

Climate  
Control

IMI TA

## TA-Slider 1600 Fail-safe 2T Plus



### Actuators

Digitally configurable proportional push-pull actuator with electronic fail-safe function and temperature measurement capability – 360 lbf (1600 N)

## TA-Slider 1600 Fail-safe 2T Plus

Digitally configurable fail-safe actuators with temperature measurement capability for all control systems for all control systems with or without change-over. 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.

#### Fully configurable fail-safe

Setting of stroke position (extended, retracted or intermediate position) and delay feature for entering/leaving fail-safe mode for a reliable and optimal fail-safe function.

#### Convenient, reliable setup

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

#### Fully configurable

More than 200 setup options allow input and output signals, binary input, relay, characteristics and many other parameters to be configured.

#### Easy diagnostics

Tracks the last 10 errors to allow system faults to be found quickly and health check of fail-safe function.

### Technical description

#### Functions:

Electronic fail-safe function  
 $\Delta T$  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

#### Relay board

+ 1 binary input, max. 100  $\Omega$ , cable max. 32.8 ft or shielded.  
 + 2 relays, max. 3A, 30 VDC/250 VAC on resistive load.  
 + Output signal in mA.

Connect one or two Pt1000 sensors depending on the application (see section "Sensors").

#### Fail-safe function:

Programmable actuator's stem extended, retracted or intermediate position on power failure.

#### Supply voltage:

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

#### Power consumption:

Peak: < 21.7 VA (VAC); < 8.7 W (VDC)  
 Operation: < 12.0 VA (VAC); < 6.0 W (VDC)  
 Standby: < 1.8 VA (VAC); < 0.7 W (VDC)  
 Peak consumption occurs for a short period after a power cut for recharging capacitors.

#### 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 $\Omega$ .  
 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.

**Fail-safe delay:**

Adjustable between 0 and 10 seconds.  
Default setting: 2 s

**Power supply stabilisation delay:**

Adjustable between 1 and 5 seconds.  
Default setting: 2 s

**Pre-charging time:**

< 60 s

**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 – +122°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:  $\pm 32.2$  °F at 32 °F  
Pt1000 Class B:  $\pm 32.5$  °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.

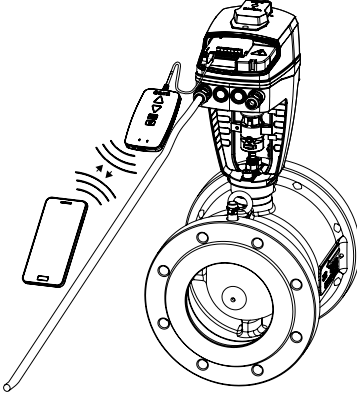
## Function

### Setting

The actuator can be set by the HyTune app (iOS version 16 or later, Android version 9 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. Connect the TA-Dongle to the actuator and press the configuration button.

HyTune can be downloaded from the App Store or Google Play.



### 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.

### Fail-safe

Goes to a pre-defined position when power supply is lost.

Pre-defined position settable to any position and delay before entering fail-safe mode after a power off settable between 0 and 10 seconds.

Default setting: Fully retracted and 2 seconds delay.

Going back to normal operation when power is back for more than a power supply stabilization delay settable between 1 and 5 seconds.

Default setting: 2 seconds.

Capacitor charge/health level of the fail-safe function is indicated by the colour of the fail-safe LED. A complete health check of the fail-safe function can be launched with the HyTune app.

### 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.




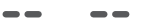




Default setting: Off

### Change-over system detection

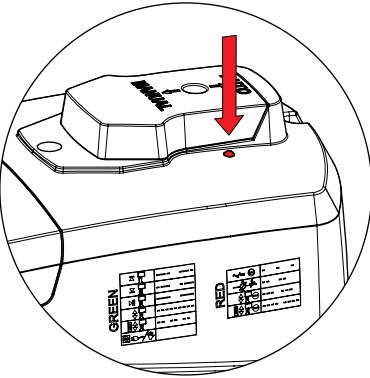
Switching between two different stroke limitation settings by toggling the binary input or using the dual-range input signal.

## LED indication

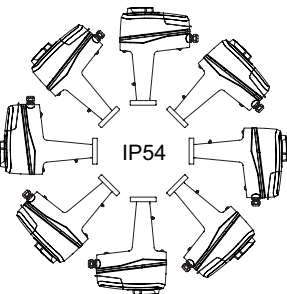
		Status	Green
		Fully retracted (actuator stem)	Long pulse - Short pulse
		Fully extended (actuator stem)	Short pulse - Long pulse
		Intermediate position	Long pulses
		Moving	Short pulses
		Calibrating	2 short pulses
		Manual mode or no power supply	Off

		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

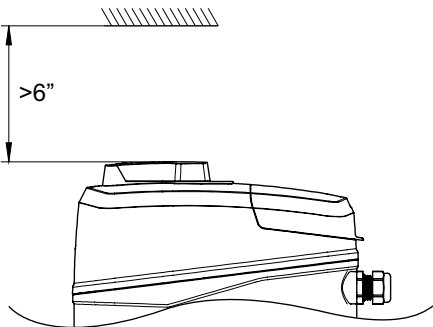
If an error is detected, red pulses are displayed as the green status lights flash alternately.  
More detailed information, please see the HyTune app + TA-Dongle.



## Installation



### Note!



## Connection diagram – Terminal/Description

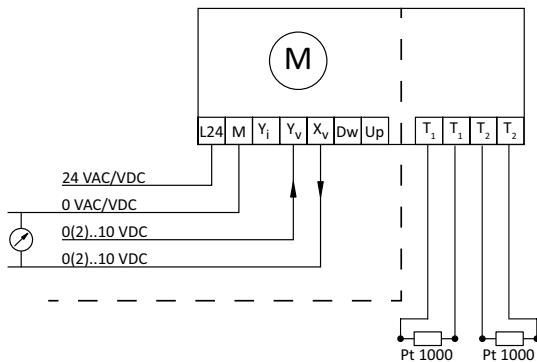
Terminal	Description
L24	Power supply 24 VAC/VDC
M*	Neutral for power supply 24 VAC/VDC and signals
Y <sub>i</sub>	Input signal for proportional control 0(4)-20 mA, 500 Ω
Y <sub>v</sub>	Input signal for proportional control 0(2)-10 VDC, 47 kΩ
X <sub>i</sub>	Output signal 0(4)-20 mA, max. resistance 700 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.

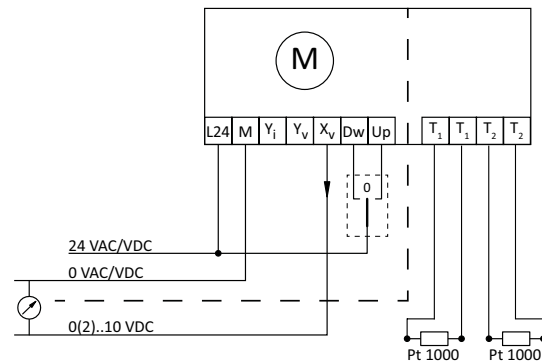
T1/T2: Required configuration via HyTune App. Temperature sensors must be enabled within ancillary inputs/outputs section of the control settings menu.

## Connection diagram – 24 V

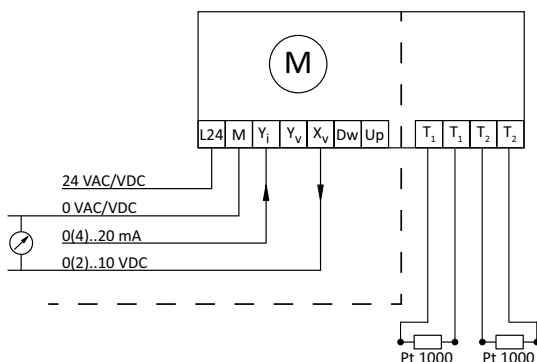
### 0(2)-10 VDC



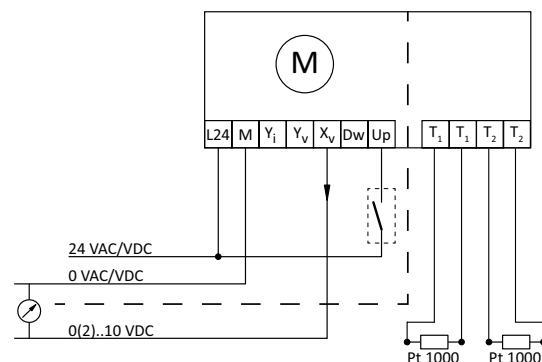
### 3-point



### 0(4)-20 mA



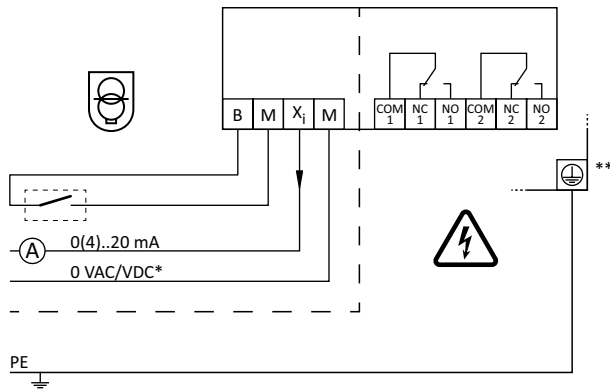
### On-off



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.

## Sensors

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

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

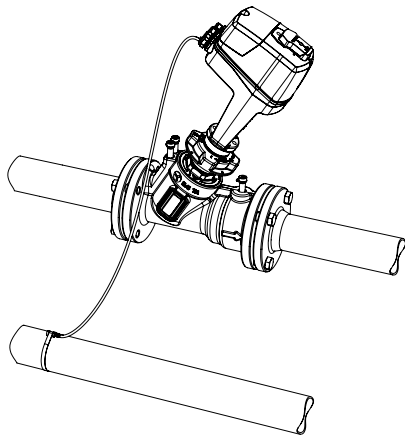
Sensor type: Pt1000, 9.84 ft. (3 m).

## Examples

### TA-Modulator with 1 sensor on return pipe

In this setup, 1 sensor should be ordered.

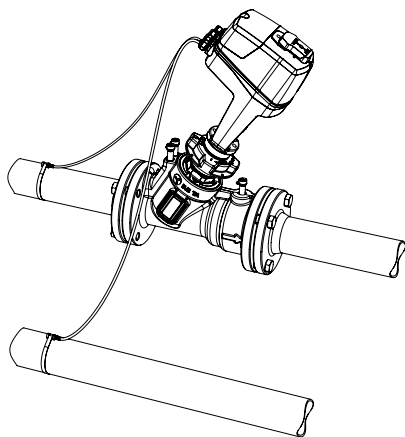
The sensor is mounted on the surface of the return pipe, for instance to monitor or control based on return water temperature.



### TA-Modulator with 2 sensors

In this setup, 2 sensors should be ordered.

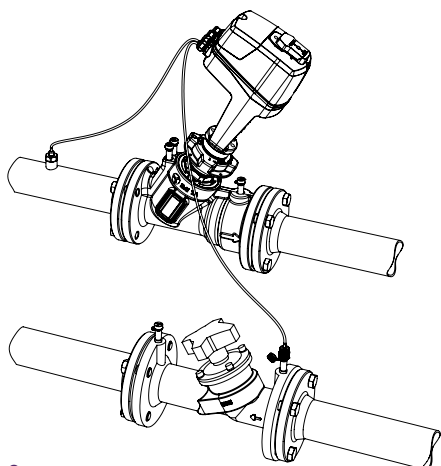
One sensor is mounted on the surface of the supply pipe, and another sensor is mounted on the surface of the return pipe.



### TA-Modulator with 2 sensors and STAF

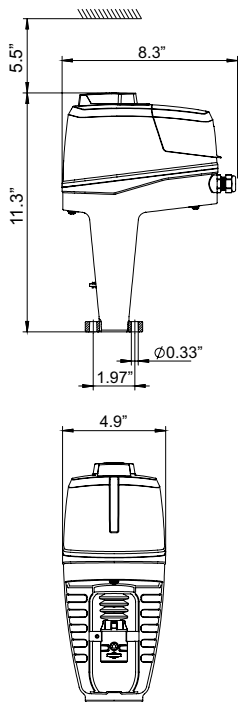
In this setup, 2 sensors should be ordered.

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 Fail-safe 2T Plus

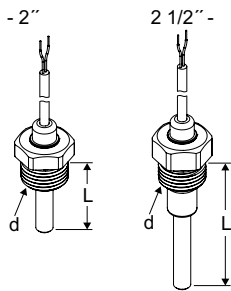
Without Pt1000. Sensors ordered separately.

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

With binary input, relays, mA output signal

Supply voltage	Article No
24 VAC/VDC	322228-10519

## Sensors

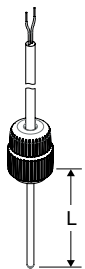


### Temperature pocket with sensor

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

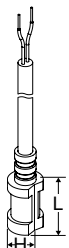


### Temperature sensor for valve measuring point

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



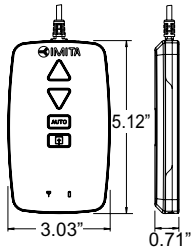
### Surface temperature sensor

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



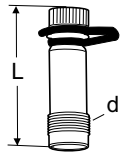
### TA-Dongle

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.

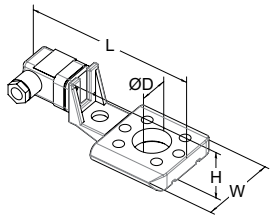
Temperature range till 14 °F.

Voltage 24 VAC ±10% 50/60 Hz ±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