RE 30263
Edition: 2022-10
Replaces: 2019-11

rexroth
A Bosch Company

Swivel angle sensor

Type ASSEMBLY KIT VT-SWA-LIN

H7175

- Component series 1X
- For use in axial piston pumps type A4 for swivel angle detection - especially for pressure and flow control systems type SYHDFEE, SYHDFEC, SYHDFEn, SYHDFED, SYHDFEF and HS5E (with integrated electronics)

Features

- Measurement of a swivel angle using a hall-effect sensor by scanning the inclined plane of the pump's positioning cylinder
- Consisting of probe tip and sensor with integrated electronics in the housing
- Electronics is calibrated to 750 mV/mm (±4 mm)

Contents

Ordering code

01		02		03	04		05		06	07
ASSEMBLY KIT VT–SWA	**–**	**LIN**	**–**	**1X**	**/**		**–**		**–**	*****

01	Swivel angle sensor	**ASSEMBLY KIT VT-SWA**
02	Linear sensor	**LIN**
03	Component series 10 ... 19 (10 ... 19: unchanged installation and connection dimensions)	**1X**

Supply voltage

04	10 V	**G10**
	15 V	**G15**

Probe tip (dependent on the pump size)

05	Size 40; 125; 180	**1**
	Size 71	**2**
	From size 250	**3**

		G10	G15	
06	Connector G4A5M, 4-pole	✓	–	**K44**
	Mating connector M12x1, 5-pole	–	✓	**C20**

07	For further information, see the plain text	*****

Technical data
(For applications outside these values, please consult us!)

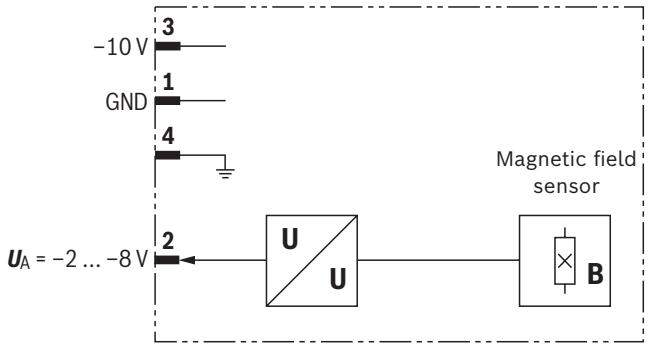
General			
Version		"G10"	"G15"
Weight	kg	0.3	0.4
Ambient temperature range	°C	–20 ... +70	
Storage temperature range	°C	0 ... +70	
Tightening torque	Nm	25^{+5}	
Protection class according to EN 60529		IP65	

Electrical				
Operating voltage		V	–10 (reference voltage from the integrated electronics of the control system)	+13 ... +36
Current consumption		mA	Approx. 25	
Measurement range; stroke		mm	±4	
Output signal		V	–8 ... –2	+2 ... +8
Temperature drift	▶ Zero point	% / K	< 0.2 / 10	
	▶ Range	% / K	< 0.2 / 10	
Electrical connection			G4A5M connector for G4W1F mating connector	Connection cable with M12x1 mating connector

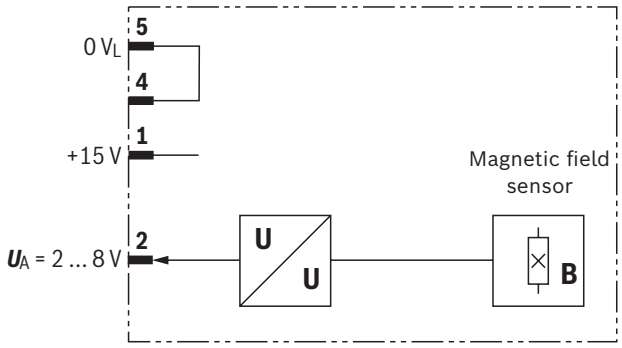
☞ **Notice:**
For information on the environment simulation testing for the areas EMC (electro-magnetic compatibility), climate and mechanical load, see data sheet 30030-U.

Block diagram / pin assignment

Version "G10"



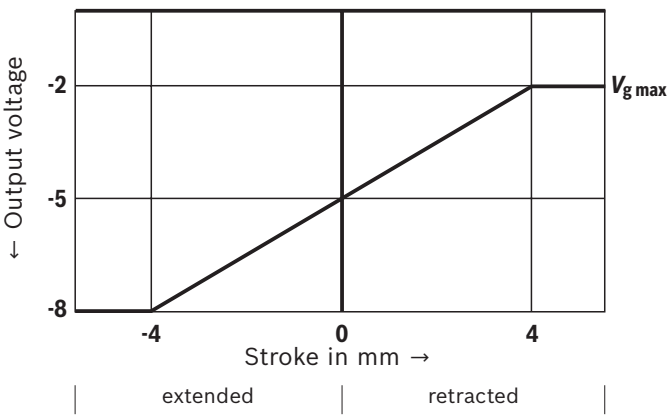
Version "G15"



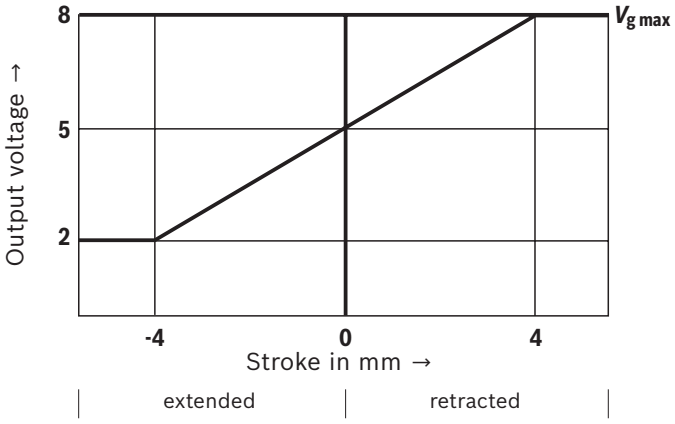
☞ **Notice:**
The VT-SWA-LIN-1X/G15-x-C20 swivel angle sensor is only dedicated for operation at SYHDFED systems. In independent operation, reversed polarity at the pins leads to the destruction of the swivel angle sensor.

Output characteristic curve

Version "G10"

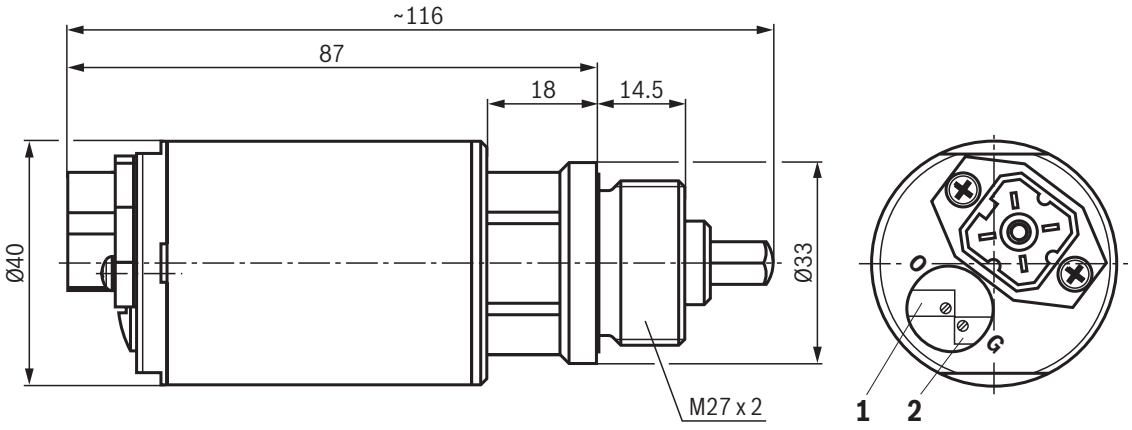


Version "G15"



Dimensions
(dimensions in mm)

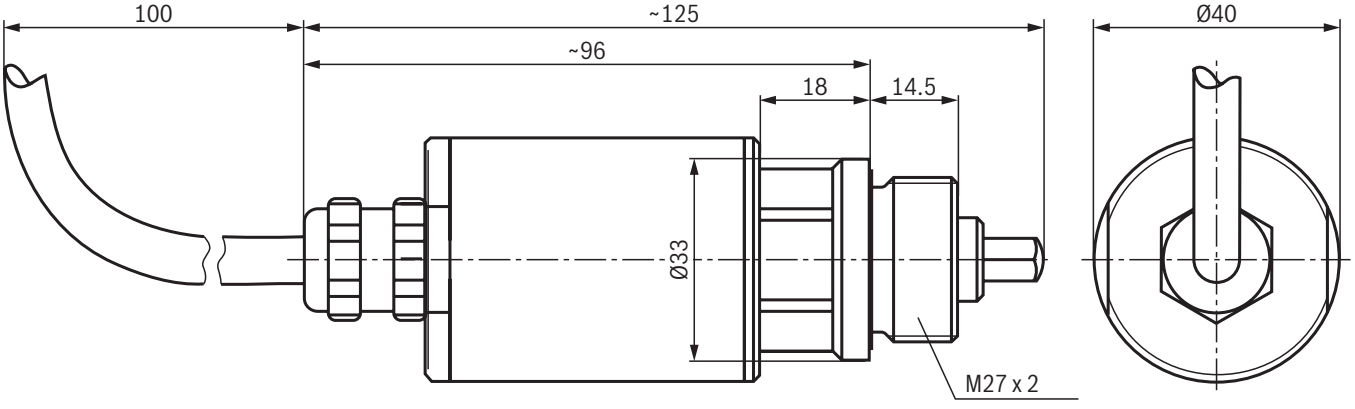
Version with connector G4A5M, 4-pole (...K44...)



1 **O:** Zero point setting of the swivel angle (–5 V)

2 **G:** Setting of the maximum swivel angle (–2 V)

Version with mating connector M12x1, 5-pole (...C20...)



Notice for installation and calibration at pressure and flow control system type SYHDFE with integrated electronics

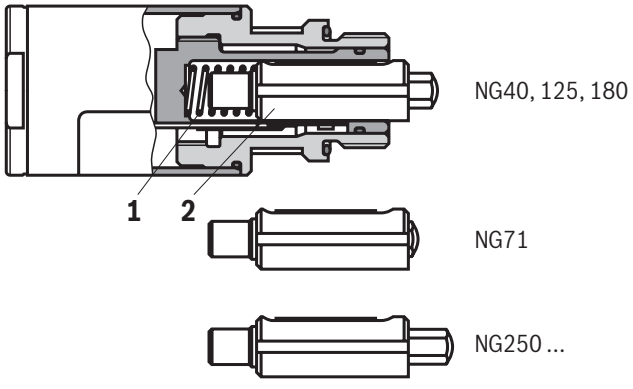
General

The probe tip is a sensitive component and must therefore be handled with care. The probe tip must not be subjected to hard shocks and must be kept at a distance from metal parts, particularly on account of its magnetic properties. The original packaging is the safest storage place until the probe tip is installed in the pump housing.

Installation of VT-SWA-LIN-1X swivel angle sensor

Prior to installation of the sensor, the spring (1) and the probe tip (2) included in the assembly kit have to be installed in the sensor as illustrated by the drawing. Please note that the side with the hardened probe head has to point from the sensor into the pump.
Afterwards, screw the sensor into the pump and tighten it with a torque of 25^{+5} Nm (SW27).

☞ **Notice:**
The sensor to be installed has to be selected according to the pump size due to the different lengths of the sensor probe tips (see type key). Installation of an incorrect probe tip leads to malfunction of the swivel angle sensor.



Check "zero" swivel angle (while system is on)

1. Close all directional control valves
2. Set a swivel angle command value >5 V and/or >50%
   Set a pressure command value of 20 bar
   (if this is technically impossible, set 0 V)

   ☞ **Notice:**
   If an external pilot oil supply is used, the pressure command value must be > 2 bar.
3. Switch on hydraulics and let pump warm up (approx. 5 minutes)
4. Verify whether the actual swivel angle value (α_{actual}) is $0^{\pm 0.01}$ V and/or $0^{\pm 0.1}$ % (With analog electronics at the central plug of the pilot valve, pin 6, violet; with digital electronics via WIN-PED and/or IndraWorks)
   Analog systems
   In case of deviations, use potentiometer (1) to calibrate; the potentiometer is marked with "O" (= offset) on the swivel angle sensor.
   Digital systems
   Start swivel angle-zero point / swivel angle offset calibration via the WIN-PED software and/or IndraWorks.

Check "100%" swivel angle (while system is on)

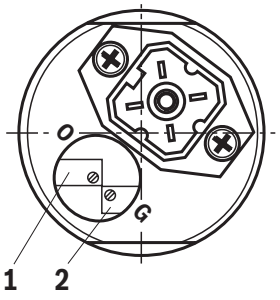
1. Swivel angle command value greater than 10.5 V and/or 105%, pressure command value approx. 100 bar (With type SYHDFED valve command value >50% via the valve direct control)
2. Let the full volume flow via the actuator, e.g. activate hydraulic motor or set pressure relief valve to approx. 20 bar; this causes a deliberate error message by the pilot valve (control deviation too high)
3. Verify whether the actual swivel angle value (α_{actual}) is $10.05^{\pm 0.01}$ V ($+100.5^{\pm 0.1}$ %). (With analog electronics at the central plug of the pilot valve, pin 6, violet; with digital electronics via WIN-PED and/or IndraWorks)
   Analog systems
   In case of deviation, use potentiometer (2) to calibrate; the potentiometer is marked with "G" (= Gain) on the swivel angle sensor
   Digital systems
   Start swivel angle factor calibration via the WIN-PED or IndraWorks software.

Notice for installation and calibration at pressure and flow control system type SYHDFE with integrated electronics

Check "100%" swivel angle (while drive motor is off)

1. Switch off the hydraulics and wait for approx. 5 minutes. until the pump is mechanically swiveled out (wait until pressure is completely reduced).
2. Verify whether the actual swivel angle value (α_{actual}) is $10.05^{\pm 0.01}$ V and/or $+100.5^{\pm 0.1}$ % (With analog electronics at the central plug of the pilot valve, pin 6, violet; with digital electronics via WIN-PED and/or IndraWorks)
   Analog systems
   In case of deviation, use potentiometer (2) to calibrate; the potentiometer is marked with "G" (= Gain) on the swivel angle sensor
   Digital systems
   Start swivel angle factor calibration via the WIN-PED or IndraWorks software.
3. The pump sometimes does not swivel to the stop. Thus, shortly switch on the motor, switch off the motor again, wait until the pump is swiveled out and measure the actual swivel angle value. If a higher voltage is measured, correct the value.
4. Repeat this process several times.

Position of the potentiometers for sensors of the type VT-SWA-LIN...K44



☞ **Notice:**

- With the digital systems SY(H)DFEC and SY(H)DFEn, zero point and gain can be calibrated in a digital and analog manner at the potentiometers of the swivel angle sensor.
- If the swivel angle sensor fails, the system cannot be properly operated.

For safety instructions and further calibration information, see the operating instructions of the respective control system:

Control system	Operating instructions
SY(H)DFEE	30012-B
SY(H)DFEC	30027-B
SY(H)DFEn	30014-B
SY(H)DFED	30017-B

Notes

Notes

Bosch Rexroth AG
Industrial Hydraulics
Zum Eisengießer 1
97816 Lohr am Main, Germany
Phone +49 (0) 93 52/40 30 20
my.support@boschrexroth.de
www.boschrexroth.de

© All rights reserved to Bosch Rexroth AG, also regarding any disposal, exploitation, reproduction, editing, distribution, as well as in the event of applications for industrial property rights.
The data specified above 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.

Bosch Rexroth AG, RE 30263, edition: 2022-10