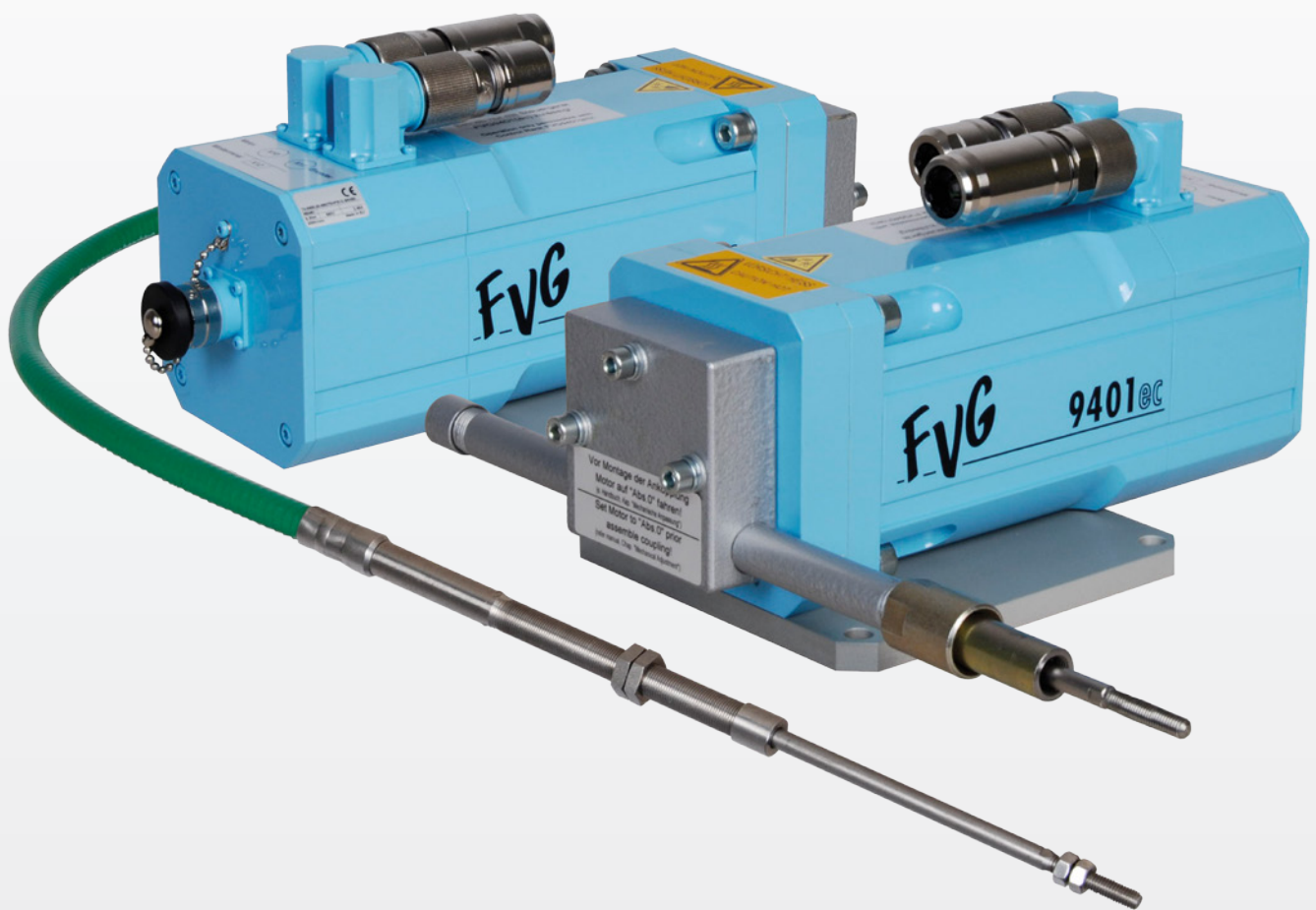


## Regulation Unit FVG9401ec

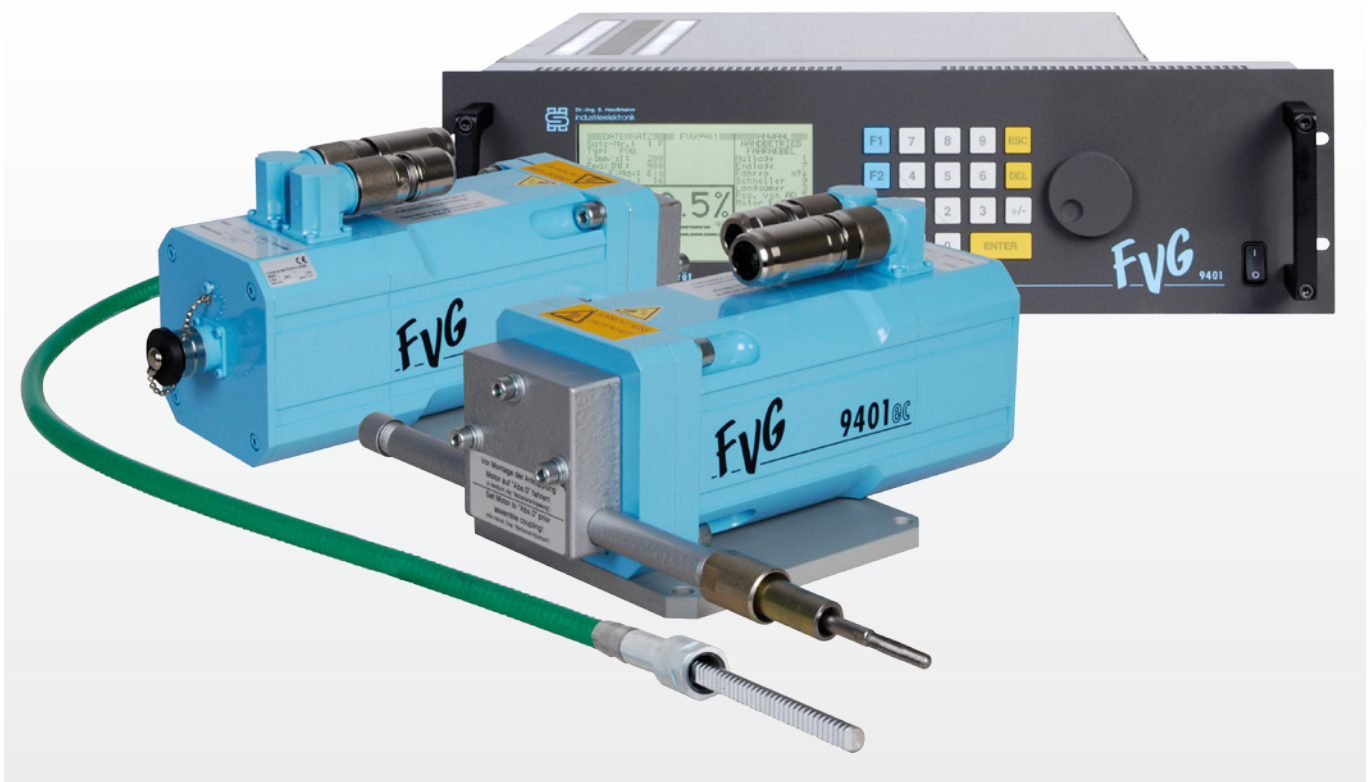
Versatile regulation unit for throttle valves,  
injection pumps and automatic gearboxes



## Regulation Unit FVG9401ec

The regulation unit FVG9401ec is a versatile linear actuator to operate throttle valves and injection pumps of

internal combustion engines, as well as selector levers of automatic gearboxes.



### Main features

- Max. shifting travel: 100mm
- Max. shifting force: 150N (500N temporarily)
- Max. shifting speed: 0.5m/s
- Resolution and repetitive accuracy:  $<\pm 0.05$ mm
- Absolute position measuring
- Push- and pull operation
- Limitation of shifting force
- Extended Safety functions:  
2-channel emergency stop and STO function  
Optional Safely-Limited Speed (SLS)

### Benefits and advantages

- Maintenance-free, convection cooled servo-controlled drive
- Mechanical coupling via FLEXBALL® cable or steel rod  
Automatic set-point standardization
- Different modes of operation selectable by configuration menu
- Comfortable software module to operate selector levers of automatic gearboxes
- Standard delivery scope includes selectable language modules in English, French or German



The actuator

#### The actuator

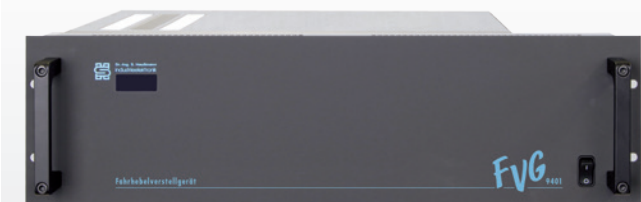
The actuator of the regulation unit FVG9401ec includes a brushless servomotor with a toothed rack inlet and mechanical coupling, alternatively by FLEXBALL® cable or by steel rod.



Version with front panel

#### Version with front panel

The power- and control electronics are mounted in a 3RU-19"-rack. The operation is supported by a large LC-display and a suitable keyboard at the front panel. The rack design allows e.g. the installation even in a 600mm wide switch cabinet.



Version with status code display

#### Version with status code display

A 3-digit status code display indicates every operating condition. The device is operated and set up through the test bench control or a Miniterminal (MT1). Connecting an external hand terminal (HT9201) allows the use of all operating and diagnostic functions.



LC-display with suitable keyboard

#### The operation

Operation and setting-up are supported by a large LC-display with background lighting and a suitable keyboard at the front panel. The control panel and the converter rack can be placed separately at different locations.

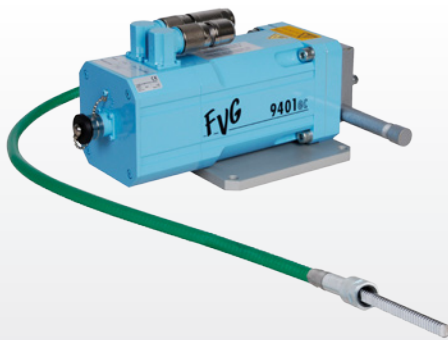
## Options and accessories for the Regulation Unit FVG9401ec



Steel rod

### Steel rod

The mechanical design allows the connection of a steel rod with toothed rack.



Flexball® cables

### Flexball® cables

The mechanical coupling is also possible by a connection of a Flexball® cables with toothed rack.



Connection for Miniterminal MT1

### Connection for Miniterminal MT1

The Miniterminal MT1 which is available as an accessory can be plugged directly to the actuator without additional cabling. This allows the operator a direct view to the actuator or coupling point for all setting work.

## More options

- Maximum force input and actual value output of force (each potential free)
- CAN-Interface
- Fieldbus connections via external modules

# Data sheet for the Regulation Unit FVG9401ec

## Actuator (Standard version)

Linear positioning unit with integrated brushless, convection cooled servomotor, absolute travel measuring system.	
Dimensions:	300 mm x 268 mm x 145 mm (L x W x H)
Weight:	8.5 kg
Protection:	IP54
Shifting travel:	100 mm
Shifting force:	150N max. (500N temporarily: 6 sec./2,5% duty cycle)
Shifting speed:	0.5 m/s max.
Resolution (actual travel value) and repetitive accuracy:	<± 0.05 mm

## Temperature range actuator

Admissible range:	-20 °C up to max. +70 °C (No condensing humidity allowed)
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## Electronics

Control and power unit as a 3RU-19" rack. IGBT-converter for the servomotor. LC-display and keyboard at the front panel for operation of the FVG9401ec. The front panel of the power and control panel is removable.	
Dimensions:	482.6 mm x 307 mm x 3 RU (L x W (without plugs) x H)
Weight:	13 kg
Protection:	IP20

## Temperature range electronics

Admissible range:	0 °C up to max. +40 °C (No condensing humidity allowed)
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## Software

The standard software for operating the FVG9401ec has the following essential features:	
- Operation of the FVG9401ec with	- Analog interface - Binary inputs - Hand terminal - Serial interface (RS232) - Option: CAN (potential free)
- Manual or automatic set-up	
- Max. 32 parameter sets can be stored for the modes of operation accelerator pedal, selector lever or pedal set-point adjuster	
- Diagnostic functions	
- German, English or French language module	

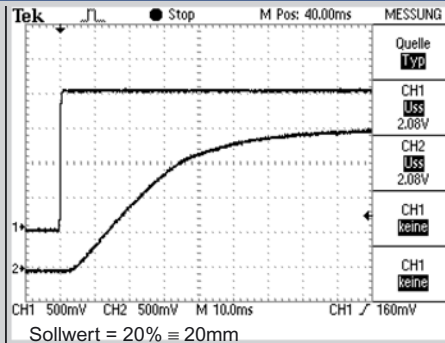
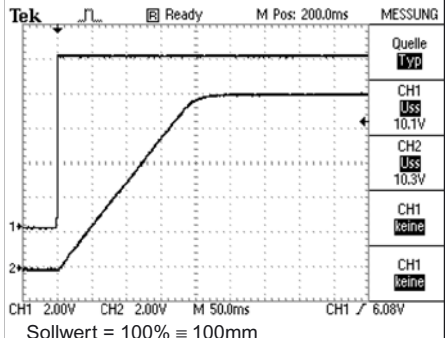
## Interfaces to peripheral units

Binary signals	
Relay contact outputs:	50V/100mA
Optocoupler inputs:	15V up to 24V
Plug-in connection:	Phoenix MC 1.5/16-STF-3.81
Analog interfaces	
Analog outputs:	0 up to $\pm 10V$ /max. 5mA
Analog inputs:	0 up to 10V/ $> 20k\Omega$ (each potential free)
Plug-in connection:	Phoenix MC 1.5/16-STF-3.81
Serial interfaces	
Type:	RS232 (potential free)
Plug-in connection:	D-Sub-9
External connection for hand terminal	
Type:	RS422
Plug-in connection:	D-Sub-15
Connection for Miniterminal MT1	
Plug-in connection:	Push-Pull

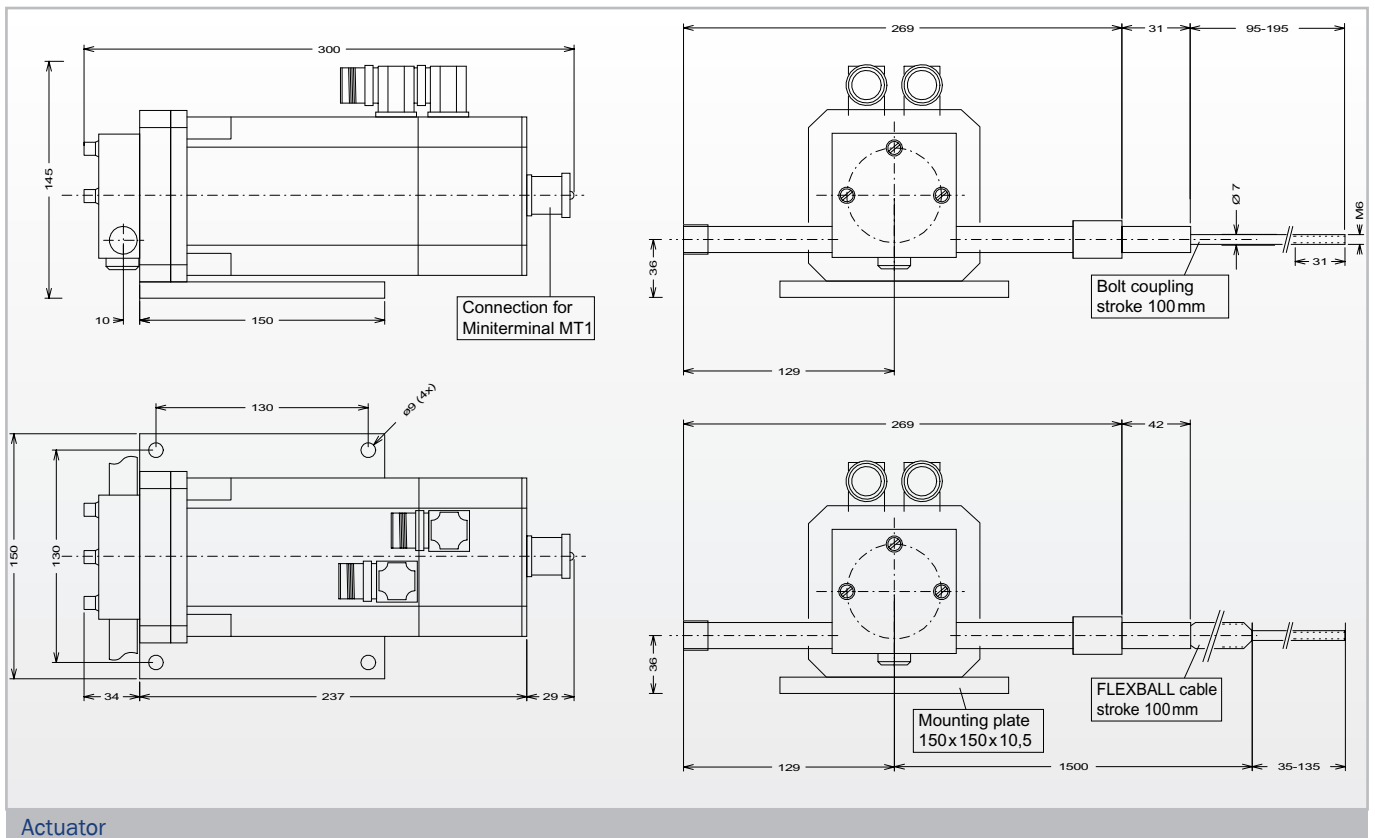
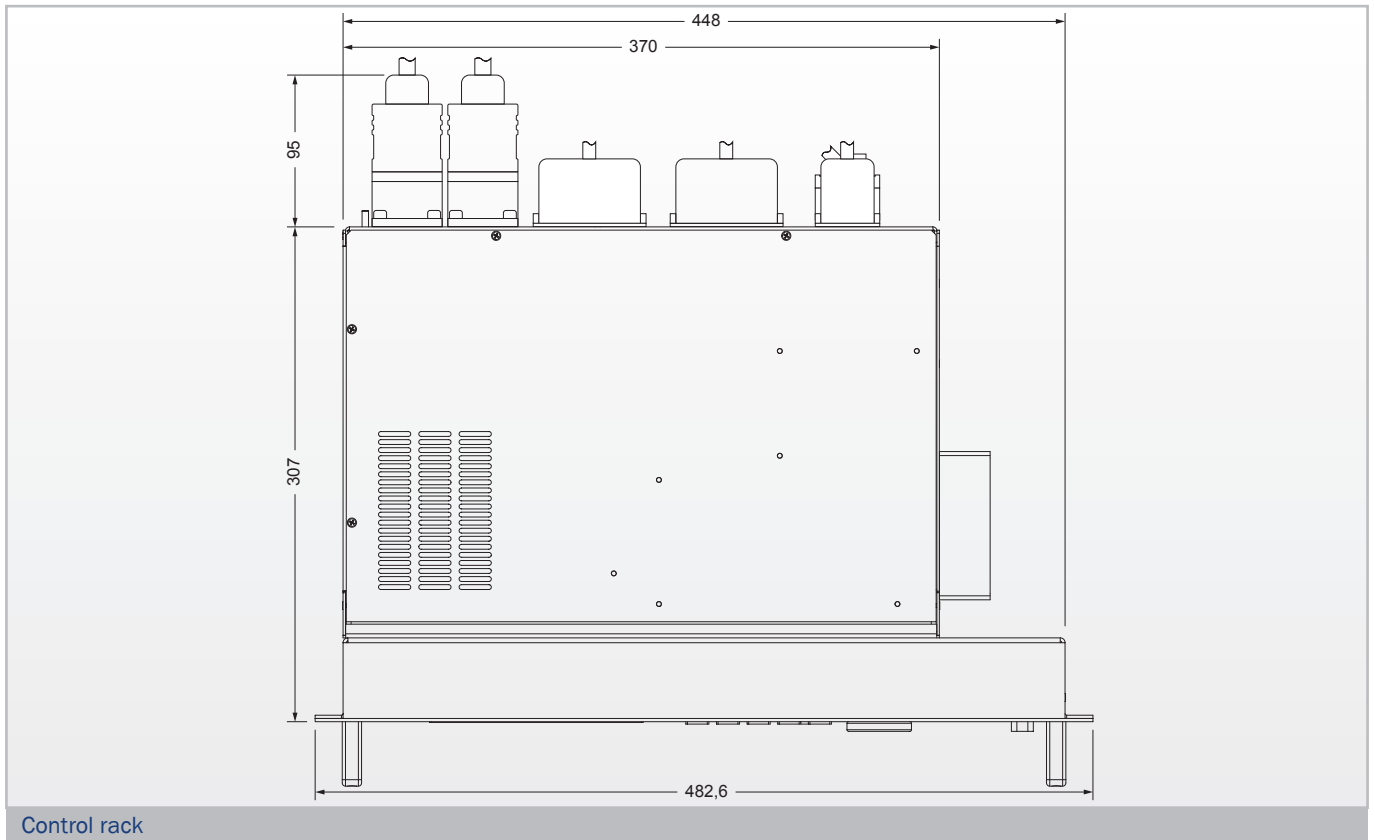
## Power supply

Rated voltage:	3/PE AC 380V ... 480V $\pm 10\%$
Frequency:	50 ... 60Hz
Installed load:	1.4kVA
Plug-in connection:	6-poles connector pair

Control response

Set-shifting travel:	100 mm
Shifting force:	150 N
Actual travel:	10V $\equiv$ 100% $\equiv$ 100 mm
Measuring instrument:	Storage oscilloscope 1 GS/s, 100 MHz
	Set-point: 20% $\equiv$ 20mm
	Set-point: 100% $\equiv$ 100mm

# Dimensions for the Regulation Unit FVG9401ec





# Order information for the Regulation Unit FVG9401ec

## 1. Regulation Unit FVG9401ec

Order information	
1.1	Regulation unit type FVG9401ec with control panel, standard version without mechanical coupling, incl. all connector pairs and technical manual
1.2	Regulation unit type FVG9401ec with status code display, standard version without mechanical coupling, incl. all connector pairs and technical manual

## 2. Options:

Order information	
2.1	Field bus connection Profibus DP (external module)
2.2	Field bus connection CAN
2.3	Foreign language module

## 3. Accessories:

Order information	
3.1	FLEXBALL® cable 1.5 m with toothed rack
3.2	FLEXBALL® cable with toothed rack, customized length
3.3	Mechanical coupling steel rod with toothed rack
3.4	Miniterminal MT1 incl. connection cable, 1.5 m and connector
3.5	Hand terminal HT9201 incl. connection cable, 3 m and connector

\* FLEXBALL® is a registered trademark of the Company DURA Deutschland GmbH

## 4. Cables:

Order information	
4.1	Connection cable set between control rack and actuator, length 15 m
4.2	Connection cable set between control rack and actuator, length 20 m
4.3	Connection cable set between control rack and actuator, customized length



Dr.-Ing. S. Haußmann Industrieelektronik  
Ingenieurbüro Dr.-Ing. S. Haußmann

Beutwang 4  
72622 Nürtingen  
Germany

Phone: +49 7022 9565-0  
Fax: +49 7022 9565-501

sales@sh-el.de  
www.sh-el.de



QM-System  
ISO9001:2015