

EH10236 TangenX™ Hydraulic Pump

USER GUIDE



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1. CAUTION

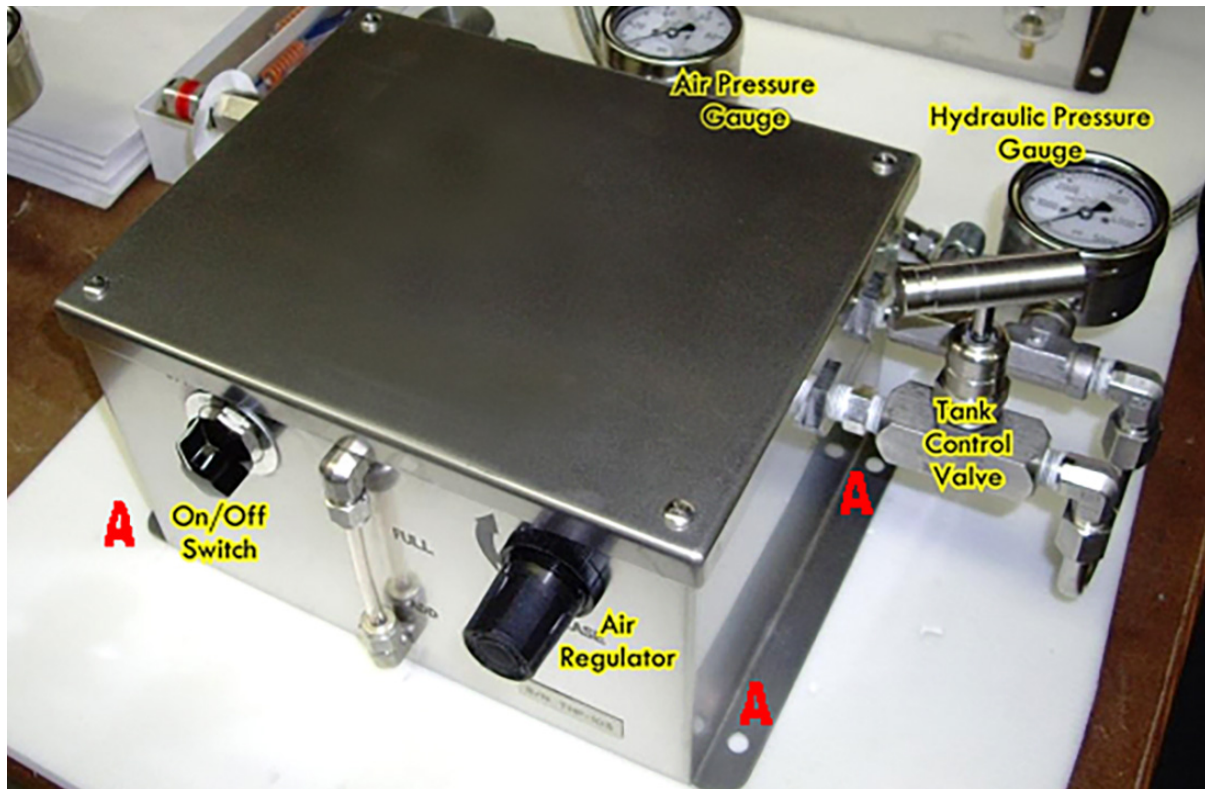
Prior to using the TangenX™ EH10236 Pump, please read and understand this document in its entirety, including the OEM Manufacturer's Pump Safety Instructions (Appendix 3). In addition to this document, the OEM's manual is also provided by Repligen that includes warnings, safety instructions, and a list of major pump components. Please contact the Repligen TangenX™ technical service department with any questions at 508-845-6400.

Maximum Pump Air Inlet Pressure.....100 psi (6.9 bar)
Maximum Pump Hydraulic Pressure.....3,600 psi (248 bar)
Hydraulic Relief Valve Set-point (by TangenX).....1,500 psi (83 bar)
Maximum Cylinder Capacity.....10 Cylinders

2. Installation

- PUMP FILLING – **THE PUMP IS SHIPPED WITHOUT HYDRAULIC FLUID IN THE RESERVOIR**
- Fill the unit with hydraulic fluid using Mobil DTE-FM-32 food grade oil.
- Open the top cover by removing the four (4) screws located on the corners.
- Pour approximately one gallon (3.8 liter) of hydraulic fluid into the unit.
- **DO NOT** pour oil directly on top of the pump because the breather port is located on the top.
- Watch the fluid level through the level gauge mounted on the front of the unit.
- **DO NOT** fill the unit past the "FULL" level mark.
- Make certain to clean the bottom of the cover before reinstalling.
- Cycle the pump 10-20 times with the Tank Control Valve open to bleed air from the pump prior to first use after filling with or replacing the hydraulic oil.
- **Always use or fill the pump while positioned on a level surface as shown in Figure 1.**

Figure 2.1 TangenX™ Hydraulic Pump – Front View



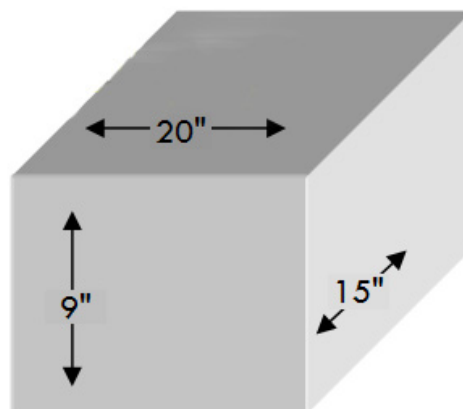
1. Permanent Mounting

- Mount the pump with ¼" diameter screws (or metric equivalents) using a 6" x 10.75" hole pattern (see "A" Figure 2.1)
- The pump must be mounted horizontally on a flat surface as shown in Figure 3.1. The cover has a sealing gasket, but fluid is prone to leak from the unit if mounted on an unlevelled surface. **DO NOT** attempt to mount pump in a vertical position.

2. Pump Envelope Dimensions

- The pump envelope dimensions are 20" wide x 15" deep x 9" high, as shown in Figure 2.2. This envelope provides enough clearance for the user to operate the controls.

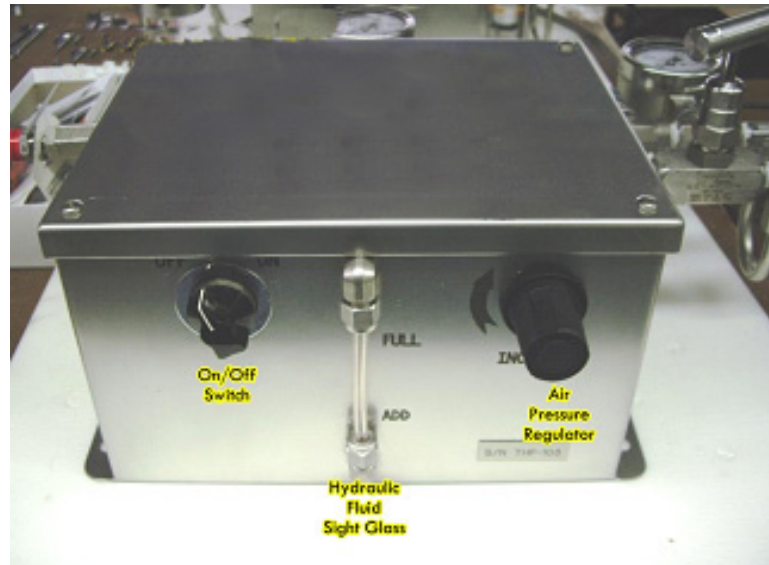
Figure 2.2 Pump Envelope Dimensions



3. Operation

1. To operate the pump, close the Tank Control Valve, and turn the Air Pressure Regulator counter-clockwise for minimum air pressure (Figure 2.1).
2. Turn the Control Switch to the “ON” position (Figure 3.1).

Figure 3.1 Control Switch



3. Slowly turn the Air Pressure Regulator clockwise to increase the air pressure. The cylinders will advance and hydraulic pressure will start to build once a load is encountered. Watch the pressure gauge for the hydraulic pressure reading (Figure 2.1).

NOTE: The pump has a maximum ratio of hydraulic pressure to input air pressure of 36:1

4. As the hydraulic pressure approaches the target value, slowly stop turning the Air Pressure Regulator knob (Figure 3.2). When the set point ratio is reached, the pump will stall. Increasing the air pressure will result in the pump increasing the outlet hydraulic pressure. A decrease in air pressure will result in a corresponding decrease in outlet hydraulic pressure.

Figure 3.2 Air Pressure Regulator Knob



5. The Hydraulic Relief Valve is set to 1,500 psi prior to shipment. This device prevents over-compression of the cassette stack, which may inadvertently occur by the operator or by an elevated temperature cycle during operation or cleaning.

CAUTION: Do not exceed 100 psi

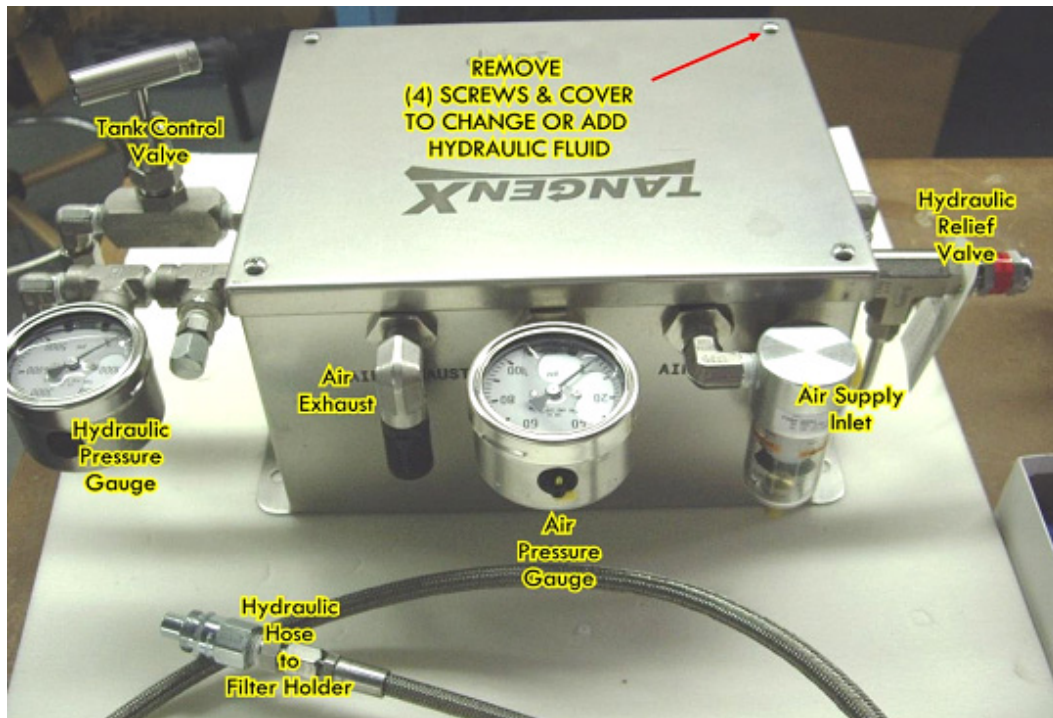
NOTE: To quickly decrease hydraulic pressure, the tank control valve must be opened to relieve any excess hydraulic pressure after the air regulator is adjusted

6. The hydraulic pressure specifications for TangenX™ PRO and TangenX™ SIUS™ cassettes are as follows and apply for TangenX™ PRO - 75, TangenX™ PRO - 150, TangenX™ PRO - 300 and TangenX™ PRO - 600 filter holders designed by Repligen.

Target	= 1,200 psi
Normal Range	= 1,100 to 1,300 psi
Hydraulic Relief Set Point	= 1,500 psi*
Maximum Operating	= 1,500 psi

NOTE: * Remove wire lock from Hydraulic Relief Valve and adjust knob setting to raise or lower the hydraulic relief set point pressure.

Figure 3.3 TangenX™ Hydraulic Pump - Back View



4. Maintenance

1. The fluid level gauge should be checked before each use. Add hydraulic fluid up to the "FULL" mark as required.
2. Check the air inlet filter bowl to make certain there is no water build-up. When the water level reaches the baffle plate, open the drain valve at the bottom of the filter.
3. Change the hydraulic fluid at least once each year.

5. To Change Hydraulic Fluid

1. Disconnect all hydraulic and air hoses from the unit.
2. Remove the top cover and pour the used fluid into a suitable container for disposal.
3. Wipe off any excess fluid on the outside of the tank using a clean, lint free cloth.
4. Refill the reservoir referencing the instructions in Section 2.

6. Appendix

6.1 OEM Manufacturer Certificate of Compliance

TOOMEY ASSOCIATES, INC. **Instrumentation & Hydraulics**



ISO 9001-2000 REGISTERED

"OUR MISSION IS TO PROVIDE ALL OF OUR CUSTOMERS
WITH THE BEST PRODUCTS AND SERVICE AVAILABLE"

1100 Russell Road P.O. Box 577 Westfield, MA 01086-0577

Tel (800) 762-5192 or (413) 562-5192 Fax (413) 568-0066 E-Mail admin@toomeyinc.com

(Manufactured of Fabricated Material)

Ref.: ISO 9001:2000 Sect: 7.2 & 8.2.4
Date: 3/20/05 QA APPROVAL KPC
File Name: certcom.doc

Date 11/26/08

We hereby certify that

P/N EH 10230, S/N TMP-103
Description of Material

Furnished to

TangenX Technology Corporation
(Company Name)

For use on

PO 8297

(Project Name and/or Contract Number)

In the amount of

1
(Quantity Represented)

Identified by our order #

1013540

Shipped on 12/01/08

Delivered on _____

Shipped VIA UPS

Meets the requirements of the pertinent project plans, special provisions and specifications in all respects. Processing, product testing and inspection control of raw materials are in conformance with all applicable specifications, drawings, and/or standards of all articles furnished.

For Toomey Associates Inc.

Lauri De...

EXAMPLE

6.2 OEM Manufacturer Inspection and Test Report

TOOMEY ASSOCIATES, INC.
Instrumentation & Hydraulics

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WITH THE BEST PRODUCTS AND SERVICE AVAILABLE

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Pg. 1 of 2

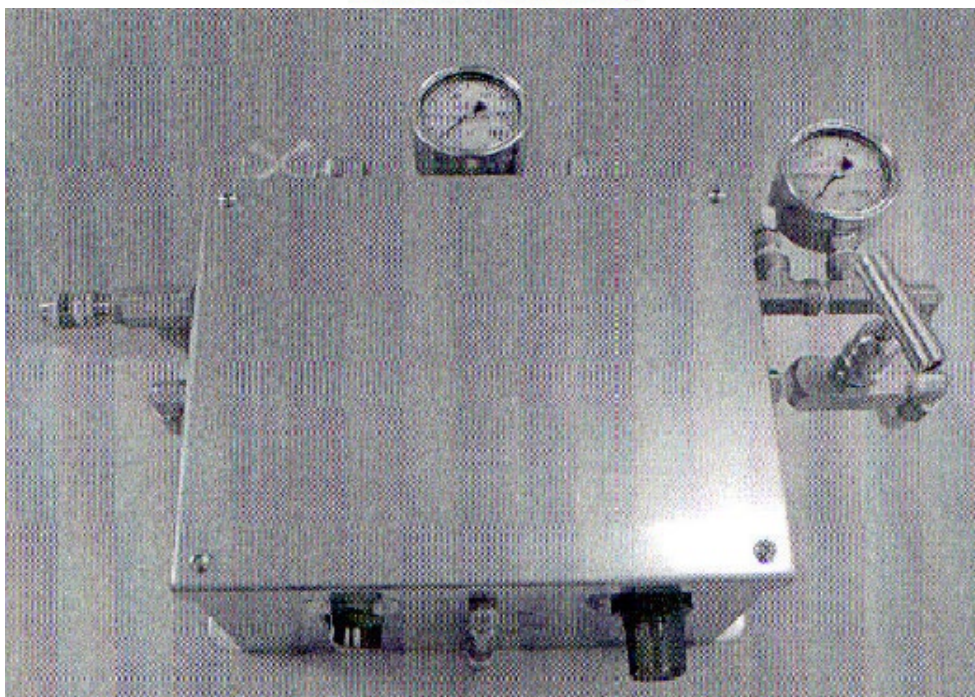
Ref.: ISO 9001:2000 Sect: 8.2.4.2

Date: 11/21/08 QA APPROVAL: LWD

TangenXI&T.doc

EXAMPLE

TANGENX STAINLESS STEEL PUMP ASSEMBLY
INSPECTION & TEST REPORT
P/N EH 10236



Pump S/N: THP- 103

Assembled By: J. Tilly, J. Toomey
V. Reed & G. Strumer

PO Ref.: 8297

Inspected By: L. Desi

Date: 11-25-08

Pump S/N: THP- 103

Subassembly Inspection

EXAMPLE

	Inspection Criteria	Tech	Q.A
a.	Verify that the SS enclosure is clean & free of scratches / defects.	VR	LD
b.	Verify that all external enclosure seams & weld joints are clean & defect free.	VR	LD
c.	Verify that the SS enclosure is clean & free of scratches / defects & that all etching is accurate & free of any cosmetic defects	VR	LD
d.	Verify that both gauges have been certified, are leak free, on zero and have a calibration sticker applied (B & G)	GS	LD
e.	Prior to assembly, place the Haskel pump into the test reservoir & verify proper operation	JT	LD
f.	Verify that all fittings are tight & have proper thread sealant applied.	JT	LD
g.	Verify that all flareless tube nuts are polished	JT	LD
h.	Verify the presence of a shipping checklist.	GS	LD

Functional Verification

	Test Criteria	Tech	Q.A
a.	Set the air pressure at 50-psi & cycle pump for 5 minutes with no-load	JT	LD
b.	Test system to stall at 3500-psi. With the air turned off pressure holds for 5 minutes.	JT	LD
c.	Test system to stall at 3000-psi. With the air turned off pressure holds for 5 minutes.	JT	LD
d.	Connect pump assembly to the counter test fixture. Set the outlet hydraulic pressure for 3000-psi with the air line connected. Keep the pump assembly under pressure for 1 hour. Note the number of cycles at the end of that time. Record all information in the space below.	JT	LD

Start Time: 2:24

Total Run Time: 1:11

End Time: 3:35

Total Cycles: 0

CERTREAD

TOOMEY ASSOCIATES, INC.
CERTIFICATION OF GAUGE ACCURACY

CERTIFICATION TYPE C
INTERNAL CONTROL # 1013540B
CALIBRATION DATE 11/14/2008
NEXT CALIBRATION DATE 11/14/2009
PRIMARY STANDARD TYPE USED S/N 1306

READINGS IN:
PSIG XX
DEG. F
IN/H2O
IN/Hg
PSID
Lbs./Force
OTHER

Base Unit ATE-100, S/N 1105, Certified 06/12/08, Due 06/12/09, Cert # 2392071

CUSTOMER TANGENX TECHNOLOGY
PO# 8297
IUT MFG WIKA IUT ACCURACY % 1.50
IUT FULL SCALE 100 ALLOWED DEVIATION +/- 1.5
IUT SERIAL # 1013540B

READING	STANDARD	IUT	DEVIATION
1	9.54	10	0.46
2	20.18	20	-0.18
3	30.58	30	-0.58
4	41.07	40	-1.07
5	50.90	50	-0.90
6	61.03	60	-1.03
7	70.92	70	-0.92
8	80.67	80	-0.67
9	90.55	90	-0.55
10	100.13	100	-0.13

EXAMPLE

READINGS ARE TAKEN AT AMBIENT ROOM TEMPERATURE

READINGS MEET XX MEETS STANDARDS
DO NOT MEET
OEM SPECIFICATIONS

STANDARD MODEL AQS-2, 0-150 PSI
STANDARD ACCURACY +/- .05% FULL SCALE
TRANSDUCER SERIAL # 1306
CERTIFIED 5/20/08 DUE 5/20/09
NIST TRACEABILITY THROUGH CERT # 2345294

TOOMEY ASSOCIATES, INC. USES ISO 10012-1 AS THE BASIS OF ITS CALIBRATION SYSTEM
CALIBRATION PERFORMED USING NIST TRACEABLE STANDARDS

TECHNICIAN GREG STURMER
QA LOUIS DEST

MEASUREMENT UNCERTAINTY DOES NOT EXCEED THE PERMISSIBLE ERROR FACTOR FOR THE CALIBRATION
STANDARD IDENTIFIED ON THIS DOCUMENT
THIS REPORT MUST BE REPRODUCED IN FULL AND REQUIRES WRITTEN APPROVAL OF TOOMEY ASSOCIATES, INC

1100 RUSSELL ROAD, PO BOX 577
WESTFIELD, MA 01086-0577

ISO 9000 REF: CALWI.DOC

TEL: 800-762-5192
FAX: 413-568-0066

CERTREAD

TOOMEY ASSOCIATES, INC.
CERTIFICATION OF GAUGE ACCURACY

CERTIFICATION TYPE C
INTERNAL CONTROL # 1013540G
CALIBRATION DATE 11/14/2008
NEXT CALIBRATION DATE 11/14/2009
PRIMARY STANDARD TYPE USED S/N 27861

READINGS IN:
PSIG XX
DEG. F
IN/H2O
IN/Hg
PSID
Lbs./Force
OTHER

Base Unit ATE-100, S/N 1105, Certified 06/12/08, Due 06/12/09, Cert # 2392071

CUSTOMER TANGENX TECHNOLOGY
PO# 8297
IUT MFG WIKA IUT ACCURACY % 1.50
IUT FULL SCALE 5000 ALLOWED DEVIATION +/- 75
IUT SERIAL # 1013540G

READING	STANDARD	IUT	DEVIATION
1	538.7	500	-38.7
2	1027.3	1000	-27.3
3	1510.1	1500	-10.1
4	2007.3	2000	-7.3
5	2499.3	2500	0.7
6	3011.2	3000	-11.2
7	3509.6	3500	-9.6
8	4033.7	4000	-33.7
9	4522.2	4500	-22.2
10	5033.0	5000	-33.0

EXAMPLE

READINGS ARE TAKEN AT AMBIENT ROOM TEMPERATURE

READINGS
MEET XX MEETS STANDARDS
DO NOT MEET
OEM SPECIFICATIONS

STANDARD MODEL HQS-2, 0 - 5000 PSI
STANDARD ACCURACY +/- .025% FULL SCALE
STANDARD SERIAL #: 27861
CERTIFIED 3/27/08 DUE 3/27/09
NIST TEST #:7479/25781
CERTIFICATION # QAID 1330

TOOMEY ASSOCIATES, INC. USES ISO 10012-1 AS THE BASIS OF ITS CALIBRATION SYSTEM
CALIBRATION PERFORMED USING NIST TRACEABLE STANDARDS

TECHNICIAN GREG STURMER
QA LOUIS DESI

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FAX: 413-568-0066

EH10236 PUMP SAFETY INSTRUCTIONS

▲ **CAUTION**

Do not use other fluids as they may damage the pump and void your warranty.

▲ **WARNING**

These cylinders are designed for a maximum pressure of 5,000 psi (360 Bar). Do not connect these cylinders to a pump with a higher pressure rating.

▲ **CAUTION**

AVOID DAMAGING HYDRAULIC HOSE.

Avoid sharp bends and kinks when routing hydraulic hose. Using a bent or kinked hose will cause severe back-pressure. Also, sharp bends and kinks will internally damage the hose leading to premature failure.

Do not drop heavy objects on hose. A sharp impact may cause internal damage to hose wire strands. Applying pressure to a damaged hose may cause it to rupture.

Do not use the hydraulic hose to carry a hydraulic components (i.e. pumps, cylinders and valves).

▲ **CAUTION**

KEEP HYDRAULIC EQUIPMENT AWAY FROM FLAMES AND HEAT!

Excessive heat will soften packings and seals, resulting in fluid leaks. Heat also weakens hose materials and packings. For optimum performance DO NOT expose equipment to temperatures of 150 deg F (65 deg. C) or higher.

▲ **WARNING**

DO NOT HANDLE PRESSURIZED HOSES

Escaping oil under pressure can penetrate the skin, causing serious injury. If oil is injected under the skin, see a doctor immediately.

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