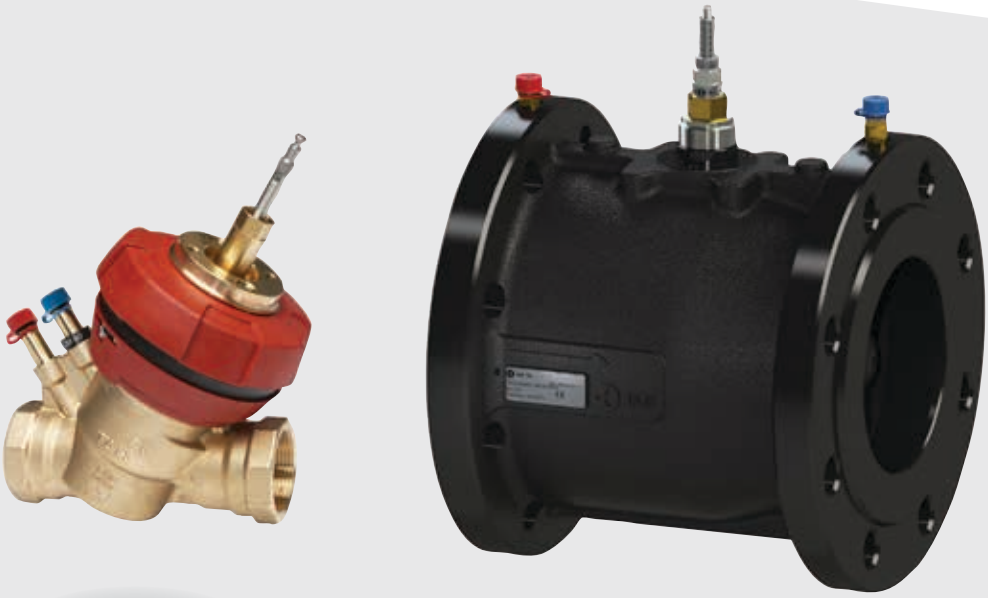
IMI TA

TA-FUSION-C



Combined control & balancing valves

With independent EQM characteristics

Engineering GREAT Solutions

IMI Hydronic Engineering

TA-FUSION-C

These innovative balancing and control valves for heating and cooling systems combine the key hydronic functions of balancing and control in one valve. Adjustable Kvs and inherent independent EQM characteristics allow correct valve sizing and optimum system controllability. The measuring points enable accurate measurement of flow, differential pressure, temperature and available differential pressure.

Key features

> **Adjustable Kvs**
Allows correct Kvs setting corresponding to system requirements.

> **Independent, inherent EQM characteristic**
Proper EQM valve characteristic for all settings.

> **Self-sealing measuring points**
Simple and accurate measurement for balancing, trouble shooting and power measurement.

Technical description

Application:
Heating and cooling systems.

Functions:
Control (EQM)
Balancing
Pre-setting (Kvs)
Measuring (ΔpV, ΔH, T, q)
Shut-off (for isolation during system maintenance)

Dimension:
DN 32-150

Pressure class:
DN 32-50: PN 16
DN 65-150: PN 16 and PN 25

Max. differential pressure (ΔpV_{max}):
400 kPa = 4 bar
ΔpV_{max} = The maximum allowed pressure drop over the valve to fulfill all stated performances.

Recommended setting range (Kv_{max}):
DN 32: 2,68 - 12,9
DN 40: 3,03 - 18,5
DN 50: 8,03 - 33,0
DN 65-2: 24,3 - 64,3
DN 80-2: 38,1 - 100
DN 100: 57,4 - 160
DN 125: 97,4 - 270
DN 150: 146 - 400
Kv_{max} = m^3/h at a pressure drop of 1 bar at each setting and fully open valve plug.

Lift:
20 mm

Rangeability:
>100 (for all recommended settings)

Leakage rate:
Tight sealing

Characteristics:
Independent EQM.

Temperature:
Max. working temperature: 120°C
Min. working temperature: -20°C

Media:
Water or neutral fluids, water-glycol mixtures.
(For other media contact IMI Hydronic Engineering.)

Material:
DN 32-50:
Valve body: AMETAL®
Valve plug: AMETAL®
Seat seal: EPDM/Stainless steel
Spindle seal: EPDM O-ring
O-rings: EPDM
Valve insert: AMETAL®/PPS/PTFE
Springs: Stainless steel
Spindle: Stainless steel
DN 65-150:
Valve body: Ductile iron EN-GJS-400
Valve plug: Stainless steel
Seat seal: EPDM/Stainless steel
O-rings: EPDM
Plug mechanism: Stainless steel and brass
Screws and nuts: Stainless steel

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

Surface treatment:
DN 32-50: Non treated
DN 65-150: Electrophoretic painting.

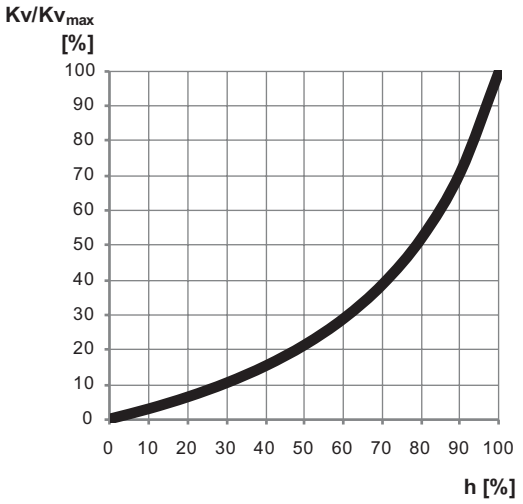
Marking:
DN 32-50: TAH, IMI, DN, PN, DR, serial No and flow direction arrow.
DN 65-80: TAH, IMI TA, DN, PN, Kvs, $T_{min}/_{max}$, serial No, valve body material and flow direction arrow, label.
DN 100-150: IMI TA, IMI, DN, PN, Kvs, $T_{min}/_{max}$, serial No, valve body material and flow direction arrow, label.
CE-marking:
DN 65-125: CE
DN 150: CE 0062 *
*) Notified body.

Connection:
DN 32-50:
Female thread according to ISO 228. Thread length according to ISO 7-1.
Male thread according to ISO 228.
DN 65-150:
Flanges according to EN-1092-2, type 21. Face to face length according to EN 558 series 3.

Actuators:
TA-Slider 750
TA-Slider 1250
TA-MC100 FSE/FSR (fail-safe)
For more details on actuators, see separate technical leaflets.

Valve characteristics

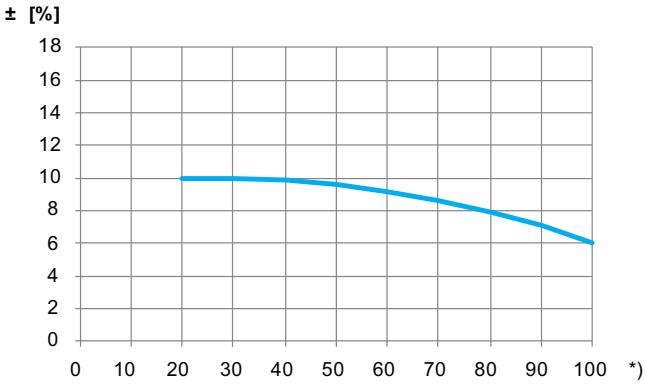
Nominal valve characteristic for all recommended settings.



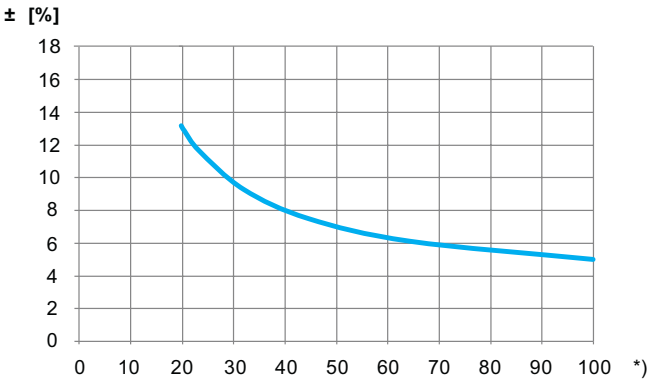
Measuring accuracy

Maximum flow deviation at different settings

DN 32-50



DN 65-150



*) Setting (%) of fully open valve.

Correction factors

The flow calculations are valid for water (+20°C). For other liquids with approximately the same viscosity as water (≤20 cSt = 3°E=100S.U.), it is only necessary to compensate for the specific density. However, at low temperatures, the viscosity increases and laminar flow may occur in the valves. This causes a flow deviation that increases with small valves, low settings and low differential pressures. Correction for this deviation can be made with the software HySelect or directly in our balancing instruments.

Noise

In order to avoid noise in the installation the flows must be correctly balanced and the water de-aerated.
Very high differential pressures can cause noise in the installations, and in that case, differential pressure controllers should be used.

The maximum recommended pressure drop in order to avoid excessive noise is 200 kPa.

Sizing

When ΔpV and flow are known, use the formula to calculate Kv_{max}.

$$Kv = 0{,}01 \frac{q}{\sqrt{\Delta p}} \qquad q\ l/h,\ \Delta p\ kPa$$

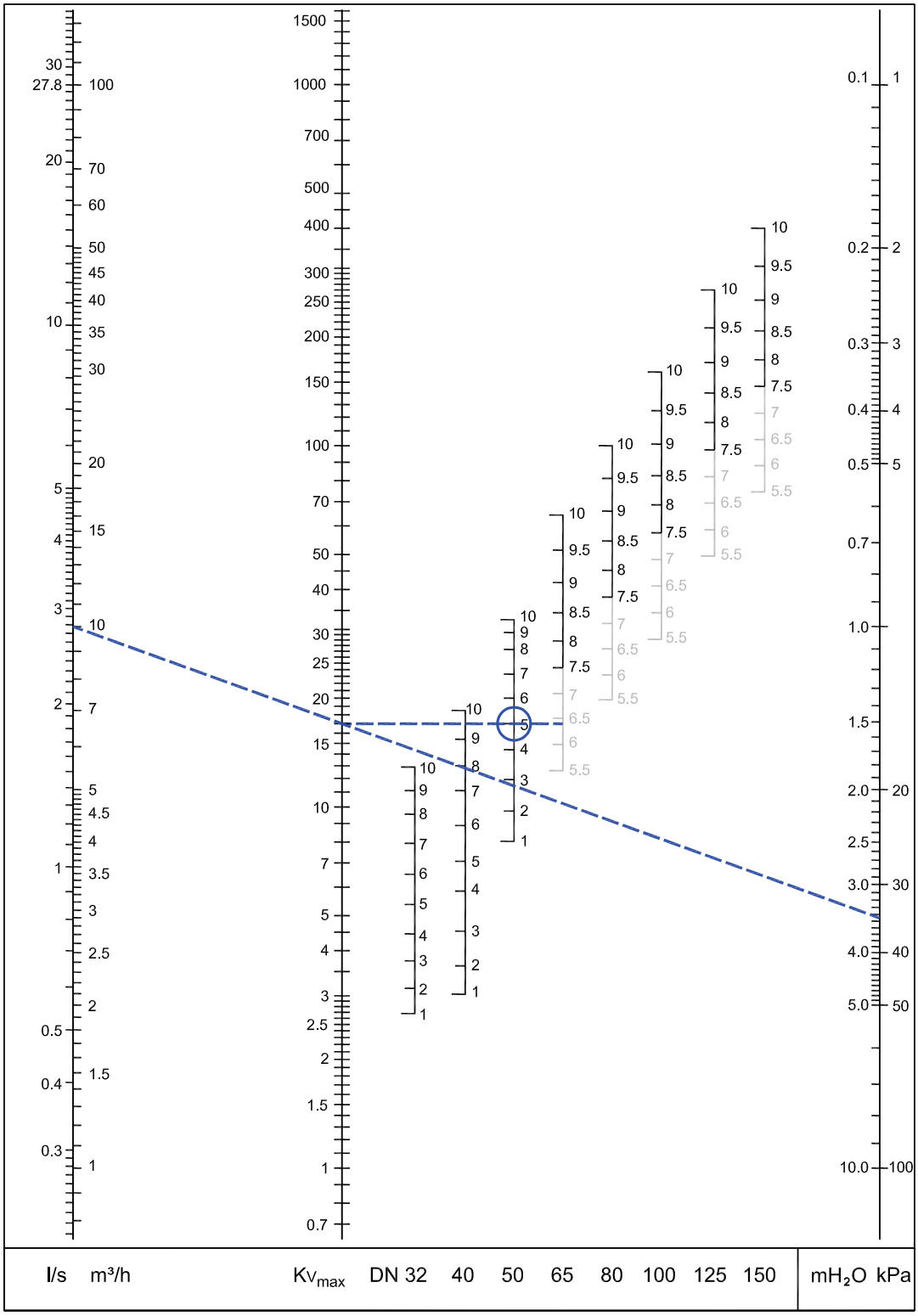
$$Kv = 36 \frac{q}{\sqrt{\Delta p}} \qquad q\ l/s,\ \Delta p\ kPa$$

Example
Flow is 10 m^3/h, ΔpV is 35 kPa and control signal (input signal) 0-10 VDC, supply voltage 24 VAC.

1. Go to sizing diagram. (When calculating the Kv_{max} by the formula go directly to step 4).
2. Draw a straight line between 10 m^3/h and 35 kPa.
3. Read the needed Kv_{max} value where the line crosses the Kv-axis. In this case Kv_{max}=16,9.
4. Draw a horizontal line from Kv_{max} 16,9, which will cross the setting bars for all valves which fit the application. In this case DN 40 setting 9,5, DN 50 setting 5,0.
5. Choose the smallest option (with some safety margin). In this case DN 50 is preferable. See “Articles – Valves”.
6. Go to “Selection of actuator” to select the actuator. In this case TA-Slider 750, article number 322226-10110.

Note
If the required flow falls outside the scale of the diagram, the reading can be made as follows: Use the design ΔpV and draw the line to a flow that is 0,1 or 10 times the design flow, getting Kv_{max} in the same relation (either 0,1 or 10 times needed).
Following the previous example
35 kPa and 10 m^3/h gives Kv_{max}=16,9
35 kPa and 1 m^3/h gives Kv_{max}=1,69
35 kPa and 100 m^3/h gives Kv_{max}=169

Sizing diagram



DN 65-150: Recommended setting range 7.5–10 (≈40–100% of Kvs).

Kv_{max} values

	Positions									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
DN 32	2,68	3,15	3,75	4,45	5,37	6,51	7,93	9,55	11,1	12,9
DN 40	3,03	3,63	4,53	5,70	7,07	8,88	11,1	13,0	15,4	18,5
DN 50	8,03	9,74	11,9	14,4	17,0	20,0	23,3	27,3	30,4	33,0

	Positions									
	5.5	6	*6.5*	*7*	**7.5**	**8**	**8.5**	**9**	**9.5**	**10**
DN 65-2	*12,6*	*14,9*	*17,6*	*20,6*	24,3	28,8	34,5	41,8	51,4	64,3
DN 80-2	*19,8*	*23,2*	*27,4*	*32,2*	38,1	45,2	54,5	65,9	81,2	100
DN 100	*29,1*	*34,5*	*40,9*	*48,4*	57,4	68,6	82,6	101	125	160
DN 125	*49,5*	*58,6*	*69,4*	*82,1*	97,4	116	140	170	212	270
DN 150	*74,5*	*88,1*	*104*	*123*	146	173	208	253	314	400

DN 65-150: Recommended setting range 7.5–10 (≈40–100% of Kvs).
Kv_{max} = m^3/h at a pressure drop of 1 bar at each setting and fully open valve plug.

Selection of actuator

		TA-Slider 750	TA-Slider 1250	TA-MC100 FSE	TA-MC100 FSR
Input signal	0(2)-10 VDC	√	√	√	√
	0(4)-20 mA	√	√	√	√
	3-point	√	√	√	√
Output signal	0(2)-10 VDC	√	√	√	√
	0(4)-20 mA			√	√
Supply voltage	24 VAC	√	√	√	√
	24 VDC	√	√		
	100-240 VAC	√	√		
	230 VAC			√	√
Fail-safe	Extending (closing)			√	
	Retracting (opening)				√
For valve		DN 32-125	DN 150	DN 32-150	DN 32-150

Article number can be found under “Articles – Actuators”.
For more variants and details on actuators, see separate technical leaflets or contact IMI Hydronic Engineering.

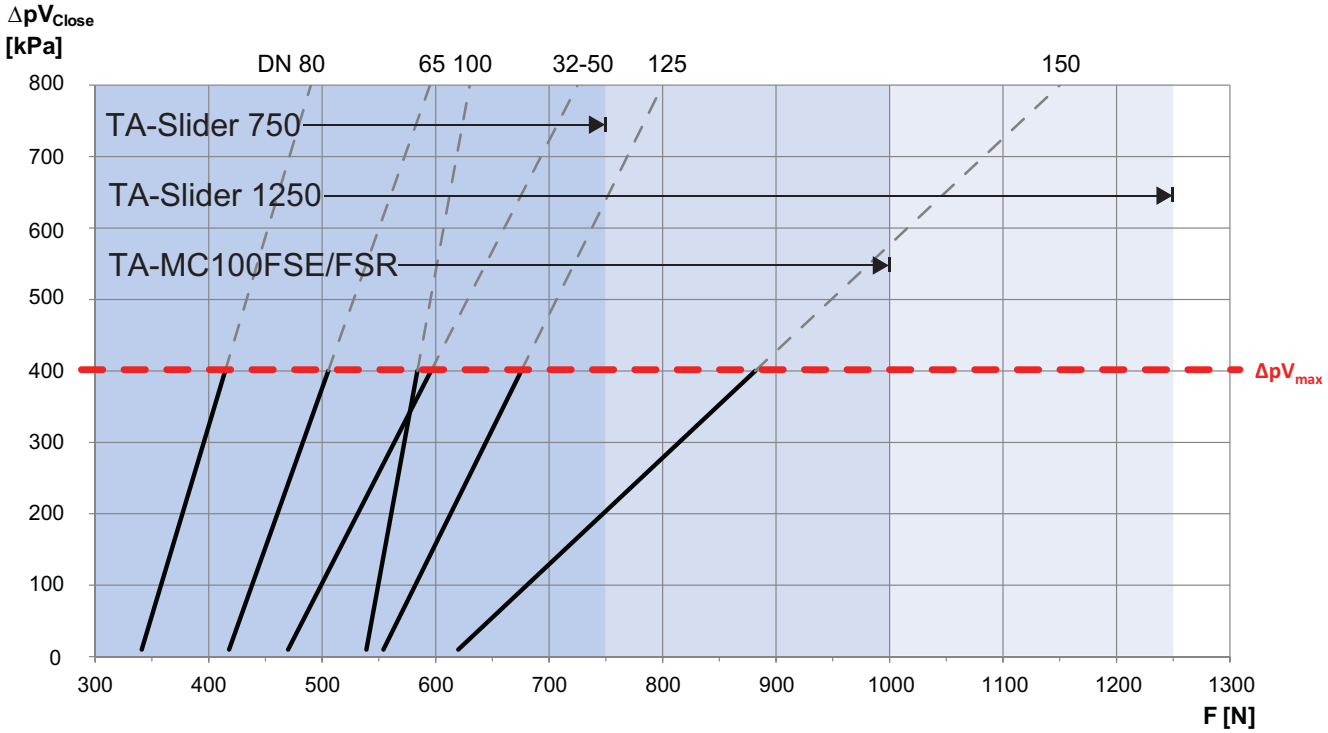
Maximum recommended pressure drop (ΔpV) for valve and actuator combination
The maximum recommneded pressure drop over the valve and actuator combination for close off (ΔpV_{close}) and to fulfill all stated performances (ΔpV_{max}). For detailed information on maximum closing off pressure, see “Closing force”.

ΔpV_{close} = The maximum pressure drop that the valve can close against from an opened position, with a specified force (actuator) without exceeding stated leakage rate.
ΔpV_{max} = The maximum allowed pressure drop over the valve to fulfill all stated performances.

DN	TA-Slider 750 [kPa]	TA-Slider 1250 [kPa]	TA-MC100 FSE/FSR [kPa]
32	400	–	400
40	400	–	400
50	400	–	400
65	400	–	400
80	400	–	400
100	400	–	400
125	400	–	400
150	200	400	400

Closing force

Necessary force (F) to close the valve versus the differential pressure (ΔpV_{close}), without exceeding stated leakage rate.

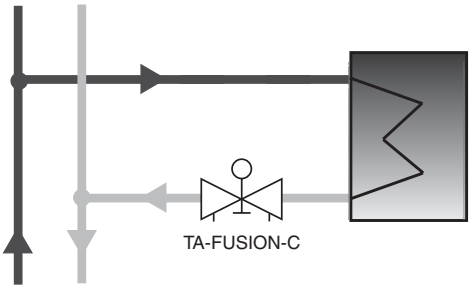


ΔpV_{close} = The maximum pressure drop that the valve can close against from an opened position, with a specified force (actuator) without exceeding stated leakage rate.
ΔpV_{max} = The maximum allowed pressure drop over the valve to fulfill all stated performances.

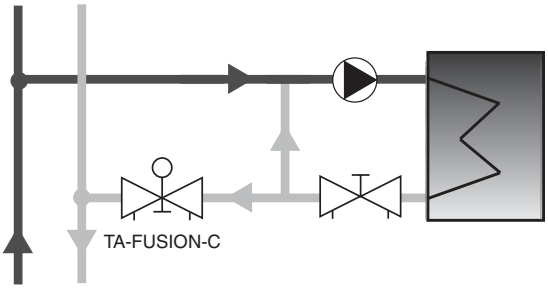
Installation

Application examples

2-way direct circuit

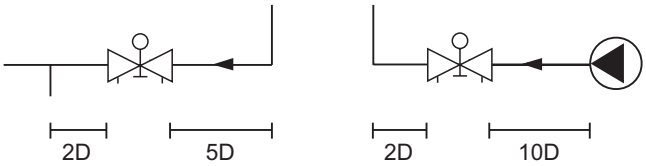


Injection circuit



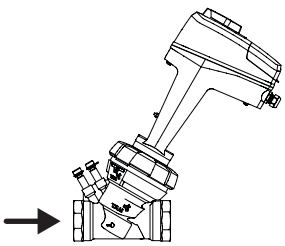
Normal pipe fittings

Avoid mounting taps and pumps immediately before or after the valve.
Installation recommendation for accurate measurement due to distortion of fully developed turbulent flow profile.

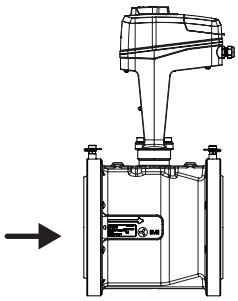


Flow direction

DN 32-50

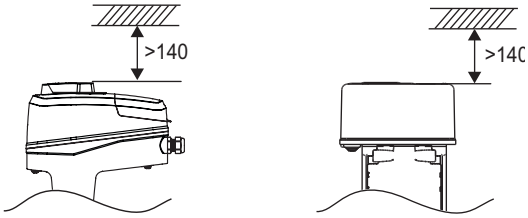


DN 65-150



Installation of actuator

Approx. 140 mm of free space is required above the actuator.

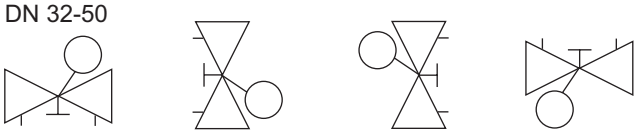


Ingress protection

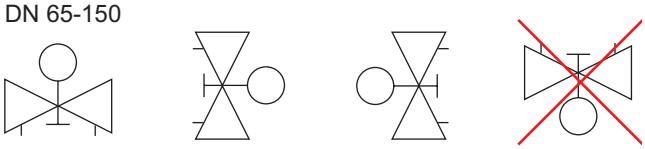
IP54
Note: Read carefully the installation instruction of the actuator.

TA-Slider 750/TA-Slider 1250

DN 32-50

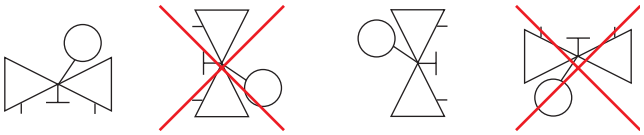


DN 65-150

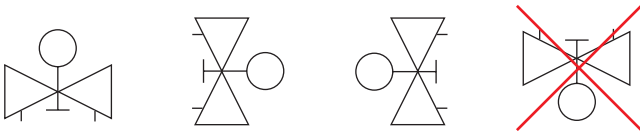


TA-MC100FSE/FSR

DN 32-50

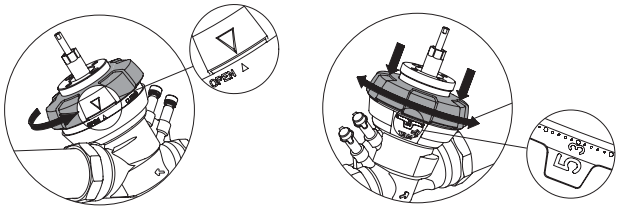


DN 65-150



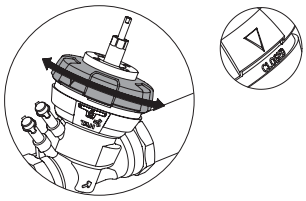
Operating function DN 32-50

Setting



1. Open the valve **fully** with the handwheel.
2. Press the handwheel downwards and turn to desired value, e.g. 5.3.

Shut-off



1. Turn the handwheel to “Closed”.

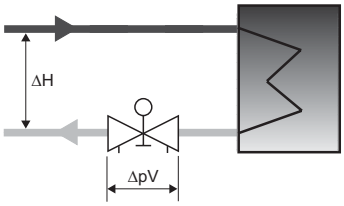
Turn the handwheel to “Open” when re-opening the valve.

Measuring ΔpV and q

Connect IMI Hydronic Engineering balancing instrument to the measuring points. Input the valve type, size and setting and the actual flow is displayed.

Measuring ΔH

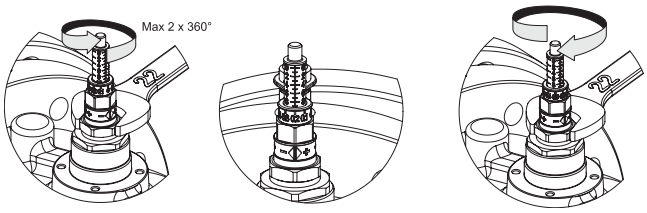
Connect IMI Hydronic Engineering balancing instrument to the measuring points. Close the valve according to “Shut-off” and measure. **Important!** The valve must be re-opened **fully** after the measurement is completed.



NOTE!
Ensure that the actuator is disengaged from the valve spindle during all operating functions described above.

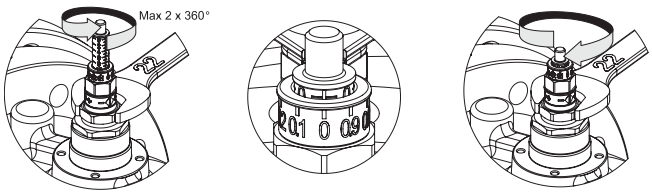
Operating function DN 65-150

Setting



1. Release the fixing nut.
2. Turn the setting screw to desired value on the scale, e.g. 9.2.
3. Tighten the fixing nut.

Shut-off



1. Release the fixing nut.
2. Turn the setting screw clockwise to stop (position 0 ±0.5). The presetting is visible on the setting scale.
3. Tighten the fixing nut.

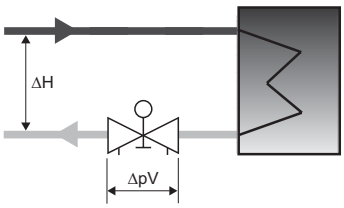
Open to **previous setting** when re-opening the valve.

Measuring ΔpV and q

Connect IMI Hydronic Engineering balancing instrument to the measuring points. Input the valve type, size and setting and the actual flow is displayed.

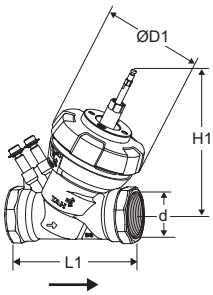
Measuring ΔH

Connect IMI Hydronic Engineering balancing instrument to the measuring points. Close the valve according to “Shut-off” and measure.
Important! The valve must be re-opened to **previous setting** after the measurement is completed.



NOTE!
Ensure that the actuator is disengaged from the valve spindle during all operating functions described above.

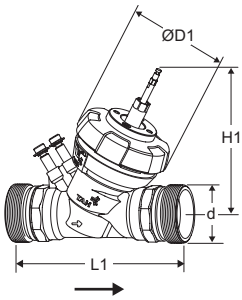
Articles – Valves



Female thread

Threads according to ISO 228

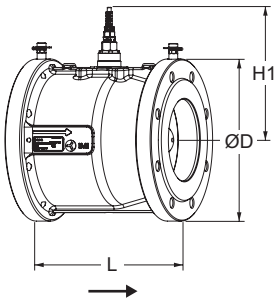
DN	d	D1	L1	H1	Kvs	Kg	EAN	Article No
PN 16								
32	G1 1/4	128	153	186	12,9	3,5	7318798639207	22106-001032
40	G1 1/2	128	159	186	18,5	3,6	7318798639306	22106-001040
50	G2	128	167	190	33,0	4,1	7318798639405	22106-001050



Male thread

Threads according to ISO 228

DN	d	D1	L1	H1	Kvs	Kg	EAN	Article No
PN 16								
32	G1 1/2	128	213	186	12,9	4,1	7318794015906	22106-005032
40	G2	128	221	186	18,5	4,2	7318794016002	22106-005040
50	G2 1/2	128	235	190	33,0	5,1	7318794016101	22106-005050



Flanged

Flanges according to EN-1092-2, type 21.

DN	D	L	H1	Kvs	Kg	EAN	Article No
PN 16							
65-2	185	190	205	64,3	17	5901688827529	22106-002065
80-2	200	203	205	100	21	5901688827550	22106-002080
100	220	229	221	160	27	3831112527881	22106-002100
125	250	254	221	270	37	3831112527911	22106-002125
150	285	267	251	400	50	3831112527942	22106-002150
PN 25							
65-2	185	190	205	64,3	17	5901688827536	22106-003065
80-2	200	203	205	100	21	5901688827567	22106-003080
100	235	229	221	160	27	3831112527898	22106-003100
125	270	254	221	270	37	3831112527928	22106-003125
150	300	267	251	400	50	3831112527959	22106-003150

→ = Flow direction

Articles – Actuators

TA-Slider 750, TA-Slider 1250, TA-MC100FSE/FSR
DN 65-150: Adapter for actuator to be ordered separately.
For more variants and details on actuators, see separate technical leaflets or contact IMI Hydronic Engineering.

Type	Supply voltage	Valve DN	EAN	Article No
TA-Slider 750	24 VAC/VDC	32-125	5901688828458	322226-10110
TA-Slider 750	100-240 VAC	32-125	5902276883620	322226-40110
TA-Slider 1250	24 VAC/VDC	150	5901688828533	322227-10110
TA-Slider 1250	100-240 VAC	150	5902276883828	322227-40110
TA-MC100FSE	24 VAC	32-150	3831112512122	61-100-101
TA-MC100FSE	230 VAC	32-150	3831112512139	61-100-102
TA-MC100FSR	24 VAC	32-150	3831112512146	61-100-201
TA-MC100FSR	230 VAC	32-150	3831112512153	61-100-202

TA-Slider 750 Plus / TA-Slider 1250 Plus
The Plus version has the following additional functions;
- Binary input, relays, output signal in mA
- BUS communication (with or without binary input, relays, output signal in mA)

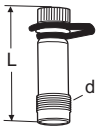
For more variants and details on actuators, see separate technical leaflets or contact IMI Hydronic Engineering.

Adapters for actuators

	Valve DN	EAN	Article No
For recommended actuators			
TA-Slider 750	32-50		*)
TA-Slider 750, TA-Slider 1250	65-150	3831112529748	22413-001055
TA-MC100FSE/FSR	32-50		*)
TA-MC100FSE/FSR	65-150	3831112529748	22413-001055
For other actuators			
Hora MC55, MC100	32-50		*)
Hora MC55, MC100	65-150	3831112529748	22413-001055
Hora MC160	65-150	3831112527751	22413-001160
Hora MC253	65-150	3831112527973	22413-101253
JC VA1125-GGA-1	32-50	3831112531635	22412-000001
JC VA1125-GGA-1	65-150	3831112531628	22413-000001
JC VA7810-GGA-12	32-50	3831112531642	22412-000002
JC VA7810-GGA-12	65-150	3831112531659	22413-000002
Sauter AVM322	32-50	3831112532342	22412-000004
Sauter AVM322	65-150	3831112532359	22413-000004
Sauter AVM234, AVN, AVF	32-50	3831112531680	22412-000003
Sauter AVM234, AVN, AVF	65-150	3831112512214	22413-000003
Siemens SAX, SQV91	32-50	3831112531611	22214-000002
Siemens SAX, SQV91	65-150	3831112530928	22214-000001

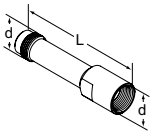
*) Integrated in the valve.

Accessories



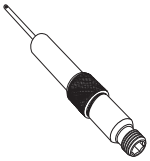
Measuring point
AMETAL®/EPDM

d	L	EAN	Article No
DN 32-50			
M14x1	44	7318792813207	52 179-014
M14x1	103	7318793858108	52 179-015
DN 65-150			
3/8	47	7318792813009	52 179-008
3/8	103	7318792814501	52 179-608



Extension for measuring point M14x1
Suitable when insulation is used.
AMETAL®
For DN 32-50.

d	L	EAN	Article No
M14x1	71	7318793969507	52 179-016

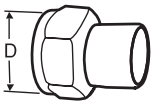


Measuring point, extension 60 mm
Can be installed without draining of the system. For all dimensions.
AMETAL®/Stainless steel/EPDM

L	EAN	Article No
60	7318792812804	52 179-006

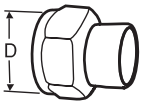
Insulation
See related insulation instruction under “Products” on www.imi-hydronic.com or contact IMI Hydronic Engineering.

Connections for DN 32-50



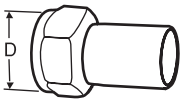
Welding connection
Swivelling nut
Max 120°C
Brass/Steel 1.0045 (EN 10025-2)

Valve DN	D	Pipe DN	EAN	Article No
32	G1 1/2	32	7318792748806	52 009-032
40	G2	40	7318792748905	52 009-040
50	G2 1/2	50	7318792749001	52 009-050



Soldering connection
Swivelling nut
Max 120°C
Brass/gunmetal CC491K (EN 1982)

Valve DN	D	Pipe Ø	EAN	Article No
32	G1 1/2	35	7318792749803	52 009-535
40	G2	42	7318792749902	52 009-542
50	G2 1/2	54	7318792750007	52 009-554



Connection with smooth end
For connection with press coupling
Swivelling nut
Max 120°C
Brass/AMETAL®

Valve DN	D	Pipe Ø	EAN	Article No
32	G1 1/2	35	7318793811004	52 009-335
40	G2	42	7318793811103	52 009-342
50	G2 1/2	54	7318793811202	52 009-354