



# Protection Tubes

United Electric Controls is  
ISO 9001:2015 certified



AST-PROTECTB 01

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**CERAMIC TUBE, NO MOUNTING FITTING**

**How to build a part number:**

Select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Consult UE-AST for custom solutions.

STYLE	TUBE DIAMETER	TUBE MATERIAL	LENGTH

**STYLE**

**CT1** - Ceramic protection tube, no mounting fitting

**TUBE DIAMETER**

**O.D.**

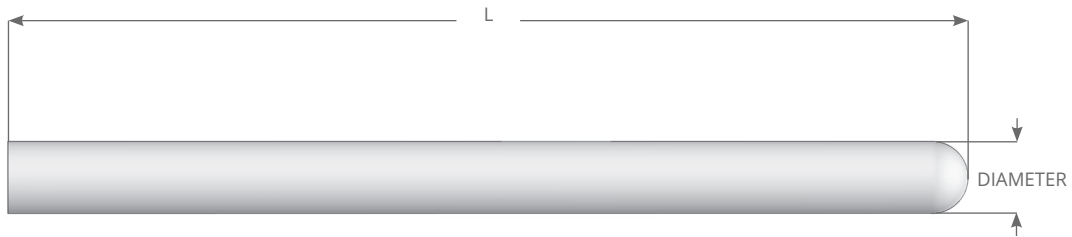
- 0 - 0.375"
- 1 - 0.5"
- 2 - 0.688"
- 3 - 0.75"
- 4 - 0.875"
- 5 - 1"
- 6 - 1.1"
- 7 - 1.25"
- 8 - 1.5"
- 9 - 1.75"

**TUBE MATERIAL**

- A** - Alumina
- M** - Mullite - not recommended for noble metal thermocouples
- H** - Hexalloy
- L** - LT-1
- S** - Sialon
- C** - Silicon carbide, oxide bonded

**LENGTH (in inches)**

**L#** - Specify length (e.g., L6 = 6" overall length)



**CT1**

**CERAMIC TUBE, WITH MOUNTING FITTING OR NIPPLE**

**How to build a part number:**

Select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Consult UE-AST for custom solutions.

STYLE	TUBE DIAMETER	TUBE MATERIAL	INSTRUMENT CONNECTION	PROCESS CONNECTION	CONNECTION MATERIAL	CONNECTION LENGTH	LENGTH

**STYLE**

**CT2** - Ceramic protection tube with threaded hex fitting

**CT3** - Ceramic protection tube with pipe nipple

**TUBE DIAMETER**

**O.D.**

- 0 - 0.375"
- 1 - 0.5"
- 2 - 0.688"
- 3 - 0.75"
- 4 - 0.875"
- 5 - 1"
- 7 - 1.25"

**TUBE MATERIAL**

- A** - Alumina
- M** - Mullite - not recommended for noble metal thermocouples
- H** - Hexalloy
- L** - LT-1

**INSTRUMENT CONNECTION\***

- 0** - 1/2" NPT
- 1** - 3/4" NPT
- 2** - 1" NPT
- 3** - 1-1/4" NPT

**PROCESS CONNECTION\***

- 0** - 1/2" NPT
- 1** - 3/4" NPT
- 2** - 1" NPT
- 3** - 1-1/4" NPT

**CONNECTION MATERIAL**

- Y** - 304 stainless steel
- W** - 316 stainless steel
- G** - Carbon steel

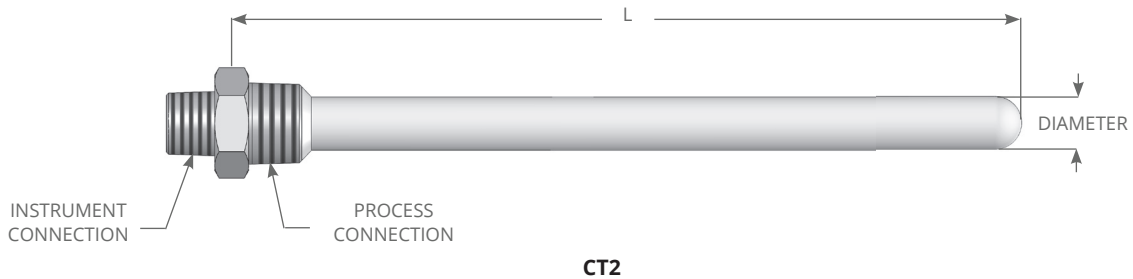
**CONNECTION LENGTH**

- 1** - CT2 only (hex fitting length)
- #** - CT3 only (length of nipple in inches; e.g., 6 = 6" nipple)

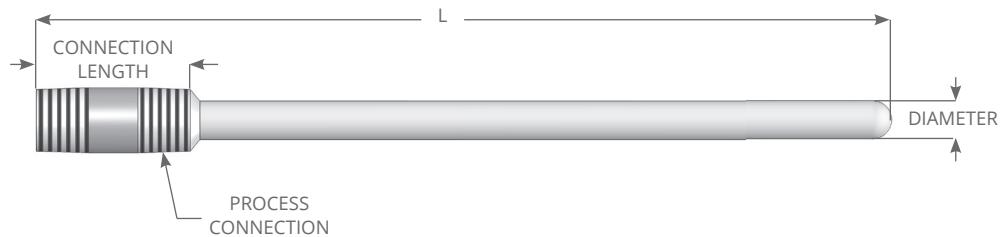
**LENGTH** (in inches)

**L#** - Specify length (For CT2, U is approximately L - 1"; for CT3, U is approximately L - the nipple length)

\* For CT3, Instrument and Process Connection sizes must be the same.



**CT2**



**CT3**

## METAL TUBE, PLAIN OR WITH MOUNTING BUSHING

### How to build a part number:

Select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Consult UE-AST for custom solutions.

STYLE	PIPE SIZE/INSTRUMENT CONNECTION	PIPE SCHEDULE	PIPE & BUSHING MATERIAL	BUSHING SIZE	OVERALL LENGTH	INSERTION LENGTH

#### STYLE

- MT1** – Metal protection tube, threaded, no bushing
- MT2** – Metal protection tube, threaded, with bushing

#### PIPE SIZE/INSTRUMENT CONNECTION

	PIPE SIZE	CONNECTION
1 -	1/2" pipe (0.840" dia.)	1/2" NPT
2 -	3/4" pipe (1.050" dia.)	3/4" NPT
3 -	1" pipe (1.315" dia.)	1" NPT

#### PIPE SCHEDULE

- 40** – Schedule 40
- 80** – Schedule 80
- 160** – Schedule 160

#### PIPE AND BUSHING MATERIAL

- 304** – 304 stainless steel
- 310** – 310 stainless steel
- 316** – 316 stainless steel
- 316L** – 316L stainless steel
- 321** – 321 stainless steel
- A20** – Alloy 20
- INC** – Inconel 600®
- 400** – Monel 400®

#### BUSHING SIZE (MT2 only)

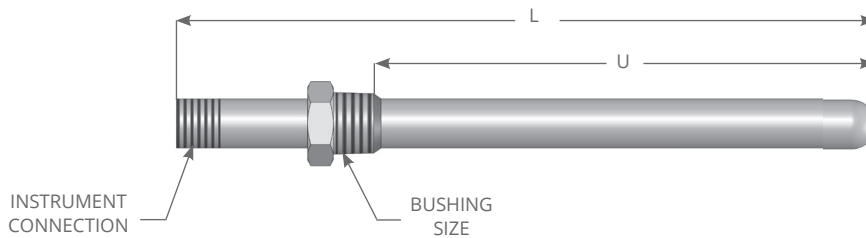
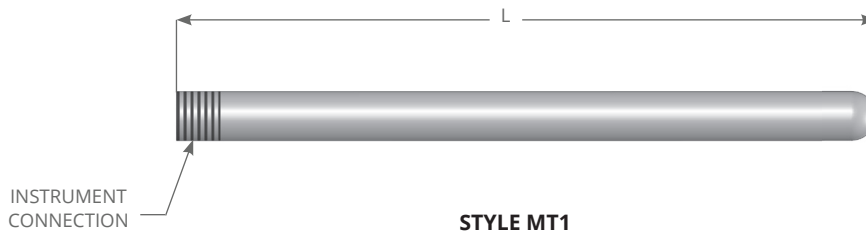
- 1** – 1/2" NPT
- 2** – 3/4" NPT
- 3** – 1" NPT
- 4** – 1-1/4" NPT
- 5** – 1-1/2" NPT
- 7** – 2" NPT

#### OVERALL LENGTH (in inches)

**L#** – Specify overall length of tube (e.g., L24 = 24" long tube)

#### INSERTION LENGTH (MT2 only, in inches)

**U#** – Specify length below bushing connection (e.g., U6 = 6" below thread)



**METAL TUBE WITH MOUNTING FLANGE**

**How to build a part number:**

Select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Consult UE-AST for custom solutions.

STYLE	PIPE SIZE/ INSTRUMENT CONNECTION	PIPE SCHEDULE	PIPE & FLANGE MATERIAL	FLANGE SIZE	FLANGE RATING	FLANGE TYPE	OVERALL LENGTH	INSERTION LENGTH

**STYLE**

**MT4** – Metal protection tube, threaded, with flange

**PIPE SIZE/INSTRUMENT CONNECTION**

Pipe Size	Connection
1 – 1/2" pipe (0.840" dia.)	1/2" NPT
2 – 3/4" pipe (1.050" dia.)	3/4" NPT
3 – 1" pipe (1.315" dia.)	1" NPT

**PIPE SCHEDULE**

- 40 – Schedule 40
- 80 – Schedule 80
- 160 – Schedule 160

**PIPE AND FLANGE MATERIAL**

- 304 – 304 stainless steel
- 310 – 310 stainless steel
- 316 – 316 stainless steel
- 316L – 316L stainless steel
- 321 – 321 stainless steel
- A20 – Alloy 20
- INC – Inconel 600®
- 400 – Monel 400®

**FLANGE SIZE**

- 1 – 1" flange
- 1.5 – 1.5" flange
- 2 – 2" flange
- 3 – 3" flange
- 4 – 4" flange

**FLANGE RATING**

- 150 – 150# flange rating
- 300 – 300# flange rating
- 600 – 600# flange rating
- 900/1500 – 900/1500# flange rating

**FLANGE TYPE**

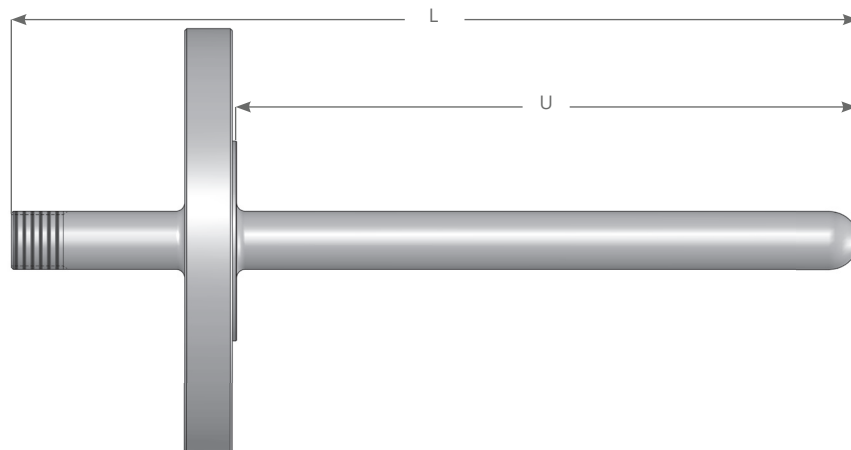
- RF – Raised face
- FF – Flat face
- RTJ – Ring type joint

**OVERALL LENGTH** (in inches)

**L#** – Specify overall length of tube (e.g., L24 = 24" long tube)

**INSERTION LENGTH** (in inches)

**U#** – Specify length below flange (e.g., U6 = 6" below flange)



**STYLE MT4**



## **SPECIAL SECONDARY (OUTER) TUBE WITH MOUNTING FLANGE**

### **How to build a part number:**

Select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Consult UE-AST for custom solutions.

STYLE	TUBE DIAMETER	TUBE MATERIAL	SLIP FLANGE SIZE	OVERALL LENGTH

#### **STYLE**

**PT3** – Outer protection tube, with 4-7/8" mounting flange for mounting, to be used with inner ceramic protection tube (Style CT2 or CT3)

#### **TUBE DIAMETER**

**9** – 1-3/4" O.D.

#### **TUBE MATERIAL**

**C** – Silicon carbide, oxide bonded

#### **SLIP FLANGE SIZE**

**5** – 4-7/8"

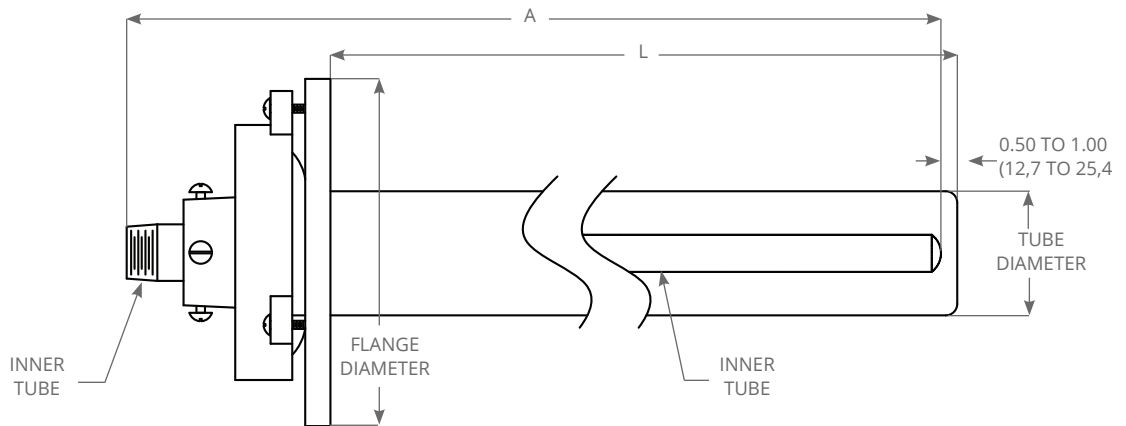
#### **OVERALL LENGTH** (in inches)

**L#** – Specify length of tube below flange (e.g., L24=24" long tube)

#### **Notes:**

When inner protection tube is required:

1. Use CT2/CT3 spec sheet to specify inner tube.
2. Style should be CT3 with a 3/4" diameter to match up with 1-3/4" outer tube.
3. Minimum nipple length should be 4" in order to extend past the collar.
4. Length of inner tube (A) should be equal to outer tube length (L) + 2.5".
5. UE-AST recommends alumina inner protection tubes when using platinum thermocouples. Mullite, although less expensive when compared to alumina, can contaminate the platinum, causing drift.



**PT3**

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UNITED ELECTRIC  
CONTROLS

180 Dexter Avenue  
Watertown, MA 02472 - USA  
Telephone: 617 926-1000 - Fax: 617 926-2568  
[www.ueonline.com](http://www.ueonline.com)

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