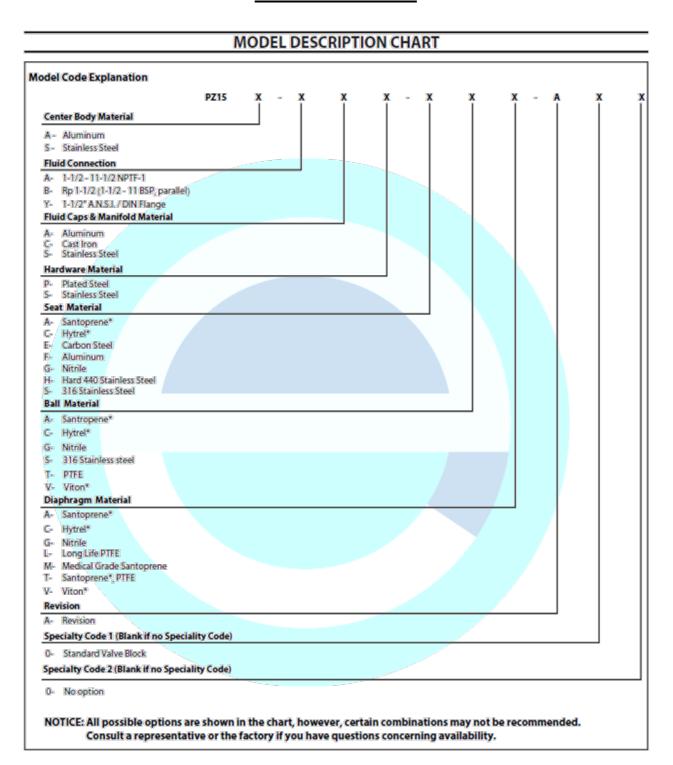
PZ05X-XXX-XXX-BXX



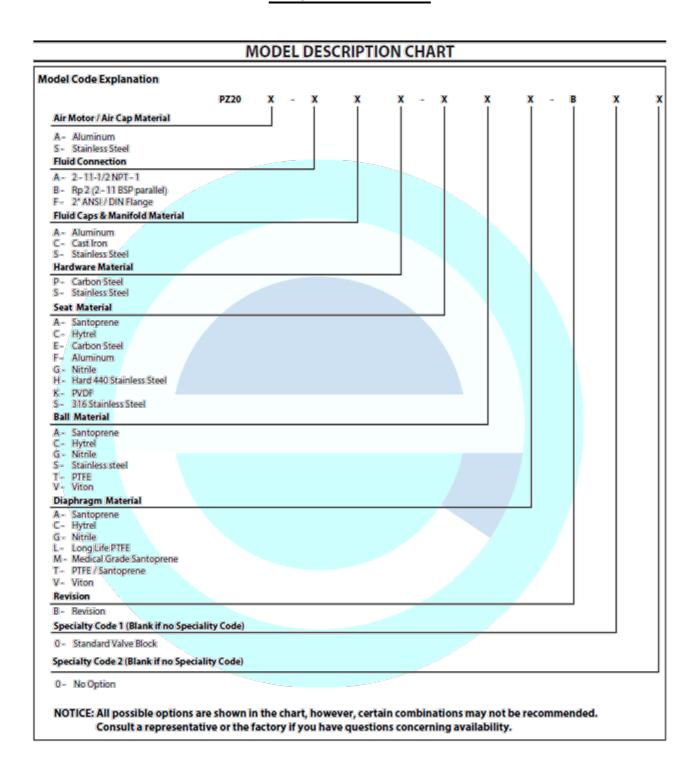
PZ10X-XXX-XXX-AXX



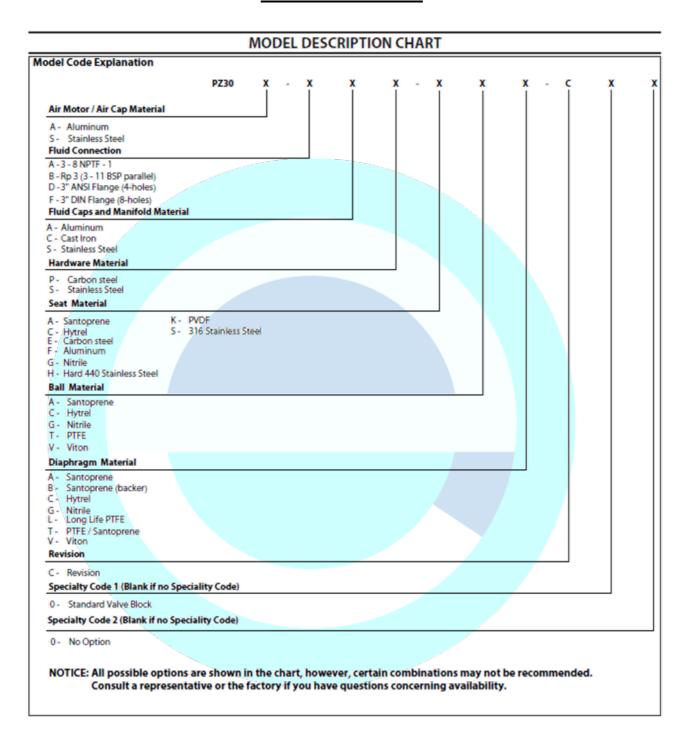
PZ15X-XXX-XXX-AXX



PZ20X-XXX-XXX-BXX



PZ30X-XXX-XXX-CXX



16 Test Report No. (as added for this issue of the certificate): TRA-051480-33-00A.

SCHEDULE TO EU - TYPE EXAMINATION CERTIFICATE

CERTIFICATE NUMBER ERO21ATEX0012X

17 Specific Conditions of Use

- 1. The seat, ball and diaphragm materials establish the ambient, air inlet and process liquid temperature limitations. Use the temperature table and the model code for ball, seat, diaphragm material to determine the temperature range for each pump model. Model code is explained in detail on the operator's manual.
- 2. Only FML-2 grease should be employed for lubrication of moving part.
- 3. Models containing aluminium parts cannot be used with 1,1,1-trichloroethane, methylene chloride or other halogenated hydrocarbon solvents which may react and explode.
- 4. Models containing aluminium must be mounted in such a manner as to eliminate the risk of sparks caused by friction or impact.
- 5. Regularly inspect coatings for damage and if damage occurs do not use in zone 0/20.
- 6. Protect pump from external damage.
- 7. Secure pump, connections and all contact points (bolting down at the feet) and clearance around the pump to avoid vibration and generation of contact or static spark.
- 8. Ensure that the pump will not exceed a maximum temperature of 25 °C lower than the auto-ignition temperature of the fluid being pumped.
- 9. This pump can be used in an area with zones Zone 0/20 Inside and outside the pump.
- 10. Potential electrostatic charging hazard clean only with a damp cloth.
- 11. Certain dusts may ignite at pump surface temperature limits. Ensure proper housekeeping to eliminate dust build up on the pump.
- 12. When assembled as a complete system, the sensors using for measuring the inlet air and fluid temperature, over pressure of inlet air and excessive vibration must be connected to a monitoring and shutdown system which is sufficiently reliable and compliant with the requirements for ATEX Safety related devices as defined in Annex II Clause 1.5.1 of Directive 2014/34/EU (i.e. b2 (SIL2) as defined by EN ISO 80079-37cl 6.5).
- 13. Trip points for the temperature and pressure monitoring system shall be set such that shutdown of the pump occurs if air inlet pressure exceeds 100 PSIG for ½ pump and 120 PSIG for all other models, or if the air inlet or fluid temperature exceeds the limitation on TEMPERATURE LIMITS table in the manual.
- 14. The ignition protection system (IPS) when installed in be subjected to functional and accuracy tests to ensure shutdown occurs if the limits specified by the manufacturer are exceeded.
- 15. Associated programmable electronic devices forming a part of ignition protection systems must be installed in a safe area or be suitably certified ATEX rated for the zone into which where are installed.



Attention is drawn to the operating and installation instructions which may contain useful information in relation to conditions of use.

18 Essential Health and Safety Requirements (Directive Annex II)

In addition to the Essential Health and Safety Requirements covered by the standards listed at item 9, all other requirements are demonstrated in the relevant reports.

19 Drawings and Documents

The list of controlled technical documentation is given in Appendix A to this schedule.

20 Routine Tests

None.

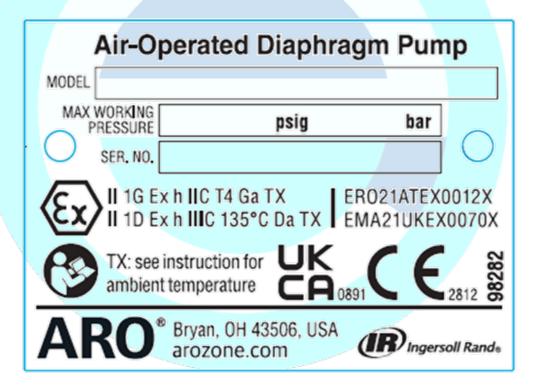
21 Specific Conditions for Manufacture

None.

22 Photographs



23 Details of Markings



24 Certificate History

Original certificate 2022-05-06 First issue.

This certificate is a consolidated certificate and reflects the latest status of the certification, including all variations and amendments.

25 Notes to CE marking

In respect of CE Marking, Element Materials Technology accepts no responsibility for the compliance of the product against all applicable Directives in all applications.

26 Notes to this certificate

Element Materials Technology certification reference: ERO035075P56 (GU-IRCQ-0001).

Throughout this certificate, the date format yyyy-mm-dd (year-month-day) is used.

Notified Body number 2812 is the designation for Element Materials Technology Rotterdam BV.

27 Conditions for the validity of this certificate

This certificate remains valid for so long as:

- (i) The equipment listed in section 4 is manufactured in accordance with the documents listed in Appendix A of this certificate.
- (ii) The standards listed in section 9 of this certificate continue to satisfy the Essential Health and Safety Requirements of Annex II of Directive 2014/34/EU and the generally acknowledged state of the art (e.g. as determined by the publishers of those standards).

APPENDIX A - TECHNICAL DOCUMENTS

Title:	Drawing No.:	Rev. Level:	Date:
CAP, AIR	15204027	L	2022-01-12
CAP, AIR	15204035	L	2022-01-11
VALVE ADAPTER PLUG	15217722	J	2022-01-12
VALVE HOUSING	15217730	К	2022-01-12
INLET MANIFOLD	15253073	G	2022-01-12
OUTLET MANIFOLD	15253081	L	2022-01-12
FLUID CAP	20033189	R	2022-01-12
BODY, CENTER	20035812	AA	2022-01-12
FLUID CAP	20064523	V	2022-01-12
CAP, AIR	20064531	AB	2022-01-12
CAP, AIR	20065090	W	2022-01-12
CAP, FLUID	20065108	N	2022-01-12
MANIFOLD, OUTLET	20065116	Р	2022-01-12
MANIFOLD, INLET	20065124	L	2022-01-12
MANIFOLD	20065645	N	2022-01-12
MANIFOLD	20065652	Т	2022-01-12
CENTER BODY	20074704	F	2022-01-12
EXHAUST COVER, MACHINED	20074712	K	2022-01-12
VALVE BLOCK	20074720	K	2022-01-12
AIR CAP	20090163	U	2022-01-12
MANIFOLD, OUTLET	20090189	Т	2022-01-12
MANIFOLD, INLET	20090197	M	2022-01-12
MANIFOLD, INLET	20090445	F	2022-01-12
VALVE HOUSING	20090643	L	2022-01-12
MANIFOLD, OUTLET	20090692	G	2022-01-12
BODY, CENTER	81710832	AA	2022-01-12
FLUID CAP	95935-X	F	2022-01-12
Label	97930	В	2022-01-12
Model LABEL Artwork ATEX Zone 0 Warning Label text	97930AW	В	2022-01-12
OPERATOR'S MANUAL PZ05X-XXX-XXX-BXX	97999-1932	В	2022-04-08
OPERATOR'S MANUAL PZ10X-XXX-XXX-AXX	97999-1933	В	2022-04-08
OPERATOR'S MANUAL PZ15X-XXX-XXX-AXX	97999-1934	В	2022-04-08
OPERATOR'S MANUAL PZ20X-XXX-XXX-BXX	97999-1935	В	2022-04-08
OPERATOR'S MANUAL PZ30X-XXX-XXX-CXX	97999-1936	В	2022-04-08
Model plate	98282	В	2022-01-12
Model LABEL Artwork - ATEX Zone 0 marking plate text	98282AW	В	2022-01-12

1	1			
CAP, FLUID	99820524	Н	2022-01-12	
MANIFOLD, INLET	99820532	Н	2022-01-12	
MANIFOLD, OUTLET	99820540	N	2022-01-12	
PLANNING CHART, 1/2" AODP METALLIC ASSY - PZ SERIES	PZ05X-XXX-XXX- BXX	С	2022-02-04	
PLANNING CHART, 1" AODP	PZ10X-XXX-XXX-	С	2022-02-04	
METALLIC ASSY - PZ SERIES	AXX			
PLANNING CHART, 1-1/2" AODP METALLIC ASSY - PZ SERIES	PZ15X-XXX-XXX- AXX	С	2022-02-04	
CHART, 2" AODP METALLIC	PZ20X-XXX-XXX-	С	2022-02-04	
ASSY - PZ SERIES	BXX			
PLANNING CHART, 3" AODP METALLIC ASSY - PZ SERIES	PZ30X-XXX-XXX- CXX	С	2022-02-04	
RESTRICTED- PLANNING CHART, 1" AODP METALLIC ASSY - PZ SERIES	R-PZ10X-XXX- XXX-AXX	С	2022-02-04	
RESTRICTED- PLANNING CHART, 1-1/2" AODP METALLIC ASSY - PZ SERIES	R-PZ15X-XXX- XXX-AXX	С	2022-02-04	
RESTRICTED- PLANNING CHART, 2" AODP METALLIC ASSY - PZ SERIES	R-PZ20X-XXX- XXX-BXX	С	2022-02-04	
RESTRICTED- PLANNING CHART, 3" AODP METALLIC ASSY - PZ SERIES	R-PZ30X-XXX- XXX-CXX	С	2022-02-04	