

TA-Smart

– NPT threads/ANSI flanges



Smart valves

2-way control valve with uniquely shaped EQM characteristics with flow, temperature and power measurement capabilities

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The ultrasonic flow measurement technology combined with unique actuation algorithms capabilities provide best-in-class control performances. The TA-Smart controls can be set to flow or power, giving high on-site flexibility and providing highly effective comfort in heating and cooling applications. Its compact arrangement and simple set-up reduces installation and commissioning time.



Key features

- > **Best-in-class control**
Accurate and fast control response even at very low flows in common part load conditions. Ensures full modulating control for the complete operating stroke leading to world class control and efficiencies.
- > **Optional cloud connection**
Easy remote access to data and configuration parameters allows to verify and adjust system performance.
- > **High measurement accuracy**
High flow and temperature measurement accuracies in all configurations (medium type, and temperature) for all flow regimes.
- > **Compactness and limited number of components**
Reduces installation time and space requirements facilitating retrofit installation.
- > **Convenient, reliable setup**
Fully customizable and commissionable using Bluetooth enabled smart device reducing commissioning and diagnostic time.
- > **Easy diagnostics**
Continuous measurement (flow, temperature, power...) enables accurate error identification in system hydronics.
- > **Versatility in communication**
Digital (key Bus protocols and MQTT) and Analog (0(2)-10 VDC or 0(4)-20 mA).

Technical description

Application:

Heating (not steam) and cooling systems.

Functions:

Control (flow, power, position)
Pre-setting (max./min. flow, max. power, max./min. position)
Reading (flow, power, energy, supply/return temperature, ΔT , position)
Manual override (via HyTune app)
Mode, status and position indication
Valve blockage protection
Valve clogging detection
Error safe position
Diagnostic
Logging
Delayed start-up

Dimensions:

3/4" – 3"

Pressure class:

3/4" - 2": PN 25 (362 psi)
2 1/2" - 6": Class 150

Differential pressure (ΔpV):

Max. differential pressure (ΔpV_{max}): 58 psi
Closing pressure: 87 psi
 ΔpV_{max} = The maximum allowed pressure drop over the valve to fulfill all stated performances.

Flow range:

The flow ranges ($q_{setmin} - q_{nom}$) for different dimensions:
3/4": 1.67 - 8.37 gpm
1": 2.38 - 11.89 gpm
1 1/4": 4.05 - 20.2 gpm
1 1/2": 6.86 - 34.3 gpm
2": 11.8 - 59.0 gpm
2 1/2": 25.5 - 128 gpm
3": 38.0 - 190 gpm
Minimum controllable flows ($q_{contr.min}$) 0.5% of q_{nom} .
 q_{setmin} = Minimum settable flow.
 q_{nom} = Maximum settable flow.

Measurement accuracy:

Flow:
 $\pm 3\%$ from 5% to 100% of q_{nom} (see "Flow accuracy")
Temperature difference:
 ± 0.1 K @ $\Delta T = 6$ K (for cooling)
 ± 0.15 K @ $\Delta T = 10$ K (for heating)
 ± 0.2 K @ $\Delta T = 20$ K (for heating)

Control accuracy:

$\pm 5\%$ from 4% to 100% of q_{nom}
 $\pm 10\%$ from 0.5% to 4% of q_{nom}

Temperature:

Max. working temperature: 230°F
Min. working temperature: 14°F
Operating environment: 32°F to 122°F (5-95%RH, non-condensing)
Storage environment: -4°F to 158°F (5-95%RH, non-condensing)

Media:

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

Leakage rate:

3/4" - 2": Leakage rate <0.01% of q_{nom} with correct flow direction (Class IV according to EN 60534-4)

2 1/2" - 3": Tight sealing with correct flow direction (Class V according to EN 60534-4)

Characteristics:

Settable: Stepless between EQM 0.25 and inverted EQM 0.25.

Supply voltage:

24 VAC/VDC \pm 15%.

Frequency 50/60 Hz \pm 3 Hz.

Power consumption:

3/4" - 2":

Operation: < 4.0 W (24 VDC);

< 5.6 VA (24 VAC)

Standby: < 1.9 W (24 VDC);

< 3.3 VA (24 VAC)

2 1/2" - 3":

Operation: < 5.8 W (24 VDC);

< 10 VA (24 VAC)

Standby: < 1.9 W (24 VDC);

< 3.3 VA (24 VAC)

Input signal:

By BACnet/Modbus or Analog signal.

Analog in VDC or mA, selectable by jumper in the SmartBox;

0(2)-10 VDC, R_i 47 k Ω .

Adjustable sensitivity 0.1-0.5 VDC.

0.33 Hz low pass filter.

0(4)-20 mA R_i 500 Ω .

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:

BACnet/Modbus

0(2)-10 VDC, max. 8 mA, min. 1.25 k Ω .

Wireless:

Bluetooth Low Energy (BLE)

Thread

Temperature sensor cable:

3/4" - 2": 9.8 ft halogen free

2 1/2" - 3": 16.4 ft halogen free

32.8 ft. halogen free cable on request.

Ingress protection:

IP54 (according to EN 60529)

Protection class:

(according to EN 61140)

III (SELV)

Material:

Sizes 3/4" - 2":

Valve body: AMETAL[®]

Valve insert: AMETAL[®]

Valve plug: AMETAL[®] and PTFE

Spindle: Stainless steel

Spindle seal: EPDM O-ring

Internal plastic parts: PPS

Springs: Stainless steel

O-rings: EPDM

Temperature housing: AMETAL[®].

Sizes 2 1/2" - 3":

Valve body: Ductile iron EN-GJS-400-15

Valve insert: Ductile iron EN-GJS-400-15 and brass

Valve plug: Stainless steel and EPDM

O-ring

Valve seat: Stainless steel

Spindle: Stainless steel

Spindle seal: EPDM

Springs: Stainless steel

O-rings: EPDM

SmartBox (3/4" - 3"):

Cover: PC/ABS, red.

Housing: PC/ABS, TPE.

Actuators:

Sizes 3/4" - 2":

Cover: PC/ABS GF8, white RAL 9016,

grey RAL 7047.

Housing: PA GF40.

Swivelling nut: Nickel-plated brass.

Sizes 2 1/2" - 3":

Cover: PBT, orange RAL 2011, grey RAL

7043.

Bracket: Alu EN44200

Wires: Halogen free

AMETAL[®] is the dezincification resistant alloy of IMI Hydronic Engineering.

Surface treatment:

3/4" - 2": Non treated

2 1/2" - 3": Electrophoretic painting

Marking:

Valve body:

3/4" - 2": IMI TA, PN, DN, inch size,

country of origin and flow direction arrow.

2 1/2" - 3": IMI TA, DN, inch size, material

and flow direction arrow. Label with

technical specification, country of origin

and CE.

SmartBox: IMI TA

Actuator: IMI TA, model, technical spec.,

LED info.

Pipe connection:

3/4" - 2": Male thread according to ISO

228. Connections (accessories) with female

NPT according to ANSI/ASME B1.20.1-

1983, or for soldering according to ASME/

ANSI B16.18.

2 1/2" - 3": Flanges according to ASME 7

ANSI B16.42 Class 150.

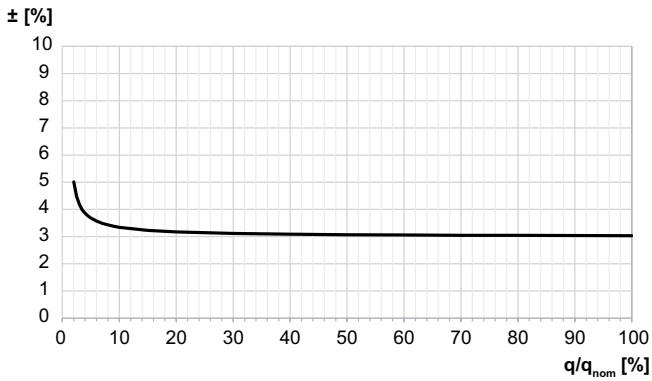
Certification and directives:

EMC-D. 2014/30/EU: EN 60730-1, -2-14.

Product standards EN 60730-x.

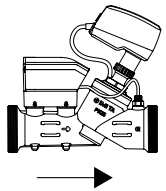
PED: 2014/68/EU

Flow accuracy

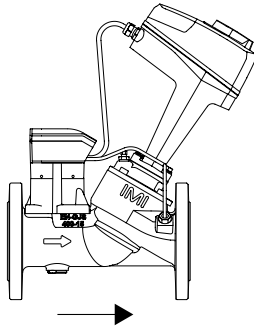


Installation

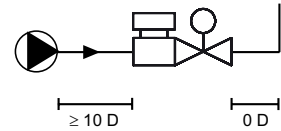
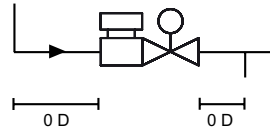
3/4" - 2"



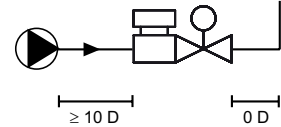
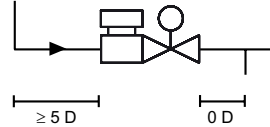
2 1/2" - 3"



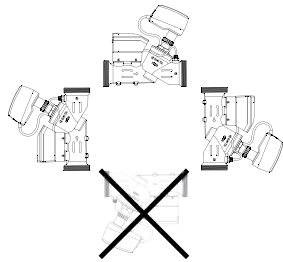
3/4" - 2"



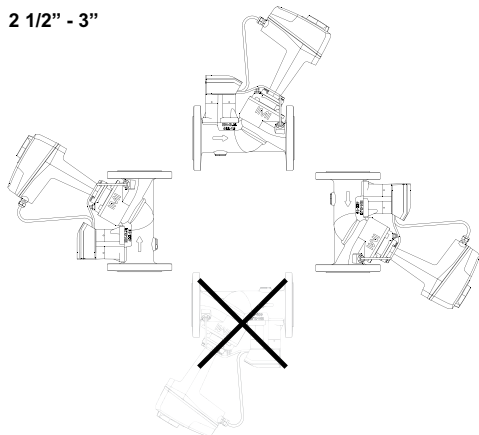
2 1/2" - 3"



3/4" - 2"

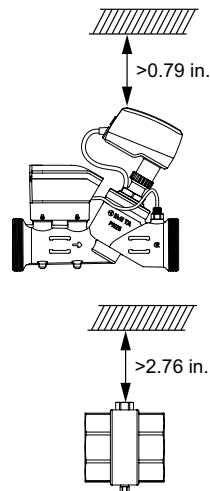


2 1/2" - 3"

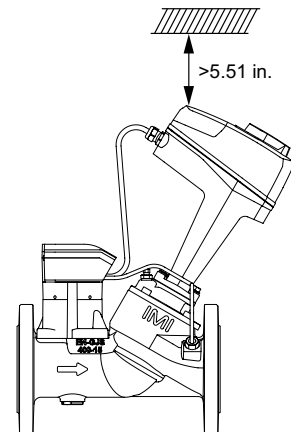


Note: Free space is required above the actuator/temperature pocket for easy mounting/dismounting.

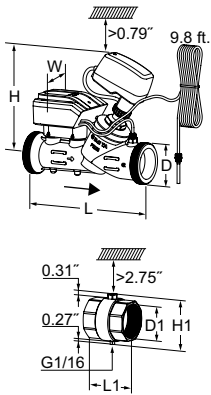
3/4" - 2"



2 1/2" - 3"



Articles



TA-Smart sizes 3/4" - 2"

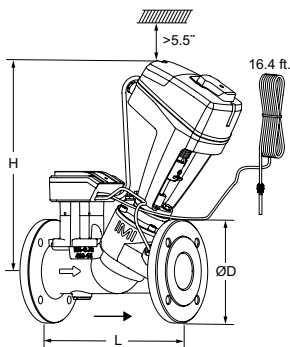
Including temperature housing and 9.8 ft. sensor cable.
(32.8 ft. cable on request, please contact IMI Hydronic Engineering)
Male threads according to ISO 228.
NPT threads - see "Connections".

Size	D	L [in]	H [in]	W [in]	Cvs	lb.	Article No
3/4"	G1	7.09	6.85	3.82	3.47	3.53	322231-00120
1"	G1 1/4	7.36	6.85	3.82	4.86	3.97	322231-00125
1 1/4"	G1 1/2	8.90	8.78	3.82	8.44	4.63	322231-00132
1 1/2"	G2	9.13	8.94	3.82	14.3	6.61	322231-00140
2"	G2 1/2	9.65	9.25	3.82	24.7	8.60	322231-00150

Temperature housing incl. temperature pocket

Included in TA-Smart sizes 3/4" - 2".
Female thread NPT according to ANSI/ASME B1.20.1-1983.

Size	D1	L1 [in]	H1 [in]
3/4"	3/4 NPT	2.17	2.20
1"	1 NPT	2.52	2.40
1 1/4"	1 1/4 NPT	2.60	2.76
1 1/2"	1 1/2 NPT	2.64	2.99
2"	2 NPT	2.68	3.50



TA-Smart sizes 2 1/2" - 3"

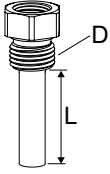
Including temperature pocket and 16.4 ft. sensor cable.
(32.8 ft. cable on request, please contact IMI Hydronic Engineering)
Free space >2.76 in. is required above the temperature pocket.
Flanges according to ASME 7 ANSI B16.42 Class 150.

Size	Number of bolt holes	D [in]	L [in]	H [in]	Cvs	lb.	Article No
Class 150							
2 1/2"	4	7.09	11.42	14.84	58.0	36.4	322231-01465
3"	4	7.48	12.20	14.96	81.2	41.0	322231-01480

→ = Flow direction

Cvs = gpm at a pressure drop of 1 psi and fully open valve.

Accessories

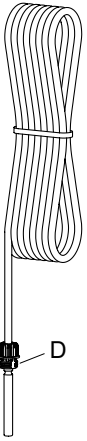


Temperature pocket

Included in TA-Smart sizes 2 1/2" - 3".

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

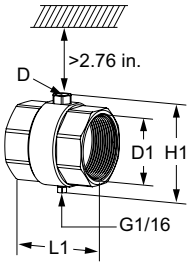
Valve size	D	D1	L [in]	Article No
3/4" - 1"	G1/4	1/4" NPT	3.09	322230-00501
1 1/4" - 3"	G1/4	1/4" NPT	6.61	322230-00500



Temperature sensor

Included in TA-Smart (9.8 ft. sizes 3/4" - 2", 16.4 ft. sizes 2 1/2" - 3").

Length [ft]	D	Article No
9.8	G1/4	322230-01100
16.4	G1/4	322230-01101
32.8	G1/4	322230-01104



Temperature housing incl. temperature pocket

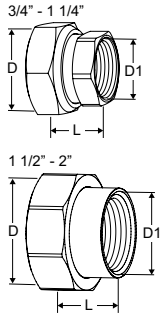
Included in TA-Smart sizes 3/4" - 2".

To be ordered separately if the pipe size does not match the valve size.

Female thread NPT according to ANSI/ASME B1.20.1-1983.

Size	D	D1	L1 [in]	H1 [in]	Article No
3/4"	G1/4	3/4 NPT	2.17	2.20	322230-00320
1"	G1/4	1 NPT	2.52	2.40	322230-00325
1 1/4"	G1/4	1 1/4 NPT	2.60	2.76	322230-00332
1 1/2"	G1/4	1 1/2 NPT	2.64	2.99	322230-00340
2"	G1/4	2 NPT	2.68	3.50	322230-00350

Connections

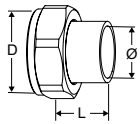


With female thread NPT

Threads according to ANSI/ASME B1.20.1-1983.

Swivelling nut
Brass/AMETAL®

Valve size	D	D1	L [in] *	Article No
3/4"	G1	1/2 NPT	0.71	52 163-320
3/4"	G1	3/4 NPT	0.91	52 163-220
1"	G1 1/4	3/4 NPT	1.06	52 163-325
1"	G1 1/4	1 NPT	1.06	52 163-225
1 1/4"	G1 1/2	1 NPT	1.06	52 163-332
1 1/4"	G1 1/2	1 1/4 NPT	1.22	52 163-232
1 1/2"	G2	1 NPT	1.18	52 163-340
1 1/2"	G2	1 1/2 NPT	1.26	52 163-240
2"	G2 1/2	1 1/2 NPT	1.26	52 163-350
2"	G2 1/2	2 NPT	1.26	52 163-250



Soldering connection

According to ASME/ANSI B16.18

Swivelling nut
Brass/gunmetal CC491K (EN 1982)

Valve size	D	Pipe Ø [in]	L [in] *	Article No
3/4"	G3/4	0.879	0.87	52 009-720
1"	G1 1/4	1.130	1.02	52 009-725
1 1/4"	G1 1/2	1.380	1.10	52 009-732
1 1/2"	G2	1.630	1.22	52 009-740
2"	G2 1/2	2.130	1.50	52 009-750

*) Fitting length (from the gasket surface to the end of the connection).

Other type of connections (ISO), see international version of TA-Smart.

