FLOWSERVE GESTRA

GESTRA Steam Systems

NRG 16-19
NRG 16-27
NRG 16-28
VKE 16-1
VKE 26

GB

Installation Instructions 818725-01

Measuring electrode NRG 16-19
Measuring electrode NRG 16-27
Measuring electrode NRG 16-28
Test set VKE 16-1
Test set VKE 26

Contents

Contents – continued –

Page

Important Notes

Usage for the intended purpose

Use the electrodes NRG 16-19, NRG 16-27 and NRG 16-28 in conjunction with a suitable detector (e. g. test station NRA 1-3) only for monitoring steam traps for banking-up of condensate and loss of live steam.

Safety note

The equipment must only be installed and commissioned by qualified and competent staff.

Retrofitting and maintenance work must only be performed by qualified personnel who – through adequate training – have achieved a recognised level of competence.

Danger

When loosening the measuring electrode steam or hot water might escape.
This presents the danger of severe scalding. It is therefore essential not to remove the electrode unless the boiler pressure is verified to be zero.

The electrode is hot during operation. This presents the danger of severe burns to hands and arms. Installation and maintenance work should only be carried out when the system is cold.

PED (Pressure Equipment Directive)

The equipment fulfils the requirements of the Pressure Equipment Directive (PED) 97/23/EC.
Applicable with fluids of group 2.

ATEX (Atmosphère Explosible)

According to the European Directive 94/9/EC the equipment must **not** be used in explosion-risk areas.

Explanatory Notes

Scope of supply

NRG 16-19
1 Measuring electrode NRG 16-19
1 Joint ring D 17 x 21 to DIN 7603 (made from 1.4301), form A, bright annealed
1 Installation manual

NRG 16-27
1 Measuring electrode NRG 16-27
1 Joint ring D 17 x 21 to DIN 7603 (made from 1.4301), form D, bright annealed
1 Installation manual

NRG 16-28
1 Measuring electrode NRG 16-28
1 Joint ring D 24 x 29 to DIN 7603 (made from 1.4301), form A, bright annealed
1 Installation manual

Description

The measuring electrode fitted in the steam trap or in a separate test chamber monitors the steam trap for banking-up of condensate and loss of live steam.

The measuring electrodes NRG 16-27, NRG 16-28 feature an additional temperature sensor for detecting the condensate temperature.

The test station NRA 1-3 is designed for the connection of up to max. 16 measuring electrodes.

Function

The following electrodes can be used for monitoring steam traps:

- Measuring electrodes NRG 16-27, NRG 16-28 for detecting loss of live steam (electrode exposed) and banking-up of condensate (by measuring the temperature of the condensate) or
- Measuring electrode NRG 16-19 for detecting banking-up of condensate **or** loss of live steam (electrode exposed or immerged).

The measuring electrode NRG 16-27, NRG 16-28 works according to the conductivity measurement principle and signals electrode exposed or immerged. The equipment is also equipped with a temperature sensing element PT 1000 for measuring the temperature of the condensate. The measuring electrode is installed either directly inside the steam trap to be monitored or in the separate test chamber VKE 16 mounted upstream of the steam trap.

Faulty steam traps cause either banking-up of condensate or loss of live steam. Both conditions will be detected by the measuring electrode and indicated and evaluated by the test station NRA 1-3.

The measuring electrode NRG 16-19 works according to the conductivity measurement principle, too. Depending on the installation the electrode detects either loss of live steam or banking-up of condensate. The readings are then evaluated by the test station NRA 1-3 or by the level switch NRS 1-2.

Technical Data

NRG 16-19, NRG 16-27, NRG 16-28

Service pressure
PN 40, max. 32 barg at 238 °C

Connection
NRG 16-19, NRG 16-27: screwed 3/8" to ISO 228-1
NRG 16-28: screwed M 24 x 1.5

Materials
NRG 16-19
Screw-in type enclosure
Spacer disk
Electrode rod
Insulating disk

NRG 16-27, NRG 16-28
Screw-in type enclosure
Electrode rod
Insulation of electrode rod

Sensitivity of response
> 1 µS/cm at 25 °C

Electrode voltage
12 V

Wiring
NRG 16-19: Connecting line made from PTFE, 2 m long, 2 x 1.5 mm^2
NRG 16-27, NRG 16-28: M 12 sensor connector, 5 poles, A coded

Protection
IP 65 to DIN EN 60529

Ambient temperature at terminal box
Max. 80 °C

Weight
Approx. 0.3 kg

Corrosion resistance

When used for its intended purpose the safe functioning of the electrode will not be impaired by corrosion.

Gylon® is a registered trademark of Garlock GmbH, Neuss

Technical Data – continued –

Test chamber VKE 16

Designs
Electrode connection in flow direction to the left or to the right. Please state when ordering.

Pressure / temperature ratings

Service pressure	barg	40	28.4	23.3	23.1
Related temperature	°C	20	250	385	400

Materials
Enclosure 1.0619
Flanges 1.0460

Connections
Flanges: DIN, PN 40
Screwed sockets: BSP and NPT thread
Nominal sizes: DN 15, 20, 25, ½", ¾", 1"
Available on request: DN 40, 50; 1½", 2"

Connection of electrode
Screwed 3/8" to ISO 228-1

Test chamber VKE 26

Pressure / temperature ratings

Service pressure	barg	40	28.4	23.3	23.1
Related temperature	°C	20	250	385	400

Materials
Flanges 1.0460

Connections
Threaded standpipe: 3/8" BSP
Air-balance pipe: 3/8" BSP

Connection of electrode
Screwed 3/8" to ISO 228-1

Technical Data – continued –

Name plate / marking

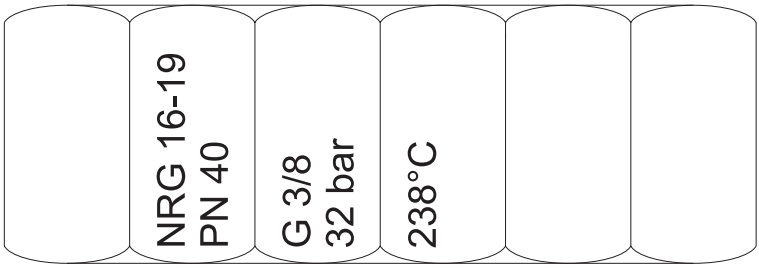
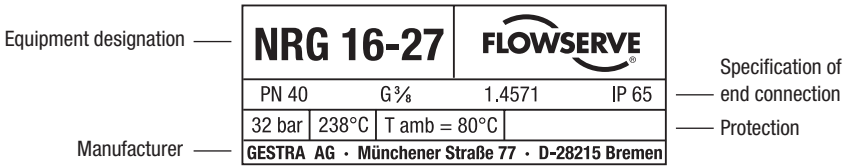


Fig. 1 Equipment designation on hexagon part of electrode



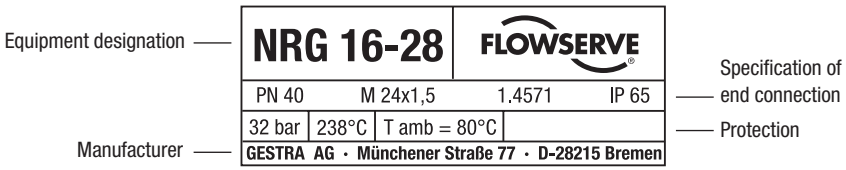


Fig. 2

Dimensions of NRG 16-19, NRG 16-27, NRG 16-28

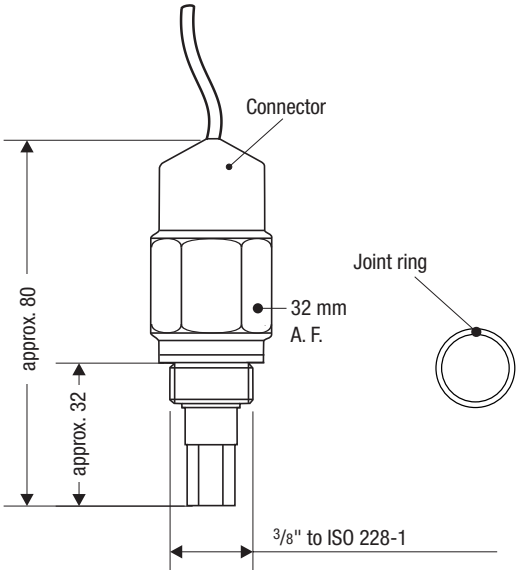


Fig. 3 NRG 16-19

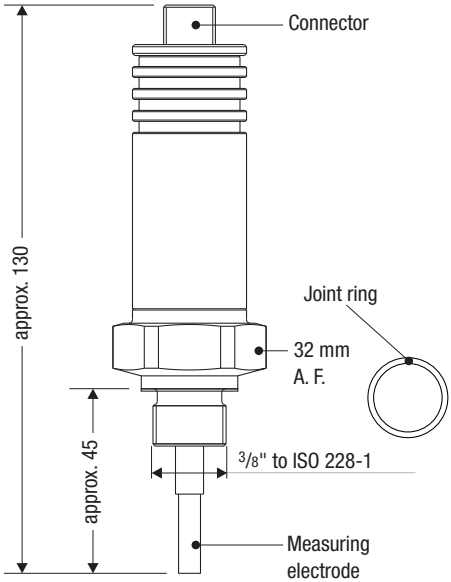
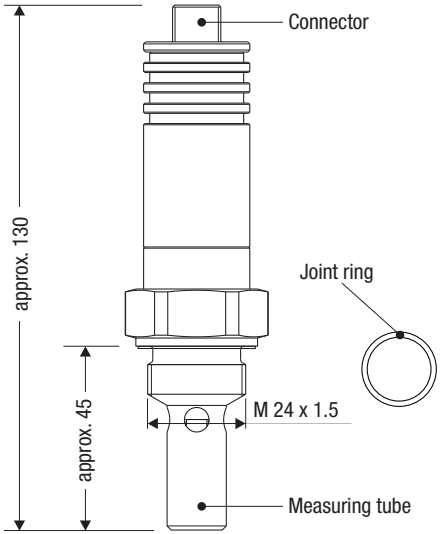


Fig. 4 NRG 16-27



NRG 16-28

Dimensions of test chamber VKE 16

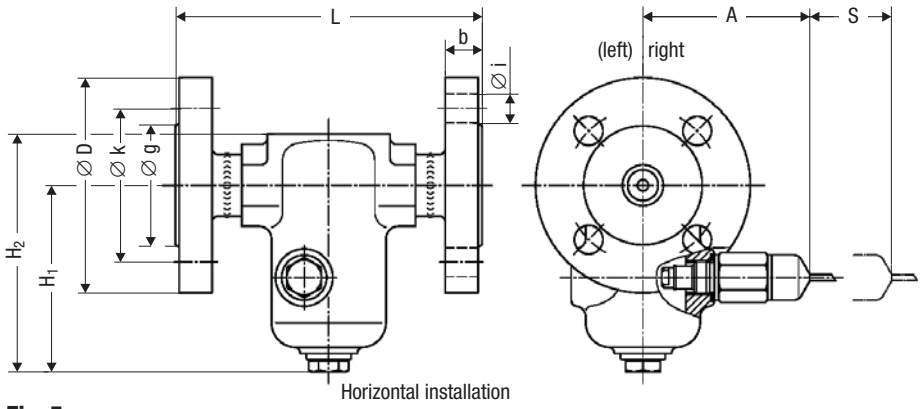


Fig. 5

Dimensions		Designs									
		Flanged to DIN					Screwed sockets				
Nominal size	mm	15	20	25	40	50	15	20	25	40	50
	Inch	½	¾	1	1½	2	½	¾	1	1½	2
Length	L	150	150	160	on request		95			on request	
	A	~80 (NRG 16-19) ~130 (NRG 16-27)					~80 (NRG 16-19) ~130 (NRG 16-27)				
Space required for servicing	S	~40 (NRG 16-19) ~50 (NRG 16-27)					~40 (NRG 16-19) ~50 (NRG 16-27)				
Height	H_1	~93									
	H_2						~118				
Flange dimensions	D	95	105	115							
	b	16	18	18							
	k	65	75	85							
	g	45	58	68							
	i	14	14	14							
Number of holes		4	4	4							

Technical Data – continued –

Dimensions of test chamber VKE 26

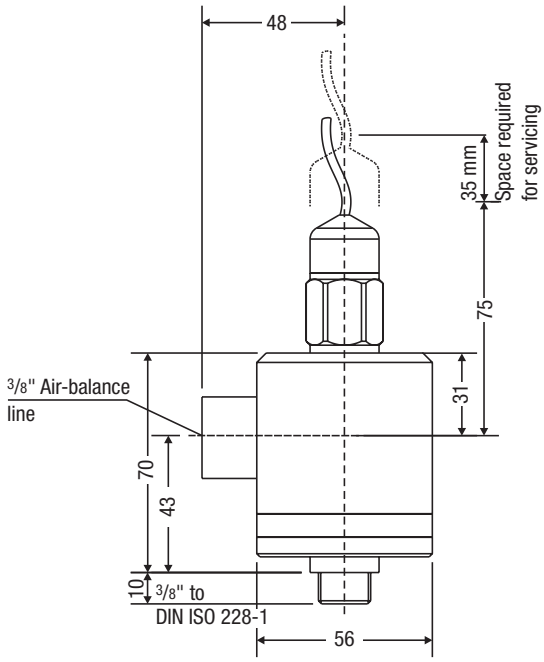


Fig. 6

Dimensions of NRG 16-28 for Rhombusline steam traps

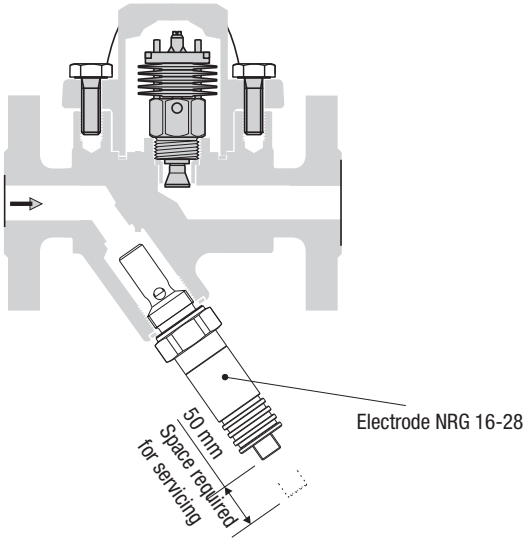


Fig. 7

Installation

NRG 16-19, NRG 16-27, NRG 16-28

The measuring electrode NRG 16-28 can be directly screwed into Rhombusline steam traps. For this purpose unscrew the sealing plug and remove the strainer (see **Fig. 7**).

The steam traps can be installed in horizontal pipes or in vertical pipes with downward flow.

The measuring electrodes NRG 16-19, NRG 16-27 are to be screwed into the test chambers VKE 16, VKE 26:

1. Check sealing surfaces of the steam trap and the test chamber.
2. Put joint ring onto the seating surface of the electrode. Use only the joint ring supplied with the electrode.
3. Apply a light smear of grease (e. g. Molykote® 111) to the thread.
4. Screw the measuring electrode into the steam trap or test chamber and tighten it, using an open-end spanner 32 mm A. F.

   The torques required for tightening when cold are:
   NRG 16-19: 60 Nm,
   NRG 16-27: 60 Nm,
   NRG 16-28: 210 Nm.

Attention

- The seating surfaces of the steam trap or the test chamber must be accurately machined.
- Do not insulate the electrode thread with hemp or PTFE tape.
- Observe the specified torques for tightening.

Tools

- Open-end spanner, 32 mm A. F.

Molykote® 111 is a registered trademark of DOW Corning Corp., Midland Michigan, USA

Examples of installation NRG 16-19, NRG 16-27, NRG 16-28

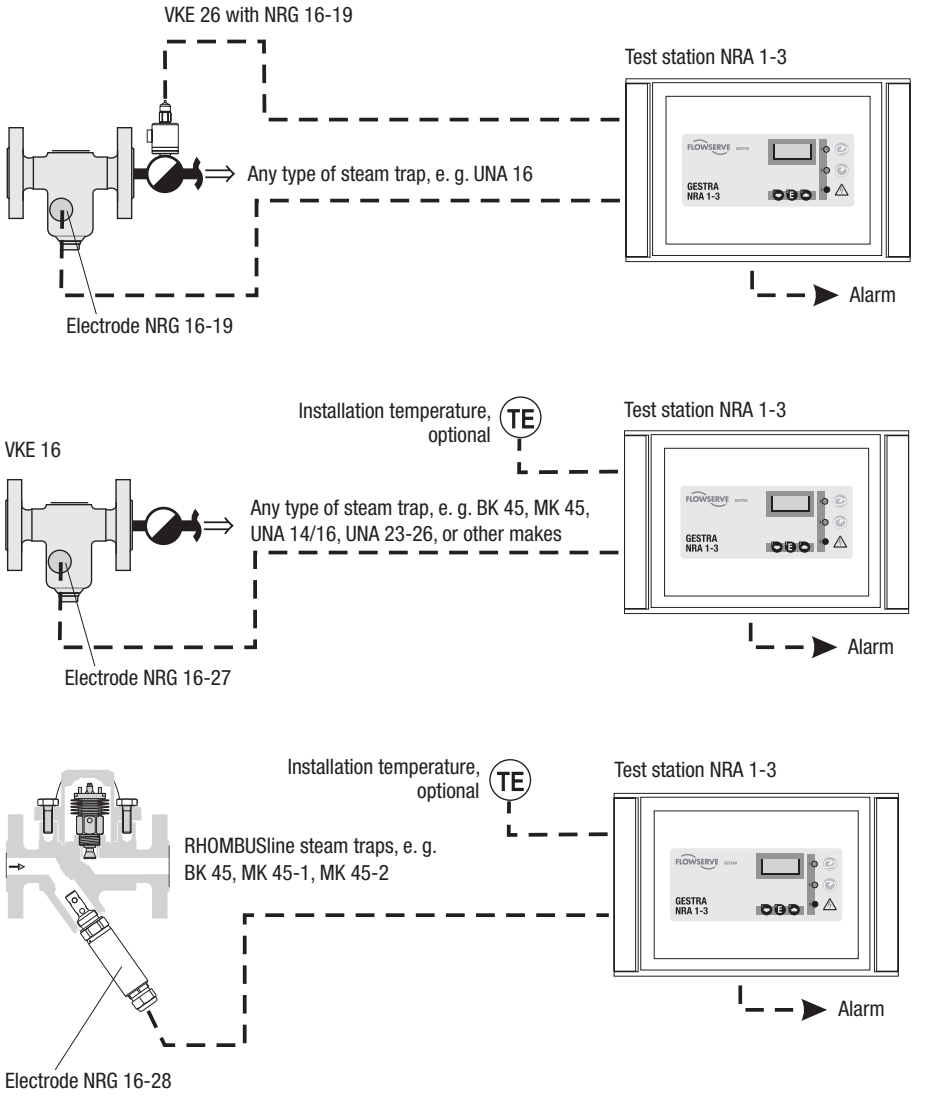


Fig. 8

Wiring

Connecting cables for measuring electrodes

NRG 16-19
The measuring electrode comes with a 2 m long connecting cable and can be directly connected to the test station NRA 1-3. To extend the cable use screened two-core cable, e. g. Ölflex 110 CH, manufactured by LAPP, 2 x 0.5 mm^2. Max. cable length between measuring electrode and test station NRA 1-3: 50 m.

NRG 16-27, NRG 16-28
Use screened five-core cable, e. g. Ölflex 110 CH, manufactured by LAPP, 5 x 0.5 mm^2. Max. cable length between measuring electrode and test station NRA 1-3: 50 m. Please connect the screen to the measuring electrode.

Pre-assembled connecting cables (with connector) of various lengths available as accessories.

Wiring

Connect the cables to the terminal strips of the test station according to the wiring diagram.

Tools

- Screwdriver for cross recess head screws, size 1 and 2
- Screwdriver for slotted screws, size 2.5, completely insulated to VDE 0680.

Measuring electrodes NRG 16-27, NRG 16-28 pin assignment

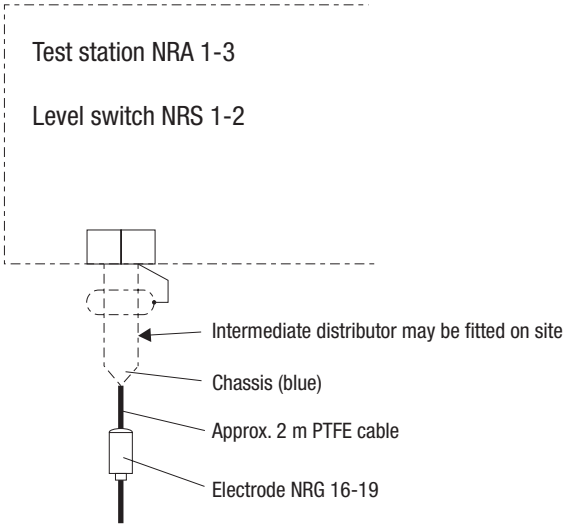
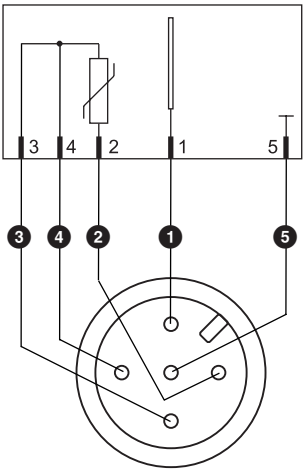


Fig. 9



❶ Measuring electrode
❷ Temperature sensor
❸ Temperature sensor
❹ Temperature sensor
❺ Chassis

Coupler

Fig. 10

Commissioning

Checking wiring

Before commissioning please check:
Are the measuring electrodes /temperature sensors wired in accordance with the wiring diagram?

Applying mains voltage

Apply mains voltage to the test station.

Maintenance

Danger

When loosening the measuring electrode steam or hot water might escape.
This presents the danger of severe scaling. It is therefore essential not to remove the electrode unless the boiler pressure is verified to be zero.

The electrode is hot during operation. This presents the danger of severe burns to hands and arms. Installation and maintenance work should only be carried out when the system is cold.

Maintenance interval

We recommend to remove the measuring electrodes every 6 months and clean them with a wet cloth.

If faults occur that are not listed above or cannot be corrected, please contact our service centre or authorized agency in your country.

Decommissioning

Disposal

Remove the measuring electrode NRG 16-19, NRG 16-27, NRG 16-28 and separate the waste materials, using the material specification as a reference. Electronic components (circuit boards) must be disposed of properly.

For the disposal of the measuring electrode observe the pertinent legal regulations concerning waste.

For your notes:

For your notes:

FLOWSERVE GESTRA

Agencies all over the world:

www.gestra.de

España

GESTRA ESPAÑOLA S.A.
Luis Cabrera, 86-88
E-28002 Madrid
Tel. 00 34 91 / 5 15 20 32
Fax 00 34 91 / 4 13 67 47; 5 15 20 36
E-mail: aromero@flowserve.com

Great Britain

Flowserve GB Limited
Abex Road
Newbury, Berkshire RG14 5EY
Tel. 00 44 16 35 / 46 99 90
Fax 00 44 16 35 / 3 60 34
E-mail: gestraukinfo@flowserve.com

Italia

Flowserve S.p.A.
Flow Control Division
Via Prealpi, 30
I-20032 Cormano (MI)
Tel. 00 39 02 / 66 32 51
Fax 00 39 02 / 66 32 55 60
E-mail: infoitaly@flowserve.com

Polska

GESTRA POLONIA Spolka z.o.o.
Ul. Schuberta 104
PL - 80-172 Gdansk
Tel. 00 48 58 / 3 06 10 -02 od 10
Fax 00 48 58 / 3 06 33 00
E-mail: gestra@gestra.pl

Portugal

Flowserve Portuguesa, Lda.
Av. Dr. Antunes Guimarães, 1159
Porto 4100-082
Tel. 0 03 51 22 / 6 19 87 70
Fax 0 03 51 22 / 6 10 75 75
E-mail: jtavares@flowserve.com

USA

Flowserve GESTRA U.S.
2341 Ampere Drive
Louisville, KY 40299
Tel.: 00 15 02 / 267 2205
Fax: 00 15 02 / 266 5397
E-mail: dgoodwin@flowserve.com

GESTRA AG

P. O. Box 10 54 60, D-28054 Bremen
Münchener Str. 77, D-28215 Bremen
Telephone +49 (0) 421 35 03 - 0
Fax +49 (0) 421 35 03 - 393
E-Mail gestra.ag@flowserve.com
Internet www.gestra.de

GESTRA

818725-01/907cm · 2006 GESTRA AG · Bremen · Printed in Germany