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Technical information subject to change  
Different variations to those specified are possible.

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## Operation

The NT 3000 is a control cabinet system control for the comfortable control and viewing of the fill level in silos and vessels via computer. This is done using standard Internet browser software which connects to the visualisation software via an IP address. The heart of the NT 3000, is a web server module which is via Ethernet connected to all computers on the network and allows viewing of the software simultaneously. The NT 3000 can process analogue 4-20mA signals, digital signals of various level measurement technologies and the Modbus RTU of the UWT Nivowave® sensoric.

The software offers alongside the fill level visualisation, trend data which can be saved and further analysed in software such as Excel.

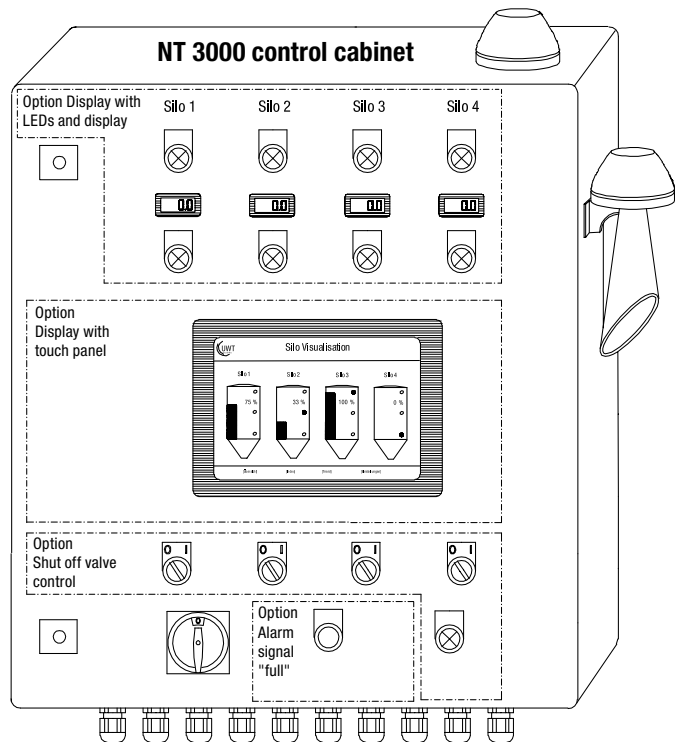
The NT 3000 software can also be accessed worldwide via a modem. Access is via a password. This makes it possible for suppliers to check the fill level and ensure that there is always sufficient material in the silo.

The NT 3000 can be installed with an alarm signal that results in either a buzzer or flashing light, once the full detector sends a signal. The installation of the buzzer or flashing light is usually near the silo filling area. The alarm is cancelled using a key switch.

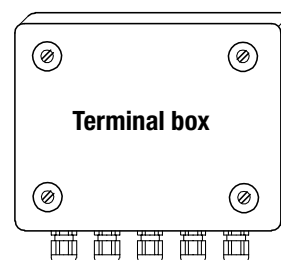
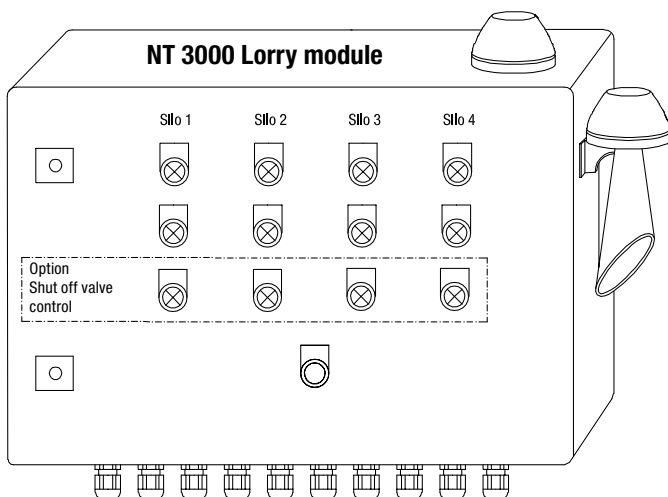
If there is a shut off valve in the filling pipes, this can be also be controlled via the NT 3000. The shut off valve can be opened before filling using several methods such as a key switch on the control cabinet, or via mouse click in the visualisation software, or a code on the operator panel, which can be entered by the operator for filling.

It is also possible that barcode can be scanned at the filling station, which opens the relevant valve. Additionally it is also possible to open up the valve using a transponder chip which can be scanned at the filling station. Each silo has its own transponder chip, which can be read by the chip scanner at the filling station. All five methods help to prevent that the incorrect silo will be filled. The shut off valve closes automatically via the signal from the full detector.

The fill level display can also be shown on the control cabinet door. The evaluation of the 4-20mA and digital signal inputs, can either be shown on a digital display with LEDs or on a touch panel. The evaluation of Modbus and digital signals is only possible via a touch panel.



Further control comfort is offered with the Lorry module, which is mounted near the filling station. It must be protected against snow, rain or sun with a roof. It contains a buzzer or flashing light which can be cancelled via a button. Likewise there is an LED for full and empty detection for each silo. Enabling of the shut off valve is also on this module. These ensure that no silo is overfilled or that the wrong silo is filled. For the clamping between the signals / supply voltage, a terminal box is mounted on the silo frame. The Nivotec NT 3000 system is supplied as a complete system with project specific electrical plans.



## Overview

### Equipment overview

<b>System</b>	Visualisation software on the web server module with various options for the fill level display and monitoring, access to the software is via Ethernet using standard PC Internet browser software.
<b>Control cabinet</b>	Project specific, complete wired system with electrical plans Includes the measurement technology power supply
<b>Signal input</b>	- 4-20 mA - digital (potential free or +24 VDC) - Modbus RTU
<b>Interfaces</b>	- Ethernet - Profibus DP
<b>Data storage with trend enquiry</b>	The fill level data is displayed as a trend via the software and can then be saved onto a PC and further analysed using Excel, for example.
<b>Remote data request</b>	Worldwide access via an integrated modem. Access is password protected.
<b>Display on the control cabinet</b>	By 4-20 mA signal input and digital (level sensor) - fill level LED- display Nivotec® NT 10 in percentage, height, volume or weight - level "full" and "empty" via LEDs - Touch panel 7" or 12.1"  By Modbus and digital signal input (level sensor) - Touch panel 7" or 12.1"
<b>Alarm signal "full" on the control cabinet</b>	Full signal via buzzer or flashing light, LEDs for full and empty signals. Cancellation is via a key on the control cabinet
<b>Lorry module</b>	The lorry module contains the alarm signal "full" and shows via LEDs which silos are full and empty. The alarm signals can be cancelled via a button on the lorry module. A green LED for each silo lights up when the silo has been cleared for filling via the shut off valve control.
<b>Shut off valve control</b>	The available release methods for filling are: - Key switch - Mouse click in the visualisation software. - Number code input on the operator panel - Scanning of a barcode at the filling station - Scanning of a transponder chip at the filling station The shut off valve will automatically close on receipt of a full signal from the full sensor.
<b>Terminal box</b>	The terminal box is for the intermediate connections of all signals and power supplies from the silo plant to further evaluations. It is a metal housing with a screw on lid and cable glands on the underside.

## Options / functions

Option	Function	
	Description	Additional information
<b>Basic equipment</b>	Control cabinet for mounting on the wall with right hinged door.	The type and dimensions are dependant on the size of the project.
	Visualisation software on web server module	The web server is directly connected to the Ethernet. The software is viewed over the web server via the web server IP address in internet browser software. Details of the software are found in the NT 3000 software user guide.
	Main switch is in the control cabinet door	
	Cable glands on the underside of the control cabinet	The number is dependant on the size of the project.
	All clamps for the connection of measurement signals, sensor and control cabinet power supplies, earthing etc are supplied in the control cabinet.	The control cabinet runs on 230 VAC. All further modules such as the power supplies, fuses, relays, logic modules, etc are in the cabinet on DIN rails and are internally wired.
	Project specific electrical plans	The electrical plans are prepared to the actual standards and contain all circuit diagrams, cable lists, clamp plans, parts lists and documentation of all components that are contained in the project.
<b>Measurement technology</b>	This option defines which measurement technology is connected to the Nivotec system for the contents measurement	Pure electronic measurement technology is for example Nivowave®, Radar etc. An electromechanical measurement systems if for example, the UWT SLS 3000 or other Lot systems.
<b>Input signal</b>	Selection between analogue 4-20mA signal input or digital signal and Modbus RTU.	By installation of a modbus network, the modbus stabiliser can be mounted in the control cabinet.
<b>Alarm signal "full"</b>	The alarm signal "full" occurs when the full sensor sends a signal during filling and is via an acoustic buzzer or optical flashing lamp. The alarm signal can be cancelled via a button on the control cabinet door. Either the option buzzer or flashing lamp may be chosen.	The buzzer or flashing lamp can be mounted where required.
<b>Display in the control cabinet door</b>	Signal input 4-20 mA or Modbus: Touch panel 7" oder 12.1"	All functions of the visualisation software are available on the touch panel.
	Signal input 4-20 mA: Per measurement point - one digital display NT 10.	The NT 10 is a current loop meter (4-20mA) and can be programmed to display the fill level in percentage, height, volume or weight. Programming is described in the Nivotec® accessories documentation.
	Per measurement point, - yellow LED for full signal - red LED for empty signal	LEDs illuminate when full or empty signal is received.
<b>Remote data enquiry</b>	A modem is integrated in the control cabinet, which allows worldwide access to the web server module. Access is password protected.	
<b>Data storage with trend enquiry</b>	The fill level, together with date and time and the selected display value can be saved on to a card. Download is via the NT 3000 software - see NT 3000 software documentation. The trend is visually displayed in the software.	The data storage parameters can be set in the software.
<b>Lorry module</b>	The lorry module contains the alarm signal "full" and shows via LEDs which silos are full and empty. The alarm signals can be cancelled via a button on the lorry module.	When the shut off valve option is selected, the module shows which silo has been released for filling via an LED. The lorry module is typically mounted near the filling station.

## Option / function

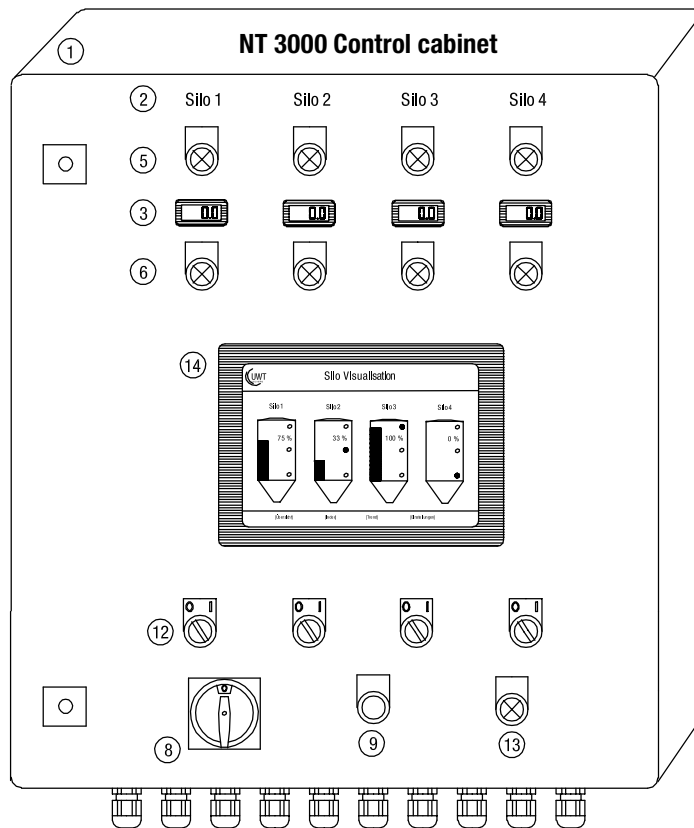
Option	Function	
	Description	Additional information
<b>Terminal box</b>	The terminal box is for the intermediate connections of all signals and power supplies from the silo plant to further evaluations. It has a metal housing with a screw on lid and cable glands on the underside.	The installation is on the silo frame. The cables are laid out according to the electrical plans. The size of the terminal box is dependant on the number and type of the sensors as well as the size of the project.
<b>Shut off valve control</b>	<p>The valve in the filling pipes is opened before filling. Once the silo is detected as full, the valve is automatically closed and therefore prevents overfilling. The valve can only be reopened (eg to blow out the filling pipe)</p> <p>The available release methods for filling are:</p> <ul style="list-style-type: none"> <li>- Key switch</li> <li>- Mouse click in the visualisation software.</li> <li>- Number code input on the operator panel - after the number is entered, the valve to the silo is opened. The operator panel us usually located near the filling station.</li> <li>- Scanning of a barcode at the filling station - the barcode scanner is usually located near the filling station.</li> <li>- Scanning of a transponder chip at the filling station</li> </ul> <p>The shut off valve will automatically close on receipt of a full signal from the full sensor.</p>	When the lorry module is selected, the silos that have been released for filling are shown via an illuminated LED.
<b>Profibus interface</b>	The NT 3000 can be set up with a profibus interface for further plant processes, which allows other plant processes access to the fill levels.	

## Technical data / components

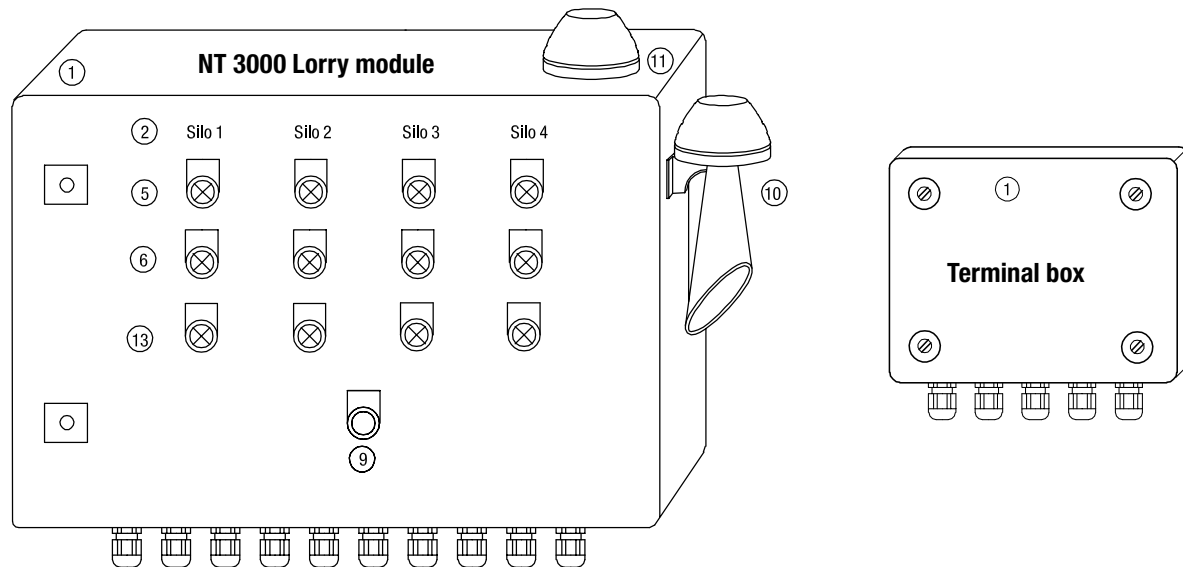
### Technical data

<b>Housing</b>	Dimensions	The dimensions of the control cabinet module, lorry module and terminal box are dependant on the number of measurement points and the option selections. Generally the cabinets are for wall mounting. Should it be required, it is possible to supply a control cabinet mounted on a stand.
	Material Protection class	Steel, colour RAL 7035 Control cabinet IP 54 Lorry module IP 66 Terminal box IP 66
<b>Power supply</b>	Supply voltage	230 VAC
	Control voltage	24 VDC
	Current consumption	Dependant on the number of measurement points and the selection of options.
	Fuse	The fusing is dependant on the project specific current loads.
<b>Display modules</b>	Touch panel	7" or 12,1"
	LED display	Nivotec® NT 10 (see documentation NT 10)
	Lamps	LED in housing red and yellow
<b>Operating conditions</b>	Temperature	0 to 50 °C

### Components



## Components



The component numbers correspond to the provided labelling on the control cabinet, lorry module and terminal box drawings.

No	Group	Beschriftung	Komponenten
1	Housing	without	Rittal AE or Häwa, with right hinged swing door, RAL 7035 (Screw on lid for terminal box)
2	Silo No.	Silo x	PVC white, black writing
3	LED display	without	Nivotec NT 10, 4-20 mA
4	Start button electromechanical Lot system	START	Green colour, lights up for the end stop signal
5	Display silo full	FULL	LED yellow
6	Display silo empty	EMPTY	LED red
7	Display malfunction electromechanical Lot system	Malfunction	LED red
8	Main switch	without	Type Moeller, red/yellow
9	Cancellation of buzzer or flashing light	ALARM OFF	Black colour
10	Buzzer	without	Type Eichhoff / Friedland 230 VAC
11	Flashing lamp	without	Type Werma / Moeller red colour
12	Key switch	Filling enabled	Type Moeller
13	Display - filling enabled	FILLING ENABLED	LED green
14	Touch panel		Typs AAEON
	All displays		LED lights, Type Moeller
	All buttons		Type Moeller
	Name plates		PVC white, black writing
	Clamps		Type Wago
	Fuses		Type ABB
	FI switches		Type ABB
	Relays		Type SHC / Schrack
	Logic modules		Type Siemens

## Installation

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### **Safety instructions:**

- The installation of the Nivotec® NT 3000 system can only be carried out by suitably qualified persons.
- The cabling and wiring must be carried out in accordance with the delivered electrical plans.
- Other cable may only be used when approved in advance by UWT
- The installation of the modules must take into account the housing protection classes.
- The system NT 3000 has no ATEX approval. If it is needed it must be discussed with UWT staff during the discussion of your project requirements.

### **Service:**

The qualified service staff at UWT can install and carry out the initial setup of the Nivotec systems as well as all level measurement technology in both a professional and qualified manner.

You will receive an acceptance test report as well as user documentation for the ongoing support of your system.

Please contact a member of the UWT sales or service team to discuss your requirements.