

Dimensions for maintenance of nozzles and discs - Modulate Action

Content

1 Purpose 1

2 Scope 1

3 References 1

4 Conditional Agreement 2

5 Introduction 2

6 Execution 2

6.1 Measures and facing profile 3

6.2 Surface Quality 3

6.3 Test 3

7 Refinishing of nozzle and disc, Modulate Action valves, metal sealing. 4

8 Refinishing disc, Modulate Action valves, plastic sealing 5

9 Refinishing disc, Modulate Action valves, soft sealing 5

10 Tables 6

1 Purpose

This LGS gives information about the dimensions and the surface quality which must be observed during the refinishing work, it also provides the work instructions.

2 Scope

This LGS applies to the LESER sites Hamburg and Hohenwestedt as well as for valve repair shops repairing and / or maintaining LESER valves. This LGS is valid for:

- semi nozzles
- discs with removable lifting aid.
- discs without lifting aid.

The scope of the product group Modulate Action includes Type 433/431 and Type 429/427.

3 References

Not applicable.

Disclosure cat.:	I	proofread by:	BBü	publish date:	03/27/24	effect. date:	03/24
author:	Haa	released by:	JR	replaces:	initial	status:	Published
resp. depart.:	TD	date of release:	03/27/24	revision No.:	0		
doc. type:	LGS	change rep. No.:	NA	retention period:	10y.	prot. class:	public

4 Conditional Agreement

The further mentioned rules for the refinishing of nozzles and discs have been issued and explained in all conscience and describe the final design of the components.

LESER reserves the right to make necessary modifications at the components without determining these changes in this standard directly. So, if there are any doubts on user side when applying these guidelines, LESER must be contacted before performance of rework to clarify the actual situation.

When applying these guidelines, it must be considered generally that they describe the refinishing at components which influence the function and capacity of the safety valves. Even marginal deviations to this guideline can affect a malfunction or constricted capacity of the safety valve and therewith an inadmissible pressure increase can arise during application/operation. This could possibly have serious consequences for humans and environment. Therefore, it must be proceeded carefully when applying these rules.

LESER assumes no liability for safety devices which have been repaired or reworked in accordance with this LGS. The repair shop is solely responsible for the function and capacity of the re-introduced safety device.

The user of this LGS should be clear on the fact that the repair of a safety device against inadmissible overpressure is subjected to international laws. The violation of valid rules will be traced and avenged acc. to relevant legislations.

In case of any doubts during application of this LGS, LESER must be consulted before starting repair or rework of LESER safety devices.

5 Introduction

If the sealing surfaces of nozzles and discs have been damaged, the original sealing quality can be restored by refinishing of the sealing surfaces. The minimum and maximum dimensions given in the tables below must be ensured.

Other additional rework like Hardfacing (build-up welding) or similar activities at the surfaces are not allowed.

6 Execution

The refinishing by smooth turning and grinding with final lapping should be done on the nozzle and if necessary, also on the disc with the least possible material removal. Please refer to the limiting values in the following tables.

These critical dimensions apply to Modulate Action valves and supersede any dimensions provided in previous versions or revisions.

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6.1 Measures and facing profile

Tables, together with the corresponding figures, contain the linear and angle dimensions which shall be observed. After processing of the nozzle surface, it is also important that the profile of the sealing area is restored moderately using inner and outer chamfers.

6.2 Surface Quality

A surface quality to a mean roughness depth of R_z 0,25 (DIN EN ISO 4287) or AA 1 (ASME B46.1) must be achieved on both sealing surfaces through lapping.

In the case of plastic and soft sealing, different surface qualities may be as shown in the figures. These sealing surfaces may be achieved alternatively through smooth turning.

6.3 Test

In a final test on the mounted valve, it must be guaranteed that:

- The semi rings on the spindle must be off the guide when the valve is closed.
- The lower spring plate may not touch the guide when the spring is assembled.
- In case of lift restricted valves, the lift restriction must be checked and if necessary, the lift restriction bushing extended or lift restriction screw adjusted.

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7 Refinishing of nozzle and disc, Modulate Action valves, metal sealing

Work is to be carried out according to Figure 1 and Figure 2 and according to Table 1 to Table 2.

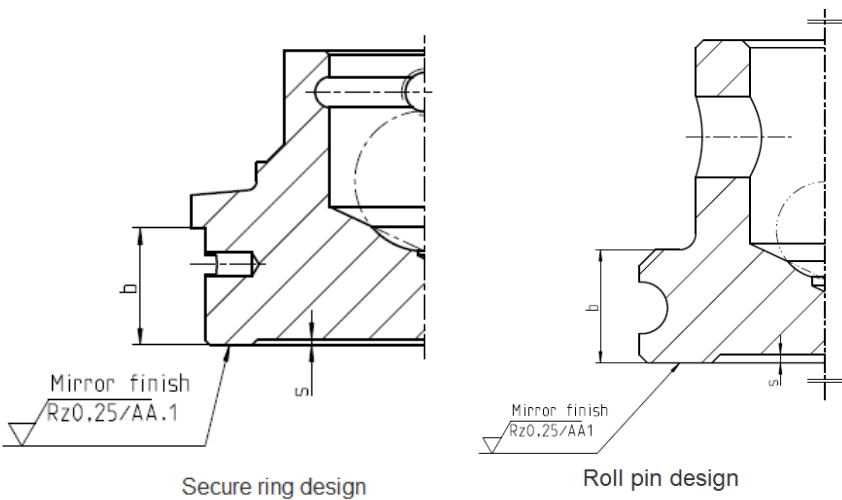


Figure 1. Disc, metal sealing.

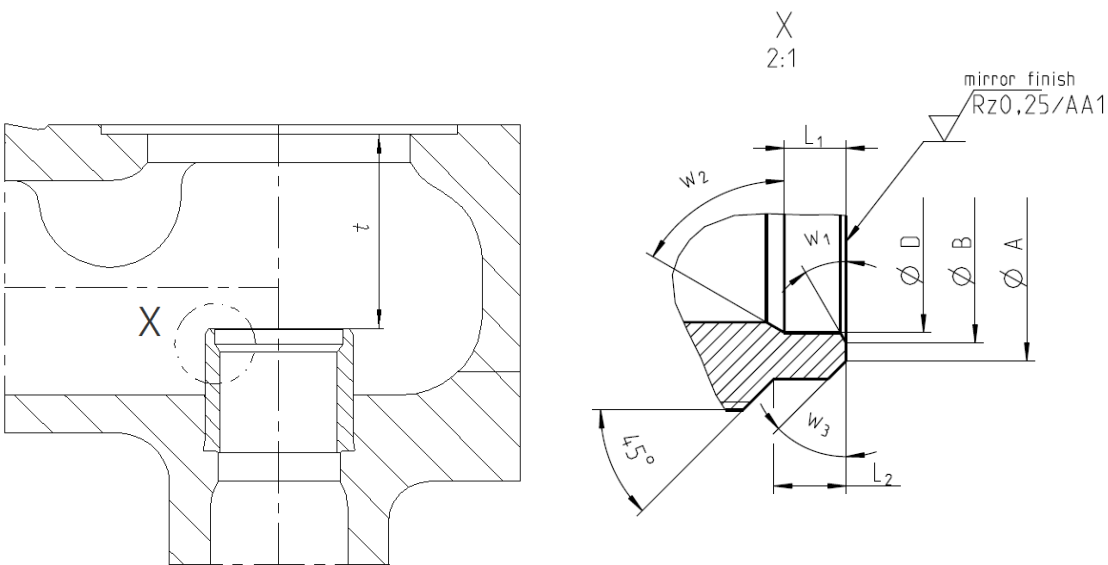


Figure 2. Nozzle.

Changes in dimension may only be such as not to reduce dimensions b and/or L below its lower limit.

Changes in dimension may only be such as not to exceed dimension t above its upper limit.

The dimensions A and B of the sealing area of the nozzle shall be restored with inner and outer chamfering within its limits.

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8 Refinishing disc, Modulate Action valves, plastic sealing

Only a small number of discs were made with plastic sealing. In case of refinishing please contact LESER to provide limits of critical dimensions. If damaged, a replacement is recommended. For nozzles refer to to Table 1 to Table 2.

9 Refinishing disc, Modulate Action valves, soft sealing

It is not permitted to rework the soft sealing disc. If damaged, a replacement is recommended. For nozzles refer to to Table 1 to Table 2.

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10 Tables

Table 1: Nozzles and discs, Modulate Action, in mm.

Type	Orifice	Size in NPS	Size in DN	Nozzle											Disc		
				Diameter					Length			Angle			Thickness		
				A Ø in mm		B Ø in mm		D Ø	t in mm	L ₁ in mm	L ₂ in mm	W ₁ in °	W ₂ in °	W ₃ in °	b in mm	b in mm before 04/2013	b in mm before 11/2013
				lower limit	upper limit	lower limit	upper limit	in mm	upper limit	lower limit	lower limit				lower limit	lower limit	lower limit
433/431	12	-	15 (PN 160)	15,4	-	-	13,6	13,5	20,5	1,5	1,4	-	60	-	11,3	-	-
433/431¹⁾	12	-	15 (PN 40)	15,2	15,4	13,6	13,8	13,5	18,8	1,5	1,4	45	60	45	11,3	-	-
433/431 (before 10/2019)	12	-	15 (PN 40)	15,2	15,4	13,6	13,8	13,5	20,3	1,5	1,4	45	60	45	11,3	-	-
433/431	18	-	20	20,3	20,5	18,3	18,5	-	23	-	-	45	-	45	5,8	6,8	-
433/431	18	-	25	20,3	20,5	18,3	18,5	-	23	-	-	45	-	45	5,8	6,8	-
433/431	18	-	32	20,3	20,5	18,3	18,5	-	23	-	-	45	-	45	5,8	6,8	-
433/431	23	-	25	27,3	27,5	25,3	25,5	25	25,5	3,0	-	45	60	55	7,4	8,9	-
433/431	29	-	50	34,3	34,5	32,3	32,5	32	28,5	3,0	-	45	60	55	7,4	8,9	-
433/431	37	-	65	42,3	42,5	40,3	40,5	40	35,5	3,0	-	45	60	55	7,4	8,9	-

Type	Orifice	Size in NPS	Size in DN	Nozzle											Disc		
				Diameter					Length			Angle			Thickness		
				A Ø in mm		B Ø in mm		D Ø	t in mm	L ₁ in mm	L ₂ in mm	W ₁ in °	W ₂ in °	W ₃ in °	b in mm	b in mm before 04/2013	b in mm before 11/2013
				lower limit	upper limit	lower limit	upper limit	in mm	upper limit	lower limit	lower limit				lower limit	lower limit	lower limit
433/431	46	-	80	53,3	53,5	50,3	50,5	50	39,5	3,5	-	45	60	45	8,3	9,9	-
433/431	60	-	100	70,9	71,1	66,9	67,1	65	55,5	3,5	-	45	60	45	7,8	10,8	-
433/431	74	-	125	85,8	86,2	81,8	82,2	78	62,8	5,0	-	45	60	45	8,3	9,8	-
433/431	92	-	150	107,8	108,2	102,8	103,2	98	73,8 ²⁾	6,0	-	45	60	45	8,8	11,3	-
429/427	12	-	15	15,2	15,4	13,6	13,8	13,5	20,3	1,5	1,4	45	60	45	11,3	-	-
429/427	18	-	20	20,3	20,5	18,3	18,5	-	23	-	-	45	-	45	5,8	-	4,8
429/427	18	-	25	20,3	20,5	18,3	18,5	-	23	-	-	45	-	45	5,8	-	4,8
429/427	18	-	32	20,3	20,5	18,3	18,5	-	23	-	-	45	-	45	5,8	-	4,8
429/427	23	-	25	27,3	27,5	25,3	25,5	25	25,5	3,0	-	45	60	55	7,4	-	6,9
429/427	29	-	50	34,3	34,5	32,3	32,5	32	28,5	3,0	-	45	60	55	7,4	-	6,9
429/427	37	-	65	42,3	42,5	40,3	40,5	40	35,5	3,0	-	45	60	55	7,4	-	6,9

Type	Orifice	Size in NPS	Size in DN	Nozzle											Disc		
				Diameter					Length			Angle			Thickness		
				A Ø in mm		B Ø in mm		D Ø	t in mm	L ₁ in mm	L ₂ in mm	W ₁ in °	W ₂ in °	W ₃ in °	b in mm	b in mm before 04/2013	b in mm before 11/2013
				lower limit	upper limit	lower limit	upper limit	in mm	upper limit	lower limit	lower limit				lower limit	lower limit	lower limit
429/427	46	-	80	53,3	53,5	50,3	50,5	50	39,5	3,5	-	45	60	45	8,3	-	7,9
429/427	60	-	100	70,9	71,1	66,9	67,1	65	55,5	3,5	-	45	60	45	7,8	-	6,3
429/427	74	-	125	85,8	86,2	81,8	82,2	78	62,8	5,0	-	45	60	45	8,3	-	7,8
429/427	92	-	150	107,8	108,2	102,8	103,2	98	73,8 ²⁾	6,0	-	45	60	45	8,8	-	-

1) Since 10/2019 new article numbers with different length "t" for DN 15 with metal, soft or plastic sealing have been established.

Article number		Add number for cap or lifting device
4331	.440*	* 2 = Cap H2 3 = Lifting device H3 4 = Lifting device H4
4335	.441*	
4332	.442*	
4334	.443*	
4311	.4405	
4315	.4415	
4312	.4425	

2) 72,8 before 07/2013

Table 2: Nozzles and discs, Modulate Action, in inch.

Type	Orifice	Size in NPS	Size in DN	Nozzle											Disc		
				Diameter					Length			Angle			Thickness		
				A Ø in inch		B Ø in inch		D Ø	t in inch	L ₁ in inch	L ₂ in inch	W ₁ in °	W ₂ in °	W ₃ in °	b in inch	b in inch before 04/2013	b in inch before 11/2013
				lower limit	upper limit	lower limit	upper limit	in inch	upper limit	lower limit	lower limit				lower limit	lower limit	lower limit
433/431	12	-	15 (PN 160)	0.606	-	-	0.535	0.531	0.807	0.059	0.055	-	60	-	0.445	-	-
433/431¹⁾	12	-	15 (PN 40)	0.598	0.606	0.535	0.543	0.531	0.740	0.059	0.055	45	60	45	0.445	-	-
433/431 (before 10/2019)	12	-	15 (PN 40)	0.598	0.606	0.535	0.543	0.531	0.878	0.059	0.055	45	60	45	0.445	-	-
433/431	18	-	20	0.799	0.807	0.720	0.728	-	0.906	-	-	45	-	45	0.228	0.268	-
433/431	18	-	25	0.799	0.807	0.720	0.728	-	0.906	-	-	45	-	45	0.228	0.268	-
433/431	18	-	32	0.799	0.807	0.720	0.728	-	0.906	-	-	45	-	45	0.228	0.268	-
433/431	23	-	25	1.075	1.083	0.996	1.004	0.984	1.004	0.118	-	45	60	55	0.291	0.350	-
433/431	29	-	50	1.350	1.358	1.272	1.280	1.260	1.122	0.118	-	45	60	55	0.291	0.350	-
433/431	37	-	65	1.665	1.673	1.587	1.594	1.575	1.398	0.118	-	45	60	55	0.291	0.350	-
433/431	46	-	80	2.098	2.106	1.980	1.988	1.969	1.555	0.138	-	45	60	45	0.327	0.390	-

Type	Orifice	Size in NPS	Size in DN	Nozzle											Disc		
				Diameter					Length			Angle			Thickness		
				A Ø in inch		B Ø in inch		D Ø	t in inch	L ₁ in inch	L ₂ in inch	W ₁ in °	W ₂ in °	W ₃ in °	b in inch	b in inch before 04/2013	b in inch before 11/2013
				lower limit	upper limit	lower limit	upper limit	in inch	upper limit	lower limit	lower limit				lower limit	lower limit	lower limit
433/431	60	-	100	2.791	2.799	2.634	2.642	2.559	2.185	0.138	-	45	60	45	0.307	0.425	-
433/431	74	-	125	3.378	3.394	3.220	3.236	3.071	2.472	0.197	-	45	60	45	0.327	0.386	-
433/431	92	-	150	4.244	4.260	4.047	4.063	3.858	2.906 ²⁾	0.236	-	45	60	45	0.346	0.445	-
429/427	12	-	15	0.598	0.606	0.535	0.543	0.531	0.878	0.059	0.055	45	60	45	0.445	-	-
429/427	18	-	20	0.799	0.807	0.720	0.728	-	0.906	-	-	45	-	45	0.228	-	0.189
429/427	18	-	25	0.799	0.807	0.720	0.728	-	0.906	-	-	45	-	45	0.228	-	0.189
429/427	18	-	32	0.799	0.807	0.720	0.728	-	0.906	-	-	45	-	45	0.228	-	0.189
429/427	23	-	25	1.075	1.083	0.996	1.004	0.984	1.004	0.118	-	45	60	55	0.291	-	0.272
429/427	29	-	50	1.350	1.358	1.272	1.280	1.260	1.122	0.118	-	45	60	55	0.291	-	0.272
429/427	37	-	65	1.665	1.673	1.587	1.594	1.575	1.398	0.118	-	45	60	55	0.291	-	0.272
429/427	46	-	80	2.098	2.106	1.980	1.988	1.969	1.555	0.138	-	45	60	45	0.327	-	0.311
429/427	60	-	100	2.791	2.799	2.634	2.642	2.559	2.185	0.138	-	45	60	45	0.307	-	0.248
429/427	74	-	125	3.378	3.394	3.220	3.236	3.071	2.472	0.197	-	45	60	45	0.327	-	0.307

Disclosure cat.:	I	proofread by:	BBü	publish date:	03/27/24	effect. date:	03/24
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				lower limit	upper limit	lower limit	upper limit	in inch	upper limit	lower limit	lower limit				lower limit	lower limit	lower limit
429/427	92	-	150	4.244	4.260	4.047	4.063	3.858	2.906 ²⁾	0.236	-	45	60	45	0.346	-	-

1) Since 10/2019 new article numbers with different length "t" for DN 15 with metal, soft or plastic sealing have been established.

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