



SERVING
SAFETY

Mors Smitt Industrial Technology
Products & Services

Mors Smitt

A Wabtec Company

Mors Smitt is part of Wabtec Corporation. A global provider of value-added, technology-based products and services for railway, transit, freight and other industrial markets, with facilities world wide.

Business activities
 Railway technology
 Industrial technology

Core competence
 Protection and Control of electrical circuits and systems in mission-critical applications serving rail car builders, rail operators, contractors and power utilities worldwide.

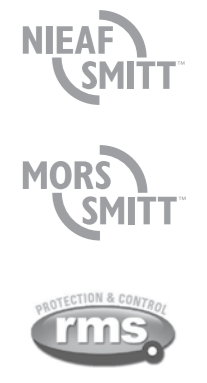
Mission statement
 To be preferred a supplier by offering safe, reliable and cost-effective solutions with focus on quality and operational excellence exceeding customer expectations.

Vision
 World leader in relay technology in railway and power markets. World leader in train borne energy measuring systems.

Our sectors

- Railway rolling stock components**
Relays, relay life services, miniature circuit breakers, transducers.
- Railway rolling stock systems**
Engineered solutions, energy measurement, power control, services.
- Railway signalling & train protection**
Signalling relays, train protection, systems, services.
- Power utility**
Relays, protection relays, test block systems, arc flash monitoring.
- Heavy industry, oil & gas**
Relays, engineered solutions, services.
- Maritime instruments**
Bridge(-wing) & ship control room instrumentation.
- Portable instruments**
Test & measuring equipment, calibration services.

Legacy brands



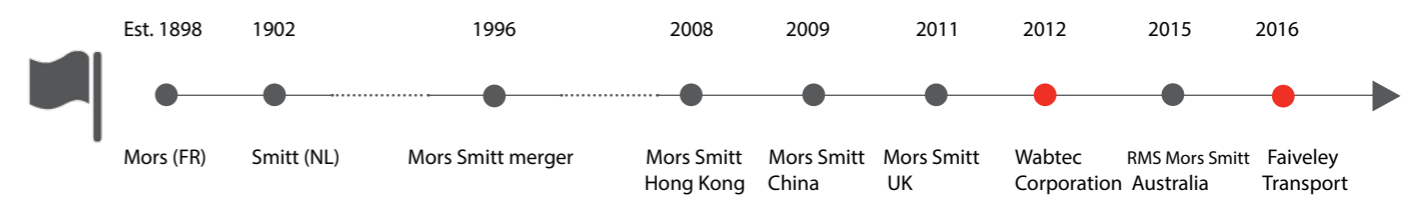
Employees
 460 (50 engineering, 35 sales & support)

Quality standards
 IRIS, ISO 9001, ISO 14001

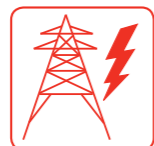
Global reach
 5 manufacturing sites
 6 sales & support offices



History



The markets we serve



Power utility

Economic growth in developing countries, search for environmental friendly power generation and fail safe operations are pushing the sector's ongoing upgrading, modernization and technical refinement.

This is the world in which Mors Smitt has invested best efforts, parts and components that work unquestioningly, offer a long effective life and result in low lifecycle cost.



Maritime instruments

World wide international trade and offshore oil and wind park sectors push the shipbuilding industry.

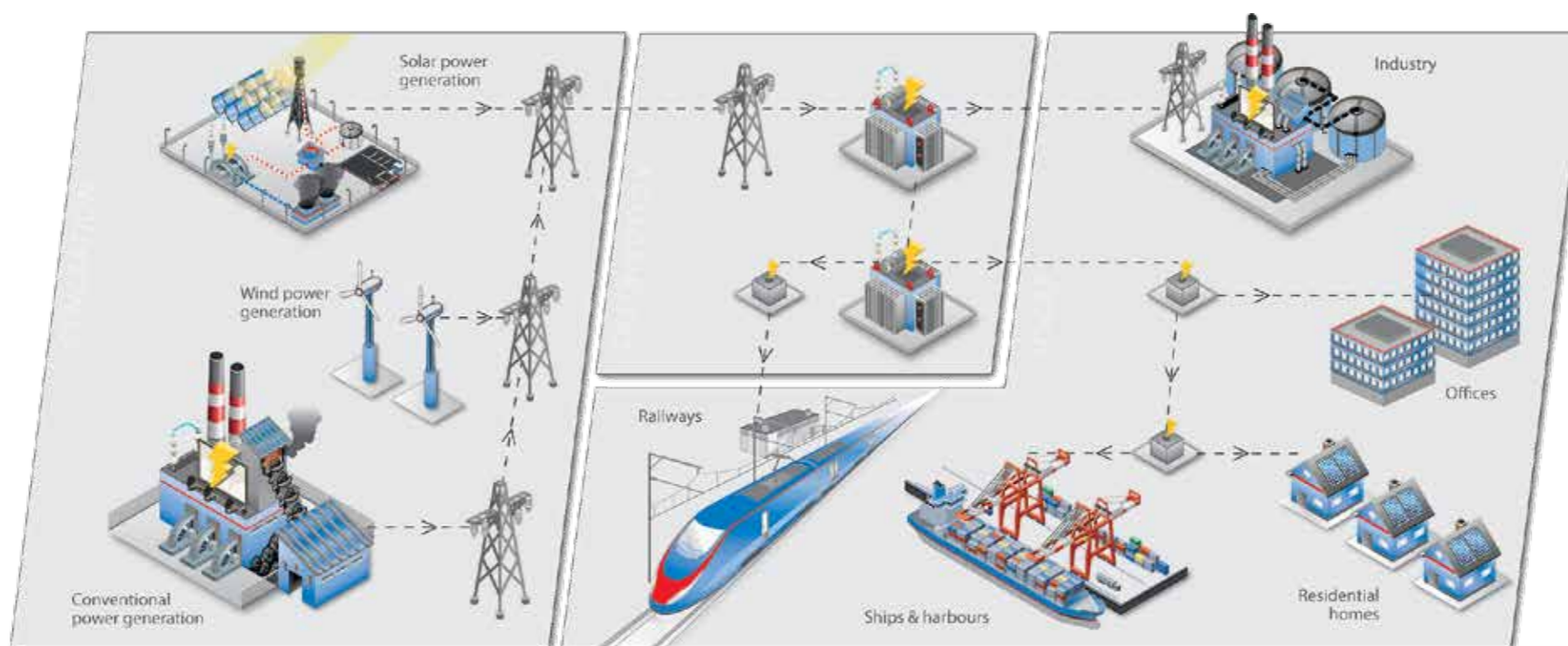
Reliable navigation supports shipping companies to maintain their delivery deadlines. Mors Smitt offers a comprehensive range of navigation instruments according MED-Marine Equipment Directive.

Heavy industry, oil & gas



The heavy industry, oil & gas world is characterized by a tough and uncompromising working environment.

Constant vibrations, dust, temperature and humidity variations and electric disturbances mean that components must work under harsh conditions, putting heavy demands on their reliability. For this environment Mors Smitt developed its D-relays "Solve-all" concept.



Portable instruments



Mors Smitt offers portable instruments marked under the 'Nieaf-Smitt' brand.

Supporting the electrical installation sector's demand for easy to use test & measuring instruments supporting their daily operations in low voltage electrical installations and maintenance.





Relays for protection & controls systems

Millions of relays used daily for power utility protection and control applications.

Mors Smitt is a total supplier supporting the power industry by combining electro-mechanical know-how and state-of-the-art electronics in ultra-reliable products.

Product range

- » Auxiliary, trip & supervision relays
- » Protection relays
- » 6R MATRIX auxiliary, trip & supervision
- » Test block & plug systems
- » Arc flash monitoring
- » PO3000 relays
- » Jones & Nathan RP relays
- » Plug-in power relays
- » General purpose relays



Auxiliary, trip and supervision relays

Alpha relays

New generation of high performance auxiliary, trip and supervision relays with up to 12 contacts. Designed for high voltage protection and control applications, Multi-contact high-speed trip relays ensure fast and reliable operation. Modular draw-out case suitable for both flush panel & 19" rack mounting

Delta relays

Compact, high performance and flexible solution for sub-station protection and control applications. Up to 4 heavy duty contacts with magnetic arc blow-out. Both flush mounting and plug-in 35 mm rail socket mounting options.

D relays

Dedicated relay series for demanding protection and control applications in power-utility and heavy industry. Up to 8 contacts with magnetic arc blow-out. Wide range of models and mounting sockets.



Testblocks

Flexible and high performance test block systems with a focus on operator safety for monitoring and secondary injection testing of power system protection schemes in conjunction with multi-fingered test plugs.

- » 2U high 19-inch rack or flush mounting
- » Wide range of auxiliary relay functions
- » 14 or 28 test circuits models available
- » Finger safe sockets
- » Staged isolation



Modular Auxiliary Relay Systems

The Delta-Flex System provides a flexible and cost effective method to mount and wire a wide range of performance auxiliary relays.

- » 2U high 19-inch rack or flush mounting
- » Wide range of auxiliary relay functions
- » Specify components or complete sub-rack system
- » M4 screw terminals suitable for ring lugs
- » Integrated front panel covers
- » Custom panel labelling



Arc Fault Monitor

The arc fault protection system provides an extensive range of high speed protection devices for the optical detection of insulation break-down in air insulated metal clad switchgear and bus bar systems.

A trip signal can be achieved in less than 10ms using arc detection only or within 15ms when using overcurrent check. Significantly faster than a traditional IDMT overcurrent relay.



Approvals

Mors Smitt relays are used around the globe. Besides product specific testing and certification Mors Smitt relays are also approved, certified and in use by many utilities. Our global Mors Smitt network of regional sales offices can support in complying utility specific demands and/or obtaining utility approval.

All equipment is designed, tested and manufactured in compliance with the strictest international standards and always with reliability and safety in front of mind.



Electromechanical relays

World's widest relay range, compliant to the strictest international industrial standards. Our wide relay portfolio is focused on markets sectors like; power generation & distribution, oil & gas industry, factory automation, petro-chemical & water treatment plants and key figures.

- » 10 million in use in world wide
- » Wide range of panel or surface mount sockets/bases
- » Proven safety validation in critical applications
- » Galvanic separation of control and power circuit(s)
- » Insensitive to electromagnetic disturbances (EMI/EMP)
- » Proven reliable and low Life-Cycle-Cost (LCC)
- » Fail-safe hard-wired relay logic (cyber-attack-proof)



Relay life services

Products, tools and services that help our customers optimizing system performance.

- » Training
- » Application support
- » System analyses
- » Relay testers
- » Relay performance monitoring
- » Maintenance consulting



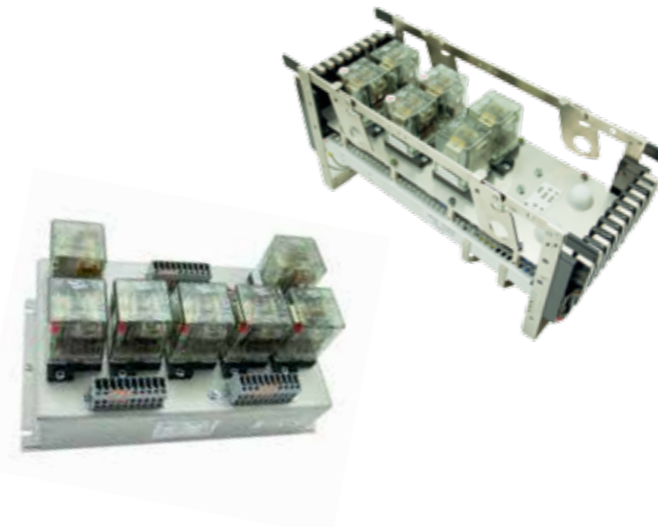
Industrial plug-in power relays

The unique D-relays power relay concept and miniature C-relays are specifically designed for heavy duty applications in power-utilities oil & gas industries and mining. High DC breaking capacity and inductive load switching offer long electrical life and low life cycle costs.

The Solve-All™ relay application concept offers ultimate flexibility to design and supply tailor made D- relays power products. Today the D-relays power are used in its millions across the world.

Product range

- » Instantaneous relays
- » High speed tripping relays
- » Latching/bi-stable relays
- » Timer relays
- » Measuring & monitoring relays
- » Pulse transducing relays
- » Relay sockets & accessories



Engineered solutions

Relay panels, circuit breaker panels, EDB electrical distribution boards, power distribution boards, relay modules / PCB's.

- » Training
- » Application support
- » System analyses
- » Relay testers
- » Relay performance monitoring
- » Maintenance consulting

New built, retrofit or replacement of obsolete parts, Mors Smitt delivers a perfect, competitive and on-time solution for any challenge of space limitations and / or technical requirements.



General purpose relays

Our high quality general purpose relays are applied mainly in industrial and power automation systems, in signalling and protection systems, and in other control and electric drive systems.

Suitable for more common controlling applications like building automation or HVAC systems.

Relays are either pin-to-pin compatible to global industry standards or suitable for 35 mm rail mounting.

Product range

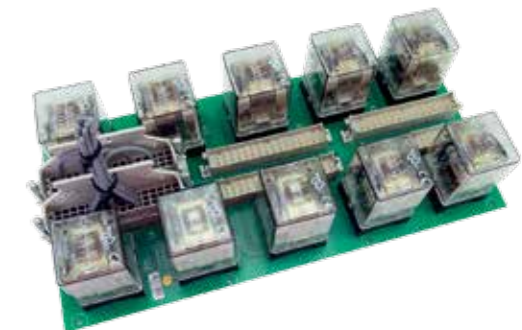
- » Instantaneous relays
- » Latching relays
- » Measuring & monitoring relays
- » Timer relays
- » Sockets & accessories



Panel solutions



Replacement solutions



Retrofit solutions



Bridge (wing) & ship control room instrumentation

Nieaf-Smitt maritime instruments are designed, engineered and manufactured for bridge, bridge-wing and control/rudder room applications on board of ships. Prime applications such as propulsion, steering and navigation are covered with a wide range of dedicated products.

All are made to the strictest prevailing standards and carry type approval and MED certification for applications such as speed, RPM, rudder angle, pitch and rate of turn.



Products groups

Bridge (wing) instruments for maritime applications. Keyword for our production and R&D is flexibility. All instruments are produced on customer request and built on order. We primarily produce navigation instruments for bridge, bridge wing and control room installation. For example for speed, RPM, rate of turn, and pitch. Especially rudder indication is a very important application.

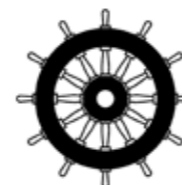
Coming from traditional electromechanical technology, the latest developments in maritime instrumentation are based on processor controlled stepper motor technology and digital communication (bus). Offering ultimate flexibility in terms of interfacing with 'the outside world'.



MED- Marine Equipment Directive

The International Maritime Organisation and the European standardisation organisations have adopted standards, including detailed testing standards, for a number of items of equipment which are listed in Annex A.2 to Directive 96/98/EC or which, albeit not listed, are considered relevant for the purpose of the said Directive.

- For indicators 5 directives are stated:
- A.1/4.7 Speed and distance measuring equipment
 - A.1/4.9 Rate of turn indicator
 - A.1/4.20 Rudder angle indicator
 - A.1/4.21 Propellor revolution indicator (RPM)
 - A.1/4.22 Pitch indicator



RAI - Rudder Angle Indication system

The Nieaf-Smitt rudder angle indication system is characterized by a diversity of indicators, in size, scales, and protection grades. The 3-face panoramic indicator and outdoor indicators according Panama Canal regulations. The system is completed by a signal calibration box and rudder angle transmitter, offering seamless adjustment to the ship, for up to 10 indicators.

- System components
- » 3-face panoramic ceiling mount indicator
 - » Rudder angle indicators for indoor use, in different dimensions & scales
 - » Rudder angle indicators for outdoor use (IP66), in different dimensions & scales
 - » Waterproof stainless steel outdoor indicators housings, IP66
 - » Scale illumination dimmers
 - » Signal calibration box for seamless adjustment
 - » Rudder angle transmitter



Moving coil indicators

- » Pointer rotation up to 90 or 240°
- » Signal & illumination options
- » Housing/dimensions options



Waterproof housing

- » IP66, for 1, 2, 3 or 4 indicators
- » 2 cableglands
- » Dimmer knob



Stepper indicators

- » Stepper motor technology
- » High accuracy
- » 360° pointer rotation



Panorama rudder indicators

- » Deckhead rudder indicator
- » 3 scales & 3 pointers
- » Integrated illumination dimmer



Azimuth CAN indicators

- » Hybrid stepper technology (0.25% accuracy)
- » Analogue signal input
- » 360° pointer rotation



Signal calibration box

- » Designed to convert signals from a (rudder) sensor and to display the corrected signals on one or more panel indicators



Rudder angle transmitter

- » Training
- » Application support
- » System analyses
- » Nog iets



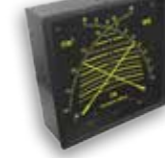
Rudder junction box

- » Connects up to 10 indicators to a rudder transmitter signal and feeds the internal illumination of the RAI-indicators



Navy indicators

- » Shockproof instruments for heavy-duty applications in the marine/submarine industry



Specials

- » The unique cross-pointer instrument is equipped with 2 measuring systems, each with its own pointer and scale (for dredging)



Portable test & measuring equipment

Wide range of high quality portable test & measuring equipment to support basic 'every-day' testing and guarantee fail-safe operations of low-voltage electrical installations.

Test instruments

User friendly portable testers to support 'every-day' testing and checking of low-voltage electrical installations

- » Test tools / 2-pole voltage testers
- » Environmeters
- » Multimeters
- » Current clamps
- » Earth leakage clamp
- » Current clamp adapters



Nieaf-Smitt

All portable test & measuring equipment is marketed under our legacy 'Nieaf-Smitt' brand name. Worldwide availability is assured by a network of professional, trained and dedicated subsidiaries, distributors and agents, offering local service and support.

Measuring instruments

Dedicated measuring instruments to guarantee check and guarantee fail-safe operations of electrical appliances and low-voltage electrical installations.

- » Solar testers
- » Installation testers
- » Power Analysers
- » Portable appliance testers



Calibration services

Mors Smitt has a professional calibration center. All electrical measurement equipment can be calibrated (for example; multimeters, current clamps, temperature meters, installation testers, power meters, safety testers, etc.).

We offer calibration services for all Mors Smitt portable test & measuring equipment as well as other brands.



Repair services

Mors Smitt provides a modern state of the art repair division, meeting the ISO 9001 and ISO 14001 standards. Our repair department is run by experienced technicians and provide an rapid and accurate service.

Over the years Mors Smitt has gained much know-how in this field, resulting in optimizing our support and services.



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**THE WESTINGHOUSE
AIRBRAKE COMPANY**

OUR MILESTONES

- 1869 Invention of air brake
- 1908 Introduction 1st pension fund
- 1913 Introduction 1st paid vacation days
- 1968 Purchased by American Standard
- 1990 Purchase in management buyout
- 1995 Initial public stock offering
- 1999 Changed name to Wabtec
- 2015 Exceeded \$3.3 billion in sales




GEORGE WESTINGHOUSE (1846-1914)


TODAY

Wabtec Corporation is a global provider of value-added, technology-based products and services for railway, transit, freight and other industrial markets. Wabtec is also specialised in aftermarket services.

 Trucks & Components

 Electronics & Control

 Positive Train Control


 Current Collecting

 Signalling & Wayside

 Brake & Friction


 Doors & Couplers

 Locomotives

 Pneumatics

 Suspensions

 Cooling & HVAC

 Parts, Reconditioning & Overhaul

Akapp-Stemmann
Austbreck
Bach-Simpson
Barber Spring
Barber Steel Foundry
Bearward Engineering
Becorit
Brecknell Willis
Brecknell Willis Composites
Brush Traction
Cardwell Westinghouse
CoFren
Dia-Frag
Durox
Faiveley
Fandstan Electric Group
FIP Brakes
Fulmer Company
G&B Specialties
Gerken Group
GT Engineering
Hunslet Engine Company
LH Group
Longwood Elastomers
Microphor

Mors Smitt
MotivePower
MTC
Napier Turbochargers
Perma-Cast
Poli
Pride Bodies
Railroad Controls
Railroad Friction Products
Ricon
SanCasT
Schaefer Equipment
Standard Car Truck
Stemmann-Technik
Swiger Coil Systems
Track IQ
TransTech
Triangle Engineered Products
Turbonetics
Unifin
Unitrac
Vapor Bus International
Vapor Europe
Vapor Stone Rail Systems
WABCO Freight Car Products

WABCO Locomotive Products
Wabtec Australia
Wabtec Brazil
Wabtec China
Wabtec Control Systems
Wabtec de Mexico
Wabtec Europe
Wabtec Foundry
Wabtec Global Services
Wabtec Huaxia Technology
Wabtec India Transportation
Wabtec MZT
Wabtec Passenger Transit
Wabtec Poland
Wabtec Rail UK
Wabtec Rail Scotland
Wabtec Railway Electronics
Wabtec Rubber Products
Wabtec Russia
Wabtec Shenyang CNR
Wabtec South Africa
Wabtec Texmaco Rail
Xorail
Young Touchstone

WWW.WABTEC.COM



Mors Smitt Asia Ltd.
29/F., Fun Tower, 35 Hung To Road,
Kwun Tong, Kowloon, Hong Kong SAR
Tel: +852 2343 5555
sales.msa@wabtec.com

Mors Smitt B.V.
Vrieslantlaan 6,
3526 AA, Utrecht, Netherlands
Tel: +31 (0)30 288 1311
sales.msbv@wabtec.com

Mors Smitt Sales & Support - Brazil
Sao Paulo, Brazil
sales.msfb@wabtec.com

Mors Smitt Sales & Support - China
Zhongshan, P.R. China
sales.msa@wabtec.com

Mors Smitt France SAS
Tour Rosny 2, Avenue du Général de Gaulle,
F-93118 Rosny-sous-Bois, France
Tel: +33 (0)14812 1440
sales.msfr@wabtec.com

Mors Smitt Technologies Ltd.
1010 Johnson Drive,
Buffalo Grove, IL 60089-6918, USA
Tel: +1 847 777 6497
salesmst@wabtec.com

Mors Smitt Sales & Support - Gulf Region
Abu Dhabi, United Arab Emirates
sales.rms@wabtec.com

Mors Smitt Sales & Support - India
Bangaluru, India
sales.msa@wabtec.com

Mors Smitt UK Ltd.
Graycar Business Park, Barton under Needwood,
Burton on Trent, DE13 8 EN, United Kingdom
Tel: +44 (0)1283 722 650
sales.msuk@wabtec.com

RMS Mors Smitt
6 Anzed Court,
Mulgrave, VIC 3170, Australia
Tel: +61 (0)3 8544 1200
sales.rms@wabtec.com

Mors Smitt Sales & Support - Malaysia
Kuala Lumpur, Malaysia
sales.rms@wabtec.com

www.morssmitt.com

