

#### **TEST REPORT NO:** B60022063 Jan.10,2020 Page : 1 of 22 FICO INDUSTRIAL CO., LTD Applicant : Test Date : Jan 10. 2020 NO.701-1 T8 Smart City NO. 1 Building BLOCK 3, NO. 28 JIHUA 1STRoad Chancheng District, Foshan GuangDong Address : **Received Date:** Jan 10, 2020 China **Contact Person :** SHIRI FY HUANG Contact Info: fico@fico.com.cn Sample Description: Ledbury thermostatic bar mixer CITY PLUMBING SUPPLIES PO No.: Buyer: 564218419 Manufacturer: WEILAIWOLAI SANITARY WARE Model No.: 327477 TECHNOLOGY (GUANGDONG)CO.,LTD SKU No.: 327477 Country of Origin: China Exported to: UK

#### Test Item **Conclusion** EN 1111:2017 Sanitary tapware — Thermostatic mixing valves (PN 10) —General technical specification PASS# Remark: 1. The results relate only to the samples tested. The tested Samples/Components/Test Item were selected by client. 2. #:These tests were subcontracted. 3

For and on behalf of UL VS Shanghai Limited

Justin Zhou - Technical Manager

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### Sample Information :

Sample	Product	Applicant's equivalent code / Color
001	Ledbury Thermostatic Bar Mixer	



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#### 1. EN 1111:2017 Sanitary tapware—Thermostatic mixing valves (PN 10) – General technical specification

Clause	Requirement	Result	Verdict				
7	Marking/identification						
7.1	Marking	Complied	Р				
7.2	Identification	Complied	Р				
8.1	Chemical and hygiene requirements	It's the manufactuer's responsibility to assure the compliance of this clause	-				
8.2							
	Visible chromium plated surfaces and Ni-Cr coatings shall comply with the requirements of EN 248.	Complied	Р				
9	Dimensional characteristics	Complied	Р				
10	Backflow protection	Complied	Р				
12	Leaktightness	· · ·					
12.2	Leaktightness of the obturator and upstream thereof						
	The outlet of TMVs without flow control (Type 4, Clause 5) shall be plugged.						
	In the case of thermostatic mixing valves without obturator (type 4, clause artificially closed	e 4) the outlet orifi	ce shall be				
12.2.2	Procedure						
	a) Connect both inlets of the valve to the test circuit;						
	b) with the outlet open and the flow control closed, apply a water pressure $0,5$ ) bar] to the TMV for (60 ± 5) s and adjust its temperature control over		1Pa [(16 ±				

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Clause	Requirement	Result	Verdict				
12.2.3	Requirements						
	There shall be no leakage.	Complied (Type 2)	Р				
12.3	Cross-flow between inlets						
	The outlet of TMVs without flow control (Type 4, Clause 5) shall be plugged sequential TMV (Type 3, Clause 5) the flow control shall be left in the flow						
12.3.2	Procedure						
	a) Connect the cold inlet of the TMV to the test circuit.						
	b) With the outlet open and the flow control closed, apply a water pressure of $(0,4 \pm 0,02)$ MPa [ $(4 \pm 0,2)$ bar] to the TMV for $(60 \pm 5)$ s and adjust its temperature control over the full range.						
	c) Disconnect the inlet and repeat the test with the hot inlet connected.						
12.3.3	Requirements						
	There shall be no leakage at the end of the unconnected inlet or at the outlet. The valve shall subsequently be subjected to 12.4. Check valves if used shall comply with EN 13959.	Complied (Type 2)	Ρ				
12.4	Leaktightness downstream of the obturator						
12.4.1	Procedure						
	a) Connect the TMV to the test circuit;						
	b) with the outlet orifice(s) artificially closed, and generally turned downwar	ds open the obt	turator(s);				
	c) apply to the inlet of the TMV a water pressure of $(0,4 \pm 0,02)$ MPa [(4,0 $\pm$ (60 $\pm$ 5) s and adjust its temperature control over the full range;	⊧ 0,2) bar] and r	naintain it for				
	d) within (5 $\pm$ 1) s reduce the pressure to (0,02 $\pm$ 0,002) MPa [(0,2 $\pm$ 0,02) k 5) s	par] and mainta	in it for (60 ±				

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Clause	Requirement	Result	Verdict					
12.4.2	Requirement	11						
	There shall be no leakage. Valves incorporating diverters shall subsequently either be subjected to 12.5 or 12.6 as applicable.	Complied	Р					
12.5	Leaktightness of manually operated diverter							
12.5.1	Procedure							
	a) Connect the TMV to the test circuit in its position of use;							
	b) put the diverter in the outlet 2 position with the outlet 2 artificially closed and the outlet 1 open;							
	c) apply a water pressure of $(0,4 \pm 0,02)$ MPa [ $(4 \pm 0,2)$ bar] for $(60 \pm 5)$ s. Check that leaktightness is obtained on the outlet 1;							
	d) within $(5 \pm 1)$ s reduce to a static water pressure of $(0,02 \pm 0,002)$ MPa [ $(0,2 \pm 0,02)$ bar] and maintain for $(60 \pm 5)$ s. Check that leaktightness is obtained on the outlet 1;							
	e) put the diverter in the outlet 1 position with the outlet 1 artificially closed and the outlet 2 open;							
	f) apply a static water pressure of $(0,4 \pm 0,02)$ MPa $((4 \pm 0,2)$ bar) for $(60 \pm 5)$ s. Check that leaktightness is obtained on the outlet 2;							
	g) within $(5 \pm 1)$ s reduce to a static water pressure of $(0,02 \pm 0,002)$ MPa [ $(0,2 \pm 0,02)$ bar] and maintain for $(60 \pm 5)$ s. Check that leaktightness is obtained on the outlet 2.							
12.5.2	Requirement							
	For the duration of the test there shall be no leakage at the outlet points indicated.	Complied	Р					
12.6	Leaktightness of diverters with automatic return							

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Clause	Requirement	Result	Verdict		
12.6.1	Procedure				
	a) Connect the TMV to the test circuit in its position of use with the outlets	fully open.			
	b) Connect the hydraulic resistance A to the outlet 2.				
	c) Put the diverter in the outlet 1 position and apply a dynamic water pressure of $(0,4 \pm 0,02)$ M 0,2) bar]. Maintain this pressure for $(60 \pm 5)$ s and check that leaktightness is obtained on the o				
	d) Put the diverter in the outlet 2 position. Maintain this pressure for $(60 \pm 5)$ s and check that leaktightness is obtained on the outlet 1.				
	e) With the diverter still in the outlet 2 position, reduce the dynamic pressu 0,005) MPa [ $(0,5 \pm 0,05)$ bar]. Check that the diverter does not revert to out for (60 ± 5) s and check that leaktightness is obtained on the outlet 1.				
	f) Turn the water off. Check that the diverter returns to the outlet 1 position				
	g) Reapply the dynamic pressure of $(0,05 \pm 0,005)$				
12.6.2	Requirement				
	For the duration of the test there shall be no leakage.	-	N/A		
13	Performance	•	1		
13.2	Determination of flow rate				

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Clause	Requirement	Result	Verdict
13.2.2.2	Procedure 1		
	If the TMV has standard accessories (aerators, showers, etc.), the measurement is carried out replacing these with a hydraulic resistance corresponding to the flow rate class marking, as defined in 17.3.3.		
	a) Fully open any integral flow controls (if applicable).		
	b) Apply and maintain the initial inlet settings shown in Table 8.		
	c) Start at the full cold position.	-	N/A
	d) Start recording the outlet temperature over flow rate.		
	e) Adjust the temperature control gradually to full hot position and then return to full cold position, over a period of at least 20 s.		
	f) Stop recording outlet temperature over flow rate.		
13.2.2.3	Procedure 2		
	The flow rate is measured at a pressure drop of $(0,15 + 0,02)$ MPa [ $(1,5 + 0,2)$ bar] across the valve.		
	a) Fully open any integral flow controls (if applicable).		
	b) Apply and maintain the initial inlet settings shown in Table 8.		
	c) Create the pressure drop across the valve by adjustment of the regulating valve as detailed in Figure A.3 and Figure A.4.	Complied	Р
	d) Start at the full cold position.		
	e) Start recording the outlet temperature over flow rate.		
	f) Adjust the temperature control gradually to full hot position and then return to full cold position, over a period of at least 20 s.		
	g) Stop recording outlet temperature over flow rate.		

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Clause						R	equi	rement	Result	Verdict	
13.3	Sensit	Sensitivity									
13.3.3	Proce	Procedure									
	a) Apply and maintain the initial settings shown in Table 8 and allow water to flow until the outlet temperature has stabilized; b) adjust to the full cold position and start recording mixed water temperature versus temperature control device displacement; c) using the apparatus in 13.1.2 and adjust the temperature control device to lowest obtainable temperature then to highest obtainable temperature and back to lowest obtainable temperature; d) stop recording mixed water temperature versus temperature control device displacement										
			In	8 — Initial settin llet	-	- 0	Jutlet	]			
	point of use	Col Temperature T <sub>C</sub> (°C)	Dynamic pressure (MPa) [bar]	Ho Temperature T <sub>H</sub> (°C)	Dynamic pressure (MPa) [bar]	Flow (l/min)	Temperature T₀ (°C)				
	shower basin, bidet, sink bath	(10 to 15)	(0,3+0,02) [3+0,2]	$(T_{c} + 50) \pm 1$	(0,3+0,02) [3+0,2]	(12-1) (9-1) (20-1)	(38-1) (38-1) (44-1)				
	Water saving valu	ves with flow rat	tes < 9 l/min :	and < 12 l/min s	hall be adjust	ted to their r	naximum flow	1			
13.3.4	Evalua	ation	of re	sults							
	takes a	a clos	er loo	ok at t	he te	mpe	ratur	re hysteresis when tested as outlined is e range of interest. Draw the $(38 + 2)^{\circ}$ and obtain x1 and x2 as indicated in R	°C line for the u		
		Figure 10 —	Temperatu	re hysteresis (:	sensitivity a	nd fidelity)		X Figure 11 — Temperature hysteresis (sensitivity and fidelity, close-up			

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Clause	Requirement Result						
13.3.5	Requirements						
	The minimum linear movement, x1 and x2, of the temperature control device required to obtain a variation of 4 K within the reference range shall be at least 10 mm for wash basins, bidets, sinks and 12 mm for showers.						
	Linear movement is a function of the angle and the maximum radius of the temperature control device.	Complied	Р				
	TMVs with special design can be approved in accordance with this standard, if the verified sensitivity meets the requirements of the standard.						
13.4	Fidelity						
13.4.3	Procedure						
	See 13.3.3						
13.4.4	Evaluation of results						
	Draw the median of section AB as per Figure 11 and determine section CD curve at (38) °C.	resembling the	e width of the				
13.4.5	Requirements						
	Section CD shown in Figure 11 shall not exceed 1 K.	Complied	Р				
13.5	Temperature stability						
13.5.1	Temperature Control operation						

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Clause	Requirement	Result	Verdict				
13.5.1.3	Procedure						
	a) Starting from full hot determine the reference points in the following sequence: $(38 \pm 0.5)$ °C, $(36 - 1)$ °C, $(40 - 1)$ °C						
	<ul><li>b) apply and maintain the initial settings shown in Table 8 and allow water to flow until the outlet temperature has stabilized;</li><li>c) start recording the mixed water temperature versus time;</li></ul>						
	d) within 1 s adjust the temperature control device to read $\vartheta$ mix = (36 - 1) °C	С;					
	e) allow the outlet temperature to stabilize;						
	f) restore the settings in b); g) within 1 s adjust the temperature control device to read $\vartheta$ mix = (40 - 1) °C;						
	h) upon temperature stabilization stop recording mixed water temperature versus time.						
13.5.1.5	Requirements						
	The mixed water temperature $\vartheta$ mix shall not differ from the set temperatures $\vartheta$ 0 for a duration (t2 - t1) longer than 1s with an amplitude of more than $\vartheta x = 3K$ . t3 = 5 s after disturbing the respective equilibrium the mixed water temperature shall not differ by more than 2K from the set temperatures nor oscillate in excess of 1 $\vartheta$ PP.	Complied	Ρ				
	NOTE If this is done with single sequential control valves (Type 3) the flow rate will also change i.e. not maintaining Table 8 conditions. K.						
13.5.2	Flow rate reduction						
13.5.2.3	Procedure						
	a) Apply and maintain the initial settings shown in Table 8 and allow water t temperature has stabilized;	to flow until the	outlet				
	b) Start recording mixed water temperature versus time.						
	c) Within (5 to 6) s adjust the flow control of the valve under test to deliver 50 % of the flow rate according to a), in case the tested valve has no flow control the outlet pipework A.3 or A.4 shall be u instead. d) Upon temperature stabilization stop recording mixed water temperature versus time.						

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Clause	Requirement	Result	Verdict	
13.5.2.5	Requirement			
	After 30 s the mixed water temperature shall not differ from the set temperature by more than 2 K nor oscillate in excess of 1 $\vartheta$ PP.	Complied	Р	
13.5.3	Cold supply failure and restoration			
13.5.3.2	Procedure			
	a) Apply and maintain the initial settings shown in Table 8 and allow water to flow until the outlet temperature has stabilized; b) within 1 s isolate the cold water supply to the TMV. c) collect the water discharged from the TMV outlet for a period of $(5 \pm 0.5)$ s and measure its volume. d) Continue to collect the water discharged from the TMV in a second vessel for a further period of $(30 \pm 0.5)$ s. e) Re open the cold water supply within 2 s, after 30 s measure the mixed water temperature. When tested i outlet 2 position, bath shower mixers with automatic diverters shall be artificially held in the outlet 2 position.			
13.5.3.4	Requirement			
	Bath outlets The volume collected in the first period of 5 s shall not exceed 400 ml. The volume collected in the second period of 30 s shall not exceed 500 ml. Upon temperature stabilization after cold supply restoration the outlet temperature shall not differ by more than 2 K from the set temperature $\vartheta$ 0.	-	N/A	
	Other outlets The volume collected in the first period of 5 s shall not exceed 200 ml. The volume collected in the second period of 30 s shall not exceed 300 ml. Upon temperature stabilization after cold supply restoration the outlet temperature shall not differ by more than 2 K from the set temperature $\vartheta$ 0.	Complied	Ρ	

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Clause	Requirement	Result	Verdict						
13.5.4	Supply pressure variation								
13.5.4.2	Procedure								
	a) Apply and maintain the initial settings shown in Table 8 and allow water to flow until the outlet temperature has stabilized;								
	b) Start recording outlet temperature versus time.								
	c) Within 1 s reduce the cold supply pressure to $(0,2 + 0,02)$ MPa [ $(2 + 0,2/0)$ bar] and maintain thi condition for at least 15 s before restoring the nominal supply pressure under a).								
	<ul> <li>d) Allow water to flow for at least 60 s.</li> <li>e) Within 1 s reduce the hot supply pressure to (0,2 + 0,02) MPa [(2 + 0,2/0) bar] and maintain this condition for at least 15 s before restoring the nominal supply pressure under a).</li> <li>f) Allow water to flow for at least 60 s.</li> </ul>								
	g) Stop recording outlet temperature versus time								
13.5.4.4	Requirements								
	Bath outlets Upon temperature stabilization the outlet temperature shall not differ by more than 2 K from the set temperature $\vartheta 0$ .	-	N/A						
	Other outlets The mixed water temperature $\vartheta$ mix shall not differ from the set temperature $\vartheta$ 0 with more than 3 K for a duration longer than 1 s (t2-t1). t3 = 5 s after disturbing the respective equilibrium (t0) the mixed water temperature shall not differ by more than 2 K from the set temperatures ( $\vartheta$ 0) nor oscillate in excess of 1 $\vartheta$ PP.	Complied	Ρ						

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Clause	Requirement	Result	Verdict					
13.5.5	Supply temperature variation							
13.5.5.2	Procedure							
	a) Apply and maintain the initial settings shown in Table 8 and allow water temperature has stabilized;	to flow until the	outlet					
	b) Start recording outlet temperature versus time.							
	ain this conditio	on for at least						
	d) Restore the hot supply temperature within 10 s and maintain this condition for 40 s.							
	e) Stop recording outlet temperature versus time.							
13.5.5.4	Requirement							
	Bath outlets $t3 = 20$ s after restoration the outlet temperature shall not differ by more than 2 K from the set temperature $\vartheta 0$ .							
	Other outlets The mixed water temperature $\vartheta$ mix shall not differ from the set temperature $\vartheta$ 0 for a duration longer than 1 s (t2 - t1) with an amplitude of more than 3 K. t3 = 20 s after disturbing the respective equilibrium (t0) the mixed water temperature shall not differ by more than 2 K from the set temperatures ( $\vartheta$ 0) nor oscillate in excess of 1 $\vartheta$ PP.	Complied	Ρ					

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Clause	Requirement	Result	Verdict	
13.5.6	Temperature Override Stops			
13.5.6.2	Procedure			
	a) Apply and maintain the initial inlet settings shown in Table 8 and allow w temperature has stabilized;	ater to flow unt	il the outlet	
	<ul><li>b) Adjust the temperature control to the override stop and note the temperature and start outlet temperature versus time.</li><li>c) Adjust the temperature control to fully cold and maintain the position for at least for 5 s.</li></ul>			
<ul> <li>d) Within 3 s adjust the temperature control to the override stop.</li> <li>e) Allow water to flow for at least 30 s.</li> <li>f) Repeat steps c) to e) to give a total of 5 results.</li> <li>g) Stop recording outlet temperature versus time.</li> </ul>				
13.5.6.4	Requirements before the endurance test			
	After step e), the outlet temperature shall not differ from the temperature override stop setting more than 1 K.	Complied	Р	
13.5.6.5	Requirements after the endurance test			
	After the endurance test the outlet temperature shall not differ from the initial temperature override stop setting more than 4 K.	Complied	Р	
14	Pressure resistance			
14.3	Testing of mechanical performance of the thermostatic mixing valve upstream of the obturator in the closed position			
14.3.1	Procedure			
	Gradually apply a static water pressure of $(2,5 \pm 0,05)$ MPa [ $(25 \pm 0,5)$ basis supplies for $(60 \pm 5)$ s. The outlet orifice of TMVs without obturator shares a static structure of the static str			

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Clause	Requirement	Result	Verdict
14.3.2	Requirement		
	This test shall not cause permanent deformation of the TMV.	Complied	Р
14.4	Mechanical behaviour downstream of the obturator – Obturator in the	open position	
14.4.1	Procedure		
	a) Connect the TMV as supplied to the test circuit.		
	<ul> <li>b) Open the obturator(s) fully. 1) For TMVs with a flow rate regulator fitted apply at the TMV inlet a dynamic water pressure of (0,4 ± 0,02) MPa [(4,0 ± 0,2) bar] and maintain it for (60 ± 5) s. 2) For TM without a flow rate regulator apply at the TMV inlet the water pressure needed to give a flow rate of (± 0,24) l/min through TMVs of nominal size 1/2 and a flow rate of (48 ± 0,48) l/min through TMVs of nominal size 3/4 and maintain it for (60 ± 5)s.</li> <li>3) For TMVs with removable flow rate regulator, the test is carried out both with and without this regulator.</li> </ul>		
	c) Check whether there is permanent deformation in any part of the TMV d	ownstream of th	ne obturator.
14.4.2	Requirement		
	There shall be no permanent deformation in any part of the TMV.	Complied	Р
15	Torsional resistance of the operating controls		
15.2.3	15.2.3 Procedure		
	<b>Flow control</b> Gradually apply over a period of 4 s to 6 s and maintain for 5 min a torque of $(6 \pm 0,6)$ to the flow control device in the closing direction of travel.		
	<b>Temperature control</b> Gradually apply over a period of 4 s to 6 s and maintain for 5 min a torque of (3 = 0,5) Nm to the end of the temperature control device both in the direction of cold water and separately in the direction of hot water.		
	<b>Temperature override stop</b> Gradually apply over a period of 4 s to 6 s and maintain for 5 min a torque of $(3 \pm 0.5)$ Nm to the temperature control device in the direction of increasing temperature.		
15.2.3.5	Requirement		
	After the test, there shall be no visible deformation on any component or any deterioration in operation.	Complied	Р

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Clause	Requirement	Result	Verdict	
16	Mechanical endurance characteristics			
16.2	Endurance test for single sequential control device			
16.2.3	Procedure			
	a) Connect the TMV to a suitable test apparatus.			
	b) Supply hot water at a temperature of $(65 + 2/-5)$ °C and cold water at a temperature valve under test.	emperature of r	nax. 30 °C to	
	c) With the control device in the closed position, adjust the static water prescircuits to $(0,4 \pm 0,05)$ MPa [ $(4 \pm 0,5)$ bar].	ssure of the two	supply	
	d) Subject the single sequential control device to 200 000 on/off cycles. Th constitutes only one cycle: 1) open to at least 75 % of the total opening mo position; 2) dwell in the open position for 1 s to 2 s; 3) close completely with Nm and maintain this torque for time t < 0,4 s; 4) retain the closed position 3 s.	vement starting h a maximum te	from the off- orque of 1,5	
16.2.4	Requirement			
	During the test no failure of any component part shall occur. After 50 000 on/off cycles, the thermal performance shall comply with Table 7, sequence 5. The requirements for the thermal performance test shall be relaxed by 1 K. After 200 000 on/off cycles, the leaktightness of the TMV shall comply with 12.2 to 12.4.	-	N/A	
16.3	Endurance test for on/off flow control device operated by rotating the control handle		e	
16.3.2	General			
	The test method as described in EN 200 shall be followed.	-	N/A	

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Clause	Requirement	Result	Verdict
16.4	Endurance test for on/off flow control device, combined with diverter mechanism		
16.4.3	6.4.3 Procedure		
	a) Connect the TMV to the test apparatus.		
	<ul> <li>b) Supply hot water at a temperature of (65 +2/-5) °C and cold water at a temperature of max. 30 °C to the valve under test.</li> <li>c) Adjust the static water pressure of both hot and cold circuits to a value of (0,4 ± 0,05) MPa [(4 ± 0,5 bar].</li> <li>d) Set the mixed water temperature to (38 ± 2) °C.</li> </ul>		
	e) In the flow-to-outlet-1 and flow-to-outlet-2 mode, adjust the flow rate to $(6 \pm 1)$ l/min by restrictioutlets.		estricting the
	f) Subject the on/off control device to 100 000 cycles each. The following procedure constitutes onl one cycle: 1) open flow to outlet 1 ( $80 \pm 5$ ) % with a maximum torque of 1,5 Nm; 2) dwell in this pos for 1 to 2 s; 3) move control to off position with no flow and retain this position for a dwell time of 2 s 3 s; 4) open flow to outlet 2 ( $80 \pm 5$ ) % with a maximum torque of 1,5 Nm; 5) dwell in this position for to 2 s; 6) move control to off position with no flow and retain this position for a dwell time of 2 s to 3		
16.4.4 Requirement			
	During the test no failure of any component part shall occur. The maximum torque shall not exceed 1,5 Nm. After 100 000 on/off cycles, verify the leaktightness of the TMV by the application of the test given in 12.2 to 12.4.	Complied	Ρ

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Clause	Requirement	Result	Verdict
16.5	Endurance test for other on-off flow control device		
16.5.3	Procedure		
	a) Connect the TMV to a suitable test apparatus.		
	b) Supply hot water at a temperature of $(65 + 2/-5)$ °C and cold water at a temperature of max. 30 °C the valve under test. c) With the TMV closed and the temperature set to $(38 \pm 2)$ °C, adjust the static water pressure of b hot and cold circuits to a value of $(0,4 \pm 0,05)$ MPa [ $(4 \pm 0,5)$ bar].		
d) Subject the on/off flow control device to 200 000 on/off cycles being: 1) open to $(80 \pm 1)$ total opening movement; 2) dwell in the open position for 1 s to 2 s; 3) close completely w maximum torque of 1,5 Nm where applicable and maintain this torque for t < 0,4 s; 4) retain position for a total dwell time of 2 s to 3 s.			th a
16.5.4	Requirement		
	During the test no failure of any component part shall occur. After 200 000 on/off cycles, verify the leaktightness of the TMV by the application of the test given in 12.2 to 12.4.	-	N/A

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Clause	Requirement	Result	Verdict		
16.6	Mechanical endurance of diverters of thermostatic mixing valves				
16.6.2.3	<ul> <li>6.2.3 Procedure</li> <li>Manual diverter <ul> <li>a) Connect the TMV to the test apparatus.</li> <li>b) Supply hot water at a temperature of (65 +2/-5) °C and cold water at a temperature of max. 30 °C the valve under test.</li> <li>c) Adjust the static water pressure of both hot and cold circuits to a value of (0,4 ± 0,05) MPa [(4 ± 1 bar].</li> <li>d) Set the temperature to (38 ± 2) °C.</li> <li>e) Adjust the flow rate at the outlet 1 to 4 l/min to 6 l/min (0,066 l/s to 0,100 l/s). This flow adjustm shall be made by means of the independently operating on/off control device or in the absence of device by partially obstructing the outlet.</li> </ul> </li> </ul>				
	f) subject the diverter to a test of 30 000 cycles, each comprising a re extreme positions.	turn movemen	t between the		
	Diverter with automatic return				
	a) Connect the TMV to the test apparatus.				
	b) Connect the drive device to the diverter operating member by means of	a flexible com	ponent.		
	c) With the TMV closed, adjust the water pressure on the supply circuits to a value of $(0,4 \pm 0,05)$ [(4 ± 0,5) bar].		4 ± 0,05) MP		
	d) With the temperature control device set to $(38 \pm 2)$ °C adjust the flow rate at the outlet 2 to 0,066 to 0,100 l/s (4 l/min to 6 l/min). This flow adjustment shall be made by means of the independence operating on/off control device or in the absence of this device by partially obstructing the outlet.				
	e) Subject the diverter to an endurance test of 30 000 cycles, one cycle is with the diverter in the outlet 1 position, allow water to flow through the out the diverter to the outlet 2 position; 3) allow water to flow through the outlet quick action valve to cut off the supply to the TMV, allowing the diverter to and then reopen the supply.	tlet 1 for $(5 \pm 0)$ et 2 for $(5 \pm 0,5)$	,5) s; 2) mov ) s; 4) use th		

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Clause	Requirement	Result	Verdict
16.6.3	Requirement		
	During the test, no failure of any component part shall occur. At the end of the test, check the leaktightness:		
	a) in the conditions specified in 12.5 for manual diverters;	Complied	P
	b) in the conditions specified in 12.6 for diverters with automatic return.		
16.7	Mechanical endurance of swivel spouts		
16.7.2.3	2.3 Procedure		
	a) Connect the TMV to the test apparatus and connect the inlets to the sup	oply circuit;	
	b) with the TMV closed, adjust the static water pressure to (0,4 $\pm$ 0,05) MP	a [(4 ± 0,5) bar]	,
	c) open the TMV fully and adjust the flow rate to (6 $\pm$ 1) l/min by restricting	the spout outle	;
	d) subject the spout to a test of 80 000 cycles, each cycle comprising a movement of the spout throu an arc of $(120 \pm 10)^\circ$ in both directions or, if there is a stop before 120°, move (90-10) % of the available travel without reaching the stops.		
16.7.3	Requirements		
	During the test shall be: a) no deformation or fracture of the swivel spout; b) no deformation or fracture of the device connecting the spout to the body; c) no leakage of the assembly. At the end of the test the spout shall be leaktight under the conditions given in 12.4	-	N/A

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Clause	Requirement	Result	Verdict
16.8	Thermal Element	1	
16.8.2	Temperature adjustable valves (Type 1, 2, 4)		
16.8.2.2	Procedure		
	a) Connect the valve to the test rig and deactivate the override stop (if fitte	d).	
	b) With the TMV closed, adjust the water pressure on the supply circuits to $[(4 \pm 0,5) \text{ bar}]$ .	a value of (0,4 :	± 0,05) MPa
	c) Supply hot water at a temperature of $(65 + 2/-5)$ °C and cold water at a the valve under test.	emperature of m	ax. 30 °C to
	d) With the temperature control device set to full hot position adjust the flow rate at the outlet 1 to 4 l/min to 6 l/min. This flow adjustment shall be made by means of the independently operating on/off control device or in the absence of this device by partially obstructing the outlet.		
	e) Subject the temperature controls to 50 000 cycles (one cycle is the more to the end position and returning to the starting position) by moving the ter 90) % of the available travel without reaching		
16.8.2.3	Requirements		
	During the test there shall be no failure of any component part. The torque to operate the control shall not exceed 1,5 Nm. Upon test completion the valve shall undergo leaktightness 12.2, 12.3 and thermal performance testing as per 13.5.3 and 13.5.6.	Complied (Type 2)	Ρ
16.8.3	Temperature set valves (Type 5)	-	N/A
16.8.4	Other valves with special control devices (Type 6)	-	N/A
17	Acoustic characteristics	Lap: 18 dB(A) Acoustic	-

Abbreviations: P = Pass N/A = Not Applicable

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**Sample Photo** 

\*\*\*\*\* End of Report \*\*\*\*\*

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