

Vickers®

# Cylinders



## LESA Series TT

# Linear Electrohydraulic Servo Actuators

Designed specifically for wood products processing applications



# Introduction

## LESA Series TT Linear Electrohydraulic Servo Actuator

The Vickers LESA Series TT servo actuator, designed primarily for wood products processing applications, combines a high performance hydraulic cylinder and a control valve manifold in one convenient package. Advanced, closed loop motion control is readily attainable with the simple addition of a proportional or servo valve and a precision non-contacting feedback transducer coupled with the appropriate electronic controls.

The LESA series servo actuators are designed to eliminate the need for separate hydraulic manifolds, plumbing between control valve and cylinder, transducer mounting brackets, and other complex arrangements typical of the cumbersome systems it replaces. With the option of the cast aluminum cover, a position transducer can be conveniently and safely contained within the cylinder assembly. All this allows the LESA Series TT servo actuator to work comfortably in harsh environments—like the wood products processing industry—that can easily damage most electric servo motors with ball screws and other types of actuators.

The available mounting styles provide the rigid connections required to achieve resolutions better than 0.001" (0.025mm). By using standard Vickers cylinder components, the Series TT servo actuator can offer a wide variety of NFPA interchangeable mountings, bores, and rod diameters, while providing significant cost savings over custom assemblies.

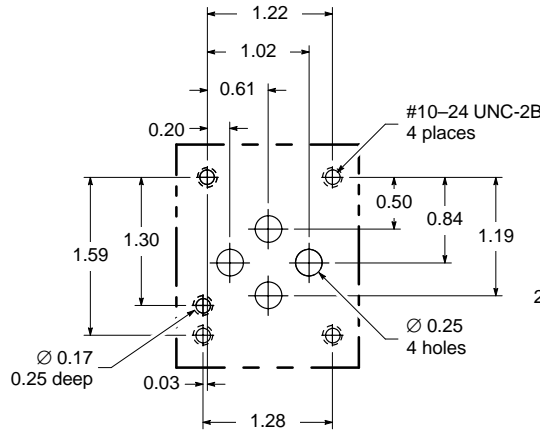
## Typical Applications

- Veneer lathes
- Chippers
- Pickers
- Carriage headrigs
- Edgers
- Resaws
- Other networks applications

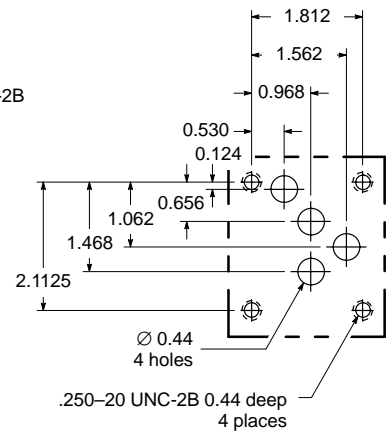
## Features & Benefits

- Five standard bore sizes from 2 inches to 5 inches (larger sizes available on request).
- Five standard stroke lengths from 12 inches to 48 inches (other lengths available on request).
- Five standard mounting styles.
- Operating pressures up to 210 bar (3000 psi).
- Completely sealed non-corrosive environment.
- Low friction, "zero leakage" actuator design.

## Valve Mounting Patterns

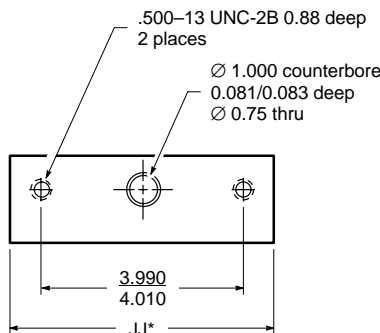


**CETOP 3**

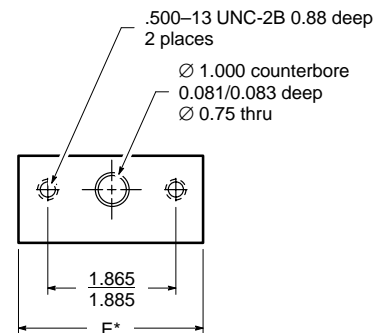


**CETOP 5**

## PFS Cap Porting Information – Code “Z”



**PFS200**  
**2" and 2 1/2" bores**

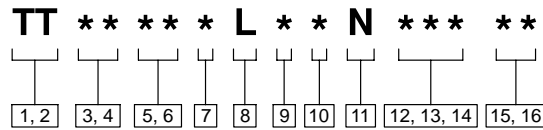


**PFS325**  
**3 1/4", 4", and 5" bores**

\* See installation dimensions starting on page 2.

# TT Model Series

## Model Code\* (Dimensions in inches)



### 1,2 Series

TT – LESA series linear electrohydraulic servo actuator

### 7 Rod end type

- 5 – Small male UN thread
- 9 – Intermediate male UN thread

### 12, 13, 14 Stroke length

Items 12 and 13 indicate stroke length from 00 inches through 99 inches. Standard stroke lengths are 12, 18, 24, 36, and 48 inches.

### 3,4 Mounting style

Vickers Code	Style	NFPA Code
02	– Tapped	MS4
09	– Head rectangular	ME5
10	– Clevis	MP1
15	– Intermediate trunnion	MT4
17	– Head trunnion	MT1

### 8 Sealing system

- L – Low friction, glass filled, Teflon™ dynamic seals with Nitrile energizers and static seals.

Item 14 indicates fractions of an inch per the following codes:

Code	Fraction	Code	Fraction
0	– 0	8	– 1/2
1	– 1/16	9	– 9/16
2	– 1/8	A	– 5/8
3	– 3/16	B	– 11/16
4	– 1/4	C	– 3/4
5	– 5/16	D	– 13/16
6	– 3/8	E	– 7/8
7	– 7/16	F	– 15/16

### 5,6 Bore and rod diameters

Code	Bore	Rod
DH	– 2	13/8
EH	– 2 1/2	13/8
EL	– 2 1/2	13/4
GH	– 3 1/4	13/8
GL	– 3 1/4	13/4
GM	– 3 1/4	2
HL	– 4	13/4
HM	– 4	2
HP	– 4	2 1/2
KM	– 5	2
KP	– 5	2 1/2
KU	– 5	3
KV	– 5	3 1/2

### 9 Valve mounting type

- P – CETOP 5 with manifold and piping
- Q – CETOP 3 with manifold and piping
- Y – Standard SAE (same as “EE”)
- Z – PFS style without manifold

### 10 Transducer cover

- A – Without cover
- B – With cover

### 11 Transducer type

- N – Prepared for magnetostrictive transducer (Magnet installed. Transducer can be provided on request.)

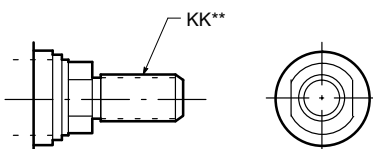
### 15, 16 Extra rod projection

Item 15 indicates extra rod projection from 0 inches through 9 inches.

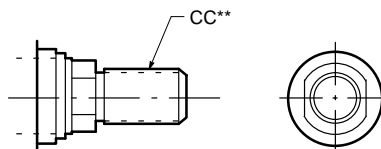
Item 16 indicates fractions of an inch per codes shown for item 14.

\* Enter “X” in all spaces where the model code does not apply. Explain all “X” spaces.

## Rod End Types



**Type 5** – Small male UN thread



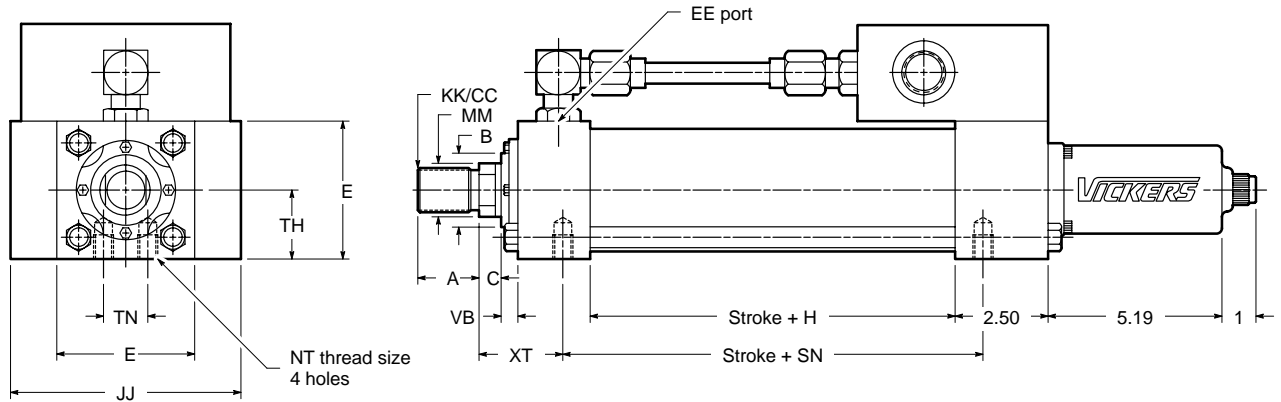
**Type 9** – Intermediate male UN thread

\*\* See installation dimensions starting on page 2.

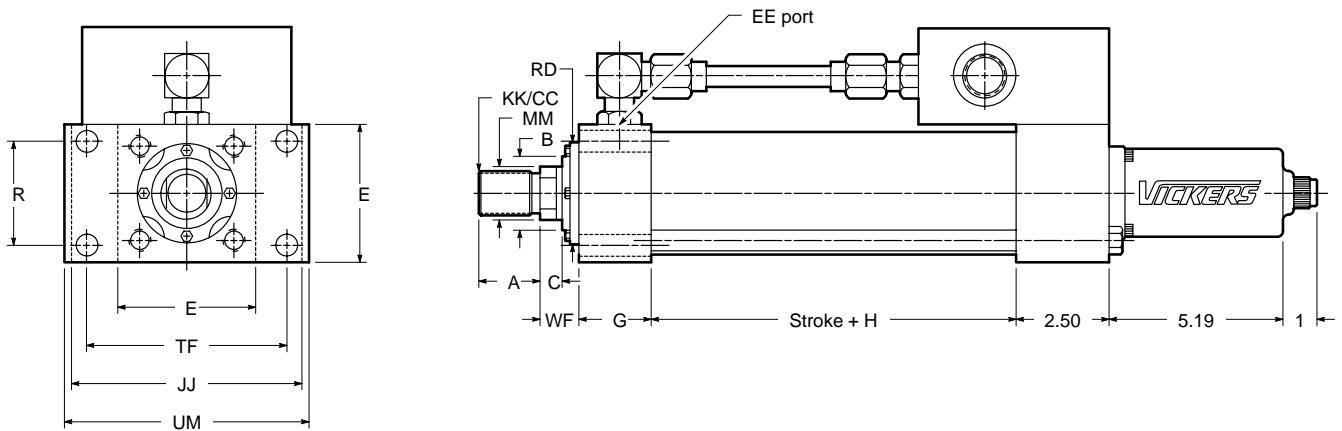
# Installation Dimensions

Dimensions in inches

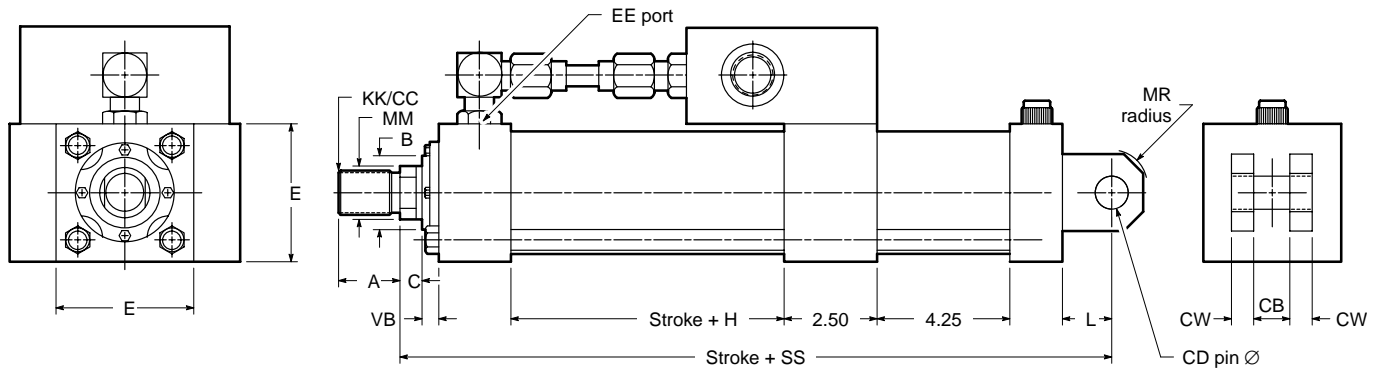
## TT02 – MS4



## TT09 – ME5



## TT10 – MP1



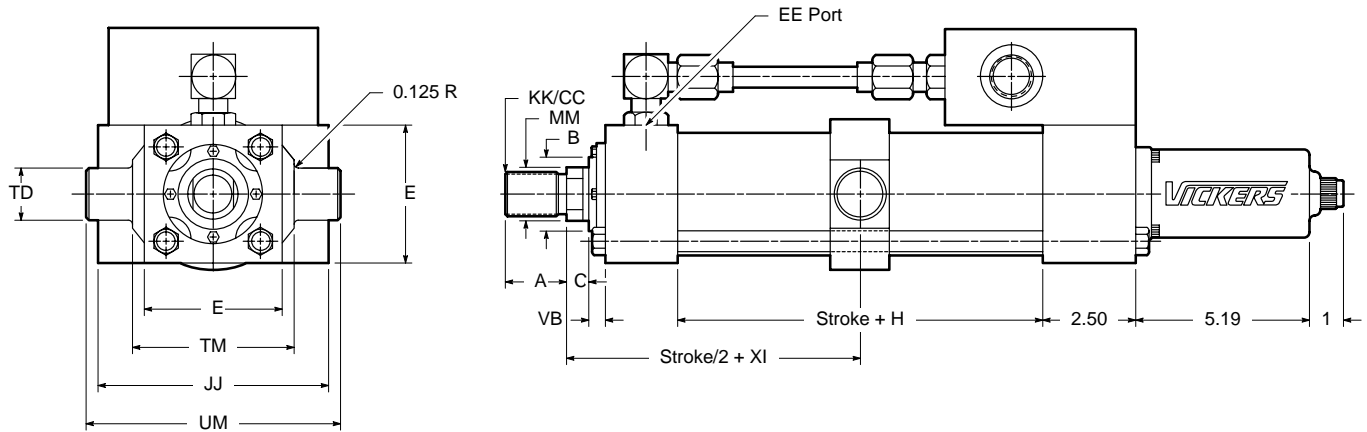
Bore	Rod End Dimensions							Mounting Dimensions Affected by Rod Diameter			
	MM	KK	CC	A	B	C	VB	XT	RD	WF	SS
2.00	1.38	1.000-14	1.250-12	1.62	1.999	0.62	1.00	2.62	2.88	1.62	14.25
2.50	1.38	1.000-14	1.250-12	1.62	1.999	0.62	1.00	2.62	3.38	1.62	14.38
	1.75	1.250-12	1.500-12	2.00	2.374	0.75	1.12	2.88	3.50	1.88	14.62
3.25	1.38	1.000-14	1.250-12	1.62	1.999	0.62	0.62	2.75	3.50	1.62	15.38
	1.75	1.250-12	1.500-12	2.00	2.374	0.75	0.75	3.00	3.75	1.88	15.62
	2.00	1.500-12	1.750-12	2.25	2.624	0.88	0.75	3.12	4.00	2.00	15.75
4.00	1.75	1.250-12	1.500-12	2.00	2.374	0.75	0.69	3.00	3.75	1.88	16.50
	2.00	1.500-12	1.750-12	2.25	2.624	0.88	0.69	3.12	4.00	2.00	16.62
	2.50	1.875-12	2.250-12	3.00	3.124	1.00	0.81	3.38	4.50	2.25	16.88
5.00	2.00	1.500-12	1.750-12	2.25	2.624	0.88	0.69	3.12	4.00	2.00	17.25
	2.50	1.875-12	2.250-12	3.00	3.124	1.00	0.81	3.38	4.50	2.25	17.50
	3.00	2.250-12	2.750-12	3.50	3.724	1.00	0.81	3.38	5.50	2.25	17.50
	3.50	2.500-12	3.250-12	3.50	4.249	1.00	0.81	3.38	5.88	2.25	17.50

Bore	Constants				TT02 – MS4			
	EE	E	H	JJ	TN	TH <small>-0.006/-0.008</small>	NT	SN
2.00	SAE #8	3.0	1.38	5.00	0.94	1.500	.500-13	2.88
2.50	SAE #8	3.5	1.50	6.25	1.31	1.750	.625-11	3.00
3.25	SAE #12	4.5	1.75	–	1.50	2.250	.750-10	3.50
4.00	SAE #12	5.0	2.00	–	2.06	2.500	1.000-8	3.75
5.00	SAE #12	6.5	2.50	–	2.94	3.250	1.000-8	4.25

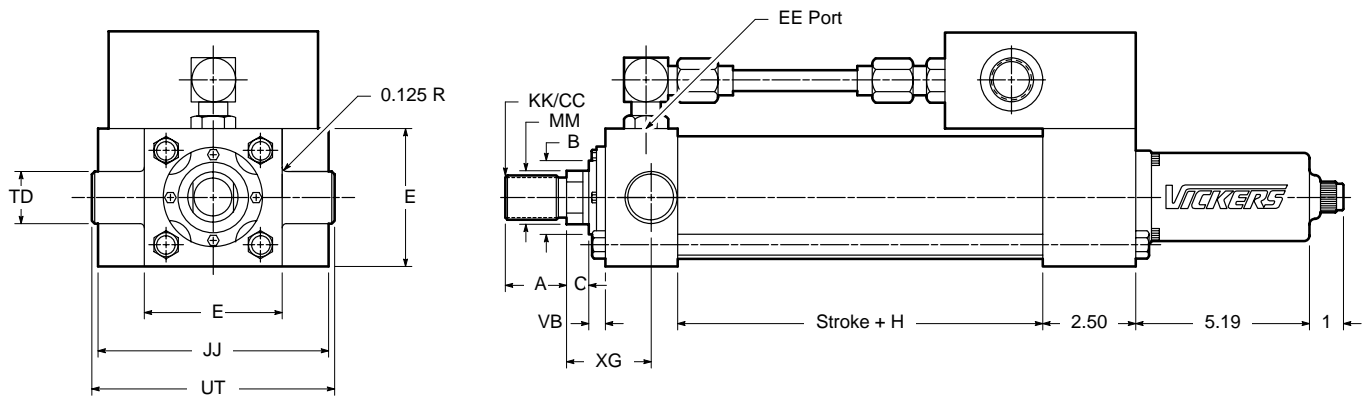
Bore	TT09 – ME5					TT10 – MP1				
	R	TF	UF	SB	G	L	MR	CD	CB	CW
2.00	2.06	4.12	5.12	0.500	1.75	1.25	0.88	0.750	1.255	0.62
2.50	2.56	4.62	5.62	0.500	1.75	1.25	0.88	0.750	1.255	0.62
3.25	3.25	5.88	7.12	0.625	2.00	1.50	1.25	1.000	1.505	0.75
4.00	3.81	6.38	7.62	0.625	2.00	2.12	1.62	1.375	2.005	1.00
5.00	4.94	8.19	9.75	0.875	2.00	2.12	1.88	1.750	2.505	1.25

Dimensions in inches

### TT15 – MT4



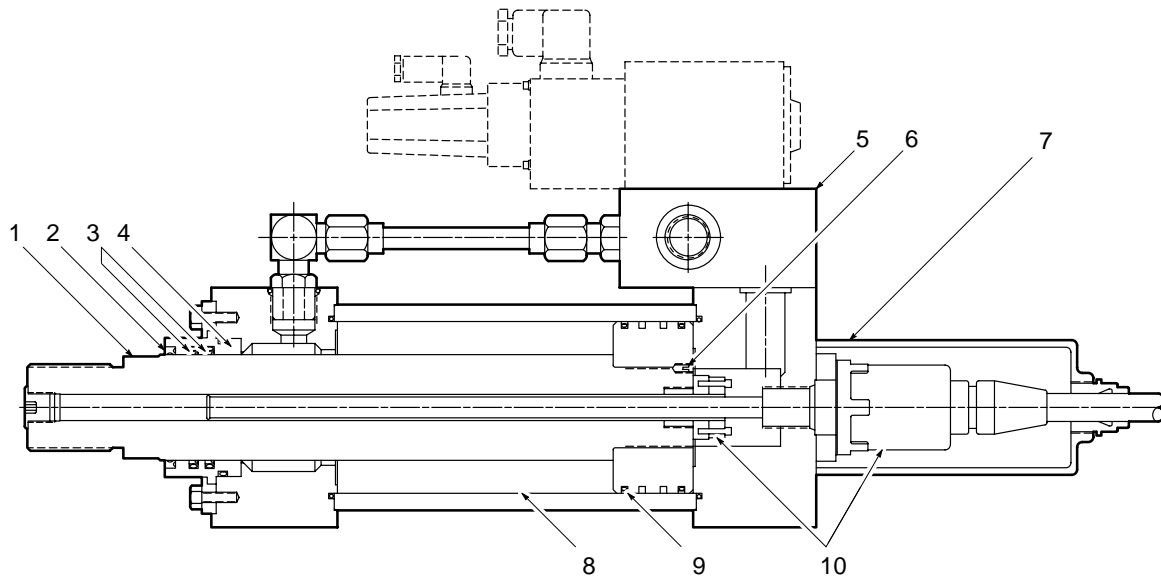
### TT17 – MT1



Bore	Rod End Dimensions							Mounting Dimensions Affected By Rod Diameter	
	MM	KK	CC	A	B	C	VB	XI	XG
2.00	1.38	1.000-14	1.250-12	1.62	1.999	0.62	1.00	3.94	2.62
2.50	1.38	1.000-14	1.250-12	1.62	1.999	0.62	1.00	4.12	2.62
	1.75	1.250-12	1.500-12	2.00	2.374	0.75	1.12	4.38	2.88
3.25	1.38	1.000-14	1.250-12	1.62	1.999	0.62	0.62	4.50	2.75
	1.75	1.250-12	1.500-12	2.00	2.374	0.75	0.75	4.75	3.00
	2.00	1.500-12	1.750-12	2.25	2.624	0.88	0.75	4.88	3.12
4.00	1.75	1.250-12	1.500-12	2.00	2.374	0.75	0.69	4.88	3.00
	2.00	1.500-12	1.750-12	2.25	2.624	0.88	0.69	5.00	3.12
	2.50	1.875-12	2.250-12	3.00	3.124	1.00	0.81	5.25	3.38
5.00	2.00	1.500-12	1.750-12	2.25	2.624	0.88	0.69	5.25	3.12
	2.50	1.875-12	2.250-12	3.00	3.124	1.00	0.81	5.50	3.38
	3.00	2.250-12	2.750-12	3.50	3.724	1.00	0.81	5.50	3.38
	3.50	2.500-12	3.250-12	3.50	4.249	1.00	0.81	5.50	3.38

Bore	Constants				TT15 – MT4 and TT17 – MT1			
	EE	E	H	JJ	TD	TM	UM	UT
2.00	SAE #8	3.0	1.38	5.00	1.375	3.38	6.12	5.75
2.50	SAE #8	3.5	1.50	6.25	1.375	4.00	7.00	6.25
3.25	SAE #12	4.5	1.75	–	1.750	5.00	8.50	8.00
4.00	SAE #12	5.0	2.00	–	1.750	6.25	9.75	8.50
5.00	SAE #12	6.5	2.50	–	1.750	7.75	11.25	10.00

# Design Features



1. **Actuator piston rod** of high strength (100,000 psi minimum yield) is precision drilled the full length to provide interference-free movement along the transducer probe.
2. **Rod wiper** protects rod seals by helping eliminate ingress of contaminants.
3. **Energized Teflon\* rod seals** maintain positive seal contact regardless of system pressure, resulting in minimum friction and long life.
4. **Fe<sup>3</sup>N rod bearing** is surface hardened for maximum wear resistance.
5. **Machined manifold** allows mounting of valve directly on cylinder cap. This eliminates leaks and piping problems and provides for simplified installation and maintenance.
6. **Piston connection** utilizes a full-length threaded one-piece piston, anaerobic adhesive bonding agent, and lock screw to allow the actuator to operate in high frequency cyclical applications with no danger of rod separation.
7. **Optional cast aluminum cover** protects transducer head from environmental and physical damage.
8. **Cylinder bore** is precision honed and hard chrome plated to provide optimum surface finish for contact with piston seal.
9. **Glass filled Teflon piston seal** provides minimum friction and long life while eliminating backlash—the perfect combination for servo system accuracy and response.
10. **Precision solid state position transducer\*\*** generates digital or analog output feedback. Magnetostrictive design eliminates mechanical contact in operation.

\* Teflon is a registered trademark of the DuPont Co.

\*\* Transducer can be provided upon request

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