

KTM 512

– NPT threads/ANSI flanges



Combined control & balancing valves

Pressure independent balancing and control valve –
size 1/2" - 5"

KTM 512

– NPT threads/ANSI flanges

High-performing and compact, these pressure-independent control valves for variable flow heating and cooling systems are particularly effective in situations requiring high temperatures and/or pressure drops. They are also suitable for use on the secondary side in district heating and comfort cooling systems. Rust protection is assured due to the electrophoretically painted ductile iron body, while the plug delivers valve characteristic, suitable for modulating control.



Key features

- > **Inline design**
Inline flow allows high pressure drops without noise.
- > **Adjustable flow**
Ensures the design flow.
- > **Adapters**
For use with most available actuators.

Technical description

Application:

Heating and cooling systems.

Functions:

Control EQM
Pre-setting (max. flow)
Differential pressure control
Measuring (ΔH , t , q)
Isolation (for use during system maintenance)

Dimensions:

1/2" - 5"

Pressure class:

Sizes 1/2" - 2": 363 psi
Sizes 2 1/2" - 5": Class 150

Differential pressure (Δp_V):

Max. differential pressure: 232 psi (ΔH_{max})
Min. differential pressure:
Low flow (LF): 3.48 psi (ΔH_{min})
Normal flow (NF): 5.80 psi (ΔH_{min})
High flow (HF): 11.60 psi (ΔH_{min})
(Valid for max. position, fully open. Other positions will require lower differential pressure, check with the software HySelect.)

Flow range:

The flow (q_{max}) can be set within the range:
DN 15/20 (LF): 0.53 - 3.52 gpm
DN 15/20 (NF): 0.66 - 4.40 gpm
DN 15/20 (HF): 0.92 - 6.16 gpm
DN 25/32 (LF): 2.11 - 14.09 gpm
DN 25/32 (NF): 2.51 - 16.73 gpm
DN 25/32 (HF): 3.57 - 23.78 gpm
DN 40/50 (LF): 5.02 - 33.46 gpm
DN 40/50 (NF): 6.16 - 41.83 gpm
DN 40/50 (HF): 8.37 - 55.48 gpm
DN 65 (LF): 10.13 - 67.80 gpm
DN 65 (NF): 14.27 - 95.10 gpm
DN 65 (HF): 19.55 - 130.32 gpm
DN 80 (LF): 11.01 - 73.53 gpm
DN 80 (NF): 14.97 - 99.95 gpm
DN 80 (HF): 21.57 - 143.09 gpm
DN 100 (LF): 17.61 - 117.12 gpm
DN 100 (NF): 27.30 - 181.40 gpm
DN 100 (HF): 33.02 - 222.79 gpm
DN 125 (LF): 23.56 - 156.74 gpm
DN 125 (NF): 36.10 - 241.72 gpm
DN 125 (HF): 44.03 - 294.11 gpm
 q_{max} = gpm at each setting and fully open valve plug.

Temperature:

Max. working temperature:
- with measuring points: 248°F
- without measuring points: 302°F
Min. working temperature: 14°F

Media:

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

Max. lift of the control valve:

Sizes 1/2" - 2": 0.394"
Sizes 2 1/2" - 5": 0.787"

Leakage rate:

Tight sealing

Characteristics:

Indicative shaped EQM, best suited for modulating control.

Material:

Valve body: Ductile iron EN-GJS-400-15
Valve insert: Brass
Throttle plug: Stainless steel
Valve plug: Stainless steel
Valve seat: Stainless steel
Seat seal: EPDM
Spindle: Stainless steel
 Δp insert: Stainless steel (plastic components for DN 15-50)
 Δp seat: Ryton plastic
Springs: Stainless steel

Surface treatment:

Electrophoretic painting.

Marking:

IMI TA, Size, Class, Cvs, material and flow direction arrow.

Connection:

Size 1/2" - 2": External threads according to ISO 228. (Separate connections with NPT threads.)

Size 2 1/2" - 5": Flanges according to ASME/ANSI B16.42 Class 150.

Actuators:

- 1/2 - 2": TA-Slider 500
- 2 1/2": TA-Slider 750*
- 3" LF/NF: TA-Slider 750*
- 3" HF: TA-Slider 1600*
- 4" LF: TA-Slider 750*
- 4" NF/HF: TA-Slider 1600*
- 5": TA-Slider 1600*

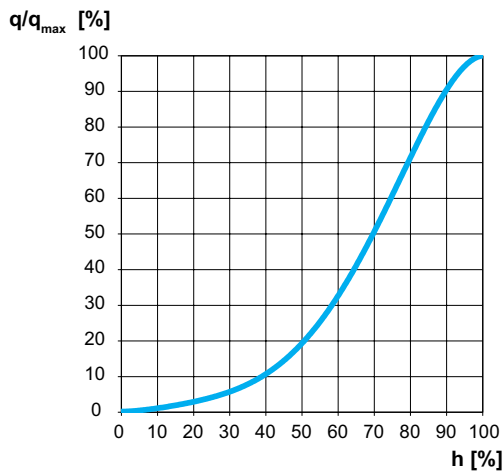
*) Adapter 52 757-907 needed.

For more details on actuators, see separate technical leaflets.

KTM 512 can be equipped with adapters for the most common actuators - see "Adapters for actuators".

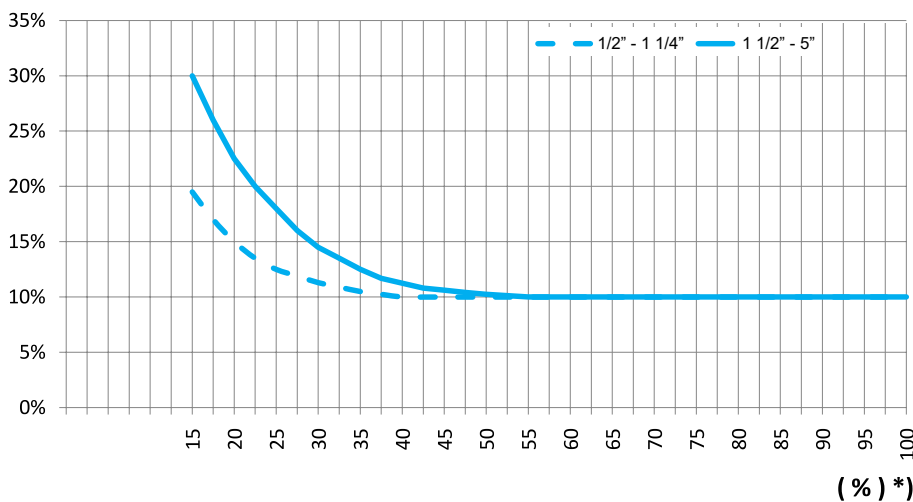
The max. lift of the actuator must be checked. In the case of a shorter lift the maximum achieved flow will be decreased. Consult your local sales office for details.

Valve characteristics



Measuring accuracy

Cv deviation at different settings (LF/NF/HF)



*) Setting (%) of fully open valve.

Correction factors

The flow calculations are valid for water (68°F). For other liquids with approximately the same viscosity as water (≤ 20 cSt = $3^{\circ}\text{E}=100\text{S.U.}$), 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 valve must be correctly installed.

Performance of the valves is subject to water quality being of an appropriate regional standard (including particulate and free, entrained and dissolved gases compliant with VDI 2035), failure to do so can result in shortened life span, reduced controllability and noise.

Sizing

The valve is capable of achieving a maximum flow according to the product tables.

Min. differential pressure:

Low flow (LF): 3.48 psi (ΔH_{\min})

Normal flow (NF): 5.80 psi (ΔH_{\min})

High flow (HF): 11.60 psi (ΔH_{\min})

(Valid for max. position, fully open. Other positions will require lower differential pressure, check with the software HySelect.)

Installation

Install the valve in the return pipe, downstream the consumer, or in the inlet pipe, upstream the consumer. Flow direction is shown by the arrow on the valve body.

Install the valve so that venting is possible and the flow adjustment scale is visible. Check allowed positions of the actuator.

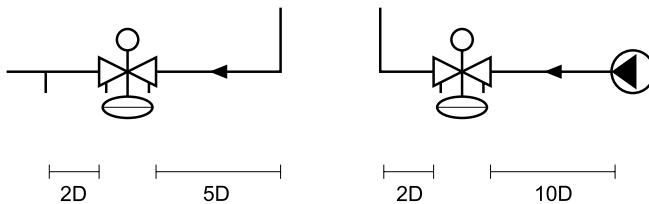
Installation of a strainer upstream of the valve is recommended.

When filling, vent the body by using the venting screws.

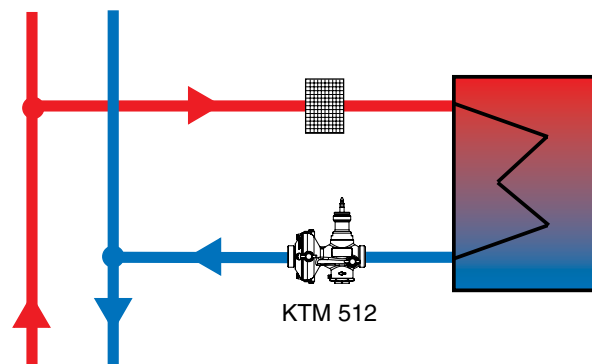
Normal pipe fittings

Try to avoid mounting taps and pumps immediately before the valve.

Installation recommendation for accurate measurement due to distortion of fully developed turbulent flow profile.



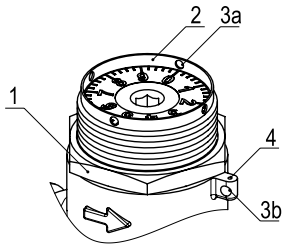
Application example



Setting

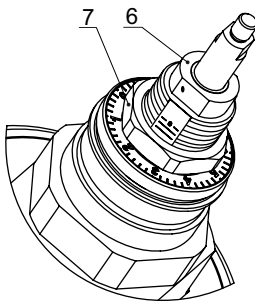
1/2" - 2"

Release the fixing nut (1). Turn the flow setting screw (2) clockwise to the position of 0.0 turns. Turn the flow setting screw **counter-clockwise** corresponding to the number of turns on the flow chart. Tighten the fixing nut. The flow setting can be sealed by using the holes (3a and 3b) on the flow setting screw and the valve body.



2 1/2" - 5"

Release the fixing nut (7). Turn the flow setting screw (6) clockwise to the position of 0.0 turns. Turn the flow setting screw **counter-clockwise** corresponding to the number of turns on the flow chart. Tighten the fixing nut.



Detailed instructions are delivered with the valves.

Table - Example:

Valid table is delivered with each valve.

KTM 512 1/2"/3/4" LF					
Position					
	0.0	1.0	2.0	3.0	4.0
.0	0.09	1.28	2.16	2.60	3.17
.1	0.22	1.36	2.20	2.64	3.21
.2	0.31	1.45	2.24	2.73	3.26
.3	0.44	1.54	2.29	2.77	3.30
.4	0.57	1.63	2.33	2.82	3.34
.5	0.70	1.72	2.38	2.90	3.43
.6	0.79	1.80	2.42	2.95	3.48
.7	0.92	1.89	2.46	2.99	3.52
.8	1.06	1.89	2.51	3.04	3.56
.9	1.14	2.07	2.55	3.12	3.61

Flow [gpm]

$$\ominus p_1=58.0 \text{ psi } p_2=43.5 \text{ psi } \Delta p=14.5 \text{ psi}$$

$$\Delta p \ll 14.5 \text{ psi} \Rightarrow \text{Flow} = \approx$$

Actuator recommendation and needed actuation force

The minimum actuator force required to operate the KTM 512 valves is dependent upon the maximum inlet pressure of the system. The following table shows the actuator recommendations from IMI Hydronic Engineering and needed actuator force.

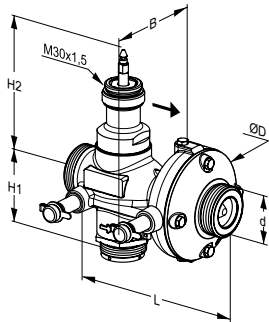
			Theoretical minimum actuator force [lbf] at different static inlet pressures				
Valve size		Stroke [in.]	≤72.5 psi	≤145 psi	≤217.5 psi	≤290 psi	≤363 psi
1/2" / 3/4"	LF	0.39	24.7	30.3	38.2	44.9	52.8
	NF		24.7	30.3	38.2	44.9	52.8
	HF		25.8	31.4	39.3	46.0	53.9
1" / 1 1/4"	LF		29.2	34.8	42.7	49.4	57.2
	NF		31.4	37.0	43.8	51.6	58.4
	HF		35.9	41.5	48.3	56.1	62.9
1 1/2" / 2"	LF		33.7	39.3	46.0	53.9	60.6
	NF		38.2	42.7	50.5	57.2	65.1
	HF		46.0	50.5	57.2	65.1	71.8
2 1/2"	LF	0.79	80.8	92.0	108.9	125.7	141.4
	NF		89.8	99.9	116.7	133.6	150.4
	HF		106.6	116.7	133.6	149.3	166.1
3"	LF		93.2	104.4	120.1	136.9	153.8
	NF		107.8	116.7	133.6	150.4	166.1
	HF		134.7	142.6	159.4	176.2	191.9
4"	LF		107.8	116.7	133.6	150.4	167.3
	NF		126.8	135.8	151.5	168.4	185.2
	HF		166.1	171.7	188.6	205.4	221.1
5"	LF	133.6	141.4	158.3	174.0	190.8	
	NF	163.9	169.5	186.3	202.1	218.9	
	HF	223.4	225.6	241.3	258.2	275.0	

Recommended actuator	Actuator force [lbf]	Max stroke [in.]
TA-Slider 500/24	112	0.71
TA-Slider 750/24	168	0.79
TA-Slider 1600/24	360	1.30

Actuator	Supply voltage	Cable length [m]	EAN	Article No
TA-Slider 500	24 VAC/VDC	1	5901688828441	322225-10111
		2	5902276883453	322225-10112
		5	5902276883460	322225-10113
TA-Slider 500 Fail-safe	24 VAC/VDC	1	5902276898761	322225-10614
		2	5902276898778	322225-10615
		5	5902276898785	322225-10616
TA-Slider 750	24 VAC/VDC		5901688828458	322226-10110
TA-Slider 750 Fail-safe Plus	24 VAC/VDC		5902276898822	322226-10319
TA-Slider 1600	24 VAC/VDC		5902276816789	322228-10110
TA-Slider 1600 Fail-safe Plus	24 VAC/VDC		5902276816987	322228-10319

For more variants and details on actuators, see separate technical leaflets or contact IMI Hydronic Engineering.
Adapters needed for DN 65-125.

Articles – With measuring points (max. 248°F)



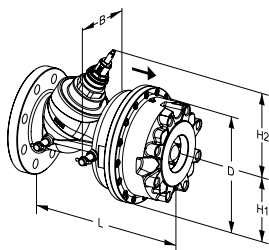
1/2" - 2"

External thread according to ISO 228.

Separate connections with NPT threads – see Connections for size 1/2"-2".

363 psi

Size	d	D [in]	L [in]	H1 [in]	H2 [in]	B [in]	q _{max} [gpm]	lb	Article No
LF, low flow									
1/2"/3/4"	G1	3.07	4.33	1.77	4.68	3.27	3.52	3.3	52 796-220
1"/1 1/4"	G1 1/4	3.82	5.91	2.09	4.53	3.54	14.08	4.4	52 796-225
1 1/2"/2"	G2	4.92	7.48	2.60	4.45	4.17	33.44	9.9	52 796-240
NF, normal flow									
1/2"/3/4"	G1	3.07	4.33	1.77	4.68	3.27	4.40	3.3	52 796-020
1"/1 1/4"	G1 1/4	3.82	5.91	2.09	4.53	3.54	16.72	4.4	52 796-025
1 1/2"/2"	G2	4.92	7.48	2.60	4.45	4.17	41.80	9.9	52 796-040
HF, high flow									
1/2"/3/4"	G1	3.07	4.33	1.77	4.68	3.27	6.16	3.3	52 796-420
1"/1 1/4"	G1 1/4	3.82	5.91	2.09	4.53	3.54	23.76	4.4	52 796-425
1 1/2"/2"	G2	4.92	7.48	2.60	4.45	4.17	55.44	9.9	52 796-440



2 1/2" - 5"

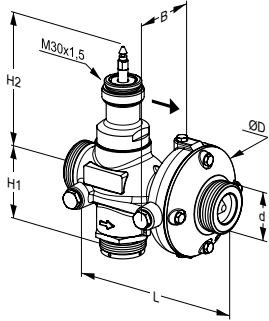
Flanges – Do not need any separate connections.

Flanges according to ASME/ANSI B16.42 Class 150.

Class 150

Size	D [in]	L [in]	H1 [in]	H2 [in]	B [in]	q _{max} [gpm]	lb	Article No
LF, low flow								
2 1/2"	8.66	11.42	4.33	6.89	5.35	67.8	48.5	52 764-665
3"	8.66	12.20	4.33	6.89	5.28	73.5	52.9	52 764-680
4"	12.60	13.78	6.30	7.72	7.05	117	119	52 764-690
5"	12.60	15.75	6.30	7.72	7.01	157	128	52 764-691
NF, normal flow								
2 1/2"	8.66	11.42	4.33	6.89	5.35	95.0	48.5	52 751-065
3"	8.66	12.20	4.33	6.89	5.28	99.9	52.9	52 751-080
4"	12.60	13.78	6.30	7.72	7.05	181	119	52 751-090
5"	12.60	15.75	6.30	7.72	7.01	242	128	52 751-091
HF, high flow								
2 1/2"	8.66	11.42	4.33	6.89	5.35	130	48.5	52 751-165
3"	8.66	12.20	4.33	6.89	5.28	143	52.9	52 751-180
4"	12.60	13.78	6.30	7.72	7.05	223	119	52 751-190
5"	12.60	15.75	6.30	7.72	7.01	294	128	52 751-191

→ = Flow direction

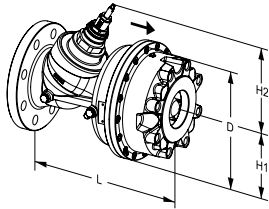
Articles – Without measuring points (max. 302°F)

1/2" - 2"

External thread according to ISO 228.

Separate connections with NPT threads – see Connections for size 1/2"-2".

363 psi

Size	d	D [in]	L [in]	H1 [in]	H2 [in]	B [in]	q _{max} [gpm]	lb	Article No
LF, low flow									
1/2"/3/4"	G1	3.07	4.33	1.77	4.68	2.17	3.52	3.3	52 761-820
1"/1 1/4"	G1 1/4	3.82	5.91	2.09	4.53	2.44	14.08	4.4	52 761-825
1 1/2"/2"	G2	4.92	7.48	2.60	4.45	3.07	33.44	9.9	52 761-840
NF, normal flow									
1/2"/3/4"	G1	3.07	4.33	1.77	4.68	2.17	4.40	3.3	52 762-820
1"/1 1/4"	G1 1/4	3.82	5.91	2.09	4.53	2.44	16.72	4.4	52 762-825
1 1/2"/2"	G2	4.92	7.48	2.60	4.45	3.07	41.80	9.9	52 762-840
HF, high flow									
1/2"/3/4"	G1	3.07	4.33	1.77	4.68	2.17	6.16	3.3	52 765-720
1"/1 1/4"	G1 1/4	3.82	5.91	2.09	4.53	2.44	23.76	4.4	52 765-725
1 1/2"/2"	G2	4.92	7.48	2.60	4.45	3.07	55.44	9.9	52 765-740


2 1/2" - 5"
Flanges – Do not need any separate connections.

Flanges according to ASME/ANSI B16.42 Class 150.

Class 150

Size	D [in]	L [in]	H1 [in]	H2 [in]	q _{max} [gpm]	lb	Article No
LF, low flow							
2 1/2"	8.66	11.42	4.33	6.89	67.8	48.5	52 761-965
3"	8.66	12.20	4.33	6.89	73.5	52.9	52 761-980
4"	12.60	13.78	6.30	7.72	117	119	52 761-990
5"	12.60	15.75	6.30	7.72	157	128	52 761-991
NF, normal flow							
2 1/2"	8.66	11.42	4.33	6.89	95.0	48.5	52 762-965
3"	8.66	12.20	4.33	6.89	99.9	52.9	52 762-980
4"	12.60	13.78	6.30	7.72	181	119	52 762-990
5"	12.60	15.75	6.30	7.72	242	128	52 762-991
HF, high flow							
2 1/2"	8.66	11.42	4.33	6.89	130	48.5	52 765-865
3"	8.66	12.20	4.33	6.89	143	52.9	52 765-880
4"	12.60	13.78	6.30	7.72	223	119	52 765-890
5"	12.60	15.75	6.30	7.72	294	128	52 765-891

→ = Flow direction

Adapters for actuators

For sizes 1/2" - 2"

For recommended actuators

For actuator	Article No
TA-Slider 500, TA-Slider 500 Fail-safe *	-
TA-Slider 750, TA-Slider 750 Fail-safe Plus	52 757-035

*) Included with the valve.

For other actuators

For actuator	Article No
Belimo NRDVX-3-T-SI	52 757-001
Belimo NRDVX-SR-T-CA	52 757-037
Belimo UNV 002	52 757-029
Belimo UNV 003	52 757-041
Clorius V2.05, V4.10	52 757-016
Danfoss AMV 10, 13, 20, 23	52 757-008
JCI VA-745x	52 757-002
JCI VA-715x, VA-720x, VA-774x	52 757-033
K&P MD200	52 757-036
Honeywell ML	52 757-042
HORA MC25	52 757-024
HORA MC45	52 757-028
HORA MC100 FSE/FSR	52 757-026
Lineg NL	52 757-007
Samson 5825	52 757-011
Schneider Electric FORTA M400, M800	52 757-019
Siemens SQX, SKD, SKB	52 757-022
Siemens SAX	52 757-045
Sauter AVM 104/114	52 757-030
Sauter AVM115SF901 (TA-R25)	52 757-031
Sauter AVM115SF901 (TA-R25 plastic)	52 757-038
TA-MC55, TA-MC55Y, TA-MC100	52 757-035

For sizes 2 1/2" - 5"

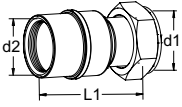
For recommended actuators

For actuator	Article No
TA-Slider 750, TA-Slider 750 Fail-safe Plus, TA-Slider 1600, TA-Slider 1600 Fail-safe Plus	52 757-907

For other actuators

For actuator	Article No
Belimo UNV 003	52 757-901
Belimo NV24 (TA-NV24)	52 757-901
Danfoss AMV 55, AMV 655	52 757-924
HORA MC100 FSE/FSR	52 757-912
Schneider Electric Forta	52 757-906
Siemens SQX, SKD, SAX	52 757-903
TA-MC55, TA-MC55Y	52 757-905
TA-MC100	52 757-907
TA-MC160	52 757-913

Connections for sizes 1/2"-2"



With internal thread NPT

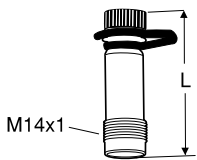
Threads according to ANSI/ASME B1.20.1-1983.

Swivelling nut

d1	d2	L1* [in]	Article No
G1	1/2 NPT	1.93	52 751-311
G1	3/4 NPT	2.28	52 751-312
G1 1/4	1 NPT	2.87	52 751-307
G1 1/4	1 1/4 NPT	3.15	52 751-308
G2	1 1/2 NPT	3.23	52 751-309
G2	2 NPT	3.66	52 751-310

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

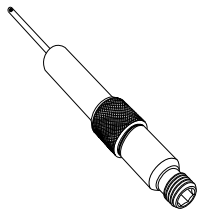
Accessories



Measuring point

AMETAL®/EPDM

L [in]	Article No
1.73	52 179-014
4.05	52 179-015

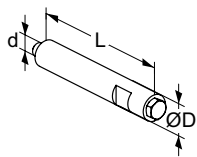


Measuring point, extension 2.36 in.

Can be installed without draining of the system.

AMETAL®/Stainless steel/EPDM

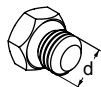
L [in]	Article No
2.36	52 179-006



Venting extension

Suitable when insulation is used.
Stainless steel/EPDM/Brass.

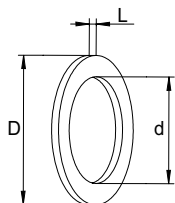
d	D [in]	L [in]	Article No
M6	0.47	2.76	52 759-220



Venting screw

Brass/EPDM

d	Article No
M6	52 759-211



Gasket

Spare part for NPT connections 52 751-3xx.
EPDM

Valve size	d	D	Article No
1/2" / 3/4"	0.787	1.181	239050-00000
1" / 1 1/4"	0.984	1.535	239050-00001
1 1/2" / 2"	1.575	2.205	239050-00002

