

## NGX-BR-NWt

### Limit switch relais



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**TH. WITT Kältemaschinenfabrik GmbH**

Lukasstrasse 32 | 52070 Aachen

Tel.: +49 241 182080

[www.th-witt.com](http://www.th-witt.com)

[sales@th-witt.com](mailto:sales@th-witt.com)

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## Content

1	Notes used and their meaning.....	5
2	General.....	6
2.1	Safety instructions.....	7
2.1.1	Commandments.....	7
2.1.2	Precautions.....	8
2.1.3	Warnings.....	9
2.1.4	Prohibitions.....	9
2.2	Responsibility.....	10
2.2.1	Responsibilities of the manufacturer.....	10
2.2.2	Responsibilities of the installer of the refrigerant system.....	10
2.2.3	Responsibilities of the operator of the refrigerant system.....	10
2.3	Structure of the manual and other applicable documents.....	11
2.4	Legal information.....	11
2.5	Behaviour in an emergency.....	13
2.6	Intended use.....	13
3	technical informationen.....	14
3.1	Design and function of the product.....	14
3.2	technical data.....	14
3.3	necessary accessory.....	15
4	Logistics.....	16
4.1	Delivery.....	16
4.2	Transport.....	16
4.3	Storage.....	16
5	Assembly and commissioning.....	17
5.1	Assembling the product.....	17
5.1.1	Alignment of the product.....	17
5.1.2	Electrical connection.....	17
5.2	Preparing commissioning.....	19
5.3	Commissioning.....	20
5.4	Operating the product.....	20
6	Decommissioning and disposal.....	21

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## Tables

Tab. 1: Technical data of the BR-NWt limit contact relay.....	14
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## Pictures

Fig. 1: Electrical circuit diagram of the BR-NWT.....	17
Fig. 2: Connection alternative 1 + 2 of the BR-NWt.....	17
Fig. 3: Setting at the BR-NWt.....	18

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## 1 Notes used and their meaning



### CAUTION

Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate physical injury or property damage.



### WARNING

Indicates a potentially hazardous situation that could result in serious injury or death.



### DANGER

Indicates an imminent danger that will result in serious physical injury or death.



### NOTE

Indicates an important note, the observance of which is important for the intended use and function of the product. Can be specified by a different symbol.

## 2 General



### NOTE



Please read the complete operating instructions carefully before working with the product described here.

Ensure that these operating instructions are known to any person who is in any way involved with the product and that they are always kept accessible in the immediate vicinity of the product.

This manual contains the internationally standardised SI units of measurement.

All information and instructions for the assembly, installation, operation and maintenance of this product are given to the best of our knowledge, taking into account our previous experience and knowledge.



### NOTE



The target group of this manual are all persons who interact directly or indirectly (e.g. when working on third-party products in the same room) with the product. This applies in particular to the personnel of refrigeration system manufacturers, system operators and service providers.



### Copyright

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## 2.1 Safety instructions

The commandments, precautions, warnings and prohibitions listed below are general instructions.

For each product, further instructions can be found in the respective chapters of this manual.

### 2.1.1 Commandments



#### NOTE



##### Observe regulations!

Observe all safety regulations regarding the handling of refrigerants, pressure-bearing devices and electrical machines to prevent personal injury and damage to property.

In particular the wearing of personal protective clothing (incl. breathing, eye and hand protection) is mandatory to avoid damage to health and/or impairment.



##### Use protective clothing!

Always wear protective clothing suitable for the working medium to avoid physical damage through possible contact with the medium.



##### Use eye and face protection!

Always wear eye and face protection (bonnet, glasses or face shield) according DIN EN ISO 4007.



##### Use protective gloves!

Use protective gloves that protect against mechanical and chemical hazards (see imprinted pictograms on the gloves).



##### Wear safety shoes!

Always wear safety shoes of at least class S3 according DIN EN ISO 20345.



##### Keep breathing protection always ready!

Respiratory protection equipment suitable for the working medium must be available at least in two independent versions and must be accessible without barriers.



##### Disconnect systems

Before starting any work on or in the immediate area of the product, secure machines and devices and switch off the power supply and secure it against being switched on again.



##### Regulations and environmental protection

- It is imperative that you comply with the local regulations for refrigerant systems, electrical circuits and environmental requirements.
- Please be aware that working with refrigerants of any kind can always have an impact on third parties and the environment, even with full personal protection.

## 2.1.2 Precautions



### CAUTION



#### Qualified staff

- All work on refrigeration products may only be carried out by competent personnel trained in handling refrigeration systems.
- Work on electrical installations or equipment may only be carried out by a qualified electrician.
- The operator of the overall system is responsible for compliance with the national and international work, safety and accident prevention regulations applicable to the specific application.



#### electrical voltages

Impairment of functionality or damage.

Adhere to the specified voltage on the type plate.



#### Avoid tripping hazards

Physical damage due to falling or tripping.

When working on the product, avoid tripping hazards caused by tools or working materials.

Install the product in such a way that no tripping hazards (e.g. caused by cables, drip pans, etc.) remain.

If they cannot be avoided, mark them with appropriate two-colour adhesive tape (warning bars).

## 2.1.3 Warnings



### WARNING



#### Presence and function of safety devices

- All work on the product may only be carried out when it is at a standstill.
- Ensure that all safety functions are connected and active in a possible manual operation.
- If the product was switched off by a safety device, the cause must be identified and documented before restarting.
- If safety devices are removed for other work, reinstall them after completion of the work and check the function of the safety device.



#### Pressure and temperature influences

- Never exceed or fall below the temperature and pressure specifications given on the type plate in order to protect the product from damage and ensure smooth operation.
- Make sure that a pressure relief device is installed and operational.
- Liquid refrigerant must not be locked up at any time. In this respect, observe the position of all upstream and downstream shut-off valves.
- Before starting any maintenance or disassembly work, the product must be depressurised and the refrigerant completely drained from the product.



#### Residual risks

Even if the product is used as intended, hazards to life and limb of the user or third parties or damage to the product and other material assets may occur.



### DANGER



#### Leakage test

Before starting any work on the product, make sure that all system components in your vicinity are leakproof.

## 2.1.4 Prohibitions



#### Fire, open light and fire protection

Open flames on and in the immediate vicinity of the product are prohibited. Take appropriate fire protection measures to prevent unauthorised heating of the product.



#### No smoking

Smoking on and in the immediate vicinity of the product is prohibited.

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## 2.2 Responsibility

### 2.2.1 Responsibilities of the manufacturer

The instructions given in this manual for maintaining the functional safety of the product, for avoiding potential hazards to man and machine during transport, installation and assembly, commissioning, operation and maintenance measures refer exclusively to the product.

The manufacturer's responsibility for the design of the product is documented according to EN 378-2 (design, manufacture and testing).

All materials used are designed to withstand the foreseeable mechanical, thermal and chemical stresses and are resistant to the working medium.

The working medium-carrying parts of the product are designed in such a way that they remain leak-proof, taking into account the foreseeable mechanical, thermal and chemical stresses, and can withstand the maximum permissible operating pressure.

All responsibility regarding the refrigerant system, in which the product is integrated, lies exclusively with the parties involved in the individual work steps.

### 2.2.2 Responsibilities of the installer of the refrigerant system

The responsibility of the installer of the refrigerant system is documented by the design of the system according to EN 378-2 (design, manufacture and testing).

### 2.2.3 Responsibilities of the operator of the refrigerant system

The responsibility of the installer of the refrigerant system is documented by the operation, maintenance and recovery of the entire system according to EN 378-4.

## 2.3 Structure of the manual and other applicable documents

The operating manual for the product include the following components:

- This manual
- Manual for WITT NGX maximum level switch
- Order-related documents

The order-related documents will be sent to you when the order is placed and contain the following information:

- the order-related delivery address
- the order-related "[Intended use](#)"
- the order-related scope of delivery
- the order-related technical data

The operating manual is part of the operating manual handbook for the system. This manual must be provided by the installer of the refrigerant system.



### NOTE

If you have not purchased the product directly from the manufacturer, you are obliged to request the order-related documents listed here from the seller.

## 2.4 Legal information

The contents of this manual must be followed without fail; any use other than that described here excludes any liability and warranty on the part of the manufacturer.

The German language manual is always the original manual.

Translations are carried out to the best of our knowledge with the involvement of native speakers. No liability whatsoever is accepted for translation errors.

We reserve the right to make technical changes of any kind to the illustrations and information in this manual.

In order to avoid accidents and to ensure optimum performance, no changes or modifications may be made to the product without the express written permission of the manufacturer.

When replacing parts or procuring spare parts, only original spare parts approved by the manufacturer must be used. Operating materials are to be used in accordance with the information in the manual.

Liability or warranty is excluded if:

- the instructions and notes in this manual are not observed,,
- the product including associated equipment is incorrectly operated or its handling does not comply with the prescribed procedure,
- the product is used contrary to its intended purpose,

- 
- safety devices are not used or are put out of operation,
  - functional changes of any kind are done without the written consent of the manufacturer,
  - the intended performance limits of the product are exceeded due to system-side performance adjustments,
  - the relevant safety regulations and accident prevention rules are not observed,
  - when replacing parts or procuring spare parts, the original spare parts approved by the manufacturer are not used and professionally installed,
  - the product, including associated components and safety devices, is improperly maintained. This includes the observance of intervals and the content of the maintenance.

## 2.5 Behaviour in an emergency



### WARNING

Before starting and during the work



- Read and understand the evacuation plan
- Block access to the product for unauthorised persons
- always comply with the "[Safety instructions](#)"



In case of an emergency situation



- compliance with the protective measures envisaged
- Shut down the product or entire system immediately
- Completely disconnect the product or entire system from the power supply
- Disconnect mains supply lines so that they cannot be switched on again
- Mark the mains supply lines so that they cannot be switched on again



The operator of the overall system must ensure that a disconnecting device, e.g. main switch with corresponding contact load and an integrated control display, is pre-installed in the mains supply line by the customer.



## 2.6 Intended use

WITT products as well as products distributed by WITT are exclusively intended for use in refrigeration or heat pump systems.

The limit contact relay BR-NWt is designed to control the WITT NGX maximum level switch.

## 3 technical informationen



### NOTE



The specified functions, typical values and materials refer to standard types of the product. Especially for special units the following applies: Please observe the information in the order-related papers.

### 3.1 Design and function of the product

When the liquid level in the refrigerant separator reaches the maximum permissible value and the balance beam of the NGX maximum level switch floats up, the contacts 13 / 14 of the BR-NWt open. This switches off the auxiliary contactor K3A and thus the compressor. An alarm message is triggered.

### 3.2 technical data

Voltage	[V]	240 / optionally 110
Permissible deviation	[%]	-20 to +10
Mains frequency	[Hz]	50 / 60
Power consumption	[VA]	< 3
Measuring circuit voltage	[VAC]	< 16
Measuring circuit current	[mA]	9
Switching capacity, max.	[VAC / A]	250 / 8
Operating selection		A = Operating mode (B = Reversal, not allowed!)
Perm. temperature range	[° C]	-20 to +50
Perm. relative humidity	[%]	0 to 90
Switching delay	[s]	0,1 to 10
Upper red LED display		Mains voltage present
Lower green indicator		Relais on
Housing protection class		IP 10
Dimensions	[mm]	approx. 75 x 45 x 110
Weight	[kg]	approx. 0,26

Table 1: Technical data of the BR-NWt limit contact relay

Classification (according IEC 61508)

SIL 1

Table 1: Technical data of the BR-NWt limit contact relay

### 3.3 necessary accessory

According to the "[electrical circuit diagram](#)", we propose the following electrical switching elements in accordance with the specifications of IEC/EN 60947-5-1:

- Contactor relays K3A (230/240 V; 50-60 Hz; ACle=4A)
- Push-button contact K.. (e.g. potential-free contact PLC)
- Reset button S4 (AC 230V, 6A; DC 24V, 3A)
- Indicator lamp H6 (230/240 V; 50-60 Hz; 5 - 15 mA)

## 4 Logistics

### 4.1 Delivery

Upon receipt of the product / order, proceed as follows

- Unpack the goods and check for transport damage.
- Dispose of packaging material in accordance with local regulations.



#### NOTE

Report any damage to the packaging to the carrier immediately and refuse acceptance if necessary.

Report any transport damage to the product immediately to the manufacturer or its representative.

### 4.2 Transport



#### WARNING



– Always ensure proper transport and storage of the product in accordance with the accident prevention measures available to you.

– Transport the product carefully.

– Above all, avoid putting the product down hard.



– Ensure that all openings on the product are always protected against the entry of dirt and moisture with suitable plugs.

– Secure the product against slipping and mechanical damage.



– Protect the product from damage to the coating.

### 4.3 Storage



#### WARNING



– Ensure that all openings on the product are always protected against the entry of dirt and moisture with suitable plugs.

– Secure the product against slipping and mechanical damage.



– Protect the product from damage to the coating.

– Store the product dry and protected from dirt.

## 5 Assembly and commissioning



### NOTE

Follow the rules for assembly and commissioning to ensure smooth operation of the product.



### WARNING



Observe at all times the present "[Safety instructions](#)" as well as the "[Behaviour in an emergency](#)" at the beginning of this document!

### 5.1 Assembling the product

The type plate must be clearly legible.

#### 5.1.1 Alignment of the product

The BR-NWt is installed in the control cabinet. It must be ensured that the luminaire and the potentiometer remain accessible.

Mount the BR-NWt on a mounting rail/top-hat rail TS35 (EN50022) in any mounting position.

The electrical connections are made according to the electrical circuit diagram.

If you install the "[necessary accessory](#)", sufficient space must be provided in the control cabinet.

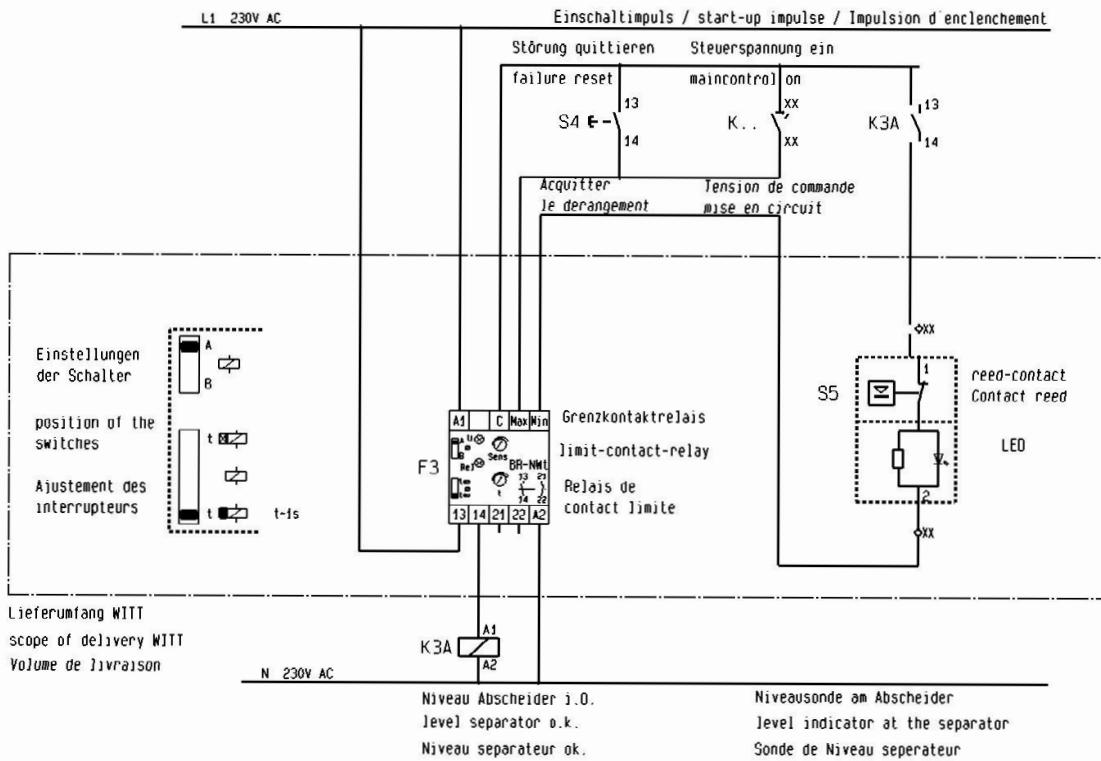
#### 5.1.2 Electrical connection



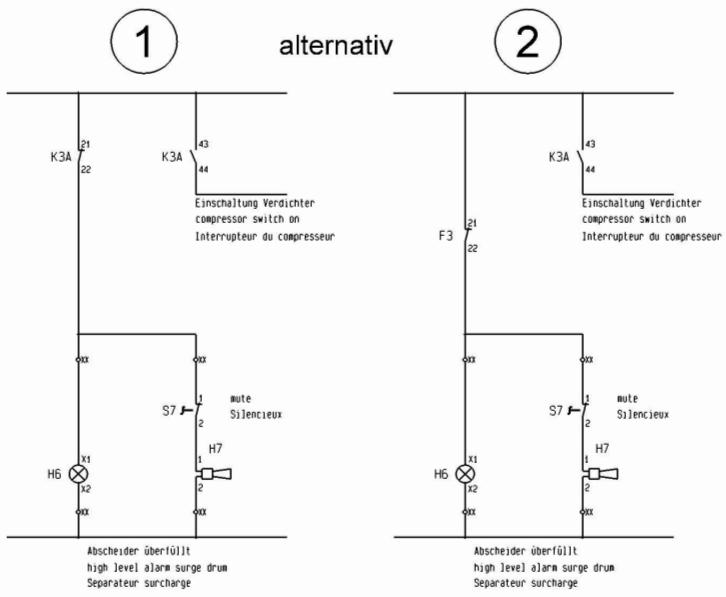
### NOTE

The electrical connections must be installed in accordance with the relevant standards and regulations. In particular, BGV A2 (VBG 4), VDE 0100, VDE 0113 (EN 60204 T1) and VDE 0660 T5 (EN 60439 T1) must be observed.

No warranty is given for damage caused by improper electrical connection to the product.



**Figure 1: Electrical circuit diagram of the BR-NWT**



**Figure 2:** Connection alternative 1 + 2 of the BR-NWt

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## 5.2 Preparing commissioning

Before the product may be put into operation, a safety analysis of the refrigerant system must be carried out.

This includes

- a thorough visual inspection of the entire piping system in accordance with the technical drawings.
- Retighten screw and flange connections.
- a holistic leak and pressure test with documentation.
- all safety devices are present and tested for function.

During initial commissioning, set the BR-NWt to the home position via a button [S4].

This closes contacts 13 / 14 and the auxiliary contactor K3A is activated.

At the auxiliary contactor K3A, contacts 13 / 14 and 43 / 44 are closed and release the reed switch [S5] and the compressor.

For an alarm message use the contacts 21 / 22 of the auxiliary contactor K3A (1) or alternatively the contacts 21 / 22 of the BR-NWt (2) according to the "[Electrical circuit diagram](#)".

To set the limit contact relay to the home position after it has been triggered by the maximum level switch, use either the "Acknowledge fault" button [S4] or optionally the switching contact [K..]. The switching contact [K..] must be wired e.g. via a PLC control.

## 5.3 Commissioning



### CAUTION

Commissioning may only take place after a successful "safety analysis".

Continuous operation is only possible when constant operating conditions have been established.

Set the top left switch to position A for normal operation and the switch below it all the way down for switch-off delay. A desired delay time can be set by turning the lower potentiometer [t] to a value between 0.1 and 10 seconds. Setting a delay time ensures that the maximum level limiter is not triggered by vibrations or foaming refrigerant. In practice, a delay time of approx. 3 seconds, turning the lower potentiometer approx. 30° to the right, has proven to be effective. The upper potentiometer [Sens.] must be set to position 0 (far left). The LEDs U and Rel. light up when the unit has been properly installed.

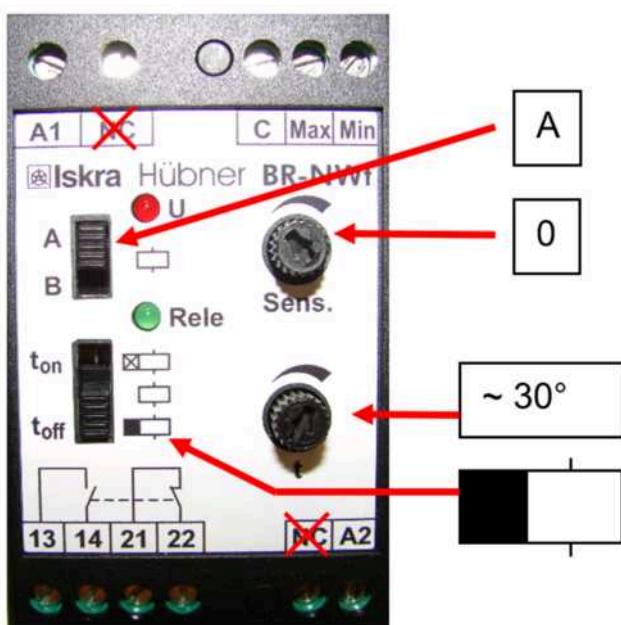


Figure 3: Setting at the BR-NWt

## 5.4 Operating the product

The product may only be operated within the range of its design data.

After the alarm has been triggered, the BR-NWt must be set to the "home position" again. Only now does the compressor starts up again.

## 6 Decommissioning and disposal



### NOTE

For temporary decommissioning of the product, the labelling requirement "out of service" must be observed.

The separate, environmentally sound disposal of materials promotes the recyclability of valuable materials. Therefore, at the end of the normal service life, the product itself and all individual parts belonging to it, e.g. auxiliary materials, packaging and wearing parts, must be taken to the recycling collection point.

Auxiliary materials and system residues (especially refrigerant residues) must be removed professionally from all individual parts.

Packaging, product and accessories are made of recyclable materials and should be disposed of accordingly. Ensure that a discarded product is rendered unusable before disposal.



### WARNING

If you do not have the necessary expertise, commission a specialist with the dismantling and disposal.

Always observe the regional disposal regulations.



## TH. WITT Kältemaschinenfabrik GmbH

Lukasstraße 32  
52070 Aachen

+49 241 18208-0 | [sales@th-witt.com](mailto:sales@th-witt.com)