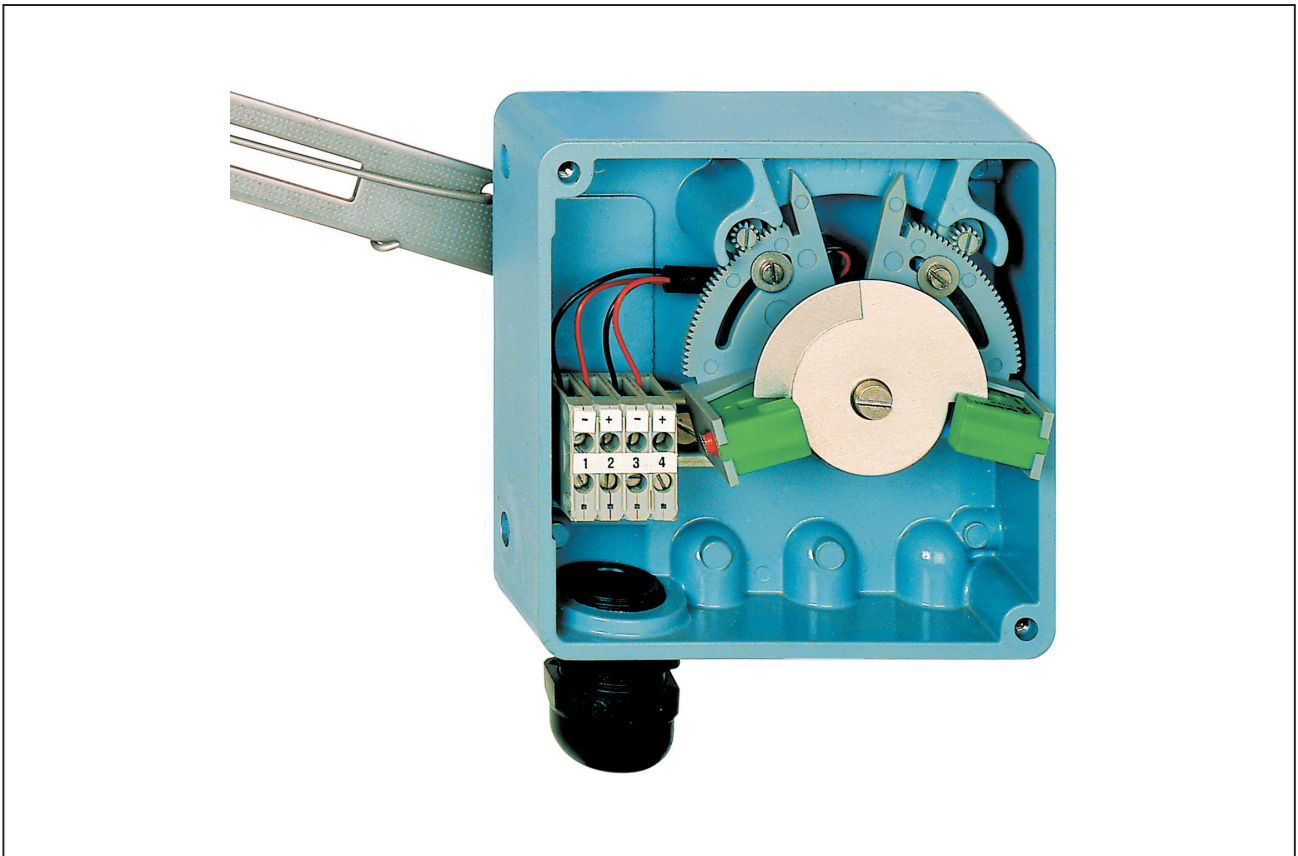


## SGE985 Limit switch



Limit switch SGE985 serves as end position signaling of actuators and can be mounted to stroke actuators as well as to rotary actuators. It is constructed with inductive sensors or micro switches and signals exceeding or declining of two adjustable positions.

### FEATURES

- Inductive limit switch according to DIN 19 234 resp. NAMUR or three wire system
- Variable switching functions
- Precise switching points through adjustable transmission
- Robust design; low vibration effect in all directions
- Mounting according to DIN IEC 534 part 6 (NAMUR)
- Rotation adapter for angles up to 120 °
- Explosion protection: II 2 G EEx ib/ia IIB/IIC T4/T6 according to ATEX
- EMC in accordance with international standards and laws (CE)

**TECHNICAL DATA**

**Input**

Stroke . . . . . up to 100 mm with attachment kit for diaphragm actuators  
 Rotary angle . . . . . up to 120 ° with attachment kit for rotary actuators

**Output Inductive Limit Switch, two-wire system Code S, T**

Output . . . . . 2 inductive proximity sensors acc. to DIN 19 234 resp. NAMUR for connection to a switching amplifier with an intrinsically safe control circuit <sup>1) 2) 3)</sup>

**Current consumption**

Vane clear . . . . . > 3 mA  
 Vane interposed . . . . . < 1 mA

for control circuit with the following electrical values

Supply voltage . . . . . DC 8 V, R<sub>i</sub> approx. 1 kΩ  
 Residual ripple . . . . . < 5 %  
 Internal inductance . . . . . 160 μH  
 Internal capacitance . . . . . 20 nF

Perm. line resistance . . . . . < 100 Ω  
 Switching differential <sup>6)</sup> . . . . . < 1 %

**Explosion protection**<sup>7)</sup> . . . . see page 3

**Output Inductive limit switch, three-wire system Code U**

Output . . . . . 2 inductive proximity sensors, three-wire system, contact, pnp <sup>2) 4)</sup>, LED indication,

Supply voltage U<sub>s</sub> . . . . . DC 10 ... 30 V  
 Residual ripple . . . . . ± 10 %, U<sub>s</sub> = 30 V  
 Switching frequency . . . . . 2 kHz  
 Constant current . . . . . 100 mA  
 Switching differential . . . . . < 1 %

**Output Limit switch assy. with micro switches Code V**

Output . . . . . 2 micro switches <sup>2) 5)</sup>

Connected load, alternating current  
 Switching capacity . . . . . max. 250 VA  
 Switching voltage . . . . . max. 50 V  
 Switching current with  
 ohmic resistance . . . . . max. 5 A  
 inductive resistance . . . . . max. 2 A  
 Bulb, metal filament . . . . . max. 0.5 A

Connected load, direct current

Switching voltage, max. V	Ohmic load A	Inductive load A
30	5	3
50	1	1

Switching differential . . . . . < 2.5 %

**Response characteristic**<sup>6)</sup>

Gain . . . . . continuously adjustable from 1:1 to approx. 7:1  
 Switching point repeatability . . . . . < 0.2 %

**Ambient conditions**<sup>7)</sup>

Ambient temperature . . . . . -25 ... 85 °C / -13 ... 185 °F  
 Relative humidity . . . . . up to 100 %  
 Transport and storage temperature . . . . . -40 ... 85 °C / -40 ... 185 °F  
 Protection class . . . . . IP 65

The device can be operated at a class D1 location according to DIN IEC 654, part 1 <sup>7)</sup>.

**Mounting**

For attaching to diaphragm actuators acc. to DIN IEC 534-6 (NAMUR) and to rotary actuators acc. to VDI/VDE 3845  
 Mounting orientation . . . . . any

**Electric connection**

Line entry . . . . . 1 or 2 cable glands M20x1.5 (others with Adapter AD-...)  
 Cable diameter . . . . . 6 to 12 mm (0.24 to 0.47 in)  
 Screw terminals . . . . . Screw terminals for wires up to 2.5 mm<sup>2</sup> (AWG 14)

**Materials**

Housing and cover . . . . . Aluminum (Alloy No. 230) finished with DD varnish  
 Control vanes . . . . . Aluminum  
 Setting mechanism . . . . . Fibre glass reinforced polyamid  
 Transmission shaft . . . . . 1.4571  
 Mounting bracket . . . . . 1.4301

**Weight**

SGE985 . . . . . approx. 0.6 kg (1.3 lbs)

- 1) For the standard version Code S one switching amplifier is required, For the security version Code T a fail-safe amplifier for each inductive proximity sensor is required.
- 2) Operating mode min. (=low) / max. (=high) selectable by adjustment of switch vanes.
- 3) Operating mode normally closed circuit / normally open circuit selectable at switch amplifier output.
- 4) Contact closed within the positive range.
- 5) Contact open within the positive range.
- 6) For feedback lever effective length 117.5 mm (4.63 in), stroke 30 mm (1.28 in) and maximum gain.
- 7) For security version: lower temperature limit -40°, and operating location at a class D2 location. For this version a fail-safe amplifier for each inductive proximity sensor is required, eg Pepperl & Fuchs WE 77/Ex-SH-03

**SAFETY REGULATIONS**

**Explosion protection**

inductive proximity sensor . . . Type SJ 3,5-N resp.  
 Type SJ 3,5-SN  
 (security version)  
 Type of protection . . . . . II 2 G EEx ib/ia IIB/IIC T4/T6  
 Certificate of conformity . . . . . PTB 02 ATEX 2153 (Option  
 Limit switch)

For operation in certified intrinsically safe circuits with the following maximum values:

- U<sub>max</sub> . . . . . 16 V
- I<sub>max</sub> . . . . . 25 mA
- P<sub>max</sub> . . . . . 64 mW
- Internal inductance . . . . . 100 µH
- Internal capacitance . . . . . 30 nF

The certificate of conformity refers to the inductive sensor installed. Mounting conforms to the stipulations of the certificate and the mounting conditions.

**CE marking**

Electromagnetic compatibility 89/336/EWG  
 Low voltage regulations . . . . . w/o Ex: 73/23/EWG fulfilled  
 (with Ex: not applicable)

**Electromagnetic compatibility EMC**

Operating conditions . . . . . industrial environment  
 Immunity according to  
 - NAMUR recommendation NE21 fulfilled  
 - EN 61 326 . . . . . fulfilled  
 - EN 61 000-6-2 . . . . . fulfilled  
 Emission according to  
 - EN 55 011,  
 Group 1, Class A . . . . . fulfilled  
 - EN 61 000-6-2 . . . . . fulfilled

**Safety requirements**

**Safety** . . . . . safety class III  
 as per DIN EN 61010-1 (DIN IEC 61010-1) (VDE 0411 part 1)  
 overvoltage category . . . . . 1  
 internal fuses . . . . . none  
 external fuses . . . . . Limitation of power supplies  
 for fire protection has to be  
 observed due to EN 61010-1  
 9.3. ff.

**SWITCHING FUNCTIONS**

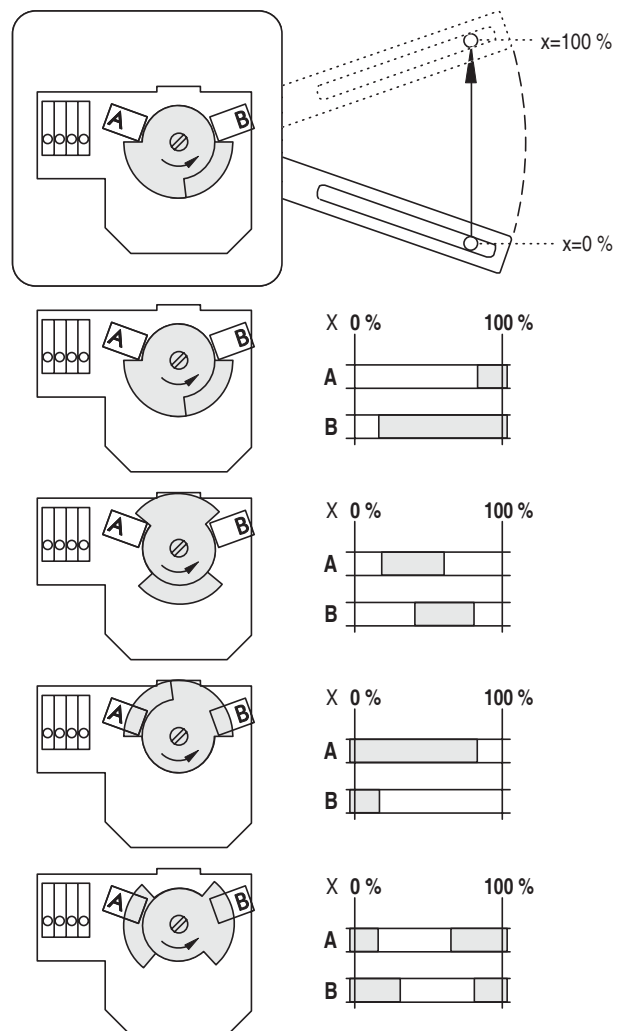
The switching functions may be freely selected and set. The control vanes may be adjusted as desired in order to reach the wanted switching behavior. The illustration here shows the four basic settings and adjacent the respective switch behavior (gray=immersed vane).

The examples are based on the following setting: Mounting left=feedback level right; transmission is selected so that at stroke x from 0 to 100 % the guidance shaft travels through a rotary angle of 180°. Illustrated in resting position x = 0%.

2-wire technique: If control vane is immersed the initiator power circuit becomes high-ohmic.

3-wire technique: If control vane is immersed the contact is closed against plus.

Micro switch: Contact opens during passing of the control vanes.



1) National installation regulations must be observed.

## MODEL CODES SGE985

<b>Limit switch</b>	<b>SGE985</b>				011004
<b>Version</b>					
inductiv switches, standard (a) . . . . .	-S				
inductiv switches, security (a) . . . . .	-T				
inductiv switches, three-wire technique . . . . . (b)	-U				
two microswitches . . . . . (b)	-V				
<b>Cable Entry</b>					
M20x1.5 with plastic cable gland . . . . .		7			
<b>Electrical certification</b>					
II 2 G EEx ia IIC T6 acc. to ATEX . . . . .			EAA		
CSA Approved For Intrinsic Safety Class I, Zone 0 or 1, Groups IIC, IIB, IIA and Class I, Division 1, Groups A, B, C, D, Hazardous Locations Indoors And Outdoors . . . . . without . . . . .			CAA ZZZ		
<b>Attachment kit</b>					
order as auxiliary . . . . .				N	
<b>Options</b>					
<b>Tag.No. Labeling</b>					
Stamped with weather resistant color . . . . .					-G
Stainless steel label fixed with wire . . . . .					-L
<b>Example:</b>					
	SGE985	-S	7	ZZZ	N -G
<b>Footnote</b>					
(b) Only available with ZZZ	Auxiliary	see EVE9902			
	Tube fittings	see EOO9001			

## MODEL CODES ACCESSORIES

<b>Attachment kit</b>		<b>EBZG</b>
For diaphragm actuators with casting yoke acc. NAMUR. (incl. standard Couple Lever) (for SRP981, SRI983, SMP981, SMI983, <b>SGE985</b> ) . . . . .		-GN
For diaphragm actuators with pillar yoke acc. NAMUR. (incl. standard Couple lever) (for SRP981, SRI983, SMP981, SMI983, <b>SGE985</b> ) . . . . .		-FN
For rotary actuators, without flange, 3 drill holes 6.5 mm (for SRP981, SRI983, SRI986, SMP981, SMI983, <b>SGE985</b> ) . . . . .		-PN
For rotary actuators, without flange, 4 threads M6 (e.g for Petras actuators) (for SRP981, SRI983, SRI986, SMP981, SMI983, <b>SGE985</b> ). . . . .		-NN
For rotary actuators, with flange (for SRP981, SRI983, SRI986, SMP981, SMI983, <b>SGE985</b> ) . . . . .		-JN
For rotary actuators acc. to VDI/VDE 3845, with shaft (for SRP981, SRI983, SRI986, SMP981, SMI983, <b>SGE985</b> ). . . . .		-ZN
For Masoneilan type Camflex II (for SRP981, SRI983, SRI986, SMP981, SMI983, <b>SGE985</b> ). . . . .		-RN
For Masoneilan type 37/38, Fisher Elliott type 656, 667 (for SRP981, SRI983, <b>SGE985</b> , SMI983, SMP981) . . . . .		-TN
For Masoneilan type 87/88 (for SRP981, SRI983, SMP981, SMI983, <b>SGE985</b> ) . . . . .		-EN
For Masoneilan VariPak (for SRP981, SRI983, <b>SGE985</b> , SMI983, SMP981). . . . .		-MN
For IAL actuators (for SRP981, SRI983, <b>SGE985</b> , SMI983, SMP981) . . . . .		-VN
Brackets VDI/VDE 3845 (A = 130 mm/5.12 in; B = 50 mm/1.97 in) (for SRP981, SRI983, SRI986, <b>SGE985</b> , SMI983, SMP981). . . . .		-C3
Brackets VDI/VDE 3845 (A = 80 mm/3.15 in; B = 30 mm/1.18 in) (for SRP981, SRI983, SRI986, <b>SGE985</b> , SMI983, SMP981) . . . . .		-C2
Brackets VDI/VDE 3845 (A = 80 mm/3.15 in; B = 20 mm/0.79 in) (for SRP981, SRI983, SRI986, <b>SGE985</b> , SMI983, SMP981) . . . . .		-C1
<b>Couple Lever / Cam</b>		
Standard (a = 72 mm) (for SRP981, SRI983, SRI986, SMP981, SMI983, <b>SGE985</b> ) . . . . .		-AN
Extended (a = 91 mm) (for SRP981, SRI983, SRI986, SMP981, SMI983, <b>SGE985</b> ) . . . . .		-BN
Inverse equal percentage cam for rotary actuators (for SRP981, SRI983, SRI986) . . . . .		-CN
<b>Adapter</b>		<b>AD</b>
Adapter 1/2" NPT to 3/4" NPT (stainless steel) . . . . .		-A3
Adapter M20 x 1.5 to G1/2" (internal thread) (stainless steel) . . . . .		-A8
Adapter M20 x 1.5 to 1/2" - 14 NPT (internal thread) (brass with nickel coating) . . . . .		-A5
Adapter M20 x 1.5 to 1/2" - 14 NPT (internal thread) (stainless steel) . . . . .		-A6
Adapter (plastic) M20 x 1.5 to PG13.5 (internal thread) . . . . .		-A9

**DIMENSIONS**

**Limit switch**

mm
in

**Limit switch, front view**

1 Line entry via screwed gland

**Limit switch, front view, cover removed**

**Connecting block**

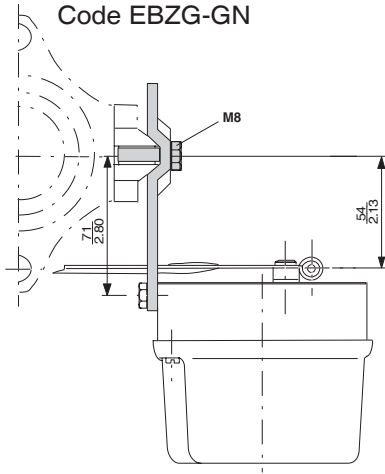
2 wire technique    3 wire technique    micro switch

<table border="1" style="margin-bottom: 5px;"> <tr><th>A</th><th>B</th></tr> <tr><td>42</td><td>51</td></tr> <tr><td>41</td><td>52</td></tr> <tr><td>1</td><td>2</td></tr> <tr><td>3</td><td>4</td></tr> </table>	A	B	42	51	41	52	1	2	3	4	<table border="1" style="margin-bottom: 5px;"> <tr><th>+</th><th>-</th><th>A</th><th>B</th></tr> <tr><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td>+</td><td>-</td><td></td><td></td></tr> </table>	+	-	A	B	1	2	3	4	+	-			<table border="1" style="margin-bottom: 5px;"> <tr><th>A</th><th>B</th></tr> <tr><td>42</td><td>51</td></tr> <tr><td>41</td><td>52</td></tr> </table>	A	B	42	51	41	52
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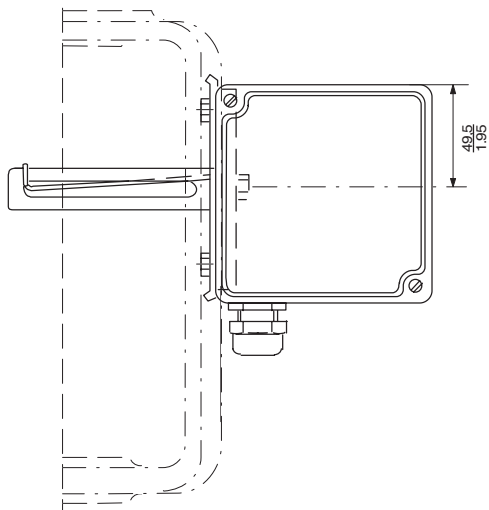
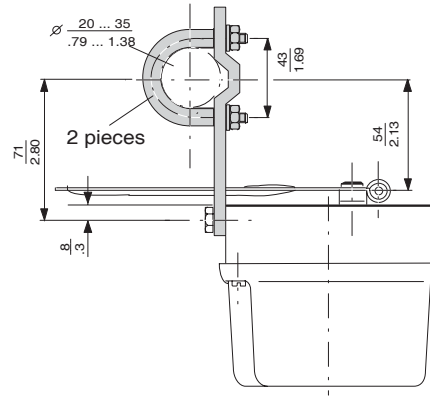
Probe **A**: 1 - / 2 +  
 Probe **B**: 3 - / 4 +

**ATTACHMENT KIT FOR DIAPHRAGM ACTUATORS**

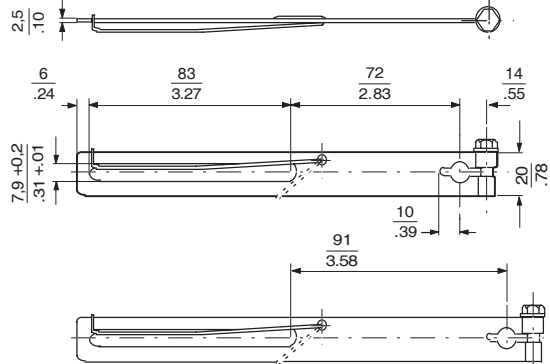
**Attachment to casting yoke**  
according to IEC 534-6 (NAMUR)  
Code EBZG-GN



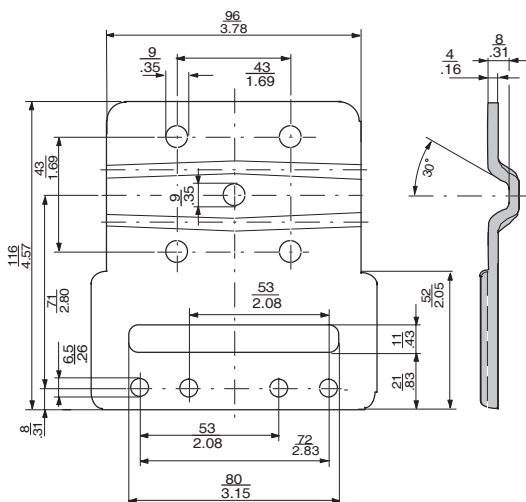
**Attachment to pillar yoke**  
according to IEC 534-6 (NAMUR)  
Code EBZG-FN



**Feedback lever**  
Code EBZG-AN, -FN, -GN  
Code EBZG-BN (extended version)

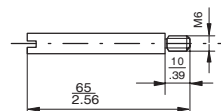


**Mounting bracket**  
according to IEC 534-6 (NAMUR)  
for Code EBZG-GN, FN



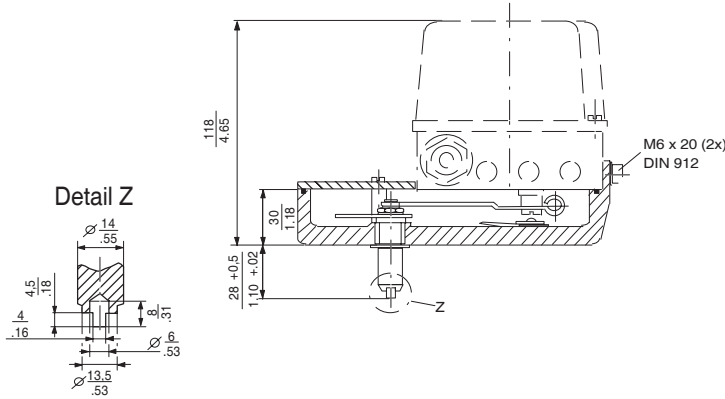
mm
in

**Carrier bolt**  
for attachment to valve stem

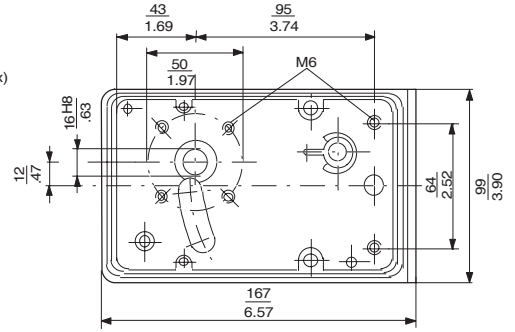


**ATTACHMENT KIT FOR ROTARY ACTUATORS**

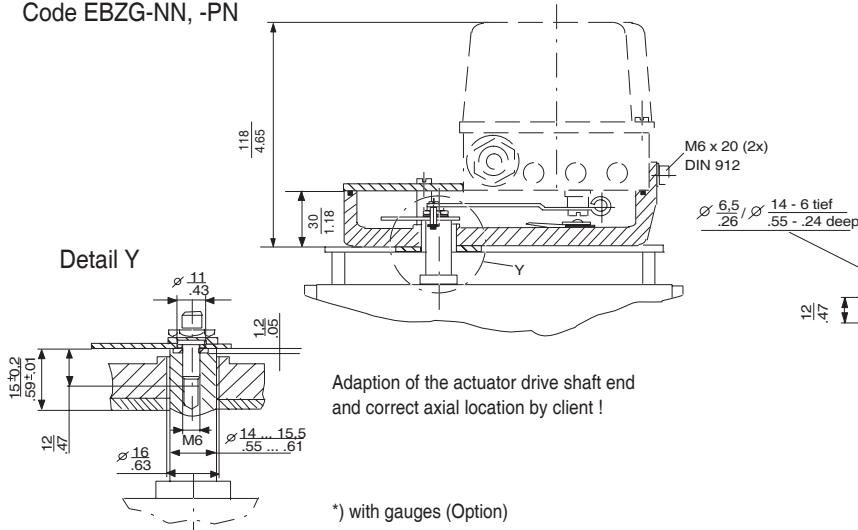
**With shaft**  
(according to VDI/VDE 3845)  
Code EBZG-ZN



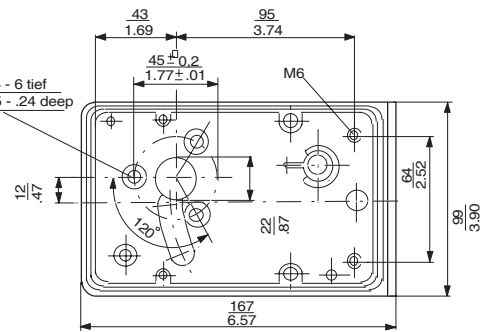
**Housing dimensions**  
Attachment kit with shaft  
resp. without flange  
Code EBZG-NN



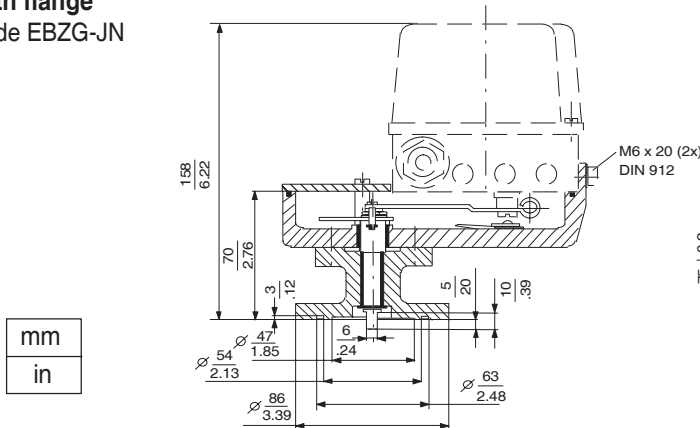
**Without flange**  
Code EBZG-NN, -PN



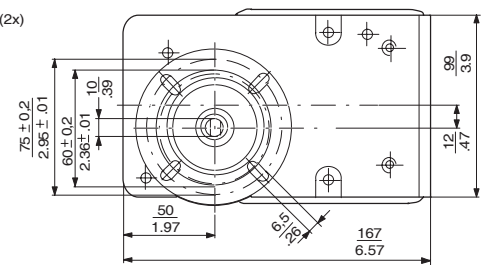
**Housing dimensions**  
Attachment kit without flange  
Code EBZG-PN



**With flange**  
Code EBZG-JN



mm
in



Rotation angle max 120°; torque requirement 14 Nm

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