

Climate  
Control

IMI TA

## TA-Slider 1600 T-2T



### **Actuators**

Digitally configurable proportional push-pull actuator –  
360 lbf (1600 N)

# TA-Slider 1600 T-2T

Digitally configurable actuators with temperature measurement capability for all control systems with or without Bus communication. To be mounted on a PIBCV for tackling  $\Delta T$  syndrome or for handling change-over based on T supply or  $\Delta T$  sign detection. Wide range of setup possibilities gives high flexibility to adapt parameters on-site. Fully programmable binary input, relay and adjustable max. stroke of the valve bring new opportunities for advanced hydronic control and balancing.



## Key features

### Optional $\Delta T$ and temperature return limitation

Optimize the efficiency of your production units by ensuring optimal temperature regimes.

### Change-over functionality

Switch between heating/cooling flows according to input signal or automatically using T supply or  $\Delta T$  sign detection.

### Convenient, reliable setup

Fully customisable by smartphone via Bluetooth using a TA-Dongle.

### Easy diagnostics

Tracks the last 10 errors to allow system faults to be found quickly.

### Perfection in connectivity

Communication with the most used Bus protocols.

## Technical description

### Functions:

$\Delta T$  and temperature return limitation  
Reading (supply/return temperature,  $\Delta T$ , position)  
Automatic change-over function  
Proportional control  
3-point control  
On-off control  
Manual override  
Stroke detection  
Mode, status and position indication  
Output signal VDC  
Stroke limitation setting  
Minimum stroke setting  
Valve blockage protection  
Valve clogging detection  
Error safe position  
Diagnostic/Logging  
Delayed start-up

BUS communication board  
+ ModBus or BACnet.

Relay board  
+ 1 binary input, max. 100  $\Omega$ , cable max. 32.8 ft or shielded.  
+ 2 relays, max. 5A, 30 VDC/250 VAC on resistive load.  
+ Output signal in mA.

For T version connect 1 Pt1000, for 2T version connect 2 Pt1000 (see section "Sensors").

### Supply voltage:

24 VAC/VDC  $\pm 15\%$ .  
Frequency 50/60 Hz  $\pm 3$  Hz.

### Power consumption:

Operation: < 11.5 VA (VAC); < 5.7 W (VDC)  
Standby: < 1.1 VA (VAC); < 0.5 W (VDC)

### Input signal:

0(2)-10 VDC,  $R_i$  47 k $\Omega$ .  
Adjustable sensitivity 0.1-0.5 VDC.  
0.33 Hz low pass filter.  
0(4)-20 mA  $R_i$  500  $\Omega$ .  
Proportional:  
0-10, 10-0, 2-10 or 10-2 VDC  
0-20, 20-0, 4-20 or 20-4 mA  
Proportional split-range:  
0-5, 5-0, 5-10 or 10-5 VDC  
0-4.5, 4.5-0, 5.5-10 or 10-5.5 VDC  
2-6, 6-2, 6-10 or 10-6 VDC  
0-10, 10-0, 10-20 or 20-10 mA  
4-12, 12-4, 12-20 or 20-12 mA  
Proportional dual-range (for change-over):  
0-3.3 / 6.7-10 VDC,  
10-6.7 / 3.3-0 VDC,  
2-4.7 / 7.3-10 VDC or  
10-7.3 / 4.7-2 VDC.  
Default setting: Proportional 0-10 VDC.

### Output signal:

0(2)-10 VDC, max. 8 mA, min. 1.25 k $\Omega$ .  
Plus version: 0(4)-20 mA, max. 700  $\Omega$ .  
Ranges: See "Input signal".  
Default setting: Proportional 0-10 VDC.

**Characteristics:**

Linear, EQM 0.25 and inverted EQM 0.25.  
Default setting: Linear.

**Control speed:**

76.2, 101.6, 152.4, 203.2, 304.8 or  
406.4 s/in  
Default setting: 76.2 s/in.

**Adjusting force:**

360 lbf

**Temperature:**

Media temperature: 32°F – +248°F  
Operating environment: 32°F – +122°F  
(5-95%RH, non-condensing)  
Storage environment: -4°F – +158°F  
(5-95%RH, non-condensing)

**Measurement accuracy:**

Temperature pocket: Class AA  
In valve measuring point: Class B  
Surface mounted: Class B

**Absolute temperature:**

Pt1000 Class AA: ±32.2 °F at 32 °F  
Pt1000 Class B: ±32.5 °F at 32 °F

**Time constant  $\tau$  (63%):**

In valve measuring point: 5s  
Temperature pocket: 9s  
Surface mounted: 20s

**Ingress protection:**

IP54 all directions  
(according to EN 60529)

**Protection class:**

(according to EN 61140)  
Class I

**Stroke:**

1.30 in  
Automatic detection of the valve lift  
(stroke detection).

**Noise level:**

Max. 40 dBA

**Weight:**

3.5 lb

**Connection to valve:**

By two M8 screws to the valve and by  
quick connection to the stem.

**Material:**

Cover: PBT  
Bracket: Alu EN44200

**Temperature sensor cable:**

Halogen free, fire class IEC 60332-3-24  
(cat. C).  
Lengths see section "Sensors".

**Colour:**

Orange RAL 2011, grey RAL 7043.

**Marking:**

IMI TA, product name, article No. and  
technical specification.  
LED indication description.

**Certification CE:**

LV-D. 2014/35/EU: EN 60730-1, -2-14.  
EMC-D. 2014/30/EU: EN 60730-1, -2-14.  
RoHS-D. 2011/65/EU: EN 63000.

**Product standard:**

EN 60730  
(for Residential and industrial areas)

**Cable:**

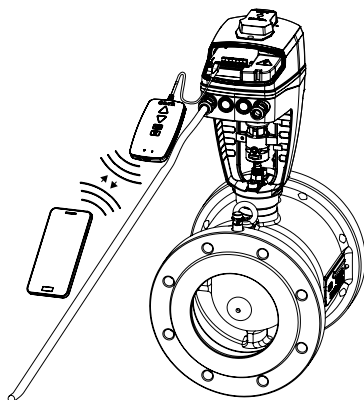
Wire cross-section\*: 20 AWG-14 AWG  
(0.5-2.0 mm<sup>2</sup>)  
- Protection class I: H05VV-F or similar  
- Protection class III: LiYY or similar

\*) **Note:** Wire cross-sections must be  
chosen according to actuator power  
consumption and line length, such as the  
voltage supply to the actuator does not  
go below 20.4 VAC/VDC (24 VAC/VDC  
minus 15%).  
In case of VDC input signal on a  
24 VAC/VDC powered actuator, the  
voltage drop on neutral line must be  
smaller than the defined hysteresis level  
for the VDC input signal.

## Function

### Setting

The actuator can be set by the HyTune app (iOS version 8 or later on iPhone 4S or later, Android version 4.3 or later) + the TA-Dongle device, with or without the actuator power supplied. The setting configuration can be stored in the TA-Dongle for setting of one or several actuators. Press the configuration button on the TA-Dongle, after connecting to the actuator. HyTune can be downloaded from the Apple App Store or Google Play.



### Setting Bus communication parameters

Configuration of Bus parameters such as address, baud rate, parity and more is to be carried out by the HyTune app + the TA-Dongle device, with or without the actuator power supplied. More detailed information, please see Bus protocol implementation documents.

### Manual override

By 5 mm Allen key or by the TA-Dongle device.

**Note:** Power supply needed when TA-Dongle is used.

### Position indicator

Visible mechanical stroke indication on the bracket.

### Calibration/Stroke detection

According to selected settings in the table.

Type of calibration	At power on	After manual override
Both end positions (full)	√ *	√
Fully extended position (fast)	√	√ *
None	√	

\*) Default

**Note:** A calibration refresh can be automatically repeated monthly or weekly.  
Default setting: Off.

### Stroke limitation setting

A maximum stroke smaller than or equal to the detected valve lift can be set to the actuator.

For some IMI TA/IMI Heimeier valves it can also be set to a

$Cv_{max}/q_{max}$ .

Default setting: No stroke limitation (100%).

### Minimum stroke setting

The actuator can be set with a minimum stroke below which it will not go (except for calibration).

For some IMI TA/IMI Heimeier valves, it can also be set to a  $q_{min}$ .  
Default setting: No minimum stroke (0%).

### Valve blockage protection

If no actuation is performed for one week or one month, the actuator will perform one full stroke cycle.

Default setting: Off.

### Valve clogging detection

If actuation stops before the desired value is reached, the actuator moves back ready to make a new attempt. The actuator will move to the configured error safe position after three attempts.

Default setting: On.

### Error safe position

Fully extended or retracted position when following errors occur; low power, line break, valve clogging or stroke detection failure.  
Default setting: Fully extended position.

### Diagnostics/logging

The last 10 errors (low power, line break, valve clogging, stroke detection failure) with time-stamps are readable by the HyTune app + TA-Dongle device. Time-stamps of past errors will be cleared if the power is disconnected.

### Delayed start-up

The actuator can be specified a delay (0 to 1275 sec.) before starting up after a power supply cut. This is useful when used with a control system that has itself a long start-up time.

Default setting: 0 seconds.

### ΔT and temperature return limitation

Ensure your installation is properly balanced and optimize the efficiency of your production units by ensuring optimal temperature regimes.

### Connection interfaces for Bus communication

- RS485; BACnet MS/TP, Modbus/RTU

- Ethernet; BACnet/IP, Modbus/TCP

### Binary input












If the binary input circuit is open, the actuator will go to a set stroke, switch to a second stroke limitation setting or drive to its full stroke regardless of any limitations for flushing purpose. See also Change-over system detection.

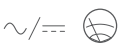







Default setting: Off

### Change-over system detection

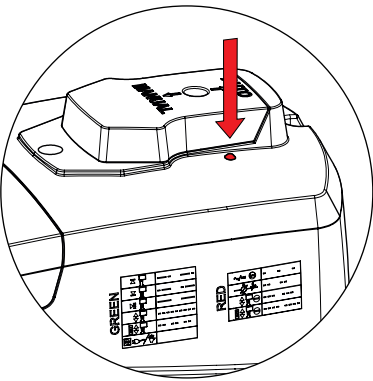
Switching between two different stroke limitation settings by toggling the binary input or using the dual-range input signal. For the Bus versions, this switching may also be made via the Bus.

## LED indication

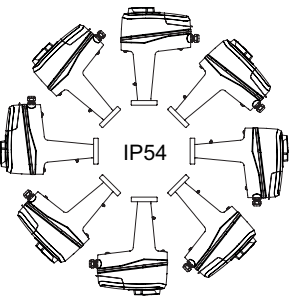
		Status	Green
		Fully retracted (actuator stem)	Long pulse - Short pulse
		Fully extended (actuator stem)	Short pulse - Long pulse
		Intermediate position	Long pulses
		Moving	Short pulses
		Calibrating	2 short pulses
		Manual mode or no power supply	Off

		Error code	Red
		Power supply too low	1 pulse
		Line broken (2-10 V or 4-20 mA)	2 pulses
		Valve clogging or foreign object	3 pulses
		Stroke detection failure	4 pulses

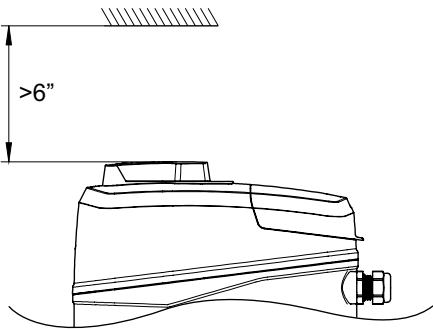
If an error is detected, red pulses are displayed as the green status lights flash alternately.  
More detailed information, please see the HyTune app + TA-Dongle.



## Installation



### Note!



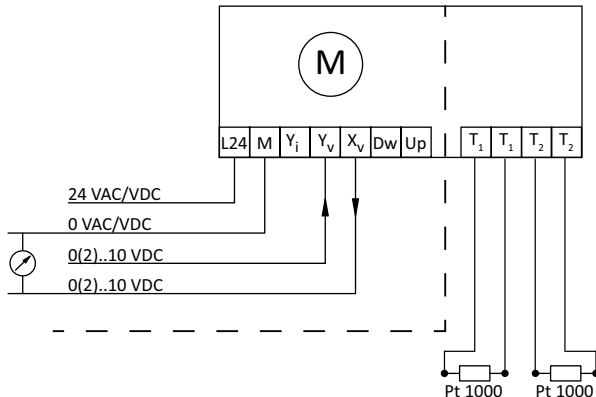
## Connection diagram – Terminal/Description

Terminal	Description
L24	Power supply 24 VAC/VDC
M*	Neutral for power supply 24 VAC/VDC and signals
Y <sub>i</sub>	Input signal for proportional control 0(4)-20 mA, 500 Ω
Y <sub>v</sub>	Input signal for proportional control 0(2)-10 VDC, 47 kΩ
X <sub>i</sub>	Output signal 0(4)-20 mA, max. resistance 700 Ω
X <sub>v</sub>	Output signal 0(2)-10 VDC, max. 8 mA or min. load resistance 1.25 kΩ
Dw	3-point control signal for extending actuator spindle
Up	3-point control signal for retracting actuator spindle
B	Connection for potential free contact (e.g. open window detection), max. 100 Ω, max. 32.8 ft (10 m) cable or shielded
COM1, COM2	Common relay contacts, max. 250 VAC, max. 5A @ 250 VAC on resistive load, max. 5A @ 30 VDC on resistive load
NC1, NC2	Normally closed contacts for relays 1 and 2
NO1, NO2	Normally open contacts for relays 1 and 2
T1	Connection to first Pt1000 temperature sensor, max. 32.8 ft (10 m) total cable length between actuator and sensor head.
T2	Connection to second Pt1000 temperature sensor, max. 32.8 ft (10 m) total cable length between actuator and sensor head.

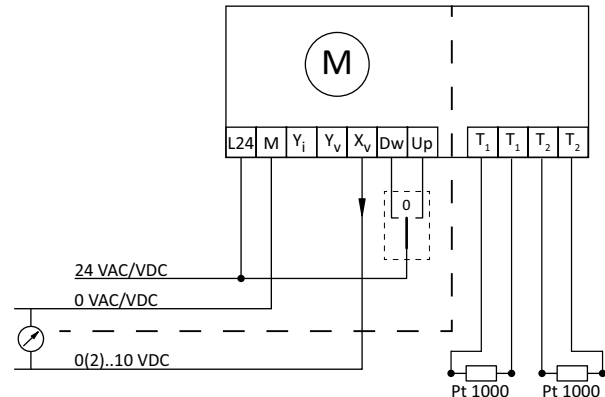
\*) All M terminals are internally connected.

## Connection diagram – 24 V

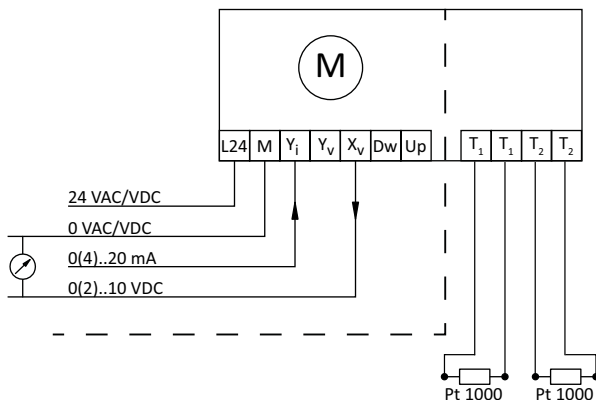
### 0(2)-10 VDC



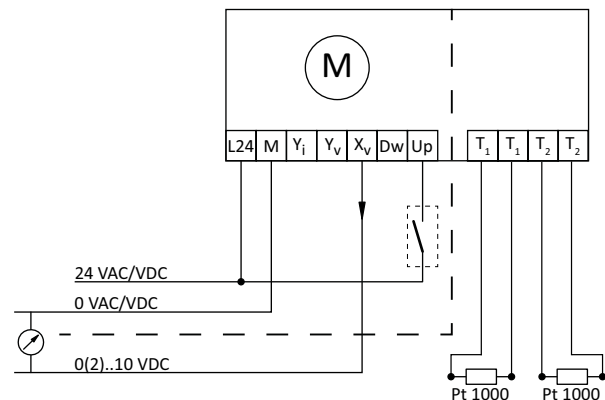
### 3-point



### 0(4)-20 mA



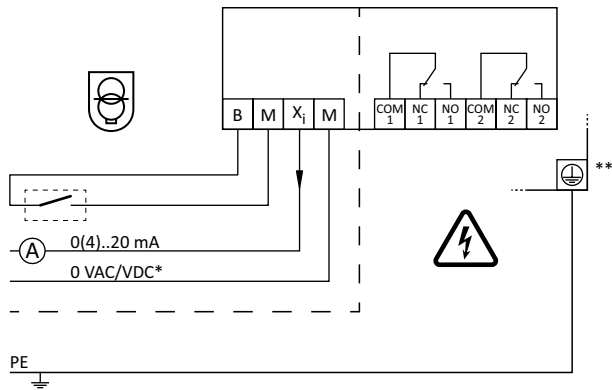
### On-off



24 VAC/VDC operating only with safety transformer according to EN 61558-2-6.

## Connection diagram – Relay

### Relay board



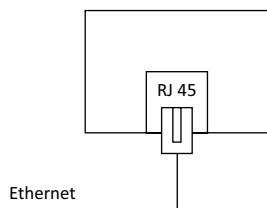
\*) Low voltage neutral

\*\*) Ground connection required.

## Connection diagram – Bus communication

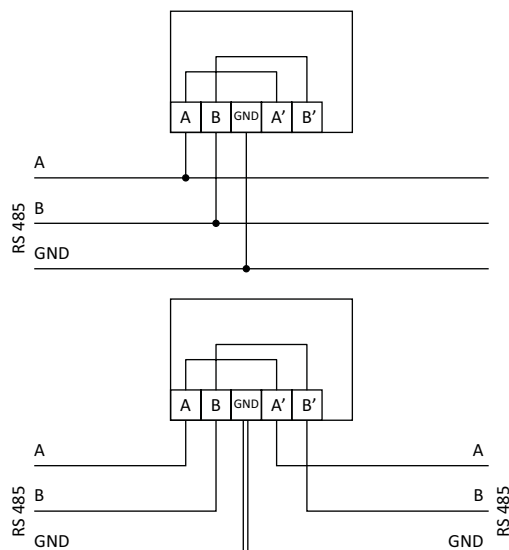
### Ethernet communication board

BACnet/IP, Modbus/TCP



### RS 485 board

BACnet MS/TP, Modbus/RTU



**Note:** A, B, A', B' and GND terminals are isolated from all other terminals.

## Sensors

T version: For applications that require only one temperature measurement, order one temperature sensor.

2T version: For applications where two temperature measurements are necessary, order two temperature sensors.

IMI offers a range of temperature sensors that are compatible with the actuator. Note that the sensors do not have to be of the same type. For article numbers see section "Sensors".

### Insertion in temperature pocket

Sensor type: Pt1000, Ø 0.197 in. (5 mm), 9.84 ft. (3 m) cable.

Pocket length [in]	Cable length [ft]	For pipe size			
		3/8" - 1"	1 1/4" - 2"	2 1/2" - 3"	4" - 10"
0.98	9.84	X			
1.57	9.84		X		
2.76	9.84			X	
3.94	9.84				X

### Insertion in valve measuring point

Sensor type: Pt1000, Ø 0.118 in. (3 mm), 9.84 ft. (3 m) or 16.4 ft. (5 m) cable.

Sensor length [in]	Cable length [ft]	TA-Modulator Size 3/8" - 2"	TBV-CM Size 1/2" - 1"	TA-COMPACT -PI-DP Size 3/8" - 1 1/4"	STAD Size 3/8" - 2"	STAF/ STAF-SG Size 2 1/2" - 5"	STAF/ STAF-SG Size 6"	STAF-SG Size 8" - 10"	STAF-SG Size 12" - 16"
2.36	9.84	X	X	X	X				
5.12	16.4					X		X	
6.69	16.4						X		X

### Surface mounted temperature sensor

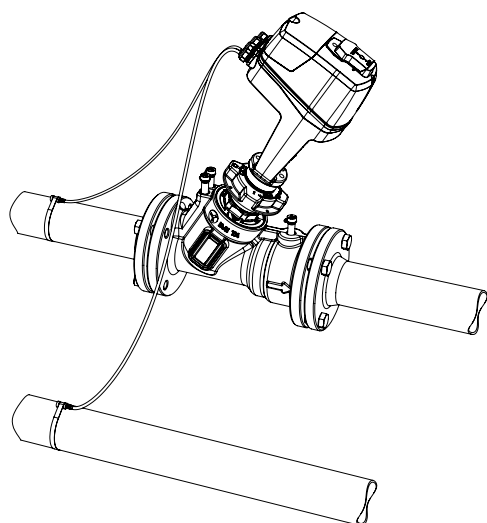
Sensor type: Pt1000, 9.84 ft. (3 m).

## Examples

### TA-Modulator with 2T version

In this setup, 2 sensors should be ordered.

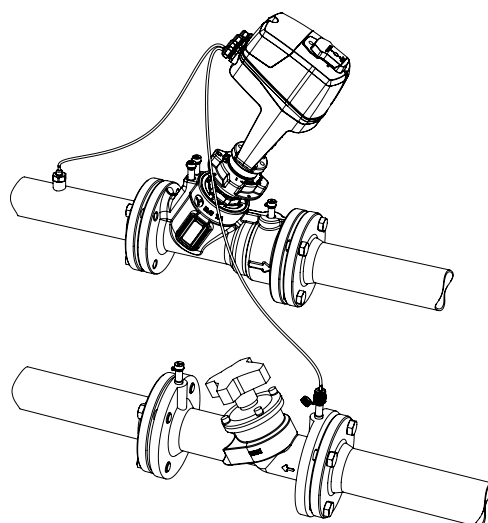
One sensor is mounted on the surface of the supply pipe, and another sensor is mounted on the surface of the return pipe.



### TA-Modulator with 2T version and STAF

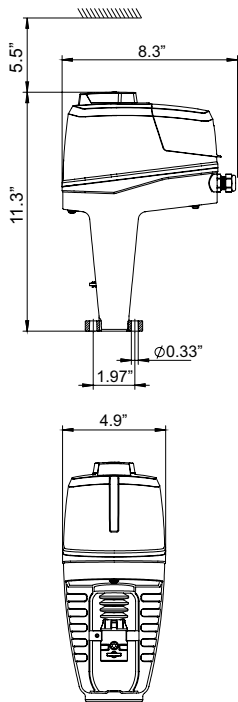
In this setup, 2 sensors should be ordered.

One sensor is inserted into a temperature pocket, and another sensor is used for insertion in the measuring point from STAF.





## Articles



### TA-Slider 1600 T-2T

Without Pt1000. Sensors ordered separately.

Input signal: 0(2)-10 VDC, 0(4)-20 mA, 3-point, on-off

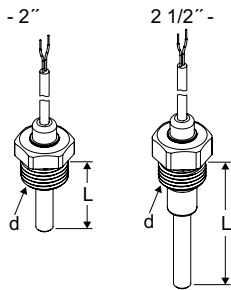
With binary input, relays, mA output signal

Supply voltage	Bus	Article No
24 VAC/VDC	-	322228-10419

With BUS communication, binary input, relays, mA output signal

Supply voltage	Bus	Article No
24 VAC/VDC	Modbus/RTU	RS 485
	BACnet MS/TP	RS 485
	Modbus/TCP	Ethernet
	BACnet/IP	Ethernet

## Sensors

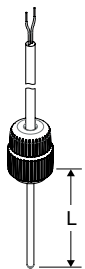


### Temperature pocket with sensor

Pt1000

For mounting directly on pipe. Free space >2.76 in. is required above the temperature pocket.

For pipe size	d	L [in]	Cable length	Article No
3/8" - 1"	G1/2	0.98	9.84 ft. (3 m)	322428-00020
1 1/4" - 2"	G1/2	1.57	9.84 ft. (3 m)	322428-00521
2 1/2" - 3"	G1/2	2.76	9.84 ft. (3 m)	322428-00621
4" - 10"	G1/2	3.94	9.84 ft. (3 m)	322428-00721

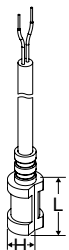


### Temperature sensor for valve measuring point

Pt1000

Applicable to families: TA-Modulator, TBV-CM, TA-COMPACT-P/-DP, STAD, STAF-SG

For valve size	L [in]	Cable length	Article No
3/8" - 2"	2.36	9.84 ft. (3 m)	322428-00122
2 1/2" - 10"	5.12	16.4 ft. (5 m)	322428-00134
12" - 16"	6.69	16.4 ft. (5 m)	322428-00135



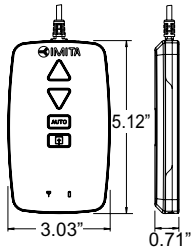
### Surface temperature sensor

Pt1000

For mounting directly on pipe surface.

H [in]	L [in]	Cable length	Article No
0.39	0.63	9.1 ft. (3 m)	322428-00429

## Additional equipment



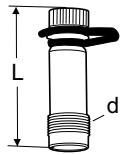
### TA-Dongle

For Bluetooth communication with the HyTune app, transfer configuration settings and manual override.

#### Article No

322228-00001

## Accessories



### Measuring point

AMETAL®/EPDM

For mounting directly on pipe and insertion of temperature sensor for measuring point.

d	L [in]	Article No
R1/4	1.535	52 179-009
R1/4	4.055	52 179-609
R3/8	1.772	52 179-008
R3/8	3.976	52 179-608

### Stem heater

Including spindle top (extension) and extended screws.

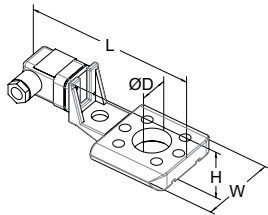
Temperature range till 14 °F.

Voltage 24 VAC  $\pm 10\%$  50/60 Hz  $\pm 5\%$ .

Power  $P_N$  approx. 30 W.

Current 1.4 A.

Surface temperature max. 122 °F.



For valve	Size	L [in]	H [in]	W [in]	D [in]	Article No
		5.71	1.93	2.75	1.18	
KTM 512	2 1/2" - 5"					322042-81401
TA-Modulator	2 1/2" - 8"					322042-80010