

**Climate  
Control**

**IMI TA**

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



### **Actuators**

Digitally configurable proportional push-pull actuator with electronic fail-safe function and temperature measurement capability – 750 N

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

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. 10 m or shielded.  
 + 2 relays, max. 3A, 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").

### 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:**

3, 4, 6, 8, 12 or 16 s/mm  
Default setting: 3 s/mm

**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:**

1600 N

**Temperature:**

Media temperature: 0°C – +120°C  
Operating environment: 0°C – +50°C (5-95%RH, non-condensing)  
Storage environment: -20°C – +50°C (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:  $\pm 0.1^\circ\text{C}$  at 0°C  
Pt1000 Class B:  $\pm 0.3^\circ\text{C}$  at 0°C

**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:**

Max. 33 mm  
Automatic detection of the valve lift (stroke detection).

**Noise level:**

Max. 40 dBA

**Weight:**

1,6 kg

**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:**

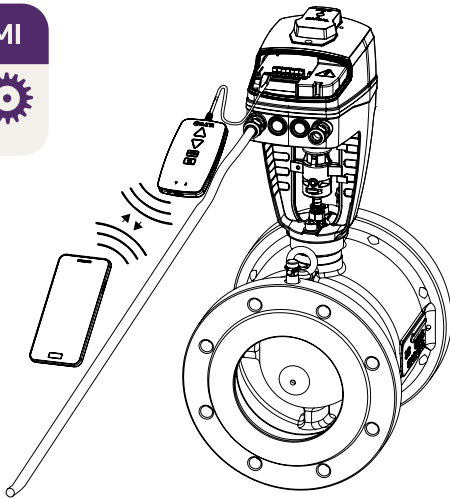
Wire cross-section\*: 0.5-2.0 mm<sup>2</sup>  
Protection class I: H05VV-F or similar  
Protection class III: LiYY or similar

\*) **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. 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  $K_{v_{max}}/q_{max}$ .  
 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

The actuator will perform a quarter of a full stroke and then back to desired value if no actuation takes place for one week or one month.  
 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 can be read using the HyTune app + TA-Dongle device. Logged 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

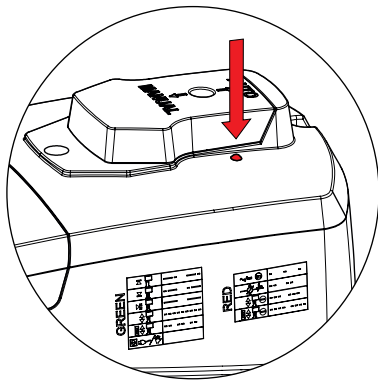
Switching between two different stroke limitation settings by toggling the binary input or using the dual-range input signal.

## LED indication

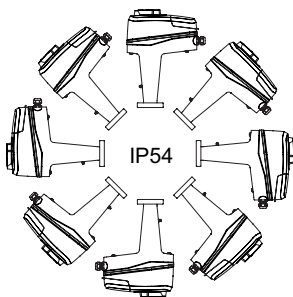
	Status	Green
	— — — —	Long pulse - Short pulse
	— — — —	Short pulse - Long pulse
	— — — —	Long pulses
	— — — —	Short pulses
	— — — —	2 short pulses
		Off

	Error code	Red
	- - -	1 pulse
	- - - -	2 pulses
	- - - -	3 pulses
	- - - -	4 pulses

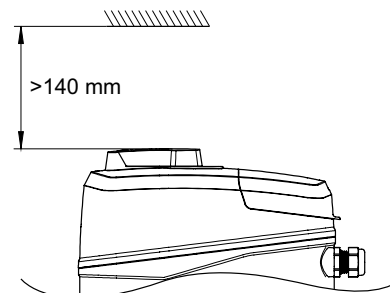
If an error is detected, red pulses are displayed as the green status lights flash alternately. More detailed information, please see the HyTune app + TA-Dongle.



## Installation



### Note!



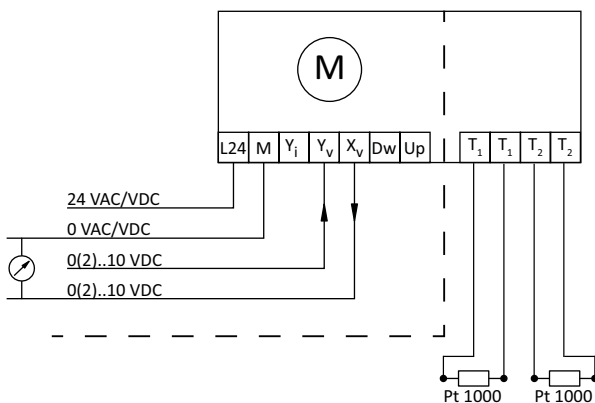
## Connection diagram – Terminal/Description

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. 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. 10 m total cable length between actuator and sensor head
T2	Connection to second Pt1000 temperature sensor, max. 10 m total cable length between actuator and sensor head.

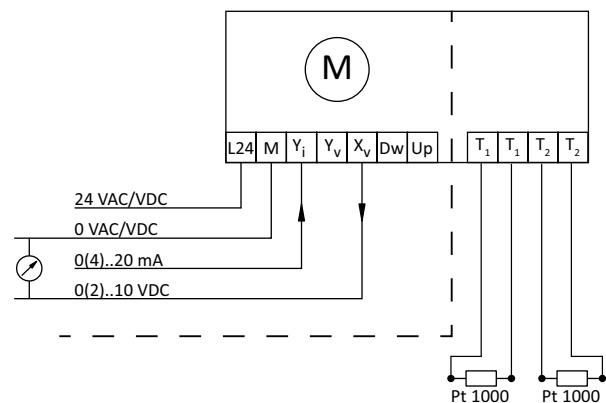
\*) All M terminals are internally connected.

## Connection diagram – 24 V

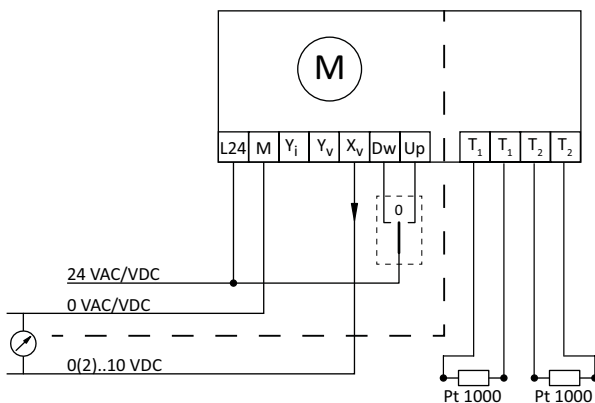
### 0(2)-10 VDC



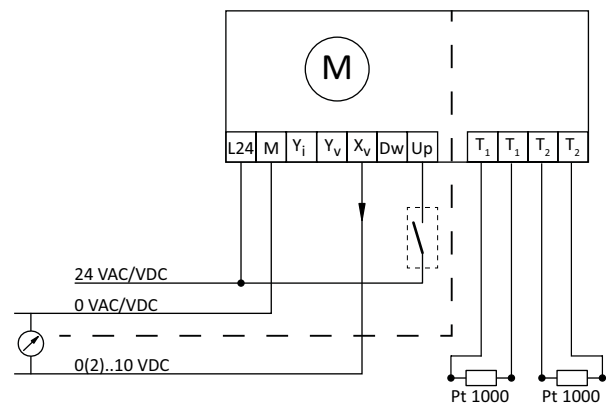
### 0(4)-20 mA



### 3-point



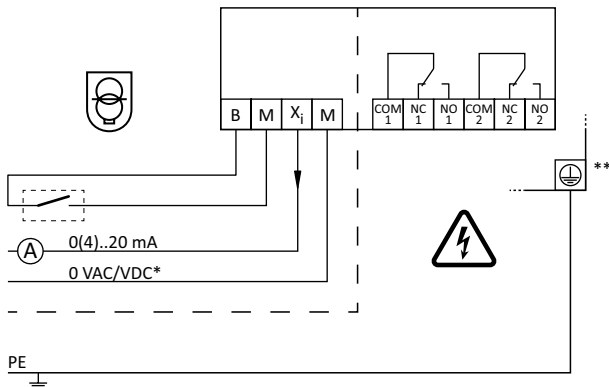
### On-off



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

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 5 mm, 3 m cable.

Pocket length [mm]	Cable length [mm]	For pipe DN			
		10-25	32-50	65-80	100-250
25	3000	X			
40	3000		X		
70	3000			X	
100	3000				X

### Insertion in valve measuring point

Sensor type: Pt1000, Ø 3 mm, 3 or 5 m cable.

Sensor length [mm]	Cable length [mm]	TA-Modulator DN 10-50	TBV-CM DN 15-25	TA-COMPACT -P/-DP DN 10-32	STAD DN 10-50	STAF/ STAF-SG DN 65-125	STAF/ STAF-SG DN 150	STAF-SG DN 200-250	STAF-SG DN 300-400
60	3000	X	X	X	X				
130	5000					X		X	
170	5000						X		X

### Surface mounted temperature sensor

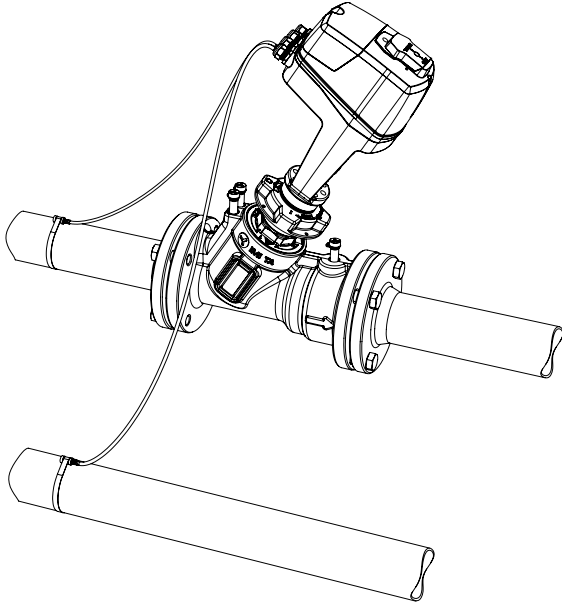
Sensor type: Pt1000, 3 m cable.

## Examples

### TA-Modulator with 2T version

In this setup, 2 sensors should be ordered.

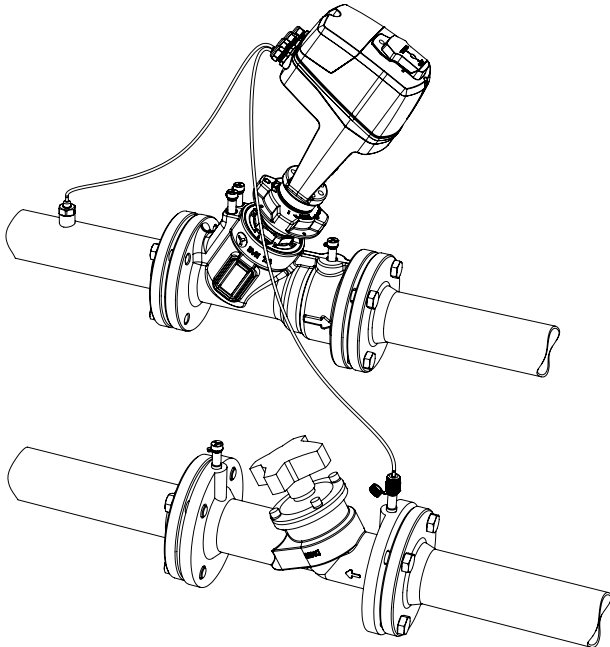
One sensor is mounted on the surface of the supply pipe, and another sensor is mounted on the surface of the return pipe.



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

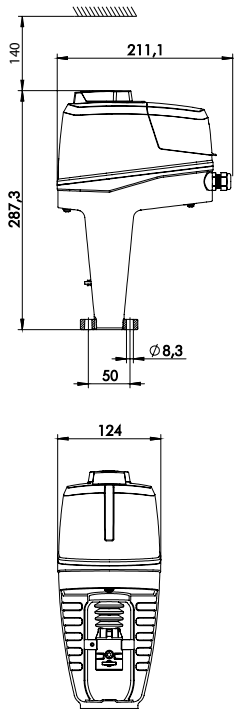
In this setup, 2 sensors should be ordered.

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





## Articles



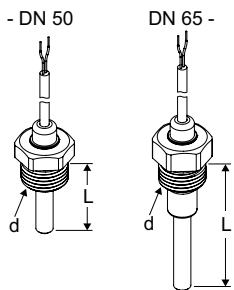
### TA-Slider 1600 Fail-safe T-2T

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	EAN	Article No
24 VAC/VDC	5902276821127	322228-10519

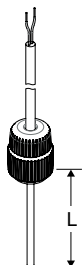
## Sensors



### Temperature pocket with sensor

Pt1000  
For mounting directly on pipe.  
Free space >70 mm is required above the temperature sensor pocket.

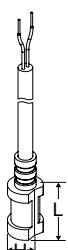
For pipe DN	d	L	Cable length	EAN	Article No
10-25	G1/2	25	3000	5902276820748	322428-00020
32-50	G1/2	40	3000	5902276820755	322428-00521
65-80	G1/2	70	3000	5902276821745	322428-00621
100-250	G1/2	100	3000	5902276821738	322428-00721



### Temperature sensor for valve measuring point

Pt1000  
Applicable to families: TA-Modulator, TBV-CM, TA-COMPACT-P/-DP, STAD, STAF/STAF-SG

For valve DN	L	Cable length	EAN	Article No
10-50	60	3000	5902276820786	322428-00122
65-250	130	5000	5902276820793	322428-00134
300-400 + STAF 150	170	5000	5902276820809	322428-00135

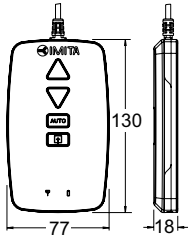


### Surface temperature sensor

Pt1000  
For mounting directly on pipe surface.

H	L	Cable length	EAN	Article No
10	16	3000	5902276820816	322428-00429

## Additional equipment

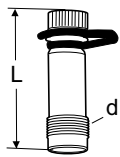


### TA-Dongle

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

EAN	Article No
5901688828632	322228-00001

## Accessories



### Measuring point

AMETAL®/EPDM

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

d	L	EAN	Article No
R1/4	39	7318792813108	52 179-009
R1/4	103	7318792814600	52 179-609
R3/8	45	7318792813009	52 179-008
R3/8	101	7318792814501	52 179-608

### Stem heater

Including spindle top (extension) and extended screws.

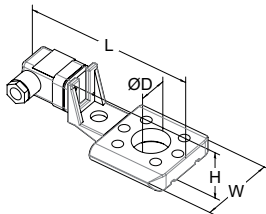
Temperature range till -10 °C.

Voltage 24 VAC ±10% 50/60 Hz ±5%.

Power  $P_N$  approx. 30 W.

Current 1,4 A.

Surface temperature max. 50 °C.



For valve	DN	L	H	W	D	EAN	Article No
		146	49	70	30		
KTM 512	65-125					3831112533455	322042-81401
TA-Modulator	65-200					3531112534834	322042-80010