



- Used to balance the internal pressure of subsea equipment and hydraulic systems with the ambient pressure of the surrounding sea water.
- Most PCX models are available with springs to over-pressurize the oil to either 2 - 4 psi (0.14 - 0.28 bar), 4 - 8 psi (0.28 - 0.56 bar) or 8 - 15 psi (0.56 - 1.0 bar).
- Compatible with all common hydraulic oils and rated for operation to full ocean depth.
- By employing a spring loaded rolling diaphragm, made from fabric reinforced neoprene, the PCX compensators eliminate unreliable piston seals.
- All PCX models can be fitted with an optional reed switch to indicate when the compensator is empty.
- The PC5X and all larger sized PCX models can be fitted with an optional string potentiometer to indicate the internal volume.
- Available with hard anodized 6061-T6 aluminum, Type 316 stainless steel, titanium or Delrin-housings.

Bollard Output

105lbf (48kgf) forward,
65lbf (29.5kgf) reverse,
w/ either RH or LH
stainless steel propellers.

Input

2.7kw at 72vdc,
100vdc, 120vdc,
150vdc, 260vdc or
300vdc,
+/-5v analog or
RS485 speed control.

Weight

12-17.5lbs (5.5-8kg)
in air,
9-13lbs (4-6kg) in
water, depending on
configuration.

Depth Rating

2,800ft (850m) &
5,000ft (1,500m) with
1 atm housings, full
ocean depth when oil
filled (PBOF).
(specifications subject to change
without notice)

Introduction

Designed to balance the internal pressure of oil filled subsea equipment and hydraulic systems with the ambient pressure of the surrounding sea water, Tecnadyne's PCX pressure compensators have been proven in the world's harshest subsea environments for many years.

The displaced volume of the PCX pressure compensators ranges from 1.3 cubic inches (0.021 liters) for the Model PC1X to 587 cubic inches (9.6 liters) for the PC12X unit.

Rolling Diaphragm

Employing a spring loaded rolling diaphragm, made from a high strength fabric reinforced neoprene material, the PCX pressure compensators maintain the internal oil pressure 4-14psi (0.25-1.0bar) above ambient. In the event of a leak in the customer's oil filled system, the slightly higher pressure of the internal oil prevents water intrusion, thereby protecting the internal equipment from water damage. And since the rolling diaphragm of the PCX pressure compensators eliminates all piston and rod seals, leaks are virtually eliminated for the highest reliability.

A telescoping stainless steel rod, visible in the illustrations, provides instant visual feedback of the piston position and the remaining volume in the compensator (it is flush with the housing when empty).

Housing Materials

The housings of the PCX pressure compensators are manufactured from hard anodized 6061-T6 aluminum and the spring and all hardware are made from passivated 18-8 stainless steel. Optional housing materials include Type 316 stainless steel and 3Al2.5V titanium. Titanium assemblies also utilize titanium hardware and springs.

Volume Sensors

All sizes of the PCX pressure compensators can be fitted with an internal magnetically tripped reed switch to indicate when the resevoir volume is fully depleted. the reed switch option increases the overall length

of the housing by 0.5in (12.7mm). The PC5X and larger sizes of PCX pressue compensators can be fitted with internal string potentiometers that return an accurate (to within 0.5mm) analog signal indicating remaining compensator volume. The internal string potentiometer option increases the overall length of the compensator by 2.75in (70mm).

Depth Rating

All PCX pressure compensators are rated for operation to full ocean depth.

Other Options

The PC10X, PC11X and PC12X can optionally be fitted with a high accuracy magnetostrictive position sensor, able to detect piston position to within 0.1mm. And these three models can also be fitted with internal pressure accumulators, used to store a reserve volume of high pressure (3,000psi, 210 bar) hydraulic oil for hydraulic power unit applications. All sizes of the PCX compensators can be fitted with optional internal pressure sensors, water detectors and temperature sensors.

Custom variations of all PCX models include hydraulic port fittings to suit customer preference as well as additional port fittings and increased residual volume so the that PCX compensator can also serve as the active hydraulic tank in hydraulic power applications.

Tecnadyne also manufactures a full line of hydraulic power units in which the pump is mounted insidethe compensator and additional fluid volume is provided so that the compensator assembly doubles as the tank

Fluid Compatibility

The PCX pressure compensators are compatible with all common hydraulic oils, including mineral oil, Shell Tellus (and other ISO compatible hydraulic fluids) and Mil-H-5606 hydraulic fluid (Skydrol).

Please note that the specifications are subject to change without notice. Additionally, Tecnadyne PCX Presssure Compensators are subject to U.S. Government export controls.

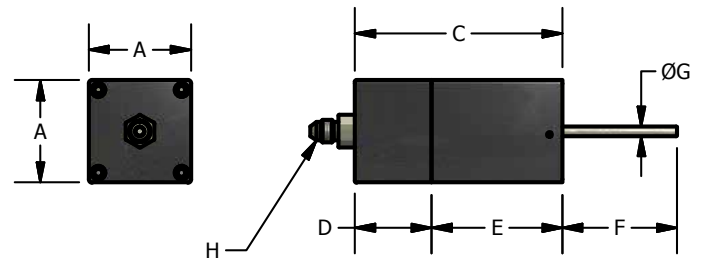
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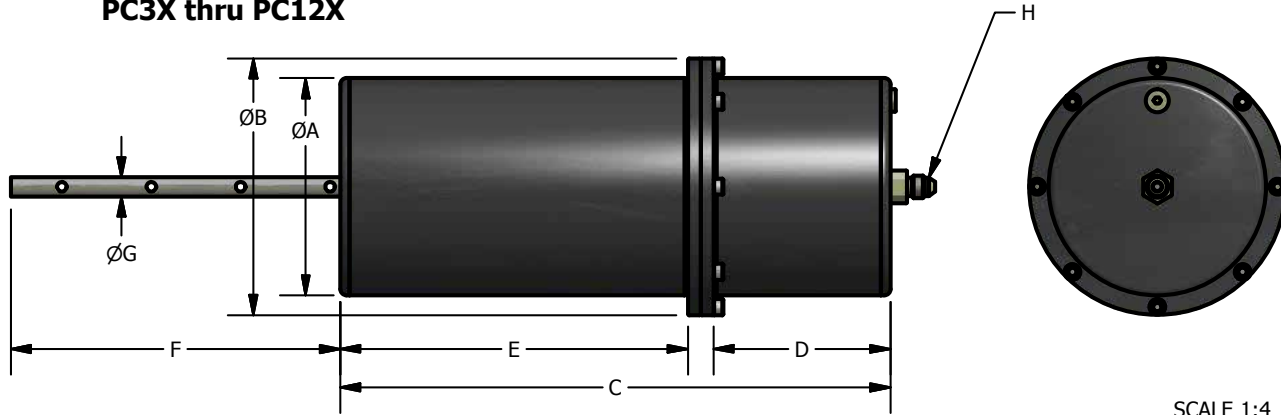
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PC1X & PC2X



PC3X thru PC12X



SCALE 1:4

Download 3D step files & pdf drawings of the compensators at www.tecnadyne.com/compensators

Model Number	Displacement cu. inch liter	Weights			A Cyl. OD in mm	B Flange OD in mm	C Length in mm	D Cap Lg. in mm	E Cyl. Lg. in mm	F Rod Lg. in mm	G Rod Dia. in mm	H SAE J514 Port
		Alum. lb kg	SS lb kg	Ti lb kg								
PC1X	1.3	0.67	1.55	0.96	1.750 sq.		2.525	0.925	1.6	1.24	0.188	-2
	0.021	0.31	0.71	0.44	44.5 sq.		64.1	23.5	40.6	31.5	4.8	
PC2X	3.5	1.17	3.07	1.78	2.000 sq.		4.055	1.5	2.555	2.24	0.188	-4
	0.057	0.53	1.40	0.81	50.8 sq.		103.0	38.1	64.9	56.9	4.8	
PC3X	13.6	1.58	3.56	2.17	2.500	3.250	6.683	2.12	4.19	3.74	0.375	-2
	0.223	0.72	1.62	0.98	63.5	82.6	169.7	53.8	106.4	95.0	9.5	
PC4X	19.2	1.94	4.23	2.60	2.750	3.500	7.426	2.37	4.68	4.29	0.375	-4
	0.315	0.88	1.92	1.18	69.9	88.9	188.6	60.2	118.9	109.0	9.5	
PC5X	23.2	2.63	5.28	3.08	3.000	3.765	7.760	2.710	5.050	4.400	0.375	-4
	0.381	1.19	2.40	1.40	76.2	95.6	197.1	68.8	128.3	111.8	9.5	
PC6X	65.0	7.06	15.13	8.70	4.250	5.015	10.760	3.710	7.050	6.400	0.375	-4
	1.065	3.21	6.87	3.95	108.0	127.4	273.3	94.2	179.1	162.6	9.5	
PC7X	82.3	8.55	17.99	10.32	4.500	5.250	11.608	3.999	7.609	6.980	0.500	-6
	1.349	3.88	8.17	4.69	114.3	133.4	294.8	101.6	193.3	177.3	12.7	
PC8X	105.5	10.88	22.04	12.71	5.000	5.750	12.448	4.244	8.204	7.440	0.500	-6
	1.729	4.94	10.01	5.77	127.0	146.1	316.2	107.8	208.4	189.0	12.7	
PC9X	149.6	14.51	27.92	16.17	5.500	6.250	13.958	4.754	9.204	8.440	0.500	-6
	2.451	6.59	12.68	7.34	139.7	158.8	354.5	120.8	233.8	214.4	12.7	
PC10X	271.0	22.37	42.44	24.74	6.500	7.250	17.208	5.879	11.329	10.440	0.500	-6
	4.441	10.16	19.27	11.23	165.1	184.2	437.1	149.3	287.8	265.2	12.7	
PC11X	451.6	31.19	59.45	34.65	8.000	9.000	17.960	6.130	11.830	10.940	0.500	-8
	7.400	14.16	26.99	15.73	203.2	228.6	456.2	155.7	300.5	277.9	12.7	
PC12X	586.8	41.64	72.24	42.82	8.500	9.500	20.210	6.880	13.330	12.440	0.500	-8
	9.616	18.90	32.80	19.44	215.9	241.3	513.3	174.8	338.6	316.0	12.7	

PC - AA - BBB - CC - DD - EEEEE - FF - GGGG

AA - Compensator Displacement Option

1X - 1.3 cu. in. (21 ml)	5X - 23 cu. in. (381 ml)	9X - 150 cu. in. (2.45 l)
2X - 3.5 cu. in. (57 ml)	6X - 65 cu.in. (1.07 l)	10X - 271 cu. in. (4.44 l)
3X - 13.6 cu. in. (223 ml)	7X - 82 cu. in. (1.35 l)	11X - 451 cu. in. (7.4 l)
4X - 19.2 cu. in. (315 ml)	8X - 105 cu.in. (1.73 l)	12X - 586 cu. in. (9.6 l)

BBB - Pressure Option

24 - 2 - 4 psi (0.14 - 0.28 bar)
48 - 4 - 8 psi (0.28 - 0.56 bar)
815 - 8 - 15 psi (0.56 - 1.0 bar)

CC - Material of Construction Option

- AL** - All external surfaces 6061-T6 aluminum, hard anodized black; Type 316 stainless steel hardware
- SS** - All external surfaces passivated Type 316 stainless steel; Type 316 stainless steel hardware
- TI** - All external surfaces titanium; titanium hardware & fittings
- DN** - All external surfaces Delrin; Type 316 stainless hardware

DD - Volume Sensor Option

- RS** - Reed switch indicates when compensator is fully discharged (empty)
- SP** - String potentiometer indicates remaining volume (PC5X and larger only)
- XX** - No volume sensor installed (default option)

EEEEEE - Subsea Connector Option (only for RS or SP options, above)

- FAWL3PBCRA** - SeaCon FAWL-3P-BC-RA connector
- MCBH3M** - SeaCon MCBH3M connector

FF - Rod Visual Indicator Option

- ROD** - Visual indicator rod installed
- NR** - Rod not installed

GGGG - Hydraulic Fittings Option

- STD** (or left blank) - Standard hydraulic fittings / ports desired
- SPEC** - Specify desired style, size and quantity of hydraulic fittings

WHAT WERE YOU DOING 30 YEARS AGO?

In 1985 Tecnadyme delivered its first thrusters, six Model 1020's that were installed on the original RTV-500 built by Mitsui Engineering & Shipbuilding (MES) of Tokyo. Since that time, we have manufactured and delivered over 6,000 thrusters, including more than 600 of the Model 1020. And even though the Model 1020 that we build today incorporates over 32 design revisions to improve reliability, efficiency and maintainability – that thruster is still 100% compatible with the Model 1020 that was installed on that first RTV-500 system more than 30 years ago. This means that, after 30+ years, MES (or any of our customers) can still purchase or repair a Model 1020 thruster to keep its fleet of ROV's working. And in those 30 years, the Model 1020 thruster has powered vehicles to the Titanic, that discovered JFK's PT-109 in the Pacific, that participated in record depth wellhead completions off the coast of West Africa, that discovered lost cities in the Black Sea, that have scoured the world's oceans for mines, and that have successfully completed thousands of routine subsea missions. And the Model 1020 thruster is still being installed on new ROV and AUV systems worldwide.

And, like the Model 1020, Tecnadyme's twenty-one other thruster models have also served the offshore community with reliability, high performance and cost effectiveness – but none for quite as long as the Model 1020's 25 years. Tecnadyme is constantly developing and releasing new thruster models, with 4 new models released in 2010 and 4 models being released in 2013.

It is Tecnadyme's commitment to its customers and to the subsea community that no vehicle system, be it an ROV, an AUV, a manned submersible or any other subsea system, will ever be made obsolete because the Tecnadyme thrusters installed on that system are no longer available for a reasonable and competitive price.

So, for your next ROV, AUV or manned submersible build or purchase, be sure to specify only genuine Tecnadyme thrusters. You, your operators, your technicians and your customers will be glad you did – for the next 30 years.

QUALITY ASSURANCE

Tecnadyme operates under a Quality Plan that is fully ISO 9001:2008 compliant. All electrical soldering is performed by technicians certified to the IPC J-STD-009 & IPC-A-610 standards.

FINAL TEST & INSPECTION

All Tecnadyme products undergo a rigorous set of final test procedures. Each thruster is operated at reduced power and full power in both directions for extended time periods. Each thruster is pressure tested and then subjected to an insulation breakdown test to identify leaks or other problems. Prior to shipment to the customer, each thruster is certified to perform correctly and to factory specifications.

EXPRESS LIMITED WARRANTY

Subsea thruster motors manufactured by Tecnadyme are warranted to the original Purchaser for a period of one year from the date of shipment from the factory to conform to Tecnadyme's specifications at the time of purchase and to be free of mechanical, electrical and physical defects in material and workmanship if the products have been installed, electrically connected, operated and serviced in accordance with Tecnadyme's instructions as listed in the Operations & Maintenance Manual accompanying the thrusters.

Except for the express warranty set forth herein, Tecnadyme makes no other warranties or guarantees, express, oral, implied or statutory, regarding its subsea thruster products. All such warranties are expressly disclaimed to the extent allowable by law.

BUILT WITH PRIDE



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