Climate
Control

IMI TA

TA-Sixline PI

Combined control & balancing valves for small terminal units

Pressure independent balancing and control 6-way valve for change-over systems

Breakthrough
engineering for
a better world

TA-Sixline PI

TA-Sixline PI is a compact and efficient linear pressure-independent (PI) 6-way valve designed for 4-pipe systems where both heating and cooling are required through a single terminal unit. Its linear design provides precise control and stable regulation across all positions. It is designed to be used in combination with the TA-Slider 200, ensuring seamless integration and easy commissioning.
If pressure-independent (PI) version and flow measurement are not required, refer to the separate TA-Sixline technical leaflet. TA-Sixline is a non-pressure-independent control valve for smaller and less demanding applications, intended for use with either a differential pressure controller or manual balancing valves at the branch to ensure proper system balancing.

Key features

Easy commissioning and balancing
Simple Kv setup via TA-Slider, without need of PLC or selection of specific Kv inserts.

Wide flow range
Wide Kv range per variant. Reduces complexity and installation errors on the field.

Flexibility
Ports A and B have the same characteristic and can be set independently, which allows flexibility and eliminate mixing of heating and cooling errors during installation.

Ease of installation
Compact design with 360° actuator orientation. M8 connector for ceiling fixation.

Technical description - TA-Sixline PI

Application:
Heating and cooling systems.
(Change-over system)

Functions:
Control
Pre-setting (max. flow heating and cooling)
Differential pressure control
Measuring (T, q)
Pressure compensation

Dimensions:
DN 15

Flow range:
The flow (q_{max}) can be set within the range:

DN 15: 30 - 300 l/h
DN 15 HF: 55 - 560 l/h

q_{max} = l/h at each setting and fully open valve plug.
HF = High flow

Pressure class:
PN 16

Temperature:
Max. working temperature: 90°C
Min. working temperature: 0°C

Differential pressure (ΔpV):
Max. differential pressure (ΔpV_{max}):
400 kPa = 4 bar

Min. differential pressure (ΔpV_{min}):
DN 15: 17 kPa = 0,17 bar
DN 15 HF: 30 kPa = 0,30 bar

(Valid for maximum setting, fully open. Other settings will require lower differential pressure, check with the software HySelect.)

ΔpV_{max} = The maximum allowed pressure drop over the valve to fulfill all stated performances.

ΔpV_{min} = The minimum recommended pressure drop over the valve, for proper differential pressure control.

The maximum difference in static pressure between heating and cooling should not exceed 100 kPa = 1 bar to fulfill all state performances.

Material:
Valve body and pistons: AMETAL®
Middle spindle: Brass CW724R (CuZn21Si3P)
Top spindle: Stainless steel
Internal plastic parts: PPS
Δp insert: PPS and AMETAL®
Spring: Stainless steel
O-rings: EPDM

AMETAL® is the dezincification resistant alloy of IMI.

Media:
Water or neutral fluids, water-glycol mixtures (0-57%).

Leakage rate:
Tight sealing (Class VI according to EN 60534-4).

Characteristics:
Independent shaped EQM.

Marking:
IMI TA, PN, DN, A/B flow direction

Connection:
External threads according to ISO 228.

Connection to actuator:
M30x1.5, push/pull

Stroke:
Total stroke: 11 mm
A-side: 4.25 mm
No flow zone: 2.5 mm
B-side: 4.25 mm

Actuators:
TA-Slider 200

Technical description - TA-Slider 200 I/O

Functions:
Proportional control
Manual override (TA-Dongle)
Stroke detection
Mode, status and position indication
Stroke limitation setting
Minimum stroke setting
Valve blockage protection
Valve clogging detection
Error safe position
Diagnostic/Logging
Delayed start-up
1 binary input, max. 100 Ω, cable max. 10 m or shielded.
Output signal

Supply voltage:
24 VAC/VDC ±15%.
Frequency 50/60 Hz ±3 Hz.

Power consumption:
Operation: < 1.3 VA (VAC); < 0.7 W (VDC)
Standby: < 0.5 VA (VAC); < 0.25 W (VDC)

Input signal:
0(2)-10 VDC, R_i 47 kΩ.
Adjustable hysteresis sensitivity 0.1-0.5 VDC.
0.33 Hz low pass filter.
Proportional dual-range (for change-over):
0-3.3 / 6.7-10 VDC,
2-4.7 / 7.3-10 VDC,
0-4.5 / 5.5-10 VDC or
2-5.5 / 6.5-10 VDC.

Proportional:
0-10, 10-0, 2-10 or 10-2 VDC.

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.

Default setting: Proportional dual range 0-4.5 / 5.5-10 VDC.

Output signal:
0(2)-10 VDC, max. 8 mA, min. 1.25 kΩ.
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:
10 s/mm

Adjusting force:
Push/Pull 200 N

Temperature:
Media temperature: max. 120°C
Operating environment: 0°C – +50°C (5-95%RH, non-condensing)
Storage environment: -20°C – +70°C (5-95%RH, non-condensing)

Ingress protection:
IP54
all directions
(according to EN 60529)

Protection class:
(according to EN 61140)
III (SELV)

Cable:
1, 3 or 5 m. With wire end sleeves.
Halogen free as option, fire class $B2_{ca}$ – s1a, d1, a1 according to EN 50575.
Type LiYY, 5x0.25 mm^2.

Stroke:
16,2 mm
Automatic detection of the valve lift (stroke detection).

Noise level:
Max. 30 dBA

Weight:
0.20 kg, 1 m cable.
0.25 kg, 3 m cable.
0.38 kg, 5 m cable.

Connection to valve:
Swivelling nut M30x1,5.

Material:
Cover: PC/ABS GF8
Housing: PA GF40.
Swivelling nut: Nickel-plated brass.

Colour:
White RAL 9016, grey RAL 7047.

Marking:
Label: IMI TA, CE, product name, article No. and technical specification.

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

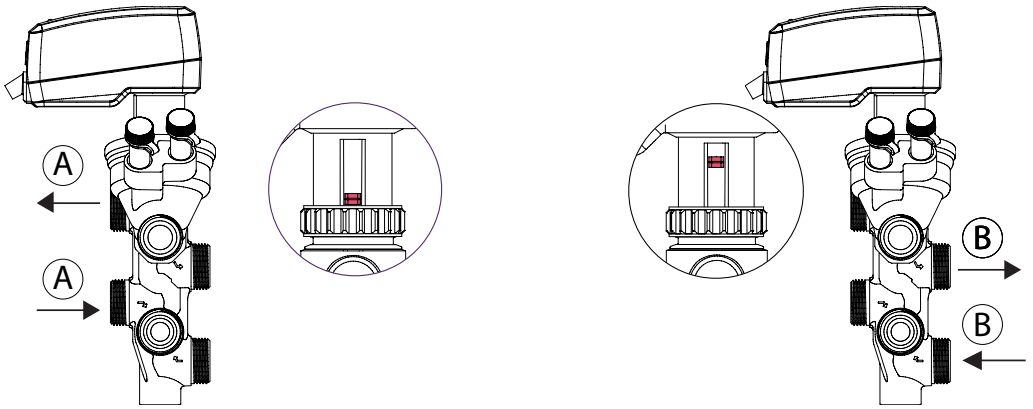
Function

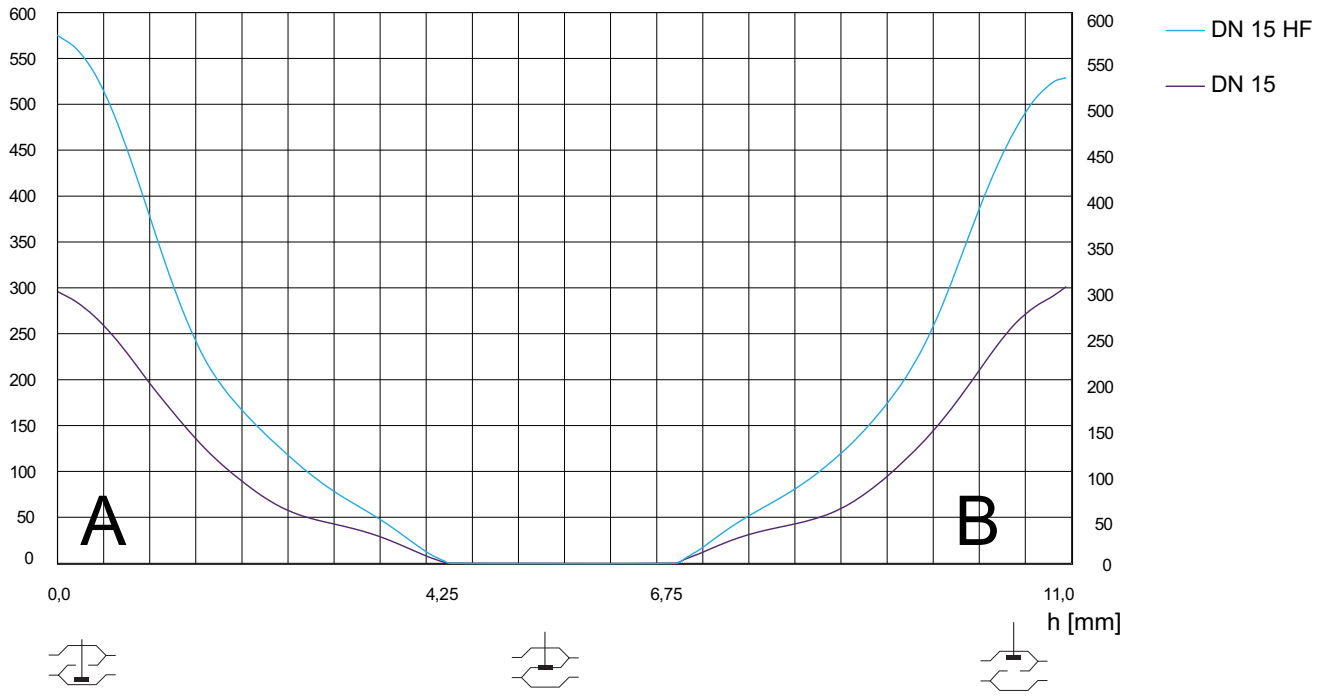
Change-over control

The change-over can be implemented by:

- - binary input that switches directly between heating and cooling.
- - 0–10 V dual-range signal configured in the HyTune app to define the control ranges for each mode.

In the body of the valve it is marked the direction of the flow and which port corresponds. Port assignment is configurable in HyTune. Ports A and B can each be set to heating or cooling, ensuring consistent flow performance regardless of assignment.





Due to the nominal flow for A-side and B-side, IMI recommends the installation of A-side for connecting with the cooling network.

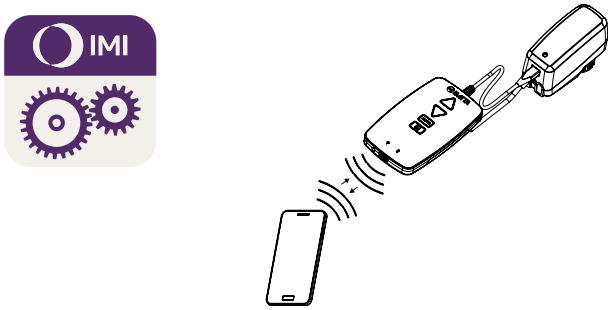
Hydronic balancing

The TA-Sixline PI, when used with the TA-Slider 200, allows the user to limit the Kv values for the heating and cooling ports independently. This is configured via the HyTune app, where maximum flow for each port can be defined.

Expansion safety mechanism

In combined heating/cooling applications, the fluid inside the valve and terminal unit may remain enclosed when both circuits are closed (no heating or cooling demand). Ambient temperature changes can then cause the fluid temperature – and therefore pressure – to rise or fall inside the valve body. To manage this, the TA-Sixline PI includes an integrated pressure compensation function that relieves excess pressure build-up up to 100 kPa (1 bar) difference between absolute pressure heating and cooling. This ensures mechanical safety, prevents stress on the valve components, and avoids unintended flow or noise caused by thermal expansion of the trapped fluid.

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 using the TA-Dongle device. No power supply needed.

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.

Flow setting
A maximum flow for each port can be assigned via HyTune app smaller than or equal to the maximum flow.
Default setting: No flow limitation (100%).

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 valves it can also be set to a 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 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.

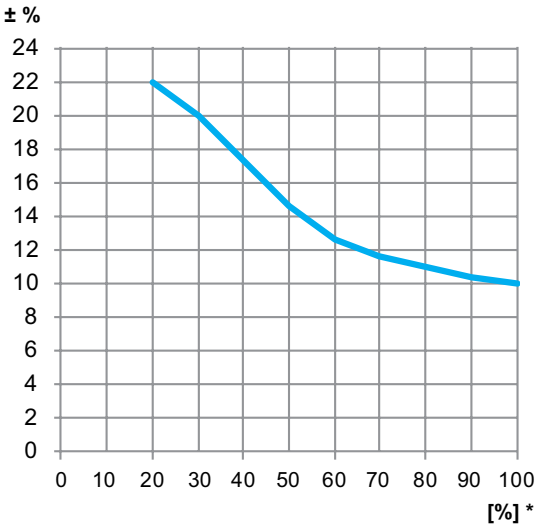
Binary input
If the binary input circuit is open, the actuator will go to a set stroke, switch to a second stroke limitation setting or drive to its full stroke regardless of any limitations for flushing purpose. See also Change-over system detection.
Default setting: Off

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

Measuring accuracy

Use the instrument TA-SCOPE together with the TA-Sixline PI for flow verification and troubleshooting purposes.

Maximum flow deviation at different settings



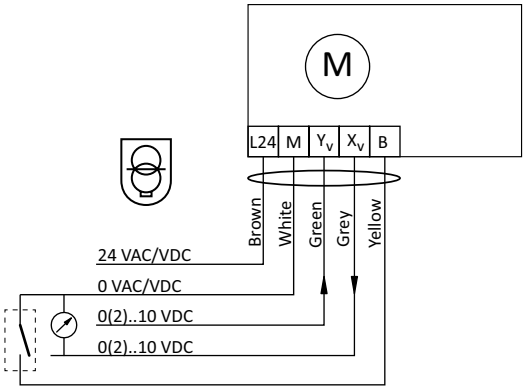
*) Setting (%) of fully open valve.

Noise

TA-Sixline PI is designed for low-noise performance when operated within the permissible differential pressure range.
To ensure that noise levels remain within designed limits, the valve should be installed in accordance with good installation practices to minimize bvibration and prvent unwanted noise generation.

Connection diagram

TA-Slider 200 I/O



Terminal	Description
L24	Power supply 24 VAC/VDC
M	Neutral for power supply 24 VAC/VDC and signals.
Y_V	Input signal for proportional control 0(2)-10 VDC, 47 kΩ
X_V	Output signal 0(2)-10 VDC, max. 8 mA or min. load resistance 1.25 kΩ
B	Connection for potential free contact (e.g. open window detection), max. 100 Ω, max. 10 m cable or shielded

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

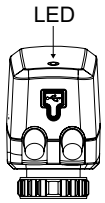
LED indication

TA-Slider 200 I/O

	Status	Red (heating) / Blue (cooling)
	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

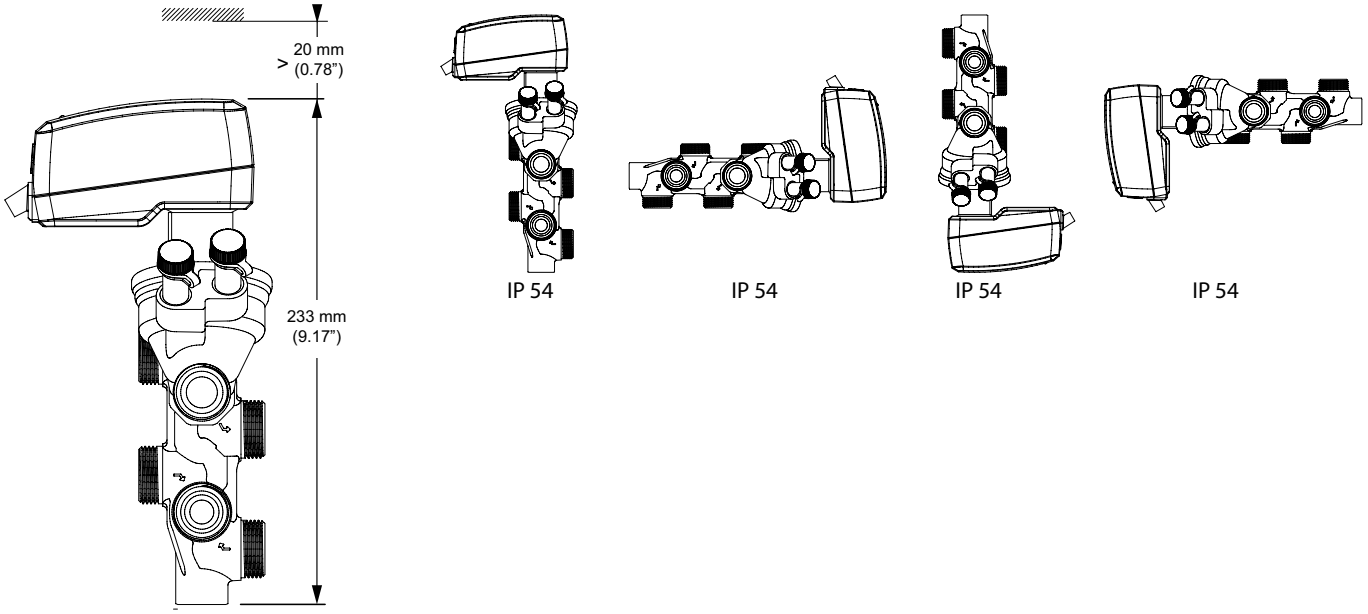
	Error code	Violet
	Power supply too low	1 pulse
	Line broken (2-10 V)	2 pulses
	Valve clogging or foreign object	3 pulses
	Stroke detection failure	4 pulses

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



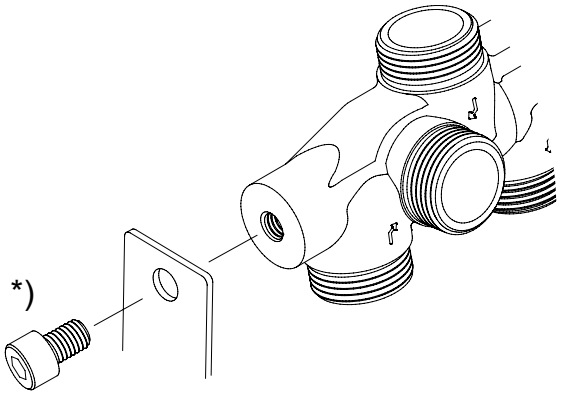
Installation

Installation of actuator
Note: Free space is required above the actuator for easy mounting/dismounting.



Pressurisation
When designing the pressurisation system: please consider that change-over systems have hydraulic interaction between the heating and the cooling system via the terminals, which cause a fluid mass transfer from the cooling to the heating system. To ensure proper control function, the difference between the static pressure of the heating and the cooling systems should not exceed 100 kPa = 1 bar.
For further information please contact IMI.

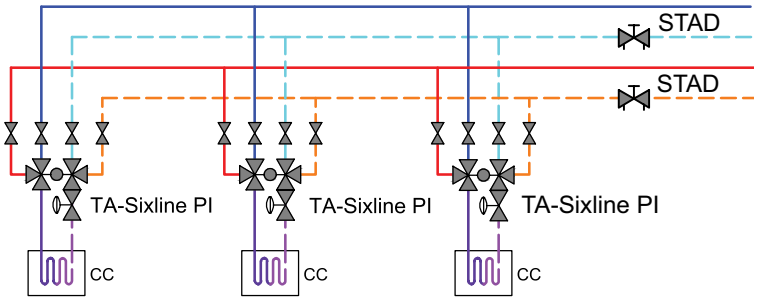
M8 fixation
When flexible hoses are used to connect both the heating and cooling pipes as well as the radiant ceiling panels, a fixing mechanism is required.
The TA-Sixline PI can be mounted on a modular rail, which is secured to the ceiling, using an M8 screw.



*) M8 screw is not included in the delivery

Application example
The TA-Sixline PI can be used to control a zone served either by multiple radiant ceiling panels or by a single panel.
When a zone includes several panels, a small manifold is installed on the emitter side of the TA-Sixline PI to distribute the flow to each panel.
For smaller zones with only one radiant ceiling panel, the panel can be connected directly to the emitter side of the TA-Sixline PI without a manifold.

TA-Sixline PI provides a much simpler and more straightforward approach to sizing, commissioning, and operation. Heating and cooling flow rates are set directly in the HyTune app, while the pressure-independent valve automatically maintains the required flow. This reduces commissioning effort and simplifies operation throughout the product lifecycle.
A STAD manual balancing valve at each branch is a good installation practice, supporting commissioning, troubleshooting, and isolation.

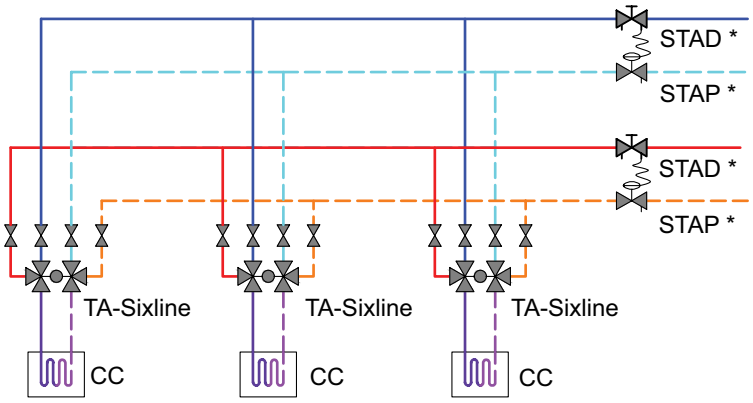


Example:
Heating flow needed 175 l/h. Cooling flow needed 430 l/h.
Available pressure over the TA-Sixline PI is estimated to 30 kPa.

Set 175 l/h and 430 l/h in HyTune respectively.

Note: if the pump head exceeds 400 kPa (4 bar), please make sure that the pressure across the TA-Sixline PI does not exceed 400 kPa (4 bar).

When TA-Sixline is installed, the following calculation example should be considered. As TA-Sixline is a non-pressure-independent control valve, balancing is required. This can be achieved by using a STAP/STAD* differential pressure controller/ balancing valve combination to limit design flow, ensure adequate valve authority, and support commissioning, troubleshooting, and isolation.



*) When continuous flow, power, energy, and other system data are required, TA-Smart-Dp provides an alternative solution with advanced monitoring capabilities.

Example:
Heating flow needed 175 l/h. Cooling flow needed 430 l/h.
Available pressure over the TA-Sixline is estimated to 15 kPa.

Heating

$$Kv = \frac{0{,}175}{\sqrt{0{,}15}} = 0{,}45$$

Cooling

$$Kv = \frac{0{,}430}{\sqrt{0{,}15}} = 1{,}11$$

Set 0,45 and 1,11 in HyTune respectively.

Pump calculation:
Heating

Take index circuit.

Pressure drop from pump to differential pressure control valve (supply and return) = 30 kPa

Pressure drop over differential pressure control valve = 6,32 kPa (STAP DN 25 HySelect sizing of 8 x TA-Sixline of 175 l/h = 1400 l/h).

Differential pressure setting is 20 kPa, assuming 5 kPa drop over branch pipes and climate ceilings (most of pressure drop) and 15 kPa over TA-Sixline. Due to high pressure drop over valve and climate ceilings there is a little influence on “pressure drop in common pipes” hence flow limitation works at different loads (all or only few climate ceilings open/close).

Pressure drop in the branch equals to setting on differential pressure control valve = 20 kPa

Pump head pump 60 kPa, it is recommended to set pump head as part of commissioning process by securing minimum pressure drop on differential pressure control valve when its setting secure total flow through branch is equal of sum of all climate ceilings.

Cooling

Take index circuit.

Pressure drop from pump to differential pressure control valve (supply and return) = 35 kPa

Pressure drop over differential pressure control valve = 6,64 kPa (STAP DN 40 HySelect sizing of 8 x TA-Sixline of 430 l/h = 3340 l/h)

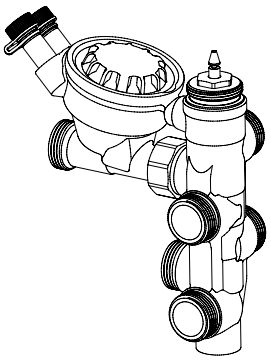
Differential pressure setting is 45 kPa, assuming 30 kPa drop over branch pipes and climate ceilings (most of pressure drop) and 15 kPa over TA-Sixline. Due to high pressure drop over valve and climate ceilings there is a little influence on “pressure drop in common pipes” hence flow limitation works at different loads (all or only few climate ceilings open/close).

Pressure drop in the branch equals to setting on differential pressure control valve = 45 kPa

Pump head pump 90 kPa, it is recommended to set pump head as part of commissioning process by securing minimum pressure drop on differential pressure control valve when its setting secure total flow through branch is equal of sum of all climate ceilings.

Articles

If pressure-independent (PI) version and flow measurement are not required, refer to the separate TA-Sixline technical leaflet. TA-Sixline is a non-pressure-independent control valve for smaller and less demanding applications, intended for use with either a differential pressure controller or manual balancing valves at the branch to ensure proper system balancing.



External threads

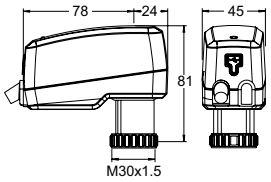
Threads according to ISO 228.

DN	d	q_{max} [l/h]	kg	EAN	Article No
15	G3/4	300	0,85	7318794197282	52 121-015
15 HF	G3/4	560	0,85	7318794197299	52 121-115

HF = High flow

Valve and actuator to be ordered and delivered separately.

TA-Sixline PI is designed to work only with TA-Slider 200. IMI cannot guarantee performance when used with other actuators.



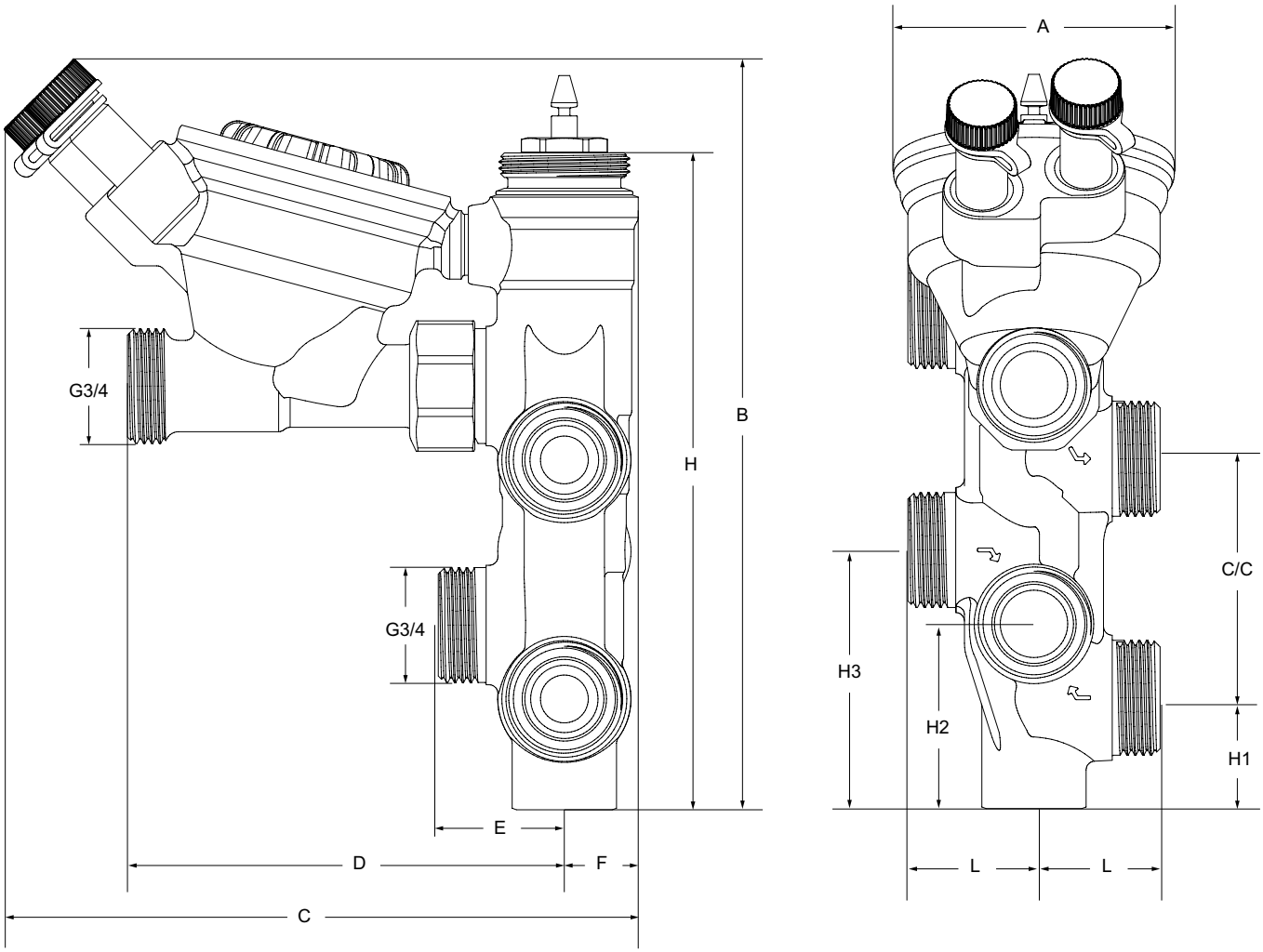
TA-Slider 200 I/O

Input signal: 0(2)-10 VDC

With binary input, VDC output signal

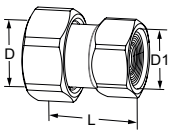
Cable length [m]	Supply voltage	EAN	Article No
1	24 VAC/VDC	5902276826610	322229-10411
3	24 VAC/VDC	5902276826627	322229-10412
5	24 VAC/VDC	5902276826634	322229-10413
With halogen free cable			
1	24 VAC/VDC	5902276826641	322229-10414
3	24 VAC/VDC	5902276826658	322229-10415
5	24 VAC/VDC	5902276826665	322229-10416

Dimensions



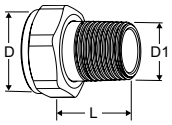
H	H1	H2	H3	C/C	A	B	C	D	E	F	L
152	25,5	42	59,5	55	65	173	141	101	29	18	29

Connections



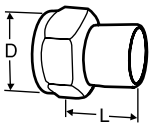
With internal thread
Threads according to ISO 228. Thread length according to ISO 7-1.
Swivelling nut. Brass.

For DN	D	D1	L*	EAN	Article No
15	G3/4	G1/2	31,5	5902276820038	52 009-815
15	G3/4	G3/4	36,5	5902276820045	52 009-915



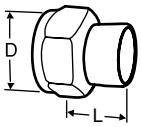
With external thread
Threads according to ISO 7-1.
Swivelling nut. Brass.

For DN	D	D1	L*	EAN	Article No
15	G3/4	R1/2	29	4024052516612	0601-02.350



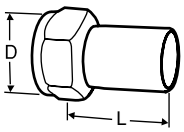
Welding connection
Swivelling nut. Brass/Steel 1.0045 (EN 10025-2)

For DN	D	Pipe DN	L*	EAN	Article No
15	G3/4	15	36	7318792748509	52 009-015



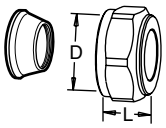
Soldering connection
Swivelling nut. Brass/gunmetal CC491K (EN 1982).

For DN	D	Pipe Ø	L*	EAN	Article No
15	G3/4	15	13	7318792749308	52 009-515
15	G3/4	16	13	7318792749407	52 009-516



Connection with smooth end
For connection with press coupling.
Swivelling nut. Brass/AMETAL®.

For DN	D	Pipe Ø	L*	EAN	Article No
15	G3/4	15	39	7318793810601	52 009-315

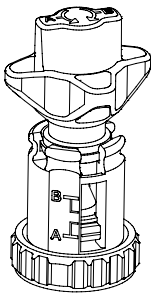


Compression connection
Support bushes shall be used, for more information see catalogue leaflet FPL.
Should not be used with PEX pipes.
Brass/AMETAL®.
Chrome plated

For DN	D	Pipe Ø	L**	EAN	Article No
15	G3/4	22	27	7318793705204	53 319-622

*) Fitting length (from the gasket surface to the end of the connection).
**) Over all length L refers to unassembled coupling.

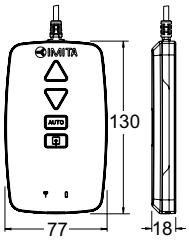
Accessories



Handwheel
For manual operation without actuator.

EAN	Article No
7318794197275	52 120-950

Additional equipment



TA-Dongle
For Bluetooth communication with the HyTune app, transfer configuration settings and manual override.
(TA-Slider 200 I/O)

EAN	Article No
5901688828632	322228-00001