

Safety, Operating & Maintenance Instructions | Appendix

H-GRD...X | H-GRDG...X Quick-release rotor system







Safety symbols

To mark important safety instructions, three types of safety symbols are used in the text. The meaning of these safety symbols is:



Failure to observe the instruction could result in damage to the valve or ancillary equipment.



Notice or operational hint. Observing the instruction could lead to more efficient operation.



Important guideline for explosion safety and protection ATEX 114.

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1 GENERAL INFORMATION

The purpose of this appendix is to be a guide for use and maintenance of the TBMA range of rotary valves type **H-GRD...X and H-GRDG...X with Quick-release rotor system**. It is an appendix to the Safety, Operation & Maintenance Instructions for rotary airlocks type H-GR...X. All standard information mentioned in these instructions also apply to this manual.



The information given in this manual is only valid for the rotary valves H-GRD...X and H-GRDG...X series.



Always read the standard operation instructions AND this appendix prior to installation and commissioning of the valves.



Rotary valves are dangerous if not all safety procedures are followed. Before any maintenance or repair work is carried out on the valve, all necessary safety measures must be followed.

1.1 Technical Support

If you have any questions referring to technical or operational aspects of TBMA equipment, please do not hesitate to contact us. If you address a question, please provide us with at least the following information:

- type machine
- serial number
- year of manufacture
- electrical specifications
- product handled
- working conditions

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2 INTRODUCTION QUICK-RELEASE ROTOR SYSTEM

Rotary valves where the interior needs to be accessed for cleaning of the rotor and other internal parts can be equipped with a quick release rotor system. There are two types of quick-release rotor systems: type reference D and type reference DG.

Fig 1 Quick-release rotor system type D

Type reference D, for example H-GRD150X Rotary valve with quick-release rotor system with special bearing housing, shaft, and adapter. This type is used for non-frequent cleaning of valve interior.



Fig 2 Quick-release rotor system type DG

Type reference DG, for example H-GRDG200X

Rotary valve with quick-release rotor system with special bearing construction, spline shaft and supporting guiding rails.

This type is used for situations where the valve needs to be frequently opened for cleaning and inspection purposes.

The supporting guiding rails are incorporated into the housing to aid the extraction and insertion of the rotor. This ensures the accurate alignment of the rotor to housing when being removed or replaced. It also eliminates the need for manual lifting or special equipment.





3 INSPECTION QUICK-RELEASE ROTOR SYSTEM TYPE D

This type quick-release rotor system is used for non-frequent cleaning of the valve interior. **Type reference D, for example H-GRD150X.**



For full instructions how to open, clean and close the valve, see the quick-guide H-ARD / H-AXD / H-GRD on pages 8 and 9.

3.1 Cleaning



For proper internal cleaning the rotary valve must be dismantled. It is **not allowed** to clean the rotary valve internally or externally using high pressure wet cleaning, since this is harmful for the valve. Consequently, if high pressure wet cleaning is used, the warranty will expire.

3.2 Axial adjustment on quick-release rotor system

Rotor centralisation on quick release rotors is achieved by inserting a shim (see section 5.2 / pos. 34). This shim is pre-machined by TBMA to the correct thickness and does not need any adjustment. If the rotor needs to be completely dismantled, make sure that the exact same shim is used during re-assembly. In this case the axial adjustment is the same as the factory pre-set.

If the axial adjustment for whatever reason should be changed, contact TBMA to obtain a shim of the desired thickness.

3.3 Removal of the rotor

- Empty the valve and switch off the power. Lock, tag and try the power switch.
- Undo the set screws holding the non-driveside end cover to the body.
- Fit two of these set screws in the threaded jacking holes (pos. X) and jack of the end cover. The rotor will be drawn out of the body as the end cover is withdrawn.
- Remove the rotor axially from the body. Fully support the rotor whilst removing if from the valve housing, keeping it in line with the housing until it is cleaf of the end cover mating face.





Never remove the non-drive-side end cover from the quick release rotor. Failure to support the rotor may cause damage to the rotor blades and/or bore of the valve body.

Place the rotor on a wooden surface to prevent the rotor blades from being damaged.

3.4 Refitting of the rotor



Before refitting the rotor, make sure the peg of the rotor and the slot of the drive shaft (see section 5.2 pos 39) are clean and free from anything that might obstruct the insertion of the rotor.





Ensure the connection flanges of both the end cover and the body are perfectly clean.



Do not damage the drive-side seal while inserting the rotor.

Slide the rotor axially into the valve body with the peg of the rotor shaft in line with the slot of the drive shaft (see section 5.2 pos 39). Ease the shaft of the rotor through the drive-side seal and rotate until you feel the peg engage the slot.

Refit the end cover retaining set screws. Tighten the set screws evenly. Use a torque wrench with the given values as mentioned in section 4.4.

Check the drive-side end cover seal. Tighten as necessary. Similarly check the non-drive side end cover seal.



Due to the more frequent movement of a quick release rotor in and out the valve housing, the chance of damaging the rotor and valve internals is much higher. These should regularly be checked for damage.

Specially make sure that the close tolerances between rotor and valve are maintained.



QUICK GUIDE (EN) H-ARD | H-AXD | H-GRD

1 | 2

QUICK GUIDE for opening, cleaning and closing easy-demountable rotary valves (EN)



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Empty the valve and switch off the power. Lock, tag and try the power switch.



Pull out the rotor half way.



It is not allowed to clean the rotary valve internally or externally using high pressure wet cleaning.



Support the rotor while removing it completely.



Demount the pipe connection piece at the non-driven side. (only for H-GRD version)



Clean end cover, rotor, shaft and spigot.



Unscrew and remove the bolts of the end disc at the non-driven side.



Remove the bolts from the threaded holes.



Insert 2 bolts in the threaded holes. Turn evenly to push the end cover from the body.



Clean the bore of the body and the end covers.

ATTENTION | This quick guide does not replace the standard Safety, Operating and Maintenance Instructions.



QUICK GUIDE (EN) H-ARD | H-AXD | H-GRD

2 | 2

QUICK GUIDE for opening, cleaning and closing easy-demountable rotary valves (EN)



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Clean shaft entry at driven side. Check the condition of the gland seal and replace if necessary.



Carefully press the end cover to the body while adjusting the alignment.



Ensure the connection flange on the end cover is fully clean.



Insert the bolts in the end cover. Start below and then screw diagonally and evenly hand-tight. Then fix the bolts in same order to 90 Nm.



Ensure the connection flange on the body is fully clean.



Remount the pipe connection piece with M12x45 bolts. Start below and then screw diagonally and evenly hand-tight. Then fix the bolts in same order with 90 Nm. (only for H-GRD version)



Support the rotor while carefully inserting it.



Remove the lock, switch on power and test run the valve. Perform AN audio/visual inspection.



Align the spigot to the spigot hole. Ensure the shaft moves smoothly through the gasket.



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4 INSPECTION QUICK-RELEASE ROTOR SYSTEM TYPE DG

This type quick-release rotor system is used for frequent cleaning of valve interior. **Type reference DG, for example H-ARD200X.**



For full instructions how to open, clean and close the valve, see the quick-guide H-ARDG / H-AXDG / H-GRDG on pages 11 and 12.

4.1 Removal of the rotor

- Empty the valve and switch off the power. Lock, tag and try the power switch.
- Clean the guiding bars and rotor shaft.
- Mark the position of the rotor by drawing a continuous line on the shaft and gland follower. (see also quick guide)
- Undo the set screws holding the non-driveside end cover to the body.
- Fit two of these set screws in the threaded jacking holes (pos. X) and jack of the end cover. The rotor will be drawn out of the body as the end cover is withdrawn.





Never remove the non-drive-side end cover from the valve housing.

4.2 Refitting of the rotor



Before refitting the rotor, make sure the splines coupling and rotor are clean and free from anything that might obstruct the insertion of the rotor. (see fig 3)



Ensure the connection flanges of both the end cover and the body are perfectly clean.

Fig 3 Inside view fo spline rotor coupling on drive-side end cover

- Slide the rotor gently into the valve body. Rotate slightly until you feel the splines coupling engage in the splines slot on the rotor.
 Fully press the rotor against the drive-side end cover
- Refit the end cover retaining setscrews. Tighten the set screws evenly. Use a torque wrench with the given values as mentioned in section 4.4.



4.3 Torque values

Valve size	150	175	200	250	300	350
Set screw end cover	50 Nm	60 Nm	90 Nm	90 Nm	110 Nm	110 Nm
Set screw motor base plate	50 Nm	50 Nm	90 Nm	90 Nm	90 Nm	90 Nm
Nut gland seal (max. torque)	6,5 Nm	6,7 Nm	10 Nm	10 Nm	25 Nm	25 Nm



QUICK GUIDE (EN) H-ARDG | H-AXDG | H-GRDG

QUICK GUIDE for opening, cleaning and closing easy-demountable rotary valves with guiding bars.

 \rightarrow A rotary valve is precisely adjusted equipment. Handle with care.



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Empty the valve and switch off the power. Lock, tag and try the power switch.



Clean the guiding bars and rotor shaft.



1 | 2

Mark the position of the rotor by drawing a continuous line on the shaft and the gland follower with a marker.



Remove the hexagon bolts from the non-driven side end cover. Keep 2 bolts separate and store the others safely.



Insert 2 bolts in the threaded holes. Turn evenly to push the end cover from the body.



Use the handles to pull out the end cover and rotor as far as possible.



Clean the rotor and the spline bush. Clean the end cover including the flange. Rotate the rotor while cleaning.



Clean the bore of the body and the connection flange for the end cover.



Clean the spline and the inlet of the valve.

ATTENTION | This quick guide does not replace the standard Safety, Operating and Maintenance Instructions.



QUICK GUIDE (EN) H-ARDG | H-AXDG | H-GRDG

QUICK GUIDE for opening, cleaning and closing easy-demountable rotary valves with guiding bars.

 \rightarrow A rotary value is precisely adjusted equipment. Handle with care.



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Ensure the spline, spline bush, guiding bars, and the flanges of both the end cover and the body are perfectly clean.



Turn the rotor until the markings on the shaft and gland follower are aligned.



2 | 2



Remove the hexagon bolts from the threaded holes.



Support the end cover while re-inserting the rotor into the body. The rotor blades must not touch the inside of the body. If this does not go smoothly, contact TBMA. **DO NOT FORCE!** \rightarrow Make sure that no product falls from above while closing the valve.



Brush away the marking line.



Remove the lock, switch on power and test run the valve. Perform an audio/visual inspection.



Push the fitting edge of the end cover in the body using the hexagon bolts. Fix the bolts evenly.



Attention: **STOP THE VALVE** in case you hear metallic contact when running the rotary valve. **Call TBMA: +31 252 345 615**



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5 TECHNICAL ILLUSTRATIONS QUICK-RELEASE ROTARY VALVES

5.1 Sectional drawings type H-GRD...X

5.1.1 Sectional drawing type H-GRD...X with quick release rotor and gland packing



5.1.2 Sectional drawing type H-GRD...X with quick release rotor and air purged seal



See parts list in section 5.2



5.2 Parts list type H-GRD...X Quick release rotor system

Part	Qty	Description	Part	Qty	Description
01	1x	Body	25	1x	Bearing cover
02	2x	End cover	26	3x	Hexagon head bolt
03	1x	Rotor	27	1x	Name plate
04	1x	Кеу	28	2x	Cover plate
05*	Set	Vulkollan rotor blade	29	2x	Support ring
06*	Set	Clamp plate	30**	2x	Lip seal
07	Set	Washer	31**	2x	Air purge fitting
08	Set	Hexagon head cap screw	32**	2x	Ring
09	Set	Rotor blade	33**	1x	Retaining ring
10	Set	Hexagon head cap screw	34**	1x	Support ring
11*	Set	Scraper blade L/R	35**	1x	Retaining ring
12*	2/0	Flexible tube coupling	36**	1x	Bearing housing QR
14	Set	Washer / end cover	37	3x	Washer
15	Set	Hexagon head bolt	38**	3x	Socket head cap screw
16	4x	Stud	39**	1x	Shaft and adaptor
17	Set	Gland packing	40**	2x	Disc spring
18	2x	Gland follower	41**	1x	Ball bearing QR
19	4x	Washer	42**	1	Retaining ring
20	4x	Hex head nut	43**	0/1	Ball bearing
21	1x	Ball bearing	44	2x	Flange
22	1x	Support ring	45	Set	Washer
23	1x	Serrated lock ring	46	Set	Hexagon head bolt
24	1x	Lock nut	47	Set	Hex head nut
* Opt	ion	** Air purge		•	·



5.3 Assembly drawing H-ARD...X Quick-release rotor system



See parts list in section 5.2



5.4 Dimensional drawings H-GRD...X Quick release rotor system

5.4.1 Dimensions H-GRD...X Quick release rotor system | without drive



Type HGRD	ltr/ rev	А	В	с	D	E	F	G	н	J	к	L	м	N	ο	Р	Q	R	s	т	U
150X	2,5	150	240	285	10	8x Ø23	280	246	63	173	95	120	M6	228	309	537	73	100	110	4xM10	30
175X	5,5	175	270	315	12	8x Ø23	335	268	65	173	105	130	M6	250	333	583	95	100	130	6xM10	30
200X	10,5	200	295	340	12	8x Ø23	400	305	87	186	128	160	M8	285	392	677	117	125	160	6xM12	32
250X	19,0	250	350	395	14	12x Ø23	465	330	87	186	128	160	M8	310	417	727	142	125	190	6xM12	32
300X	34,0	300	400	445	16	12x Ø23	555	379	89	198	170	205	M10	365	468	833	180	125	225	6xM12	38
350X	58,0	350	460	505	21	16x Ø23	645	414	89	203	170	205	M10	400	503	903	210	125	270	6xM12	38

Type HGRD	v	w	AA	BB	bb	сс	СС	DD	dd	EE	FF	GG	нн	11	кк	ш	мм	QQ	RR	Υ*	Z*	kg
150X	33	8	50	95	-	120	95	10	10	2x Ø12	130	150	73	198	45	154	4x Ø12	67,5	160	1⁄4″	1⁄2″	53
175X	33	8	65	104	60	150	118	10	10	4x Ø12	160	175	79	220	65	190	4x Ø12	85	200	1⁄4″	1⁄2″	71
200X	35	10	80	115	80	170	137	12	10	4x Ø14	185	215	98	255	75	230	4x Ø18	95	230	1⁄4″	3∕4″	118
250X	35	10	100	139	98	200	163	12	10	4x Ø14	215	250	110	280	100	274	4x Ø18	120	275	1⁄4″	3⁄4″	155
300X	41	10	125	164	115	230	189,5	14	15	4x Ø14	260	295	125	330	135	350	4x Ø22	125	320	1⁄4″	1″	280
350X	41	10	150	152	152	240	215	15	15	4x Ø14	305	340	130	365	155	410	4x Ø23	137,5	325	1⁄4″	1¼	410
PN10: S Dimens	PN10: Standard drilling pattern; alternative flange drilling patterns on request Dimensions in mm																					

*Note Y: Standard plugged	*Note Z: Standard plugged	Ref. drawing: 17130-112
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5.4.2 Dimensions H-GRD...X Quick release rotor system | with standard chain drive









Standard drive: Nord

Type H-GRD	Α	в	с	D	E		F	FF	G	GG	н	4	N	АА	BB	bb	co	с сс	C	D	dd		EE
150X	150	240	285	10	8x Ø	23	280	130	246	150	73	3 2	28	50	95	-	12	0 95	1	.0	10	2x	Ø12
175X	175	270	315	12	8x Ø	23	335	160	268	175	79) 2	50	65	104	60	15	0 118	1	.0	10	4x	Ø12
200X	200	295	340	12	8x Ø	23	400	185	303	215	98	3 2	85	80	115	80	17	0 137	1	2	10	4x	Ø14
250X	250	350	395	14	12x Ø	23	465	215	328	250	11	0 3	10	100	139	98	20	0 163	1	.2	10	4x	Ø14
300X	300	400	445	16	12x Ø	23	555	260	378	295	12	53	65	125	164	11	5 23	0 189,	5 1	.4	15	4x	Ø14
350X	350	460	505	21	16x Ø	23	645	305	413	340	13	0 4	00	150	152	15	2 24	0 215	1	.5	15	4x	Ø14
_																							
Type H-GRD	Ltr/ rev.	kW	Nm	kg	кк	L	L	ММ	Q	Q	RR	н		ı	kk	L	m	0	Ρ	0	2	Υ*	z
150X	2,5	0,37	131	75	45	15	54	4x Ø12	67	7,5	160	75	101	337	119	398	145	378	480	4	5	1⁄4″	1⁄2″
175X	5,5	0,37	131	93	65	19	90	4x Ø12	8	5	200	100)	368	119	423	145	420	526	5	5	1⁄4″	1⁄2″
200X	10,5	0,75	286	165	75	23	30	4x Ø18	9	5	230	100) 4	440	140	482	165	504	610	6	5	1⁄4″	3⁄4″
250X	19,0	0,75	286	200	100	27	74	4x Ø18	12	20	275	100) 4	480	140	482	165	554	678	7	'5	1⁄4″	3⁄4″
300X	34,0	1,5	478	350	135	35	50	4x Ø22	12	25	320	120) 5	555	145	545	185	649	778	9	95	1⁄4″	1″
350X	58,0	1,5	478	490	155	41	LO	4x Ø23	13	7,5	325	120) (520	145	545	185	734	873	9	5	1⁄4″	1¼″
Electri	cal su	pply:	230/	400V	-50Hz							РГ	N10): Sta	andar	d dri	lling	patterr	; alto	erna	ative	e flar	nge
Protec	tion o	lass:	IP 55									dr	illir	ng pa	atterr	ns on	requ	est					
Insulat	Insulation class: ISO F												me	ensio	ns in	mm							
*Note	*Note Y: Standard plugged *Note Z: Standard p											olug	ged	1				Ref. dr	awir	ig: 1	1713	30-1	14



5.5 Sectional drawing type H-GRDG...X

5.5.1 Sectional drawing type H-GRDG...X Quick release rotor system, gland, and guiding rails



Part	Qty	Description	Part	Qty	Description
01	1x	Body	19	2x	Bearing (special) non-drive side
02	1x	End cover drive side	20	1x	Spacer ring
03	1x	End cover non - drive side	21	8/9x	Rotor blade
04	12x	Hexagon-head bolt	22	1x	Bearing cover
05	12x	Washer	23	12x	Hexagon-head bolt
06	1x	Rotor	24	12x	Washer
07	1x	Rotor shaft end	25	2x	Guiding shaft
08	1x	Кеу	26	2x	Fixation ring
09	2x	Lock nut	27	1x	Splines coupling
10	2x	Serrated lock ring	29	2x	Plug / Gland
11	1x	Spacer	30	1x	Circlip / retaining ring
12	1x	Bearing drive side	31	2x	Flange
13	2x	Gland follower	36	1x	Bearing cover
14	6x	Stud	37	2x	V-ring
15	6x	Hex head nut	38	4x	Hexagon-head bolt
16	6x	Washer	39	4x	Washer
17	8x	Gland packing	19	2x	Bearing (special) non-drive side
18*	2x	Lantern ring gland	20	1x	Spacer ring
* Opt	ion				



5.5.2 Dimensions H-GRDG...X Quick release rotor system | with chain drive









Type H-GRDG	А	В	с	D		E	F	FI	F	G	н	Hh	J	к	L	м	m	N	0	Q	P in P out
175x	175	270	315	12	8x	Ø23	335	17	5 1	.44	115	300		96	575	100	145			55	
200x	200	295	340	12	8x	Ø23	400	21	.5 1	.80	145	375	620	121	700	100	165	305	877	65	
250x	250	350	395	14	12x	Ø23	465	25	0 2	.03	167	435		140	800	100	165			75	730/1116
300x	300	400	445	16	12x	Ø23	555	29	5 2	57	200	520	812	167		100	185			95	
Type H-GRDG	ltr/ rev	kW	N	n	AA	BB	t	b	сс	c	c	EE	кк	u	м	м	QQ	RR	Y*	Z*	kg
175x	5,5	0.37	/ 13	1	65	104	÷ e	0	150	1	18	4x Ø12	65	190) 4x (Ø12	85	200	1⁄4″	1⁄2″	
200x	10,5	0.55	5 28	6	80	115	5 8	0	170	13	37	4x Ø14	75	230) 4x (Ø18	95	230	1⁄4″	3⁄4″	
250x	19,0	0.75	5 28	6	100	139) 9	8	200	10	63	4x Ø14	100	274	4x (Ø18	120	275	1⁄4″	3⁄4″	
300x	34,0	1,5	47	'8	125	164	1	15	230	18	9,5	4x Ø14	135	350) 4x (Ø22	125	320	1⁄4″	1″	
Electrical supply: 230/400V-50Hz Protection class: IP 55 Insulation class: ISO F												PN10 patter Dimer	: Stan rns or nsions	dard o i requ s in mi	drilling est m	patte	ern; al	ternat	ive fla	nge (drilling
*Note Y: Standard plugged *Note Z: Standard drill											Irilleo	ed / plugged Ref. d							ing: 17	7911-	001-01