

# Product Solutions For Marine Applications

Fail-Safe  
Field-Proven  
Marine-Certified



**rexroth**  
A Bosch Company

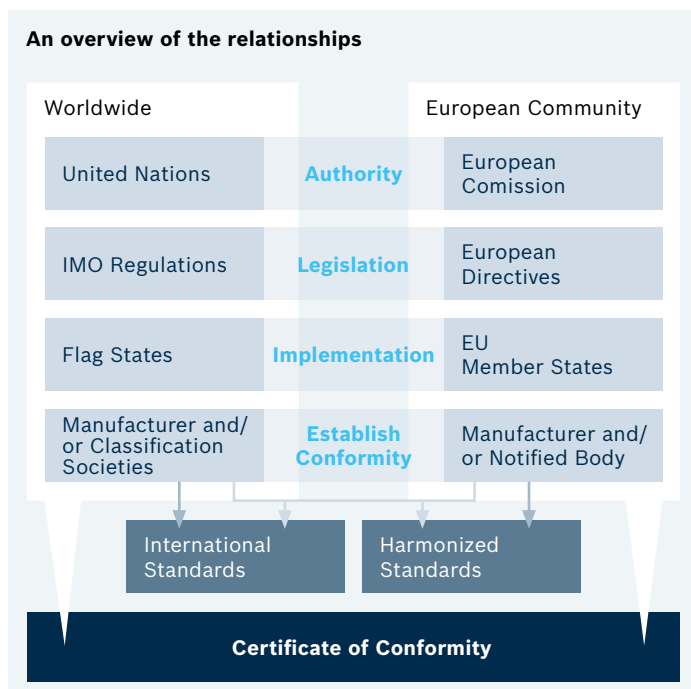
# Why are Marine Certifications necessary?

Worldwide statutory provisions enacted by the UN agency on shipping specify general regulations and rules necessary to obtain an operating license for all categories of ship, marine and offshore applications. The size, intended use and type of the ship, as well as the application of the ship's operating equipment and installation room, define the mandatory types of inspection documents and certificates needed for approval. With higher hazard potential, the legal requirements and approval tests required to be accepted and certified by the respective classification society become stricter.

## International Maritime Legislation

The International Maritime Organization (IMO) is a specialized agency of the United Nations (UN). Its primary purpose is to develop and maintain a comprehensive regulatory framework for shipping. Its remit includes safety, environmental concerns, legal matters, technical co-operation, maritime security and shipping efficiency.

IMO is the source of approximately 60 legal instruments that guide the regulatory development of its member states to improve safety at sea, facilitate trade among seafaring states and protect the maritime environment. The most well known are the International Convention for the Safety of Life at Sea (SOLAS), International Convention for the Prevention of Maritime Pollution (MARPOL) and International Convention of the Safe and Environmental Sound Recycling of Ships ("Green Passport").



## Classification Societies

A classification society is a non-governmental organization that establishes and maintains technical standards for the construction and operation of ships and offshore structures based on IMO regulations. The society also validates that construction follows these standards and carries out regular surveys to ensure compliance with the standards. To avoid liability, societies assume no responsibility for the safety, practical capabilities or seaworthiness of the ship.

Classification societies set technical rules, confirm that designs and calculations meet these rules, survey ships and structures throughout construction and commissioning, and periodically survey completed vessels to ensure that they continue to meet the standards.

Classification societies are also responsible for classifying oil platforms, submarines and other offshore structures. This survey process covers diesel engines, important ship-board pumps and other vital machinery. Classification surveyors inspect ships to make sure that its components and machinery are built and maintained according to the standards required for their class. Typically, classification societies provide general requirements for ships and application specific requirements in standards (e.g. standard for lifting appliances, standard for mobile offshore drilling units MODU).

The major classification societies are members of the International Association of Classification Societies (IACS), which is a technically-based organization consisting of twelve marine classification societies headquartered in London. Marine classification is designed to promote occupational safety, property and the environment. This is achieved through the establishment and verification of compliance with technical and engineering standards for the design, construction and life-cycle maintenance of ships, offshore units and other marine-related facilities. These standards are contained in rules established by each society.

Although IACS is a non-governmental organization, it plays a role within IMO, for which IACS provides technical support and guidance and develops unified interpretations of the international statutory regulations developed by the member states of the IMO. Once adopted, these interpretations are applied by each IACS member society when certifying compliance with statutory regulations on behalf of authorizing flag states.

#### Twelve Members of IACS – the International Association of Classification Societies



# Types of inspection documents and certificates according to EN10204

Depending on the function for which a product is used, specific approval from classification societies may be required. This specific product approval or certification requires the societies' involvement for establishing individual product certificates or issuing general applicable product type approvals. Product certificates may be according to standard EN10204, while type-approval certificates require a specific format from the society involved.



Each type of certificate mentioned below is available as a material or function certificate.\*

## Declaration of Compliance with the order "Type 2.1"

Document in which the manufacturer declares that the products supplied are in compliance with the requirements of the order, without inclusion of the test results.

## Test report "Type 2.2"

Document in which the manufacturer declares that the products supplied are in compliance with the requirements of the order and in which they supply test results based on a non-specific inspection.

\* Material certificates only refer to (raw) material properties and function certificates refer to functional features of the products.



► **Summary of inspection documents**

EN10204 Reference	Designation of Document Type	Document Content	Document validated by
Type 2.1	Declaration of compliance with the order	Statement of compliance with the order	The manufacturer
Type 2.2	Test report	Statement of compliance with the order, with indication of results of non-specific inspection	The manufacturer
Type 3.1	Inspection certificate 3.1	Statement of compliance with the order, with indication of results of specific inspection	The manufacturer's authorized inspection representative independent of the manufacturing department (internal second authority)
Type 3.2	Inspection certificate 3.2	Statement of compliance with the order, with indication of results of specific inspection	The manufacturer's authorized inspection representative independent of the manufacturing department and either the purchaser's authorized inspection representative or the inspector designated by the official regulations (third-party witness)

**Inspection Certificate 3.1 "Type 3.1"**

Document issued by the manufacturer in which they declare that the products supplied are in compliance with the requirements of the order and in which they supply test results. The test unit and tests to be carried out are defined by product specification, official regulation and its corresponding rules and/or the order. The document is validated by the manufacturer's authorized inspection representative, independent of the manufacturing department (e.g. quality management).

It is permissible for the manufacturer to transfer relevant test results previously obtained by a specific inspection on primary or incoming products to an inspection certificate 3.1, provided that the manufacturer operates traceability procedures and can provide the required corresponding inspection documents.

**Inspection Certificate 3.2 "Type 3.2"**

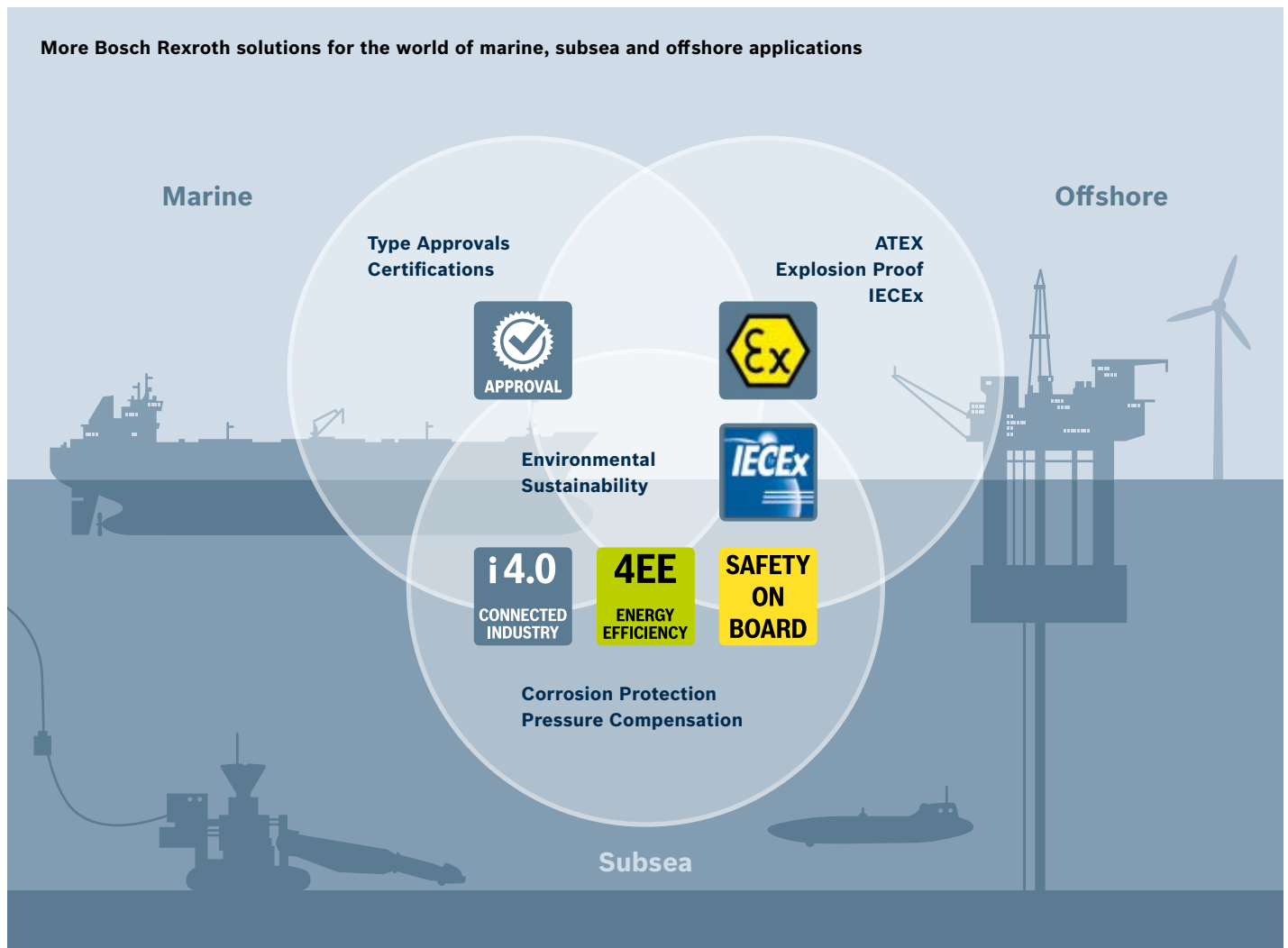
Document prepared by both the manufacturer's authorized representative, independent of the manufacturing department and either the purchaser's authorized representative or the inspector designated by the official regulations and in which they declare that the products supplied are in compliance with the requirements of the order and in which test results are supplied.

It is permissible for the manufacturer to transfer relevant test results previously obtained by a specific inspection on primary or incoming products to an inspection certificate 3.2, provided that the manufacturer operates traceability procedures and can provide the required corresponding inspection documents.

# Overview: Product Solutions for Marine Applications

Bosch Rexroth offers a wide range of certified products, assemblies and systems for all kind of marine applications, both on deck and below deck. The different technologies – hydraulic, mechanical and electric – or combinations of these, enable us to supply the best drive and control solutions to our customers from a single source. Stay on course with reliable, robust and certified products from Bosch Rexroth. We move, you win.

More Bosch Rexroth solutions for the world of marine, subsea and offshore applications





FIVA Valves



Winch Control Blocks



Internal Gear Pumps



Filters



Hydraulic Valves



Winch Drives



Manifolds



Hydraulic Power Units



Axial Piston Pumps



Swing Drives



Radial Piston Motors



Hägglungs Drive Units



Axial Piston Motors



Sensors



Electric Controls



Electric Drives





Hydraulic Cylinders



Large Hydraulic Cylinders



Product groups/Type Code	Data sheet	Brochure or Catalogue	Achievable/Available Types of Certificates			
			Type Approval	3.2 Inspection Certificates: Material and/or Function	3.1 Inspection Certificates: Material and/or Function	
<b>Hydraulics</b>						
<b>Directional Proportional Servo Solenoid Valves</b>						
4WRPE 6 ... -948	29020		x	x	x	
4WRPE 6 ... -960	29025		x	x	x	
<b>Proportional Pressure Relief Valves</b>						
DBEBE6X-1X/...-12	29159		x	x	x	
<b>Directional Control Valves</b>						
STW0175-1X (FIVA1000)	29101	R999000228	x	x	x	
STW0280-1X (FIVA2000)	29101	R999000228	x	x	x	
STW0280-2X (FIVA2000)	29101	R999000228	x	x	x	
<b>Directional Spool Valves</b>						
4WMM 6 ... SO900	22280				x	
4WMR 6 ... SO900	22280				x	
4WMU 6 ... SO900	22280				x	
H5-4WMM 10 ... SO900	22334				x	
<b>Axial Piston Units</b>						
Pumps of Types A1 ... A30		R999000369		x	x	
Motors of Types A2 ... A10		R999000371		x	x	
Accessory: Electric Swivel Angle Sensor			x	x	x	
<b>Internal Gear Pumps</b>						
PGH-2X/ 5 ... 16	10223	R999000369		(x)	x	
PGH-3X/ 20 ... 250	10227	R999000369		(x)	x	
<b>Radial Piston Motors</b>						
Hägglands CAB	15354	R999000371	x		x	
Hägglands CA	EN410-35h	R999000371	x		x	
Hägglands CB	15302	15302-01	x		x	
Hägglands CBM	15300	15300-01	x		x	
Hägglands CBP	EN817-7h	R999000371	x		x	
Hägglands VI	EN322-12h	EN397-4a	x		x	
<b>Accessories for Radial Piston Motors</b>						
VI brake cylinders			x		x	
VI brake assembly			x		x	
VI brake bracket			x		x	
MDA brake			x		x	
VI V46 valve						x
COCB valve				x		x
<b>Winch Control Blocks</b>						
YM-WCB ... 16 ... -4X ...	65051			(x)	x	
<b>Winch Drives</b>						
MOBILEX GFT-W	77502			(x)	x	
MOBILEX GFW 5000	77506			(x)	x	
<b>Swing Drives</b>						
MOBILEX GFB	77201			(x)	x	
MOBILEX GFB 8000	79058			(x)	x	
<b>Filters</b>						
25TE ... (Return single)	51472				x	
63FLDKN ... (Pressure Duplex)	51445		(x)		x	
150LDN ... (Pressure Duplex)	51446				x	
245/350/445LEN ... (Pressure single)	51421				x	
245/350PSFN ... (Pressure single)	51418				x	
450FEN...-2X... (Pressure single)	51467				x	
16 FKE / FKD... (Pressure single / Duplex)	58B				x	
16 FE / 16 FD... (Inline single)	51403				x	
100/450 EL .... (Inline single)	43B				x	



Notes		
2.2 Test report	2.1 Declaration of compliance with the order	
x	x	Type approved by ABS, BV, CCS, DNV-GL, KR, LR, NK and RINA
x	x	Type approved by ABS, BV, CCS, DNV-GL, KR, LR, NK and RINA
x	x	Type approved by ABS, BV, CCS, DNV-GL, KR, LR, NK and RINA
x	x	Type approved by ABS, BV, CCS, DNV-GL, KR, LR, NK and RINA
x	x	Type approved by ABS, BV, CCS, DNV-GL, KR, LR, NK and RINA
x	x	Type approved by ABS, BV, CCS, DNV-GL, KR, LR, NK and RINA
x	x	Description of special design SO900: All components pressurised with p ≥ 16 bar are made of materials with elongation ≥ 12%; tensile strength ≤ 650 N/mm <sup>2</sup> ; melting point ≥ 927 °C (based on the corresponding shipbuilding guidelines) Max. pressure in line T = 16 bar
x	x	Individual approval by ABS, BV, CCS, DNV-GL, KR, LR, NK, RINA and RS
x	x	Individual approval by ABS, BV, CCS, DNV-GL, KR, LR, NK, RINA and RS
x	x	Type approved by ABS, BV, CCS, DNV-GL, KR, LR, NK, RINA and RS
x	x	(x) = on request
x	x	(x) = on request
x	x	Type approval by DNV MSA
x	x	Type approval by DNV MSA. CA210 Type Approval by RS
x	x	Type approval by DNV MSA. CB400, CB560 Type Approval by RS
x	x	Type approval by DNV MSA
x	x	Type approval by DNV MSA
x	x	Type approval by DNV MSA. VI84 Type Approval by RS
x	x	Type approval by DNV
x	x	Type approval by DNV
x	x	Type approval by DNV
x	x	MDA 7-10 Type Approval by DNV. MDA 14-21 Type Approval by DNV pending
x	x	
x	x	Type approval by RS
x	x	(x) = on request. YM-WCB16 is combinable with the A6VM hydraulic motor
x	x	(x) = on request. Optional with fixed motor A2FM/E or variable motor A6VM/E available
x	x	(x) = on request. Optional with fixed motor A2FM/E or variable motor A6VM/E available
x	x	(x) = on request
x	x	(x) = on request
x	x	Please order maintenance indicator made of brass (B2.2) or made of stainless steel (F2.2)
x	x	Type examination by LR: 63bar for sizes 0063-0100 and 48bar for sizes 0130-0250
x	x	Please order maintenance indicator made of brass (V5,0)
x	x	Please order maintenance indicator made of brass
x	x	Please order maintenance indicator made of brass
x	x	Please order maintenance indicator made of brass
x	x	Please order maintenance indicator made of steel or made of stainless steel
x	x	
x	x	Stainless Steel - Inline Filters

**Footnotes and Legend**

x = available per order

(x) = available on request








MSA = Manufacturing Survey Agreement,

TA = Type Approval

**General Information**

Inspection Certificates „type 3.2“ are possible as individual approval by only one Class for systems, e. g. power units, motor-pump-groups, manifolds, cylinders. Inspection Certificates „type 3.1“, Test reports „type 2.2“ and Declarations of compliance with the order „type 2.1“ are possible for almost all of our sub-systems, products and components, e. g. manifolds, cylinders, pumps, motors, valves, filters.



Product groups/Type Code	Data sheet	Brochure or Catalogue	Achievable/Available Types of Certificates		
			Type Approval	3.2 Inspection Certificates: Material and/or Function	3.1 Inspection Certificates: Material and/or Function
<b>Electrics</b>					
<b>Electric Controls</b>					
IndraControl XM22	R999000426	R911340667	x	x	x
IndraControl S20	R999001321		x	x	x
<b>Electric Drives</b>					
IndraDrive ML	R999000340		x	x	x
<b>Sensors</b>					
HM20 Series 2X (Pressure Transducer)	30272		x	x	x
<b>Assemblies and Systems</b>					
<b>Cylinders</b>					
CDH ... (Mill type)	08130			x	x
CYT ... (Tie rod type)				x	x
CYH ... (Mill type)				x	x
LHC (Large Hydraulic Cylinders)		R999000121		x	x
<b>Manifolds</b>					
ABVSK-AGEV1 ...				x	x
<b>HPU – Hydraulic Power Units</b>					
ABPAC-Marine 3 ... 90 kW				(x)	(x)
MHPU 350 ... 3000 kW			x	x	x
ABVPG- ...				x	x
ABYAG-				x	x
Hägglands PAC/PBC	15322	15322-01			x
Hägglands DUE	15325	15325-01			x
Hägglands DUP					x
Hägglands DUH					x

Notes		
2.2 Test report	2.1 Declaration of compliance with the order	
x	x	Type approved by ABS, BV, DNV-GL, LR, and RINA
x	x	Type approved by ABS, BV, DNV-GL, LR, and RINA
x	x	Type approved by ABS, BV and DNV-GL
x	x	Type approved by DNV-GL
x	x	Individual approval by ABS, BV, CCS, DNV-GL, KR, LR, NK, RINA and RS
x	x	Individual approval by ABS, BV, CCS, DNV-GL, KR, LR, NK, RINA and RS
x	x	Individual approval by ABS, BV, CCS, DNV-GL, KR, LR, NK, RINA and RS
x	x	Individual approval by ABS, BV, CCS, DNV-GL, KR, LR, NK, RINA and RS
x	x	Individual approval by ABS, BV, CCS, DNV-GL, KR, LR, NK, RINA and RS
(x)	(x)	
x	x	Individual approval. Marine Design Appraisal Document by LR and DNV-GL
x	x	Individual approval by ABS, BV, CCS, DNV-GL, KR, LR, NK, RINA and RS
x	x	Individual approval by ABS, BV, CCS, DNV-GL, KR, LR, NK, RINA and RS
x	x	Individual approval case-by-case by ABS, BV, DNV-GL, LR and PRS
x	x	Individual approval by ABS, BV, DNV-GL, LR, and PRS
x	x	Individual approval by ABS, BV, DNV-GL, LR, and PRS
x	x	Individual approval by ABS, BV, DNV-GL, LR, and PRS

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x = available per order  
(x) = available on request  
MSA = Manufacturing Survey Agreement,  
TA = Type Approval

**General Information**

Inspection Certificates „type 3.2“ are possible as individual approval by only one Class for systems, e. g. power units, motor-pump-groups, manifolds, cylinders. Inspection Certificates „type 3.1“, Test reports „type 2.2“ and Declarations of compliance with the order „type 2.1“ are possible for almost all of our sub-systems, products and components, e. g. manifolds, cylinders, pumps, motors, valves, filters.



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**Advice:**

This brochure is intended to provide a brief overview of the main products which are already available with marine certificates. If you are missing a component or product please contact our team.

**Find your local contact person here:**

[www.boschrexroth.com/contact](http://www.boschrexroth.com/contact)

**Further information:**



**Marine**

Brochure R999001175  
[www.boschrexroth.com/marine](http://www.boschrexroth.com/marine)



**Subsea**

Brochure R999000122  
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**Offshore**

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**Large Engines**

Brochure R999000228  
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The data specified only serve to describe the product. No statements concerning a certain condition or suitability for a certain application can be derived from our information. The information given does not release the user from the obligation of own judgment and verification. It must be remembered that our products are subject to a natural process of wear and aging.