

### /// Plug-in industrial relay with 2 contacts

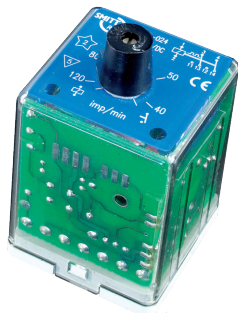
Rugged plug-in relays for extreme reliability, within long endurance

**This relay is obsolete  
from January 1, 2023**

## FDA

Flashing relay

Part of D-platform



## Description

Plug-in electronic pulsing relay with two change-over contacts, suitable for DC and AC coil voltage (50/60 Hz). When the relay is activated the coil starts with an interval. The pulse time and interval time are equal. The pulsing frequency is adjustable with a lockable knob. The relay can also be supplied with a fixed pulsing frequency (no knob). The relay is standard equipped with double zener diode coil protection.

The construction of the relay and choice of materials makes the FDA relay suitable to withstand low and high temperatures, shock & vibrating and dry to humid environments.

No external retaining clip needed as integrated 'snap-lock' will hold relay into socket under all circumstances and mounting directions.

Compact design, choice of many options and a wide range of sockets makes the FDA relay an easy and flexible solution to use.

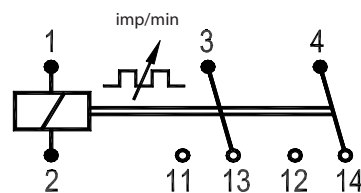
## Application

These relay series are designed for demanding industrial applications where a pulse frequency in output is necessary after activating the relay.

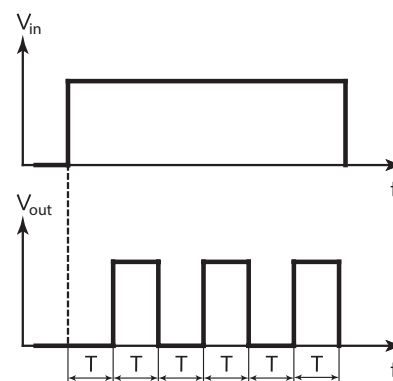
## Features

- Flashing relay (symmetrical)
- Duty cycle: 1/2
- DC and AC (50/60 Hz) input
- Standard coil is 50 Hz (60 Hz on request)
- Compact plug-in design
- 2 C/O contacts
- Pulse time adjustable with a lockable knob
- Pulse times between 0.5 s - 3 s
- Also available with fixed pulse time (no knob)
- Double zener diode coil protection
- Flat, square and silver plated relay pins for excellent socket connection
- Integrated snap lock
- Optional positive mechanical keying relay to socket

## Connection diagram



## Timing diagram



## Compliance

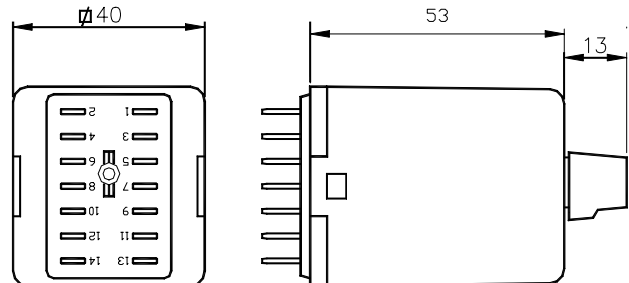
IEC 61810  
 IEC 60947  
 IEC 60947-5  
 IEC 60255

## Flashing relay FDA

### Options

- Low temperature
- Extra dust protection

### Dimensions (mm)



### Solve-All relay application concept

The unique D relay with all its options has been designed in close cooperation with customers from the power utility industry.

The Solve-All relay application concept offers ultimate flexibility to design and supply tailor made D relays.

### Sockets

		Mounting			
		Surface / Wall	35 mm rail	Panel / Flush	PCB
Terminal connection	Screw	V23	V23	-	-
	Screw - wide terminals	V22BR	V23BR	-	-
	Spring clamp	V29	V29	V33	-
	Faston	-	-	V31	-
	Crimp	-	-	V26	-
	Solder tag	-	-	V3	-
	PCB	-	-	-	V32

For more information see the respective datasheets

For more detailed technical specifications, drawings and ordering information, go to the product page on [www.morssmitt.com](http://www.morssmitt.com)

 Over 10 million Mors Smitt relays in use in applications worldwide!

**Mors Smitt Asia Ltd.**  
 Unit B & C, 25/F., Casey Aberdeen House  
 38 Heung Yip Road, Wong Chuk Hang  
 Hong Kong  
 Tel: +852 2343 555  
[sales.msa@wabtec.com](mailto:sales.msa@wabtec.com)

**Mors Smitt France SAS**  
 2 Rue de la Mandinière  
 72300 Sablé-sur-Sarthe, France  
 Tel: +33 (0) 243 92 82 00  
[sales.msf@wabtec.com](mailto:sales.msf@wabtec.com)

**Mors Smitt UK Ltd.**  
 Graycar Business Park,  
 Burton on Trent, DE13 8EN, UK  
 Tel: +44 (0)1283 357 263  
[sales.msuk@wabtec.com](mailto:sales.msuk@wabtec.com)

**Wabtec Netherlands B.V.**  
 Vrieslantlaan 6,  
 3526 AA, Utrecht, Netherlands  
 Tel: +31 (0)30 288 1311  
[sales.msbv@wabtec.com](mailto:sales.msbv@wabtec.com)

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

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

(c) Copyright 2019

All rights reserved. Nothing from this edition may be multiplied, or made public in any form or manner, either electronically, mechanically, by photocopying, recording, or in any manner, without prior written consent from Mors Smitt. This also applies to accompanying drawings and diagrams. Due to a policy of continuous development Mors Smitt reserves the right to alter the equipment specification and description outlined in this datasheet without prior notice and no part of this publication shall be deemed to be part of any contract for the equipment unless specifically referred to as an inclusion within such contract. Mors Smitt does not warrant that any of the information contained herein is complete, accurate, free from potential errors, or fit for any particular purpose. Mors Smitt does not accept any responsibility arising from any party's use of the information in this document.

## Flashing relay FDA

### Technical specifications

#### Pulse characteristics

Pulse function	Flashing (symmetrical) ; duty cycle 1/2
Pulse rate (xx)	20...60 imp/min adjustable per lockable knob 40...120 imp/min adjustable per lockable knob Fixed without knob (set in factory)
Accuracy - adjustment	< 10 %
After adjusting / fixed pulsing frequency	No variation in setpoint
Accuracy - repeatability	± 0.5 %
Time variation - vs voltage variation	± 0.05 % / % Unom
Time variation - vs temperature variation	± 0.02 % / K
Maximum permissible ripple	50 %
Example pulse time: time range 0.3...3 s Pulse time set on 2 s : it will be between 1.9 s...2.1 s For example: 2.0 s. The ambient temperature is 40 degrees Celsius which is 20 degrees different compared to the standard 20 degrees Celsius. This results in 0.4 % pulse time variation. The applied voltage is 30 % lower than the nominal voltage. This results in 1.5 % extra time variation. The total time variation is then 0.5 % (repeatability) + 0.4 % (time variation) + 1.5 % (voltage variation) = 2.4 %. In this case the pulse time will be between 1.95 s and 2.05 s.	

#### Coil characteristics

Nominal power consumption	During interval time	< 0.2 W
	During pulse time	0.73 W/VA (24 V) 0.79 W/VA (48 V) 0.84 W/VA (60 V) 0.90 W/VA (110 V) 0.98 W/VA (120 V) 1.04 W/VA (125 V) 1.62 W/VA (220 V)
Operating voltage range	0.8 - 1.1 Unom	

Type	Unom (VAC/DC)	Umin (VAC/DC)	Umax (VAC/DC)	Udrop-out (VAC/DC)
FDA-024	24	19.2	26.4	2.4
FDA-048	48	38.4	52.8	4.8
FDA-060	60	48.0	66.0	6.0
FDA-110	110	88.0	121.0	11.0
FDA-120	120	96.0	132.0	12.0
FDA-125	125	100.0	137.5	12.5
FDA-220	220	176.0	242.0	22.0

Other types on request

#### Remarks:

- Umin is the must-operate voltage at which the relay has picked up in all circumstances (worst-case situation), in practice the relay picks up at a lower voltage
- Udrop-out is the must-release voltage at which the relay has dropped-out in all circumstances (worst-case situation), in practice the relay drops out at a higher voltage (Urelease)
- To reset the time function, the voltage must drop below Udrop-out
- AC, voltage 50/60 Hz
- Always select the nominal voltage as close as possible to the actual voltage in the application

#### Contact characteristics

Amount and type of contacts	2 C/O
Maximum make current	14 A
Maximum continuous current	8 A
Maximum switching voltage	300 VDC, 250 VAC
Minimum switching voltage	12 V
Minimum switching current	100 mA
Material	AgCdO

## Flashing relay FDA

### Electrical characteristics

Dielectric strength	EN 50155 Cont-coil	2.5 kV, 50 Hz, 1 min
Insulation between open contacts		1 kV, 50 Hz, 1 min

### Mechanical characteristics

Mechanical life		20 x 10 <sup>6</sup> operations
Maximum switching frequency		Mechanical: 3600 ops/h Electrical: 1200 ops/h
Maximum torque value screw to lock knob		0.15 Nm
Weight		90 g (without options)

### Environmental characteristics

Environmental		EN 50125-1 and IEC 60077-1
Vibration		IEC 61373, Category I, Class B, Body mounted
Shock		IEC 61373, Category I, Class B, Body mounted
Operating temperature		-25 °C...+70 °C (with option C -40 °C)
Humidity		95%
Salt mist		IEC 60068-2-11, class ST4
Damp heat		IEC 60068-2-30, Test method Db variant 1
Protection		IEC 60529, IP40 (relay on socket) (with option K: IP50)
Fire & Smoke		NF F 16-101, NF F16-102, EN 45545-2
Insulation materials		Cover: polycarbonate Base: polyester

### Industry compliancy

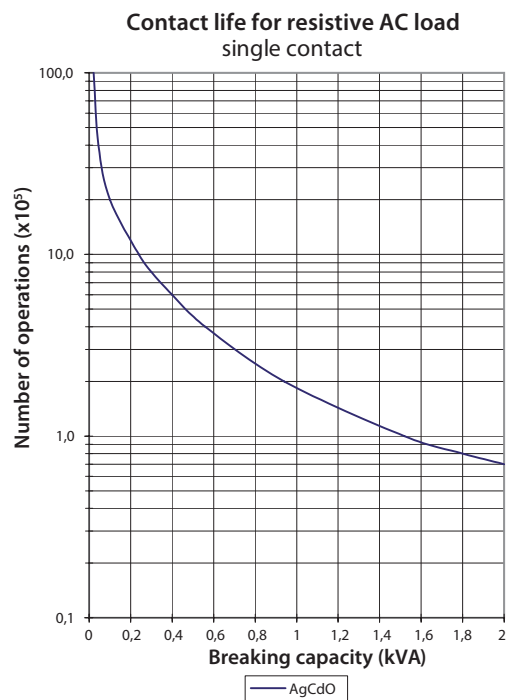
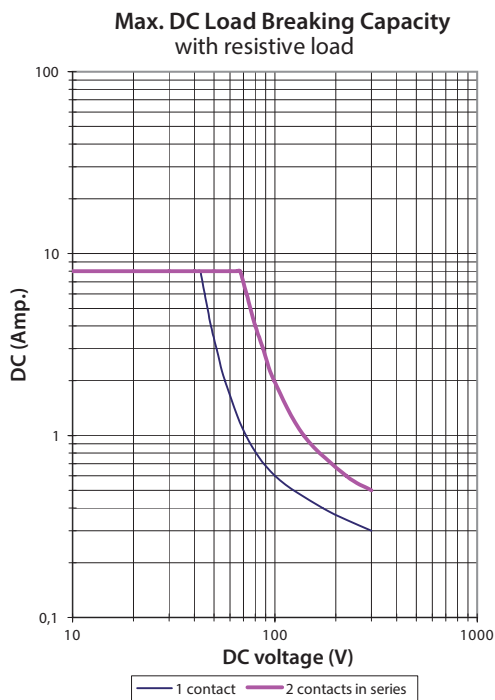
IEC 61810	Electromechanical elementary relays
IEC 60947	Low voltage switch gear and control gear
IEC 60947-5-1	Electromechanical control circuit devices and switching elements
IEC 60255	Relay design and environmental conditions
CE	

# Flashing relay FDA

## Options

Code	Description	Remark	Can not be combined with
Standard options			
C	Lower temperature (-40 °C).	Max contact current 8A	
K	Extra dust protection. Cover sealed with sealant.	IP50 Cat 2 for the relays mounted in a Mors Smitt socket. Application PD1/PD2 and contact load > 0.5 A.	

## Maximum switching capacity and contact life



## Flashing relay FDA

### Mounting possibilities/sockets



#### Surface/wall mounting

338000302	V22BR	Screw socket, wall mount, front connection (9 mm terminals)
338000580	V23	Screw socket, wall mount, front connection (7.5 mm terminals)
338000610	V29	Spring clamp socket, wall mount, front dual connection (2.5 mm <sup>2</sup> )

#### Rail mounting

338000580	V23	Screw socket, rail mount, front connection (7.5 mm terminals)
338000402	V23BR	Screw socket, rail mount, front connection (9 mm terminals)
338000610	V29	Spring clamp socket, rail mount, front dual connection (2.5 mm <sup>2</sup> )

#### Panel/flush mounting

338100100	V3	Solder tag socket, panel mount, rear connection
328400100	V26	Crimp contact socket, panel mount, rear connection, A260 crimp contact
338000560	V31	Faston connection socket, rear dual connection (4.8 x 0.8 mm)
338000570	V33	Spring clamp socket, flush mount, rear dual connection (2.5 mm <sup>2</sup> )

#### PCB mounting

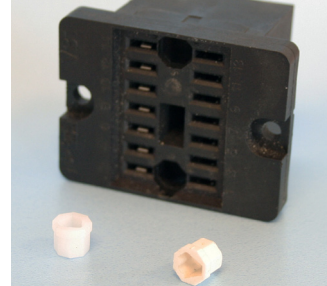
338000561	V32	PCB soldering socket
-----------	-----	----------------------

No external retaining clip needed as the 'snap-lock' will hold the relay into the socket under all circumstances and mounting directions (according shock & vibration requirements IEC 61373, Category I, Class B, Body mounted). If regulations require external retaining clips, these are available as well.

For more details see datasheets of the sockets on [www.morssmitt.com](http://www.morssmitt.com)

# Flashing relay FDA

## Mechanical keying relay and socket (optional)



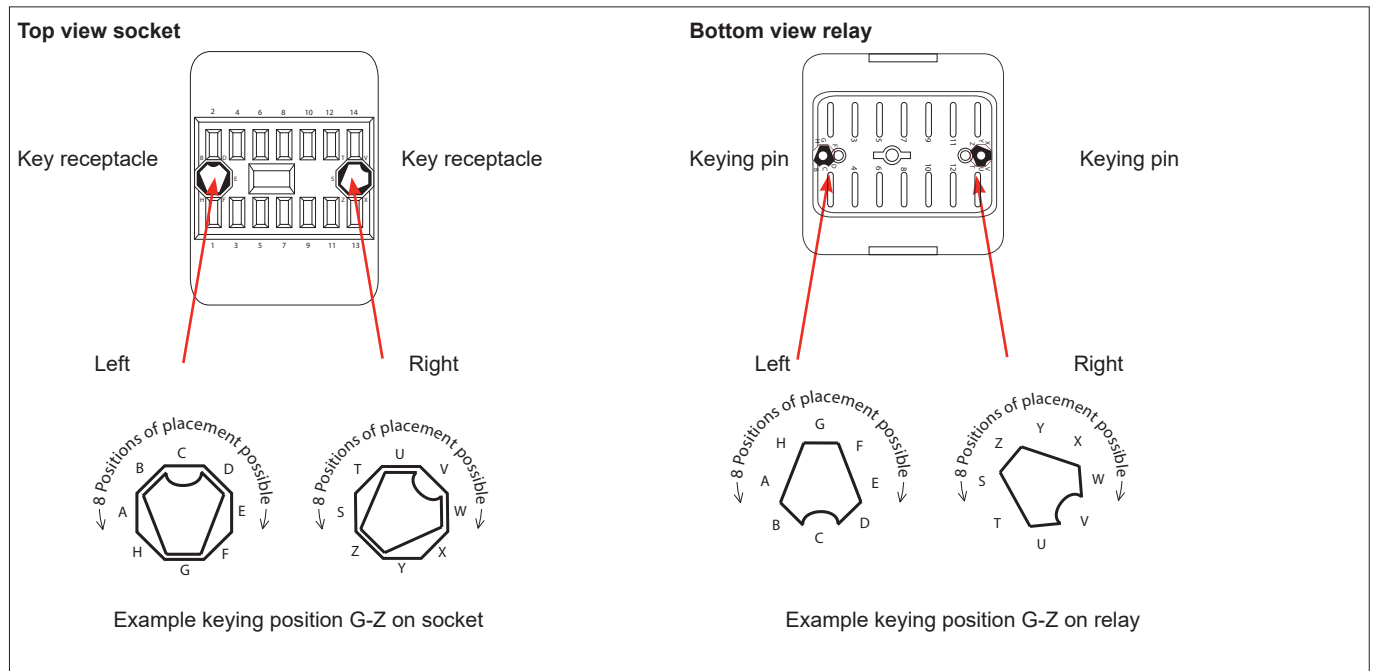
**Function:**

- To prevent wrong installation
- To prevent damage to equipment
- To prevent unsafe situations

Using keyed relays and sockets prevents a relay is inserted in a wrong socket. For example it prevents that a 24 VDC relay is put in a 110 VDC circuit. Positive discrimination is possible per different function, coil voltage, timing, monitoring, safety and non-safety.

The D relay socket keying option gives  $8 \times 8 = 64$  possibilities. Upon ordering the customer simply indicates the need for the optional keying. Mors Smitt will assign a code to the relay and fix the pins into the relay. The sockets are supplied with loose key receptacles. Inserting the keys into the socket is very simple and self explaining.

Remark: Sockets and relay shown are examples.



## Flashing relay FDA

### Important for relay selection and operation

Make sure the relay is suitable for the application. For critical applications (for example: green loop applications) relays should be checked on correct working during periodic inspection.

### Recommendations for long time contact reliability

For relays to enable failure free performance over a very long operational time, it is important to create the right circumstances. In any relay, contact usage and atmospheric conditions influence the contact surface. To counter this effect it is common practice to use a safety factor of  $> 2$  to ensure long time contact reliability.

Therefore for long time contact reliability we recommend:

- With higher load switching, e.g. 110 VDC and  $> 1$  A, put relay contacts in series
- Check relays regularly, for example with the Mors Smitt Portable Relay Tester and visually through the transparent cover

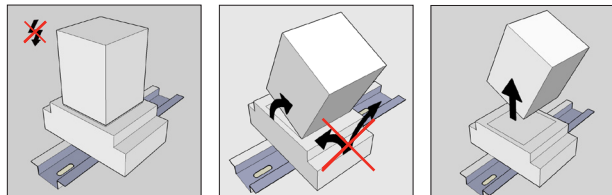
### Instructions for use

#### Installation

Before installation or working on the relay: disconnect the power supply first (no hot swapping)! Install socket and connect wiring according to the terminal identification. Plug relay into the socket ensuring there is no gap between the bottom of relay and the socket. Reverse installation into the socket is not possible due to the mechanical blocking snap-lock feature. Check to ensure that the coil connection polarity is not reversed. Relays can be mounted tightly together to save space. When rail mounting is used, always mount the socket in the direction of the UP arrow, to have proper fixation of the socket on the rail.

#### Warning!

- Never use silicon in the proximity of the relays
- Do not use the relay in the presence of flammable gas as the arc generated from switching could cause ignition
- To remove relays from the socket, employ up and down lever movements. Sideway movement may cause damage to the coil wires



- Relays should never be swapped to other circuit positions when taken out of its socket for inspection or fault finding, always place it back into the original position to prevent contact resistance problems. Contact resistance problems can be created when swapping relays between different circuit loads due the contact wear/condition having changed during its operational life.

#### Operation

After installation always apply the rated voltage to the coil to check correct operation. Long term storage may corrode the silver on the relay pins. When plugging the relay into the socket, the female bifurcated or trifurcated receivers will automatically cut through the corrosion on the pins and guarantee a reliable connection.

Before actual use of relays, it is advised to switch the load several times with the contacts. The contacts will both be electrically and mechanically cleaned due to the positive wiping action. Sometimes a contact can build up increased contact resistance ( $\leq 15$  m $\Omega$  when new). When using silver contacts one can clean the contact by switching a contact load a few times using  $>24$  VDC &  $\sim 2$ A. Increased contact resistance is not always problematic, as it depends on circuit conditions. In general a contact resistance of  $1 \Omega$  is no problem, consult Mors Smitt for more information.

Condensation in the relay is possible when the coil is energised (warm) and the outside, environmental temperature is cold. This is a normal phenomenon and will not affect the function of the relay. Materials in the relay have no hygroscopic properties.



## Flashing relay FDA

### Inspection / maintenance

Correct operation of the relay can easily be checked as the transparent cover provides good visibility of the moving contacts. If the relay does not seem to operate correctly, check for presence of the appropriate coil voltage and polarity using a suitable multimeter. If a LED is fitted, it indicates voltage presence to the coil. If coil voltage is present, but the relay does not operate, a short circuit of the suppression diode is possible (This may have been reversed due to the coil connection).

Relays can easily be tested with the Mors Smitt Relay Tester. More information on: [www.morssmitt.com](http://www.morssmitt.com).

If the relay doesn't work after inspection, replace the relay unit with a similar model. Do not attempt to open the relay cover or try to repair. Contacts are calibrated and in balance, touching can affect proper operation. Also resoldering may affect correct operation. Since 2009 relays have tamper proof seals fitted and once broken, warranty is void.

Most relay defects are caused by installation faults such as overvoltage, spikes/transients, high/short current far exceeding the relay specifications. When returning the relays for investigation, please provide all information on the RMA form. Send defective relays back to the manufacturer for repair or replacement. Normal wear and tear or external causes are excluded from warranty.

RMA procedure see [www.morssmitt.com](http://www.morssmitt.com)

## Flashing relay FDA

### Ordering scheme

FDA-		-	-	-	
Coil voltages	024				24 VAC/DC
	048				48 VAC/DC
	060				60 VAC/DC
	110				110 VAC/DC
	120				120 VAC/DC
	125				125 VAC/DC
	220				220 VAC/DC
Options		C			Low temperature (-40 °C) - Max contact current 8 A
		K			Extra dust protection, IP50
Pulse time			20-60		imp/min
			40-120		imp/min
			Fixed		No knob

Examples:

#### FDA-024-C 40-120

Description: FDA relay, Unom 24 VAC/DC, low temperature (-40 °C), 40-120 imp/min

**Flashing relay**  
**FDA**

**Mors Smitt Asia Ltd.**  
Unit B & C, 25/F., Casey Aberdeen House  
38 Heung Yip Road, Wong Chuk Hang  
Hong Kong  
Tel: +852 2343 555  
sales.msa@wabtec.com

**Mors Smitt France SAS**  
2 Rue de la Mandinière  
72300 Sablé-sur-Sarthe, France  
Tel: +33 (0) 243 92 82 00  
sales.msf@wabtec.com

**Mors Smitt UK Ltd.**  
Graycar Business Park,  
Burton on Trent, DE13 8EN, UK  
Tel: +44 (0)1283 357 263  
sales.msuk@wabtec.com

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

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

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

(c) Copyright 2019

All rights reserved. Nothing from this edition may be multiplied, or made public in any form or manner, either electronically, mechanically, by photocopying, recording, or in any manner, without prior written consent from Mors Smitt. This also applies to accompanying drawings and diagrams. Due to a policy of continuous development Mors Smitt reserves the right to alter the equipment specification and description outlined in this datasheet without prior notice and no part of this publication shall be deemed to be part of any contract for the equipment unless specifically referred to as an inclusion within such contract. Mors Smitt does not warrant that any of the information contained herein is complete, accurate, free from potential errors, or fit for any particular purpose. Mors Smitt does not accept any responsibility arising from any party's use of the information in this document.