

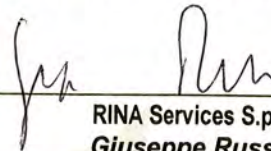


TYPE APPROVAL CERTIFICATE
No. MAC142516XG

This is to certify that the product identified below is in compliance with the regulations herewith specified.

<i>Description</i>	Valves
<i>Type</i>	Check Valves, Globe Valves, Safety Valves, Gate Valves, Strainers, Changeover Valves, Pressure Regulators
<i>Applicant</i>	HEROSE GMBH Armaturen und Metalle - HEROSE GMBH ELLY-HEUSS-KNAPP-STRASSE 12 23843 BAD OLDESLOE GERMANY
<i>Manufacturer</i> <i>Place of manufacture</i>	HEROSE GMBH Armaturen und Metalle - HEROSE GMBH ELLY-HEUSS-KNAPP-STRASSE 12 23843 BAD OLDESLOE GERMANY
<i>Reference standards</i>	Part C, Chapter 1, Appendix 7 (Gas Fuelled Ship) RINA Rules ; Part E Chapter 9 Section 9 (Liquified Gas Carrier) RINA Rules; IGF Code as per IMO MSC.391(95), ; IGC Code as last amended by IMO MSC.377(93); British Standard BS-6364:1984

Issued in **HAMBURG** on **January 17, 2017**. This Certificate is valid until **January 16, 2022**



RINA Services S.p.A.
Giuseppe Russo

This certificate consists of this page and 1 enclosure



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Check Valves, Globe Valves, Safety Valves, Gate Valves, Strainers, Changeover Valves, Pressure Regulators

Product Description

The products are globe valves, check valves, strainers, gate valves, divertor valves, safety valves and pressure-regulators for cryogenic application on board of liquefied gas carrier and gas fuel propelled ships. All valves are designed and type tested according to British Standard – BS 6364:1984.

Reference documents

Assembly Drawings booklet approved with RINA no. HMMC-7419
 Valves Catalogue booklet filed with RINA no. HMMC-7976
 Actuators Catalogue booklet filed with RINA no. HMMC-8351
 Operating & Maintenance Instructions booklet filed with RINA no. HMMC-7977
 Cryogenic Test Reports booklet filed with RINA no. HMMC-7978
 Fire Test Reports booklet filed with RINA no. HMMC-8352

Materials/Components

Valves Body on Stainless steel or bronze according to the following standards:
 EN 1.4308 (ASTM A 351 CF8), EN 1.4409 (ASTM 351 CF3M), EN CC491K (ASTM B 62 UNS C83600).
 For material details reference shall be made to assembly drawings and catalogues above mentioned.

Technical Characteristics

Maximum/Minimum Working Temperature range -196 °C / +120 °C

VALVES				
Type	Model	Dimension	Pressure Rating	Connection
CHECK VALVES				
054	14	DN 10 - DN 150	PN 50 / PN 40 / PN 25	Butt and socket welded
	17	DN 10 - DN 50	PN 50	Threaded
	19	DN 25 - DN 150	PN 50 / PN 16 Class 300 / Class 150	Flanged
057	14	DN 10 - DN 150	PN 50 / PN 40 / PN 25	Butt and socket welded
	17	DN 10 - DN 50	PN 50	Threaded
	19	DN 25 - DN 150	PN 50 / PN 16 Class 300 / Class 150	Flanged
STRAINERS				
084	16	DN 10 - DN 50	PN 50	Threaded
	17	DN 10 - DN 150	PN 50 / PN 40 / PN 25	Butt and socket welded
	32	DN 25 - DN 150	PN 50 / PN 16 Class 300 / Class 150	Flanged
087	17	DN 10 - DN 150	PN 50 / PN 40 / PN 25	Butt and socket welded
GATE VALVES				
093	40	DN 25 - DN 100	PN 50 / PN 40	Butt and socket welded
	43	DN 25 - DN 80	PN 50 / PN 40	Butt and socket welded
DIVERTOR / CHANGE OVER VALVES				
065	10	DN 20 / DN 32	PN 50	Threaded or Butt and socket welded
	11	DN 20 / DN 32	PN 50	like 06510 with mounted safety valves
	20	DN 20	PN 50	Threaded or Butt and socket welded
	21	DN 20	PN 50	like 06520 with mounted safety valves
	30	DN 20	PN 50	Threaded or Butt and socket welded
	31	DN 20	PN 50	like 06530 with mounted safety valves

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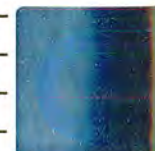
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GLOBE VALVES

013	41	DN 10 - DN 200	PN 50 / PN 40 / PN 25	Butt and socket welded
	42	DN 15 - DN 50	PN 50	Butt and socket welded
	43	DN 10 - DN 200	PN 50 / PN 40 / PN 25	Butt and socket welded
	51	DN 10 - DN 100	PN 50 / PN 40	Butt and socket welded
	53	DN 15 - DN 80	PN 50	Butt and socket welded
014	20	DN 15 - DN 50	PN 50	Butt welded
	23	DN 15 - DN 50	PN 50	Butt welded
016	41	DN 10 - DN 200	PN 50 / PN 40 / PN 25	Butt and socket welded
	43	DN 10 - DN 200	PN 50 / PN 40 / PN 25	Butt and socket welded
	51	DN 10 - DN 100	PN 50 / PN 40	Butt and socket welded
017	41	DN 10 - DN 200	PN 50 / PN 40 / PN 25	Butt and socket welded
	43	DN 10 - DN 200	PN 50 / PN 40 / PN 25	Butt and socket welded
	51	DN 10 - DN 100	PN 50 / PN 40	Butt and socket welded
	53	DN 15 - DN 80	PN 50	Butt and socket welded
018	41	DN 10 - DN 200	PN 50 / PN 40 / PN 25	Butt and socket welded
	43	DN 10 - DN 200	PN 50 / PN 40 / PN 25	Butt and socket welded
	51	DN 10 - DN 100	PN 50 / PN 40	Butt and socket welded
03	341	DN 25 - DN 200	PN 50 / PN 16 Class 300 / Class 150	Flanged
	343	DN 25 - DN 200	PN 50 / PN 16 Class 300 / Class 150	Flanged
	351	DN 25 - DN 100	PN 50 / PN 16 Class 300 / Class 150	Flanged
	641	DN 25 - DN 200	PN 50 / PN 16 Class 300 / Class 150	Flanged
	643	DN 25 - DN 200	PN 50 / PN 16 Class 300 / Class 150	Flanged
	651	DN 25 - DN 100	PN 50 / PN 16 Class 300 / Class 150	Flanged
	741	DN 25 - DN 200	PN 50 / PN 16 Class 300 / Class 150	Flanged
	743	DN 25 - DN 200	PN 50 / PN 16 Class 300 / Class 150	Flanged
	751	DN 25 - DN 150	PN 50 / PN 16 Class 300 / Class 150	Flanged
	841	DN 25 - DN 200	PN 50 / PN 16 Class 300 / Class 150	Flanged
	843	DN 25 - DN 200	PN 50 / PN 16 Class 300 / Class 150	Flanged
851	DN 25 - DN 100	PN 50 / PN 16 Class 300 / Class 150	Flanged	
012	52	DN 10 - DN 50	PN 50	Butt and socket welded
	72	DN 10 - DN 50	PN 50	Butt and socket welded
032	52	DN 25 - DN 50	PN 50 / PN 16 Class 300 / Class 150	Flanged
	72	DN 25 - DN 50	PN 50 / PN 16 Class 300 / Class 150	Flanged
11	14	DN 10 - DN 200	PN 50 / PN 40 / PN 25	Butt and socket welded or threaded or flanged
	16	DN 10 - DN 200	PN 50 / PN 40 / PN 25	Butt and socket welded or threaded or flanged
PRESSURE REGULATORS				
4186	1	DN 20	PN 50	Threaded
	3	DN 20	PN 40	Threaded

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SAFETY VALVES				
Type	Size	d0 (mm)	Pressure Range	Connection
06800	GW1/2	12.5	3 - 25bar	female thread
	GW1/2	15	3 - 25bar	
	GW3/4	20	3 - 25bar	
	GW1	23	3 - 25bar	
06801	GW1/2	12.5	3 - 25bar	like 06800 with male thread
	GW3/4	15	3 - 25bar	
	GW1	20	3 - 25bar	
	GW1	23	3 - 25bar	
06805	GW1/2	12.5	3 - 25bar	like 06800 with lifting device
	GW1/2	15	3 - 25bar	
	GW3/4	20	3 - 25bar	
	GW1	23	3 - 25bar	
06806	GW1/2	12.5	3 - 25bar	like 06801 with lifting device
	GW3/4	15	3 - 25bar	
	GW1	20	3 - 25bar	
	GW1	23	3 - 25bar	
06011	GW1/4	6	5 - 55bar	male thread
	GW3/8	6	5 - 55bar	
	GW1/2	6	5 - 55bar	
06012	GW1/4	6	1 - 55bar	male thread
	GW3/8	6	1 - 55bar	
	GW1/2	6	1 - 55bar	
06016	GW1/4	6	1 - 55bar	like 06012 with lifting device
	GW3/8	6	1 - 55bar	
	GW1/2	6	1 - 55bar	
06383	GW1/2	7	3,3 - 50bar	male thread
	GW3/4	7	3,3 - 50bar	
	GW1/2	10.5	2,9 - 50bar	
	GW3/4	10.5	2,9 - 50bar	
	GW1	15	2,9 - 50bar	
	GW1 1/4	23	2,0 - 50bar	
	GW1 1/2	23	2,0 - 50bar	
	GW2	23	2,0 - 50bar	
06413	GW1/2	7	3,3 - 50bar	male thread, with lifting device
	GW3/4	7	3,3 - 50bar	
	GW1/2	10.5	2,9 - 50bar	
	GW3/4	10.5	2,9 - 50bar	
	GW1	15	2,9 - 50bar	
	GW1 1/4	23	2,0 - 50bar	
	GW1 1/2	23	2,0 - 50bar	
	GW2	23	2,0 - 50bar	
06388	GW1/2	7	3,3 - 50bar	male thread
	GW3/4	7	3,3 - 50bar	
	GW1/2	10.5	2,9 - 50bar	
	GW3/4	10.5	2,9 - 50bar	
	GW1	15	2,9 - 50bar	
	GW1 1/4	23	2,0 - 50bar	
	GW1 1/2	23	2,0 - 50bar	
	GW2	23	2,0 - 50bar	



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SAFETY VALVES				
Type	Size	d0 (mm)	Pressure Range	Connection
06418	GW1/2	7	3,3 - 50bar	male thread, with lifting device
	GW3/4	7	3,3 - 50bar	
	GW1/2	10.5	2,9 - 50bar	
	GW3/4	10.5	2,9 - 50bar	
	GW1	15	2,9 - 50bar	
	GW1 1/4	23	2,0 - 50bar	
	GW1 1/2	23	2,0 - 50bar	
	GW2	23	2,0 - 50bar	
06420	GW1/2	7	0,4 - 50bar	male thread
	GW3/4	7	0,4 - 50bar	
	GW1/2	10.5	0,4 - 50bar	
	GW3/4	10.5	0,4 - 50bar	
	GW3/4	14	0,4 - 40bar	
	GW1	14	0,4 - 40bar	
	GW1	18	0,4 - 40bar	
	GW1 1/4	18	0,4 - 40bar	
	GW1 1/4	23	0,4 - 10bar	
06425	GW1/2	7	0,4 - 50bar	like 06420 with lifting device
	GW3/4	7	0,4 - 50bar	
	GW1/2	10.5	0,4 - 50bar	
	GW3/4	10.5	0,4 - 50bar	
	GW3/4	14	0,4 - 40bar	
	GW1	14	0,4 - 40bar	
	GW1	18	0,4 - 40bar	
	GW1 1/4	18	0,4 - 40bar	
	GW1 1/4	23	0,4 - 10bar	
06421	GW1/2	7	0,4 - 50bar	like 06420 with female thread
	GW1/2	10.5	0,4 - 50bar	
	GW3/4	14	0,4 - 40bar	
	GW1	18	0,4 - 40bar	
	GW1 1/4	23	0,4 - 10bar	
06426	GW1/2	7	0,4 - 50bar	like 06421 with lifting device
	GW1/2	10.5	0,4 - 50bar	
	GW3/4	14	0,4 - 40bar	
	GW1	18	0,4 - 40bar	
	GW1 1/4	23	0,4 - 10bar	
06440	GW1/2	7	0,4 - 50bar	like 06420 with stainless steel material
	GW3/4	7	0,4 - 50bar	
	GW1/2	10.5	0,4 - 50bar	
	GW3/4	10.5	0,4 - 50bar	
	GW3/4	14	0,4 - 40bar	
	GW1	14	0,4 - 40bar	
	GW1	18	0,4 - 40bar	
	GW1 1/4	18	0,4 - 40bar	
	GW1 1/4	23	0,4 - 10bar	

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SAFETY VALVES				
Type	Size	d0 (mm)	Pressure Range	Connection
06445	GW1/2	7	0,4 - 50bar	like 06440 with lifting device
	GW3/4	7	0,4 - 50bar	
	GW1/2	10.5	0,4 - 50bar	
	GW3/4	10.5	0,4 - 50bar	
	GW3/4	14	0,4 - 40bar	
	GW1	14	0,4 - 40bar	
	GW1	18	0,4 - 40bar	
	GW1 1/4	18	0,4 - 40bar	
	GW1 1/4	23	0,4 - 10bar	
06441	GW1/2	7	0,4 - 50bar	like 06440 with female thread
	GW1/2	10.5	0,4 - 50bar	
	GW3/4	14	0,4 - 40bar	
	GW1	18	0,4 - 40bar	
	GW1 1/4	23	0,4 - 10bar	
06446	GW1/2	7	0,4 - 50bar	like 06441 with lifting device
	GW1/2	10.5	0,4 - 50bar	
	GW3/4	14	0,4 - 40bar	
	GW1	18	0,4 - 40bar	
	GW1 1/4	23	0,4 - 10bar	
06474	GW1/4	6	4,5 - 45bar	male thread
	GW3/8	6	4,5 - 45bar	
	GW1/2	6	4,5 - 45bar	
	GW3/4	6	4,5 - 45bar	
06478	GW1/4	6	4,5 - 45bar	like 06474 with lifting device
	GW3/8	6	4,5 - 45bar	
	GW1/2	6	4,5 - 45bar	
	GW3/4	6	4,5 - 45bar	
06472	GW1/4	6	0,5 - 6bar	like 06474 with metal to metal seat
	GW3/8	6	0,5 - 6bar	
	GW1/2	6	0,5 - 6bar	
	GW3/4	6	0,5 - 6bar	
06477	GW1/4	6	0,5 - 6bar	like 06472 with lifting device
	GW3/8	6	0,5 - 6bar	
	GW1/2	6	0,5 - 6bar	
	GW3/4	6	0,5 - 6bar	




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Field of Application

The valves can be used for LNG application such as cargo lines of liquefied gas carriers, gas fuel and bunkering system of LNG propelled ships.

Acceptance Conditions

For gas fuelled ships the following IGF Code (IMO Resolution MSC.391(95)) and RINA Rules requirements are applicable:

- the valves connection to piping in accordance with 7.3.6.4.1 for direct connections and 7.3.6.4.2 for flanged connections.
- Material testing in accordance with Table 7.4
- Welding procedure tests in accordance with 16.3.4
- Tests on board as per 16.7.3.2 and 16.7.3.5
- Emergency shut down valves in accordance with 16.7.3.6
- Production Test in accordance with Part C Chapter 1 Appendix 7 par. 16.7.3 of RINA Rules

For liquefied gas carrier the following IGC code (as last amended by IMO Resolution MSC.377(93)) and RINA Rules requirements are applicable:

- The valves connection to piping in accordance with 5.2.10
- Material Testing in accordance with Table 6.4
- Welding procedure tests in accordance with 6.3.5
- Production Test in accordance with Part E Chapter 9 Section 9 par. 3.1.2 of RINA Rules.

The valves used for pressure relieving system of liquefied gas fuel tanks shall be sized according to Part C Chapter 1 Appendix 7 par. 6.7 of RINA Rules.

Remarks

The maximum working pressure is to be reduced as per the Manufacturer's instructions .
Final acceptance of valves is subject to satisfactory outcome of testing as per RINA Rules.

HAMBURG January 17, 2017



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