14th Floor, Centre Tower
3300 Bloor Street West
Toronto, Ontario
Canada M8X 2X4
Tel.: 416.734.3300
Fax: 416.231.1626
Toll Free: 1.877.682.8772

www.tssa.org

June 19, 2014

ROGER WENIGE
ENDRESS + HAUSER GMBH + CO KG
1 HAUPTSTRASSE
MAULBURG 79689
DE

Service Request Type: BPV-Fitting Registration
Service Request No.: 1160888
Your Reference No.: LIQUIPANT TRANSDUCER FTL-OTL31-33 - 3 MFG SITES: GERMANY, CHINA & USA
Registered to: ENDRESS + HAUSER GMBH + CO KG

Dear ROGER WENIGE,

Technical Standards and Safety Authority (TSSA) is pleased to inform you that your submission has been reviewed and registered as follows:

CRN No.: 0F16950.5
Main Design No.: LIQUIPHANT TRANSDUCER FTL-OTL31-33 - SEE SCOPE OF REGISTRATION DOC: 960016105 R.0
Expiry Date: 19-Jun-2024

Please be advised that a valid quality control system must be maintained for the fitting registration to remain valid until the expiry date.

See attached "Part of CRN" for the scope.

The stamped copy of the approved registration and the invoice are mailed separately. Should you have any questions or require further assistance, please contact a Customer Service Advisor at 1.877.682.TSSA (8772) or e-mail customerservices@tssa.org. We will be happy to assist you. When contacting TSSA regarding this file, please refer to the Service Request number provided above.

Yours truly,

Charley Dong

Charley Dong, P.Eng.

Tel.: 416-734-3436
Fax: 416-231-6183
Email: cdong@tssa.org

TECHNICAL STANDARDS & SAFETY AUTHORITY
14th Floor, Centre Tower
3300 Bloor Street West
Toronto, Ontario
Canada M8X 2X4

Show facsimile of manufacturer's logo or trademark, as it will appear on the fitting, in the space below

Endress+Hauser
People for Process Automation

STATUTORY DECLARATION
Registration of Fittings

I, Michael Frei Quality Assurance Manager
(Name and Position, e.g. President, Plant Manager, Chief Engineer)

of Endress+Hauser GmbH+Co. KG; Endress + Hauser(Suzhou) Automation Instr. Co. Ltd.; E+H(India); Endress+Hauser (USA) Automation Instrumentation, Inc.
(Name of Manufacturer)

Located at DE-79689 Maulburg, Germany; 215021 Suzhou (P.R. China); Aurangabad - 431136; +49 7622 28 1737 +49 7622 28 1573
(Plant Address) (Telephone No.) (Fax No.)
2340 Endress Place, Greenwood, IN, 46143 USA

☑ do solemnly declare that the fittings listed hereunder, which are subject to the ***Technical Standards and Safety Act***, Boilers and Pressure Vessels Regulation, comply with all of the requirements of
ASME B31.3
(Title of recognized North American Standard)
which specifies the dimensions, materials of construction, pressure/temperature ratings, identification marking the fittings and service;

☐ or are not covered by the provisions of a recognized North American standard and are therefore manufactured to comply with _____ as supported by the attached data which identifies the dimensions, material of construction, pressure/temperature ratings and the basis for such ratings, the marking of the fitting for identification and service.

I further declare that the manufacture of these fittings is controlled by a quality system meeting the requirements of ISO 9001:2009 which has been verified by the following authority, SQS.
The items covered by this declaration, for which I seek registration, are category Category F type fittings. In support of this application, the following information and/or test data are attached as follows:
Technical Description 960016068--; Scope of Registration Summary 960016105--; Drawing 960015905--
(drawings, calculations, test reports, etc.)

Declared before me at _____ **in the** _____ **of** _____

the _____ **day of** _____ **AD 20**_____.

Commissioner for Oaths:

_____
(Printed name)

_____ _____
(Signature) (Signature of Declarer)

FOR OFFICE USE ONLY

To the best of my knowledge and belief, the application meets the requirements of the ***Technical Standards and Safety Act***, Boilers and Pressure Vessels Regulation, and CSA Standard B51 and is accepted for registration in Category F.

CRN: OF 16950.5 NOTE: SEE ATTACHED "PART OF CRN" FOR THE SCOPE.

Registered by: Charley Dong

Dated: July 19/14

NOTE: This registration expires on July 19, 2024 TSSA July 19/14

Technical Standards and Safety Authority
Boilers and Pressure Vessels Safety Program
REGISTERED
C.R.N.: OF 16950.5
Signed: Charley Dong
Date: July 19/14

PV 09553 (06/04)

1.2.2 Scope of Registration

Table 1.2.2 – Scope of Registration Summary - Notes: Refer to drawing E+H drawing 960015905 - -.

	Process connection (please refer to drawing 960015905--)		Materials of Construction	Maximum Design Pressure (bar) and Temperature (°C)
	Design	**Pressure components**		
LIQUIPHANT FTL31 FTL33 OTL31 OTL33	ISO 2852	DN25-38 (1" to 1-1/2"), DN40-51 (2")	UNS S31603, SA-479, (316L, 1.4435, 1.4404) UNS S31603, SA-312, (TP316L, 1.4435, 1.4404)	25 bar @ -40°C…+150°C
	DIN 11851 Tube connection and slotted nut	DN25, DN32, DN40, DN50		DN25, DN32, DN40: 40 bar @ -40°C…+100°C 25 bar @ -40°C…+140°C DN50: 25 bar @ -40°C…+140°C
	SMS Adapter connection and slotted nut	≤ 1-1/2"		25 bar @ -40°C…+150°C
	E+H proprietary weld adapter	≤ ø65mm		25 bar @ -40°C…+150°C
	Varivent	F (DN25), N (DN32-DN162)		25 bar @ -40°C…+150°C
	Pipe Thread standard DIN/ISO 228	G1/2", G3/4", G1"		40 bar @ -40°C…+150°C
	Pipe Thread standard DIN/ISO 228	G3/4", G1" (including welding boss)		40 bar @ -40°C…+100°C 25 bar @ -40°C…+150°C
	ASME B1.1 DIN/ISO 13	M24 x 1.5		40 bar @ -40°C…+150°C
	ASME B1.20.1-1983 NPT Thread	NPT 1/2", NPT 3/4", NPT 1"		40 bar @ -40°C…+150°C
	DIN EN 10226-1 Thread	Threaded: R 1/2", R3/4", R1"		40 bar @ -40°C…+150°C
	Flush mounted for welding neck 1"	G1" aligned (including welding boss) Rd52 (including welding boss)		40 bar @ -40°C…+100°C 25 bar @ -40°C…+150°C
		Extension Tube	UNS S31603, SA-312, (TP316L, 1.4435, 1.4404) UNS S31603, SA-479, (316L, 1.4435, 1.4404)	40 bar @ -40°C…+150°C
		Fork	MIM-316L (B 883-97)	40 bar @ -40°C…+150°C

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Boilers & Pressure Vessels Safety Division

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Safety Division

	Process connection		Method qualifying to CSA B51(Please refer to drawing 960015905--) Proof tests results and calculations in Appendix B of this report
	Design	**Pressure components**	
LIQUIPHANT **FTL31** **FTL33** **OTL31** **OTL33**	ISO 2852	DN25-38 (1..1-1/2"), DN40-51 (2")	o Valid CRN 0F15498.5C o Proof test results witnessed by an authorized inspector per CSA B51 para. 4.2.6 (viii) o Proof test reports: 970004359, 970004360, 970004361 (Appendix B of this report)
	DIN 11851 Tube connection and slotted nut	DN25, DN32, DN40, DN50	o Valid CRN 0F15498.5C o Pressures and temperatures per DIN 11851 published standard. (section 1.5 of report)
	SMS Adapter connection and slotted nut	≤ 1-1/2"	o Valid CRN 0F15498.5C o ASME B31.3 304.7.2 (d) detailed stress analysis (Section 1.8 of this report)
	E+H proprietary weld adapter	≤ ø65mm	o Valid CRN 0F15498.5C o Proof test results witnessed by an authorized inspector - CSA B51 para. 4.2.6 (viii) o Proof test result: 970004363 (Appendix B of this report)
	Varivent	F (DN25), N (DN32-DN162)	o Valid CRN 0F15498.5C o Detailed stress analysis - B31.3 para. 304.7.2 (d) (Section 1.6.1 of this report)
	Pipe Thread standard DIN/ISO 228	G1/2", G3/4", G1"	o Valid CRN 0F15498.5C o Proof test results witnessed by an authorized inspector - CSA B51 para. 4.2.6 (viii) o Proof test reports: 970004356, 970004357 (Appendix B of this report)
	Pipe Thread standard DIN/ISO 228	G3/4", G1" (including welding boss)	o Valid CRN 0F15498.5C o Proof test results witnessed by an authorized inspector per CSA B51 para. 4.2.6 (viii) o Proof test report: 970004358 (Appendix B of this report)
	ASME B1.1 DIN/ISO 13	M24 x 1.5	o Valid CRN 0F15498.5C o Proof test results witnessed by an authorized inspector - CSA B51 para. 4.2.6 (viii) o Proof test report: 970004363 (Appendix B of this report) o ASME B31.3 table 326.1: ASME B1.13M Non-Mandatory Appendix B (Section 1.3.2 and 1.3.3 of this report)
	ASME B1.20.1-1983 NPT Thread	NPT 1/2", NPT 3/4", NPT 1"	o Valid CRN 0F15498.5C o ASME B31.3 paragraph 314.2.1(Section 1.3.1 of this report)
	DIN EN 10226-1 Thread	Threaded: R 1/2", R3/4", R1"	o ASME B31.3 paragraph 314.2. (Section 1.3.1 of this report)
	Flush mounted for welding neck 1"	G1" aligned (including welding boss) Rd52 (including welding boss)	o Valid CRN 0F15498.5C (full version) & 0F11261.5C (Aligned) o Proof test results witnessed by an authorized inspector per CSA B51 para. 4.2.6 (viii) o Proof test report: 970004362, 970004357, 970004361, 970004359, 970004363 (Appendix B of this report)
		Extension Tube	o Proof test results witnessed by an authorized inspector - CSA B51 para. 4.2.6 (viii) o Proof test results: 970004356 (Appendix B of this report)
		Fork	o Proof test results witnessed by an authorized inspector - CSA B51 para. 4.2.6 (viii) o Proof test results: All of the above. (Appendix B of this report)

1.2.3 Material Specifications

Table 1.2.3 Material Specifications and Design Temperatures

Part	Listed Material	Temperature Range
Liquiphant Transducer	UNS S31603, A-479, (316L, 1.4435, 1.4404) UNS S31603, A-312, (TP316L, 1.4435, 1.4404) ASTM B883, MIM-316L	-40 °C to 150°C

Name and Form [1,2]	UNS	Min. Tensile (ksi) [1]	Min. Yield (ksi) [1]	Maximum Allowable Stress (psi) up to 302°F [1]
ASTM B883, MIM-316L	--	65	20	13,300
UNS S31603, A-479, (316L, 1.4435, 1.4404)	S31603	70	25	16,676
UNS S31603, A-312, (TP316L, 1.4435, 1.4404)	S31603	70	25	16,676

NOTES

[1] Per ASME B31.3-2012 table A-1

[2] Alloy types and grades with superior physical and chemical properties permissible.

[3] Note that all E+H alloys are dual listed, and comply to International, European and ASME standards.

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Technical Standards & Safety Authority
Boilers & Pressure Vessels
Safety Division