



# Design Appraisal Document

**Lloyd's Register EMEA**  
**Rotterdam Technical Support Office**  
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Date  
**15 February 2018**

Please quote this reference number on all future communications  
**RTS/ENG/175664/MPB**

**Producer** : Wouter Witzel Eurovalve B.V.  
**Place of Production** : Industrierrein de Pol 12, Losser, The Netherlands  
**Subject** : CHECK VALVES, Type 'ECV'  
**Type Approval Certificate No.** : 17/30007

Valid until 05 December 2021

The undernoted documents have been reviewed for compliance with the requirements of Lloyd's Register Type Approval System TA14, version June 2015 and the relevant Rules and Regulations, as stated on LR Type Approval Certificate;-

**PRODUCT TYPE:** ECV :

**SIZES:-** DN 50, DN65, DN80, DN100, DN125, DN150, DN200, DN250, DN300, DN350, DN400, DN450, DN500 and DN600

**RATINGS:** Pressure Rating : 150 lbs, PN6, PN10, PN16  
Design Pressure : 16 bar  
Temperature : -10 to +200 °C ( dependant on applied types of material )

**MATERIALS:-**

Body	Ductile Iron	5.3106 (JS 1030)	EN 1563
	Ductile Iron	5.3103 (JS 1049)	EN 1563
	Ductile Iron	Grade 60-40-18	ASTM A-395
	Cast Steel	1.0619, Grade WCB	ASTM A-216
	Cast Iron	5.1301 (JL1040)	EN 1561
	Alu Bronze	Cu Al 10 Fe5 Ni 5-C (CC333G)	EN 1982
Disc	Alu Bronze	UNS C95800	ASTM B148
	Alu Bronze	UNS C95800	ASTM B148
	Stainless Steel	1.4408 (G5X crNi Mo 19-11-2)	EN 10213
	Alu Bronze	Cu Al 10 Fe5 Ni 5-C (CC333G)	EN 1982
	Alu Bronze	UNS C95800	ASTM B148
	Stainless Steel	1.4057 (X17 CrNi 16-2)	EN 10088-3
Seat	Stainless Steel	1.4462 (X2 CrNi Mo N 22-5-3)	EN 10088-3
	Stainless Steel	1.4469 (GX2 CrNi Mo N 26-7-4)	EN 10213
	Stainless Steel	1.4408 (G5X crNi Mo 19-11-2)	EN 10213
	Ethylene Propylene Diene Rubber (EPDM)	ISO 1629	
	Nitrile Butadien Rubber (NBR)	ISO 1629	
	Fluoro Rubber (FPM)	ISO 1629	

FINAL ACCEPTANCE OF ACTUAL ITEM(S) DEPEND(S) ON SATISFACTORY SURVEY AND TESTING

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APPLICATIONS:-

The type 'ECV' check valves have been considered for following essential- and non-essential services:-

- Inert Gas system;
  - Inert Gas Main line (on open deck) and Inert Gas Distribution lines (on open deck)
  - Water seal effluent line; Scrubber effluent line;
- Ballast-, Ballast Transfer- and Anti-heeling system;
- Salt and Fresh Cooling Water systems for essential services;
  - HT-cooling system, LT-cooling system; Seawater cooling;
  - Auxiliary cooling system (electric drives), Condensate return
- Sea Water systems for non-essential services;
  - Jet water, Gland system, Dredging system;
  - High velocity water system; Scrubber system, UV system;
  - Anchor wash system, Ballast water treatment system.
- Fresh Water systems for non-essential services;
  - Air Conditioning system, Sanitary Supply services,
  - Waste water, Blackwater system, Greywater system;
  - Desalination system, Drinking water, Potable water;
  - Swimming pool system, Hydrophore system;
  - Fresh water chilled (HVAC) system, Technical water;
  - Wash water (fixed tank cleaning systems).
- Compressed air (non-essential service, < 7 bar);
- Pulper system (domestic waste);
- Bulkhandling system (dry cargo in bulk );
- Brines, Drilling fluids, Mud system and Liquid mud system.

MANDATORY COMMENTS AND OPERATIONAL LIMITATIONS:-

1. All relevant materials used (eg. body, disc) for pressure-retaining parts are to be tested and certified as per the "Rules for the Manufacture, Testing and Certification of Materials". Final acceptance remains to be to the attending Surveyor's satisfaction (Part 5, Chapter 12, 1.3.1 refers) AQS
2. For use in applications, where design temperature is below 0 deg.C and for other application where guaranteed impact properties are required, relevant materials used for pressure-retaining parts are subject to Charpy V-test requirements, as per the Rules for Materials. AQS
3. ECV-type check valve is not acceptable when fitted as non-return valve at open end of bilge suction pipes in cargo holds (Part 5, Chapter 13, Section 7.11 refers) --
4. ECV-type check valve is not metal-seated and not acceptable when fitted as non-return valve in main bilge line in series with a resilient-seated butterfly valve (Part 5, Chapter 12, Section 6.1.3 refers) --

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5. ECV-type check valves are not to be used in cargo piping systems of following types of ships; --
  - on ships for the carriage of liquefied gases in bulk; and
  - on ships for the carriage of chemicals in bulk, and
  - on ships for the carriage of oil in bulk, and
  - on ships, permanently or temporarily equipped oil recovery operations.
6. ECV-type check valve is not to be used in piping systems where flanged connections are required. --
7. ECV type check valve is not acceptable in piping systems where leakage or failure of the valve caused by fire could result in fire spread, flooding or loss of an essential service (Part 5, Ch.12 Sec.6.1.3) --

In addition the following product limitation(s) will be stated on the certificate:-

1. Grey Cast Iron (JL 1040) is not permitted to be fitted in following positions (Part 5, Ch.12, Sec.4.2.3);- --
  - Ship's side, bottom plating and sea chest;
  - Bilge and ballast piping in tanks and inside tunnels in double bottom;
  - Piping systems, containing media with temperatures below 0 deg.C and above 200 deg.C;
  - Piping systems subject to pressure shocks, excessive strains or vibrations;
2. Grey cast iron (JL 1040) not allowed for use in starting air systems.
3. ECV-type check valve is not acceptable for use in Class I and Class II piping systems;
4. Check valves are not allowed to be fitted on collision bulkhead or in overboard discharges on the ship's shell plating (scuppers and discharges) and sea chest connections;
5. In all cases, the materials of valve body, disc, seat and gaskets are to be suitable for the proposed service and media.
6. Valves are to be installed to Manufacturer's instruction and the satisfaction of the attending Surveyor. The shaft must be in vertical position when fitted in a horizontal pipe.



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## Appendix

1. The documents listed below have been examined

Document No.	Rev.	Title	Status	Date
PDS02.01.001	--	Product Data Sheet – Wouter Witzel - ECV	B	15 Feb. 2018
D-AKK170-B	2018.01.23	Butterfly Valve – ECV – DN50-600	B	15 Feb. 2018
1.403481	25-02.16	Body Machined DN50, PN16	B	15 Feb. 2018
1.403482	25-02.16	Body Machined DN65, PN16	B	15 Feb. 2018
1.403483	25-02.16	Body Machined DN80, PN16	B	15 Feb. 2018
1.403484	25-02.16	Body Machined DN100, PN16	B	15 Feb. 2018
1.403485	25-02.16	Body Machined DN125, PN16	B	15 Feb. 2018
1.403486	25-02.16	Body Machined DN150, PN16	B	15 Feb. 2018
1.403487	25-02.16	Body Machined DN200, PN16	B	15 Feb. 2018
1.403488	25-02.16	Body Machined DN250, PN16	B	15 Feb. 2018
1.403489	25-02.16	Body Machined DN300, PN16	B	15 Feb. 2018
1.403490	25-02.16	Body Machined DN350, PN16	B	15 Feb. 2018
1.403491	25-02.16	Body Machined DN400, PN16	B	15 Feb. 2018
LK1800-D	D	Body Machined DN450, PN16	B	15 Feb. 2018
LK2000-D	E	Body Machined DN500, PN16	B	15 Feb. 2018
LK2400-E	E	Body Machined DN600, PN16	B	15 Feb. 2018
1.401583	25-02.16	Body Casted DN50, PN16	B	15 Feb. 2018
1.401584	25-02.16	Body Casted DN65, PN16	B	15 Feb. 2018
1.401585	25-02.16	Body Casted DN80, PN16	B	15 Feb. 2018
1.401586	25-02.16	Body Casted DN100, PN16	B	15 Feb. 2018
1.401587	25-02.16	Body Casted DN125, PN16	B	15 Feb. 2018
1.401588	25-02.16	Body Casted DN150, PN16	B	15 Feb. 2018
1.401589	25-02.16	Body Casted DN200, PN16	B	15 Feb. 2018
1.401590	25-02.16	Body Casted DN250, PN16	B	15 Feb. 2018
1.401591	25-02.16	Body Casted DN300, PN16	B	15 Feb. 2018
1.401594	25-02.16	Body Casted DN350, PN16	B	15 Feb. 2018
1.401595	25-02.16	Body Casted DN400, PN16	B	15 Feb. 2018
FK1401-G	G	Body Casted DN450, PN16	B	15 Feb. 2018
FK1601-G	G	Body Casted DN500, PN16	B	15 Feb. 2018
FK2400-E	E	Body Casted DN600, PN16	B	15 Feb. 2018

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2. The documents listed below have been considered together with the submitted documents in the appraisal

Document No.	Rev.	Title	
<b>GRO1605085/2</b>	<b>20.02.17</b>	<b>Product Quality Assessment Form – 'Wouter Witzel Eurovalve - "ECV" Valves'</b>	
--	--	<b>Binder_'ECV – VK007658'.pdf</b>	<b>(5 pages)</b>
--	--	<b>Binder_'ECV – VK009383'.pdf</b>	<b>(1 page)</b>
--	--	<b>Binder_'ECV – VK009714 po1453-1 20170208'.pdf</b>	<b>(4 pages)</b>
--	--	<b>Binder_'EV.. + ECV – VK007796 POANMAT 54013 20170703.pdf</b>	<b>(103 pages)</b>
--	--	<b>Binder_'EV.. + ECV – VK003904.pdf</b>	<b>(78 pages)</b>

### Appraisal Status Key

- AQS Details to be submitted by the client to the local surveyor's Office responsible for surveying the building and the arrangements verified in accordance with the Rule/Regulations requirements by the surveyor.
- B Examined for compliance with the design and testing requirements of the Rules / Standards listed above and considered in order.

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