

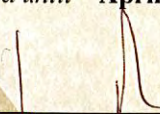


**TYPE APPROVAL CERTIFICATE**  
No. MAC090519XG/001

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

<i>Description</i>	<b>Valves</b>
<i>Type</i>	<b>Check Valves Globe Valves Safety Valves Gate Valves Strainers Changeover Valves Pressure Regulators, (including double wall arrangement)</b>
<i>Applicant</i>	<b>HEROSE GMBH Armaturen und Metalle - HEROSE GMBH ELLY-HEUSS-KNAPP-STRASSE 12 23843 BAD OLDESLOE GERMANY</b>
<i>Manufacturer</i>	<b>HEROSE GMBH Armaturen und Metalle - HEROSE GMBH</b>
<i>Place of manufacture</i>	<b>ELLY-HEUSS-KNAPP-STRASSE 12 23843 BAD OLDESLOE GERMANY</b>
<i>Reference standards</i>	<b>Part C, Chapter 1, Section 10 of RINA Rules</b>

Issued in **HAMBURG** on **April 29, 2019**. This Certificate is valid until **April 29, 2024**

  
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RINA Services S.p.A.  
Giuseppe Russo

This certificate consists of this page and 1 enclosure





**TYPE APPROVAL CERTIFICATE**  
**No. MAC090519XG/001**  
**Enclosure - 7 Pages**  
**Check Valves**  
**Globe Valves**  
**Safety Valves**  
**Gate Valves**  
**Strainers**  
**Changeover Valves**  
**Pressure Regulators,**  
**(including double wall arrangement)**

***Product Description***

The products are globe valves, check valves, strainers, gate valves, divertor valves, safety valves and pressure-regulator, including double wall , 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  
Double Wall DN10-150 H=370, HMMC/13328

***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





<b>VALVES</b>				
<b>Type</b>	<b>Model</b>	<b>Dimension</b>	<b>Pressure Rating</b>	<b>Connection</b>
<b>CHECK VALVES</b>				
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 / Class150	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 / Class150	Flanged
<b>STRAINERS</b>				
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 / Class150	Flanged
087	17	DN 10 - DN 150	PN 50 / PN 40 / PN 25	Butt and socket welded
<b>GATE VALVES</b>				
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
<b>DIVERTOR / CHANGE OVER VALVES</b>				
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





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



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	
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	



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	
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	



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	
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	



**TYPE APPROVAL CERTIFICATE**  
No. **MAC090519XG/001**

**Field of Application**

The valves can be used for LNG application such as cargo lines of liquified 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.

Material Certification According to Tab 36 Pt C, Ch 1 Sec 10 of RINA Rules 2019 edition:

- for Class I if  $DN \geq 50$ mm and for Class II if  $DN \geq 100$  mm ,class certificate is required. ( applicable for both inner and double piping

**Reference Standards**

Part C, Chapter 1, Section 10 of RINA Rules  
PartC, Chapter 1, Appendix 7 (Gas fuelled Ship) RINA Rules  
Part E Chapter 9 (Liquefied Gas Carrier) RINA Rules  
IGF Code as per IMO MSC.391(95);  
IGC Code as latest amended by IMO MSC.377(93)

**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 April 29, 2019**

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