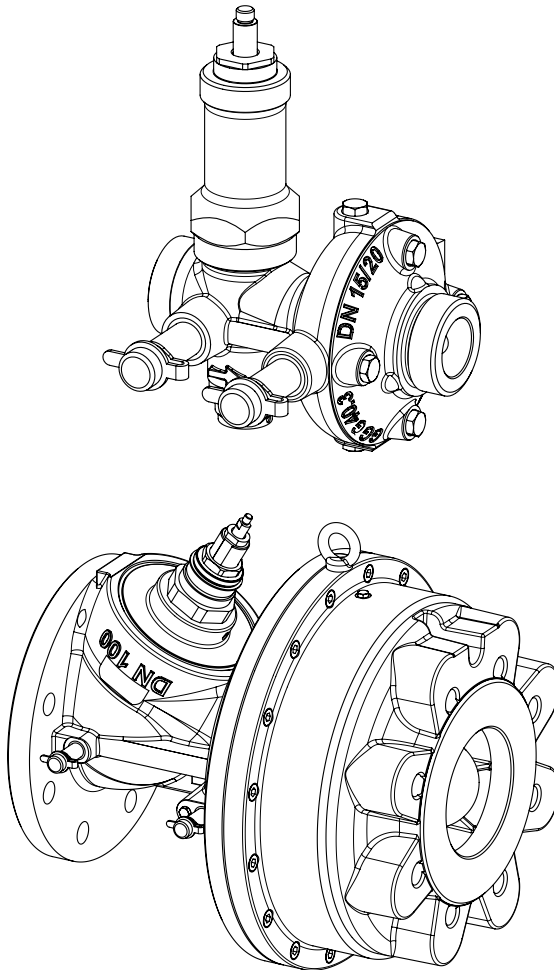


KTM 512 (DN 15 -125)

Installation, maintenance and operating instructions



General

- High-performing and compact, these pressure-independent control valves for variable flow heating and cooling systems are particularly effective in situations requiring high temperature and/or pressure drops.
- They are also suitable for use on the primary and secondary side in district heating and cooling systems.
- Rust protection is assured due to the electrophoretically painted ductile iron body (KTL).

Marking

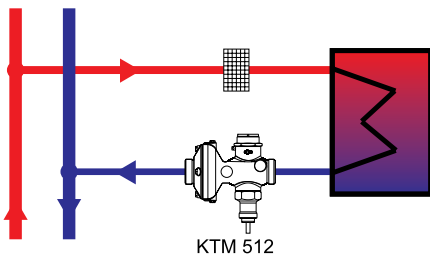
The valve displays the following data:

- TA - Manufacturer: according to table 3
- Material: according to table 2
- DN: according to table 2
- Max. (PN) working pressure according to table 2
- CE-marking according to table 1; 3
- → Unidirectional flow arrow for the recommended direction of flow
- Max. permitted temperature: 120°C (table 3)
- Control Spring: LF (low flow) / NF (normal flow) HF (high flow) (table 3)
- Date of manufacture: year, week (table 3)

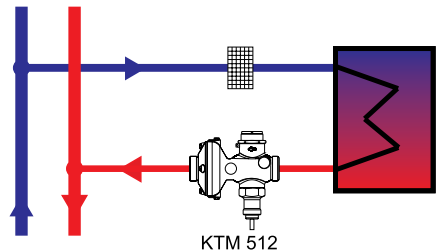
Installation

- The valve serving the terminal unit can be installed in the flow or the return pipe

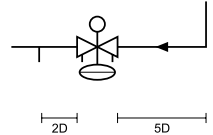
- Heating



- Cooling

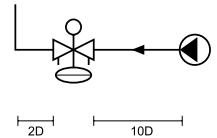


- Valve may be installed in vertical, horizontal or inclined pipeline.
- The valve should be installed to match the direction of flow, with the flow direction arrow shown on the valve body or on the identification plate.
- Install the valve so that venting is possible and the flow adjustment scale is visible and accessible
- Check allowed positions of the actuator and provide adequate space for future service and maintenance.
- Installation of a strainer upstream of the valve is strongly recommended.



Note: To ensure flow measurement accuracy it is essential that the piping on the inlet and outlet sides is straight and has a minimum uninterrupted length equivalent to 5 diameters at inlet and 2 diameters at outlet as shown:

If the valve is located on the outlet from a pump then it is essential that the straight uninterrupted pipe length between pump outlet and valve inlet is a minimum of 10 diameters.



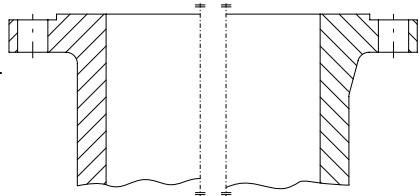
Installation - Preparation

- Ensure valve is suitable for service conditions e.g. pressure, temperature, service media.
- Ensure the pipe system has been cleaned.
- Ensure the strainer is installed.
- Ensure all sealing surfaces are clean and undamaged.
- The installation shall provide adequate means of draining and venting to avoid harmful effects such as water hammer, vacuum collapse, corrosion and uncontrolled chemical reactions and to permit cleaning, inspection and maintenance in the correct manner.
- The valve has been designed for load, appropriate to its intended use and other reasonable foreseeable operating conditions. Load caused by traffic, wind and earthquake, have not been taken into account.

Flange joints

Flanges may be damaged by over tightening the bolts. The following procedures will reduce this risk:

- Check that the counter-flanges are parallel before the valve is installed.
- Lubricate the threads on the bolts and fit washers. Ensure adequate lubrication of bolts and washers.
- Full faced gaskets should be used with integral flanges according to standard EN 1092-2:1997 (Type 21).
- Always use the correct size and number of bolts.
- Tighten the bolts crosswise using a torque wrench to the tightening torque set out in table 4.
- Check that the full faced gaskets are in accordance with the given standard for flanges and that they are centred correctly on the sealing surfaces.

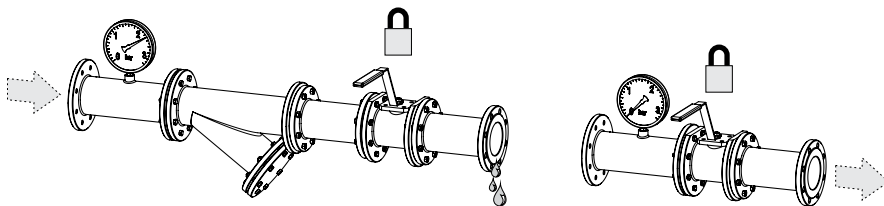


Threaded joints

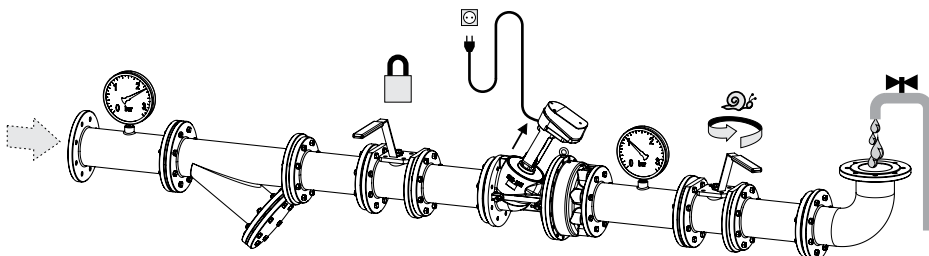
- The valves are supplied with the external inch threads ends.
- To avoid distortion of the valve during installation, the valve must be held with the proper tools so that the valve is in line.
- Care should be taken to avoid 'pipe ending'. This is a condition that occurs when the pipe is screwed in too far resulting in distortion to the valve seat.
-
- The male thread on the pipe must have fully formed undamaged threads.

Start-up procedure

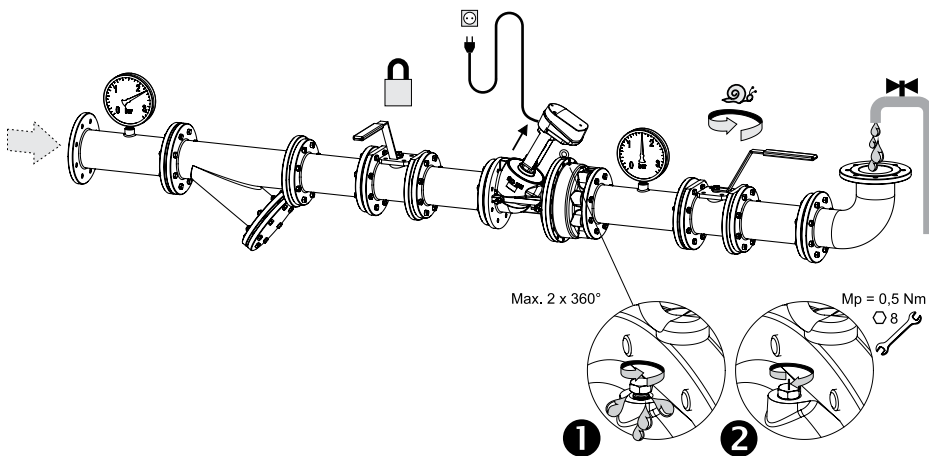
- Install the valve into dry pipe. Verify the installation of a strainer upstream of the KTM valve. Isolation valves at the inlet and outlet side of the KTM should be closed.



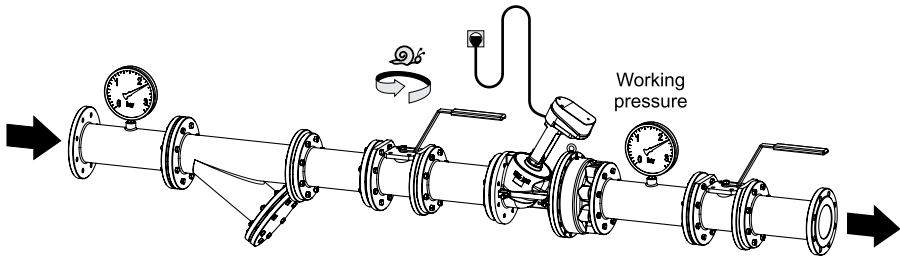
- Fill the system with the tap water from the reverse side by slowly opening the isolation valve at the outlet side of the KTM, while the isolation valve at the inlet side of the KTM is still closed. Actuator should be switched off and control valve should be full open.



- When isolation valve on the outlet side of the KTM valve is fully open and the valve is under pressure, vent the valve by using 8 mm spanner.



- Switch on the actuator and slowly open the isolation valve at the inlet side of the KTM.



- **Reversing the flow and flushing through the KTM valve is not allowed!!!**

Pre-commission

- Check that the arrow on the valve body is in the same direction as the flow.
- Fully open the valve by unscrewing the throttle anticlockwise with key according to table 5, from 50% to 100% open (factory setting is 50%),
- Ensure that actuator is not on the valve.
- Check that the strainer basket is clean.
- Slowly fill the system with the tap water according to the “Start-up procedure”
- Close the bypasses.
- Check sealing.

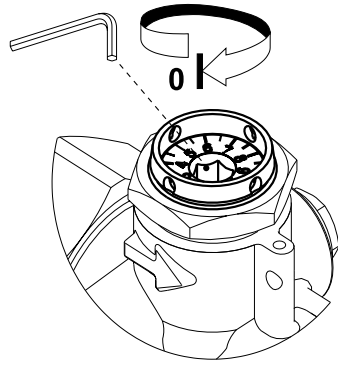
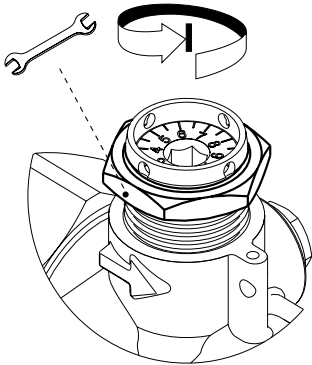
Commission

- Be sure that actuator is removed and the valve (throttle) is fully open.
- Slowly raise the pressure to working pressure.
- Vent the valve.
- Check sealing.
- Set the flow according to the flow chart supplied with the valve.
- Install the actuator.

Presetting

DN 15-50

The valve's opening position can be read on the digital label on the throttle. Factory setting is on half open (50%). Example of presetting the valve to 3.5 turns is done as follow:



- Unscrew the fix nut on the throttle. Use the spanner according to the table 5.
- Fully close the valve by screwing the throttle with the allen key according to the table 5.
- Set the flow according to the flow chart supplied with the valve. Unscrew the throttle for 3,5 turns. Count the turns.

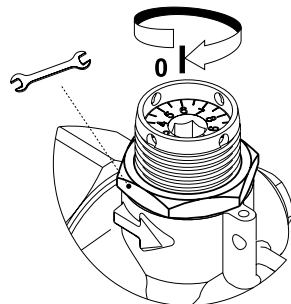
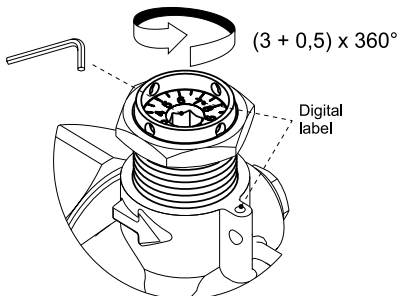
KTM 512 DN 15/20 LF					
Position - Einstellung					
	0,0	1,0	2,0	3,0	4,0
.0	0,02	0,29	0,49	0,59	0,72
.1	0,05	0,31	0,50	0,60	0,73
.2	0,07	0,33	0,51	0,62	0,74
.3	0,10	0,35	0,52	0,63	0,75
.4	0,13	0,37	0,53	0,64	0,76
.5	0,16	0,39	0,54	0,65	0,76
.6	0,18	0,41	0,55	0,67	0,79
.7	0,21	0,43	0,56	0,68	0,80
.8	0,24	0,45	0,57	0,69	0,81
.9	0,26	0,47	0,58	0,71	0,82

Flow - Volumenstrom (m³/h)

$p_1=4\text{bar}$ $p_2=3\text{bar}$ $\Delta p=1\text{bar}$

$\Delta p < >> 1 \text{ bar} \rightarrow \text{Flow} = \infty$

Flow chart is valid when Δp cross the valve is 1bar. If Δp cross the valve is less than 1 bar, or much greater than 1 bar means, that flow chart is useful for approximately presetting.

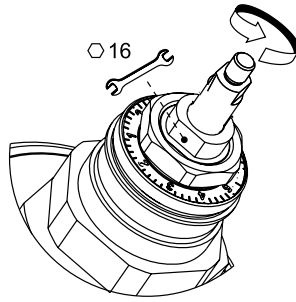
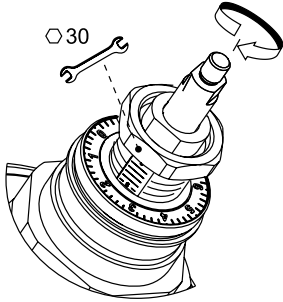


- Fix the throttle with fix nut

Presetting

DN 65-125

The valve's opening position can be read on the digital label on the throttle. Factory setting is on half open (50%). Example of presetting the valve to 5.5 turns is done as follow:

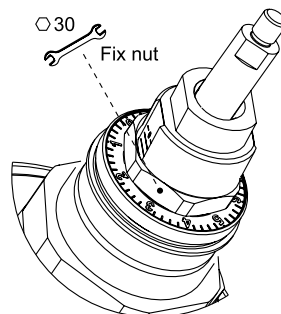
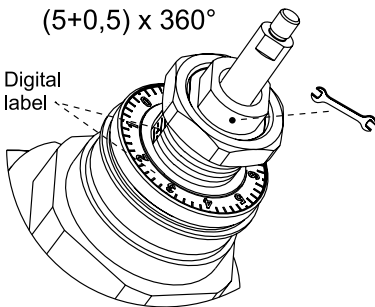


- Unscrew the fix nut on the throttle. Use the spanner according to the table 5.
- Fully close the valve by screwing the throttle with the spanner according to the table 5.
- Set the flow according to the flow chart supplied with the valve. Unscrew the throttle for 5,5 turns. Count the turns.

KTM 512 DN 80 LF										
Position - Einstellung										
	0,0	1,0	2,0	3,0	4,0	5,0	6,0	7,0	8,0	9,0
,0	0,00	0,97	1,35	1,95	3,14	5,28	7,98	10,89	13,86	15,73
,1	0,10	1,01	1,41	2,07	3,35	5,55	8,27	11,19	14,05	15,84
,2	0,19	1,05	1,47	2,19	3,57	5,82	8,56	11,48	14,23	15,94
,3	0,29	1,08	1,53	2,31	3,78	6,09	8,85	11,78	14,42	16,05
,4	0,39	1,12	1,59	2,43	4,00	6,36	9,14	12,08	14,61	16,16
,5	0,49	1,16	1,65	2,55	4,21	6,63	9,44	12,38	14,80	16,27
,6	0,58	1,20	1,71	2,66	4,42	6,90	9,73	12,67	14,98	16,37
,7	0,68	1,24	1,77	2,78	4,64	7,17	10,02	12,97	15,17	16,48
,8	0,78	1,27	1,83	2,90	4,85	7,44	10,31	13,27	15,36	16,59
,9	0,87	1,31	1,89	3,02	5,07	7,71	10,60	13,56	15,54	16,69

Flow - Volumenstrom (m³/h)
 ⊖ p₁=4bar p₂=3bar Δp=1bar
 Δp <>> 1 bar → Flow = =

- Flow chart is valid when Δp cross the valve is 1bar. If Δp cross the valve is less than 1 bar, or much greater than 1 bar means, that flow chart is useful for approximately presetting.

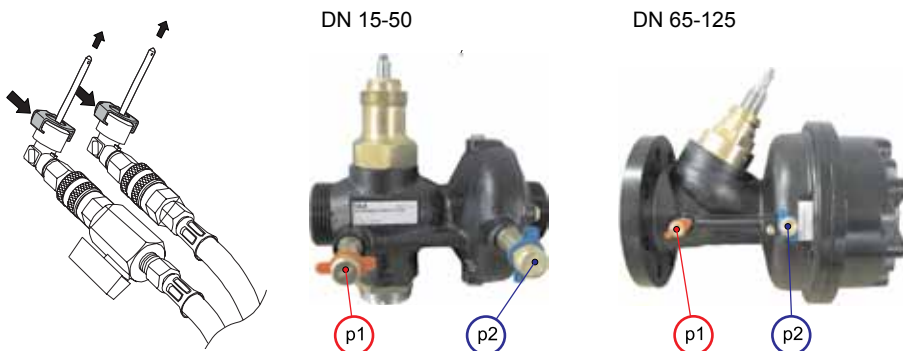


- Fix the throttle with fix nut.

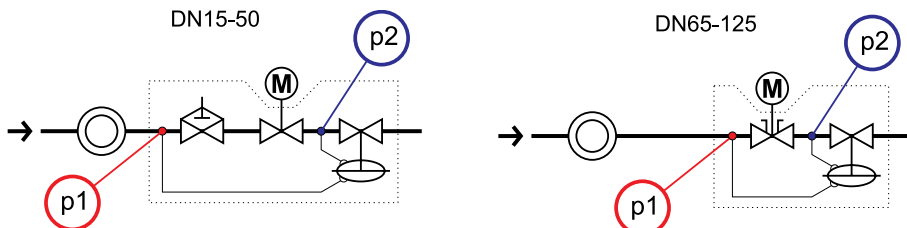
Measuring

For precise flow setting use TA-SCOPE or U-tube and measure the flow over measuring points.

- Be sure, that the system is under working pressure and all isolation valves are fully open.
- Connect TA-SCOPE or U-tube on the valve with measuring probes.



- TA-SCOPE will read only Δp across the valve excluding the differential pressure diaphragm.



- Based on the measured Δp TA-SCOPE will calculate and display the current flow.
- For fine-tuning use the TA-SCOPE or U-tube.
- For measuring the flow with U-tube, you need Kv table. Contact local sells office.
- Before measuring the max. possible flow, be sure that throttle on the valve is fully open the same as isolation valves and that bypasses are closed.
- Be aware that, to reach the max. possible flow link required minimum Δp across the valve as detected in the data sheet.

Maintenance

The valves are maintenance free under the condition that they are used within their normal application.

Trouble-shooting guide

1. Valve is fully open and design flow is not able to be measured
 - Check pump head is sufficient and in manual mode
 - Ensure all by-pass valves are closed
 - Check all control valves are fully open
 - Check strainers are not blocked
 - Ensure that water is not being drained at another part of the system.
 - If possible measure the pressure drop of the control valve fully open and check Kv.

2. Valve is adjusted but no change in flow is measured
 - Check both valve chambers are vented and water is evident, if not;
 - Capillary may be blocked with dirt. (a fine hard wire may dislodge trapped dirt)
 - Throttle in valve body may be blocked with dirt. (a fine hard wire \varnothing 0,8 mm may dislodge trapped dirt)

Tables

Table 1 Categorization according to directive 97/23/EC (PED)

	PS (PN)	
	PN16	PN25
Article 3&3		DN 15-40
Category I	DN 65-200	DN 50-125
Category II		DN 150-200

Table 2 Markings on housing / plates

DN	15/20	25/32	40/50	65	80	100	125
Material	✓	✓	✓	x	x	x	x
DN	✓	✓	✓	✓	✓	✓	✓
PN	✓	✓	✓	✓	✓	✓	✓



Table 3 Marking on plates

DN	15/20	25/32	40/50	65	80	100	125
Logo - TAH	✓	✓	✓	✓	✓	✓	✓
CE	x	x	✓	✓	✓	✓	✓
Temp. °C	✓	✓	✓	✓	✓	✓	✓
Δp	✓	✓	✓	✓	✓	✓	✓
Date	✓	✓	✓	✓	✓	✓	✓

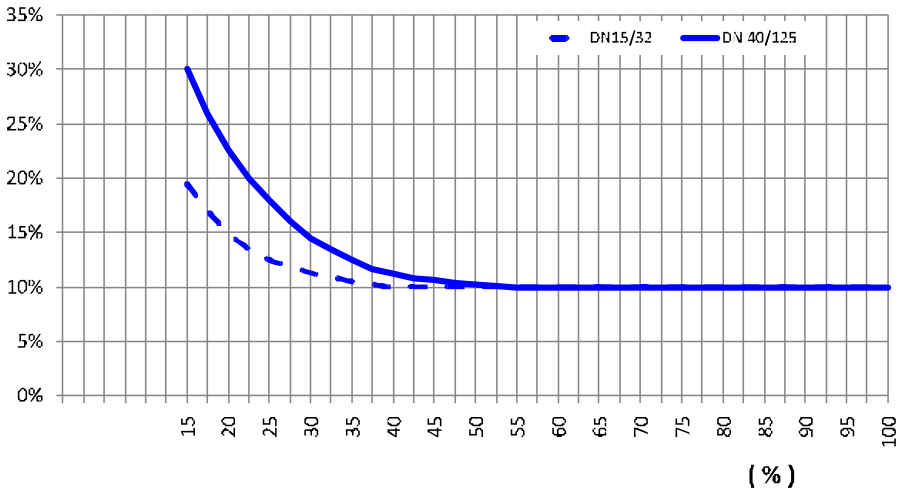
Table 4 Bolts, gaskets, torque

DN	15/20	25/32	40/50	65	80	100	125
Threads	G1"	G1 1/4"	G2"	M16	M16	M16/M20	M20/M24
Screw length inlet	x	x	x	65	70	45/40	70/80
Screw length outlet	x	x	x	35	40	45	50
N°	x	x	x	4/8	8	8	8
Nm	50	100	150	100	130	200	280
Gasket	30/23 x2	39/25 x2	56/40 x2	127/77 x2	142/89 x2	168/115 x2	194/141 x2

Table 5 Turns of throttle

DN	15/20	25/32	40/50	65	80	100	125
	4	6	4	x	x	x	x
	24	41	19	16/30	16/30	16/30	16/30
Turns	5	7	10	10	10	10	10

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



Start-up procedure - fill form

1. Pre-commission

Check

1. Install the valve in the pipeline according by the arrow on the label (flow direction)
2. Unscrew the throttle from 50% on 100% open (factory setting is 50%)
3. Be sure that actuator is not on the valve
4. Check that the strainer basket is clean
5. Slowly fill the system with the tap water
6. Close the bypass
7. Check sealings

2. Commission

Check

1. Be sure that actuator is removed and the valve (throttle) is fully opened.
2. Slowly rise the pressure to workin pressure
3. Vent the valve
4. Check the sealing
5. Check the flow according to the flow chart
6. Check the flow on measuring points
7. Install the actuator on the valve

Location/object:	Valve typ:	Date: Signature:
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Notes:

We reserve the right to introduce technical alterations without previous notice.

