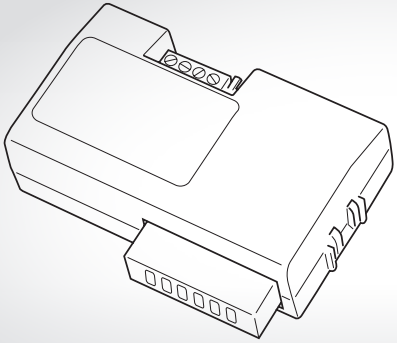
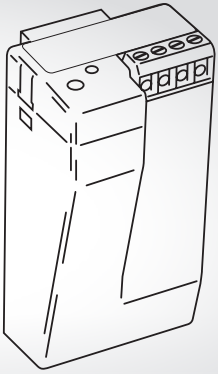
Pioneering for You

Wilo-Control
IF-Module LON / Stratos LON





de Einbau- und Betriebsanleitung
en Installation and operating instructions

2 165 357-Ed.01 / 2016-03-Wilo

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Fig.1a:

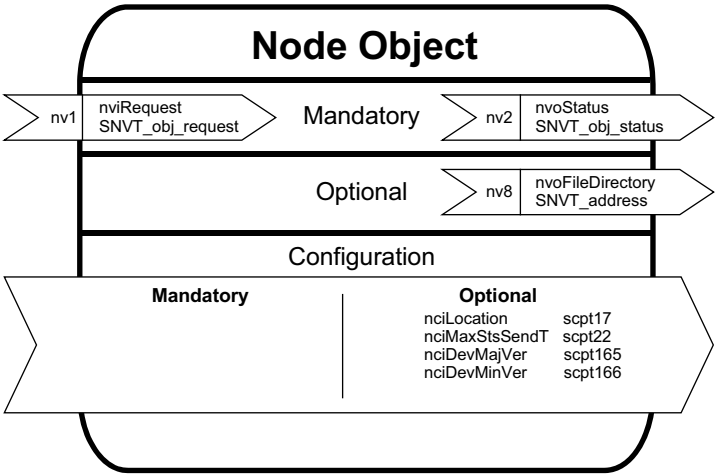
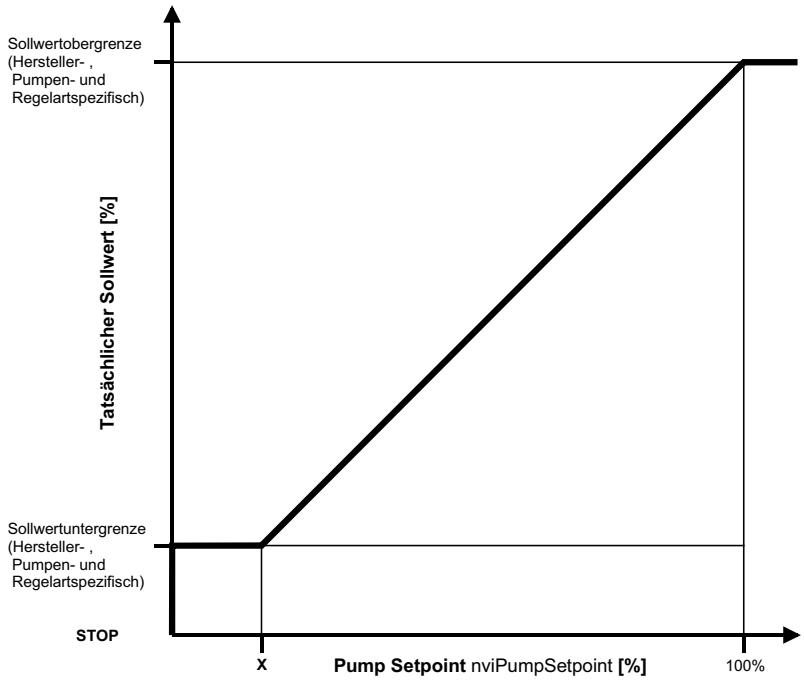


Fig.2:



X = (Sollwertuntergrenze / Sollwertobergrenze) * 100%

Fig.1b:

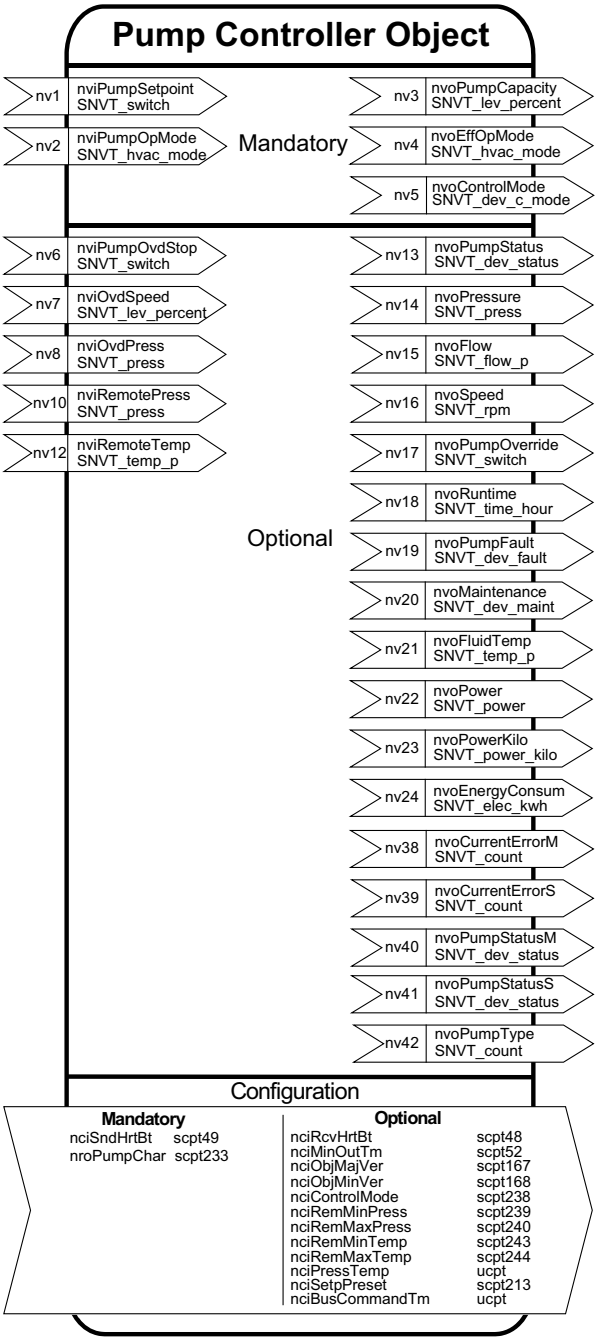

Pump Controller Object
nv1 nviPumpSetpoint SNVT_switch
nv2 nviPumpOpMode SNVT_hvac_mode
Mandatory
nv3 nvoPumpCapacity SNVT_lev_percent
nv4 nvoEffOpMode SNVT_hvac_mode
nv5 nvoControlMode SNVT_dev_c_mode
nv6 nviPumpOvdStop SNVT_switch
nv7 nviOvdSpeed SNVT_lev_percent
nv8 nviOvdPress SNVT_press
nv10 nviRemotePress SNVT_press
nv12 nviRemoteTemp SNVT_temp_p
Optional
nv13 nvoPumpStatus SNVT_dev_status
nv14 nvoPressure SNVT_press
nv15 nvoFlow SNVT_flow_p
nv16 nvoSpeed SNVT_rpm
nv17 nvoPumpOverride SNVT_switch
nv18 nvoRuntime SNVT_time_hour
nv19 nvoPumpFault SNVT_dev_fault
nv20 nvoMaintenance SNVT_dev_maint
nv21 nvoFluidTemp SNVT_temp_p
nv22 nvoPower SNVT_power
nv23 nvoPowerKilo SNVT_power_kilo
nv24 nvoEnergyConsum SNVT_elec_kwh
nv38 nvoCurrentErrorM SNVT_count
nv39 nvoCurrentErrorS SNVT_count
nv40 nvoPumpStatusM SNVT_dev_status
nv41 nvoPumpStatusS SNVT_dev_status
nv42 nvoPumpType SNVT_count
Configuration
Mandatory
nciSndHrtBt scpt49
nroPumpChar scpt233
Optional
nciRcvHrtBt scpt48
nciMinOutTm scpt52
nciObjMajVer scpt167
nciObjMinVer scpt168
nciControlMode scpt238
nciRemMinPress scpt239
nciRemMaxPress scpt240
nciRemMinTemp scpt243
nciRemMaxTemp scpt244
nciPressTemp ucpt
nciSetpPreset scpt213
nciBusCommandTm ucpt

Fig.3a:

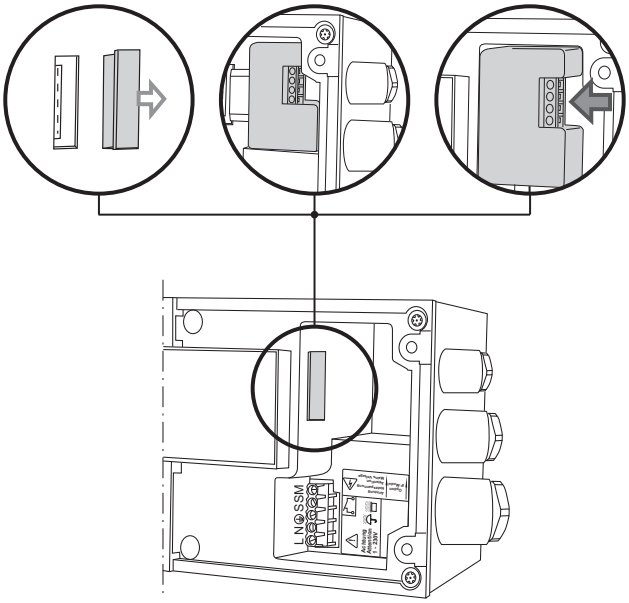


Fig.3b:

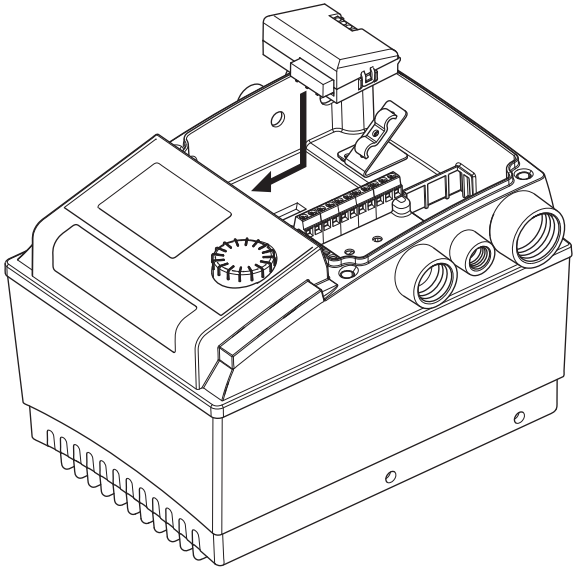


Fig.3c:

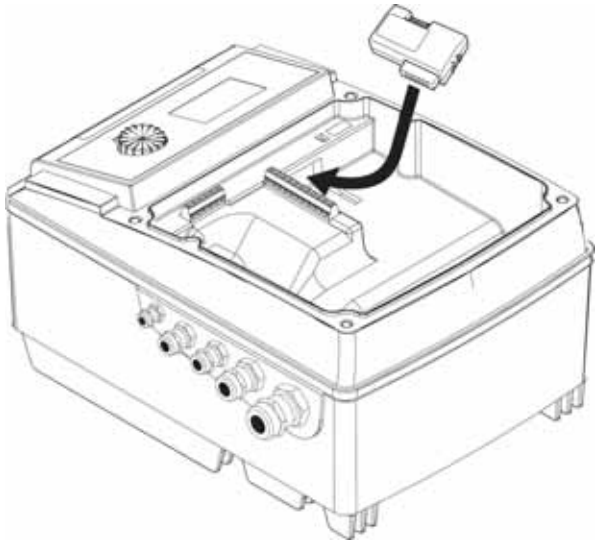


Fig.4a:

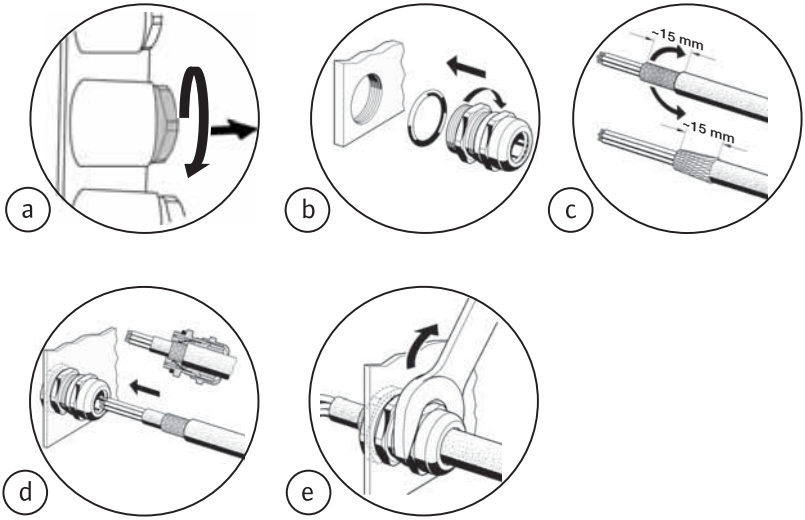


Fig.4b:

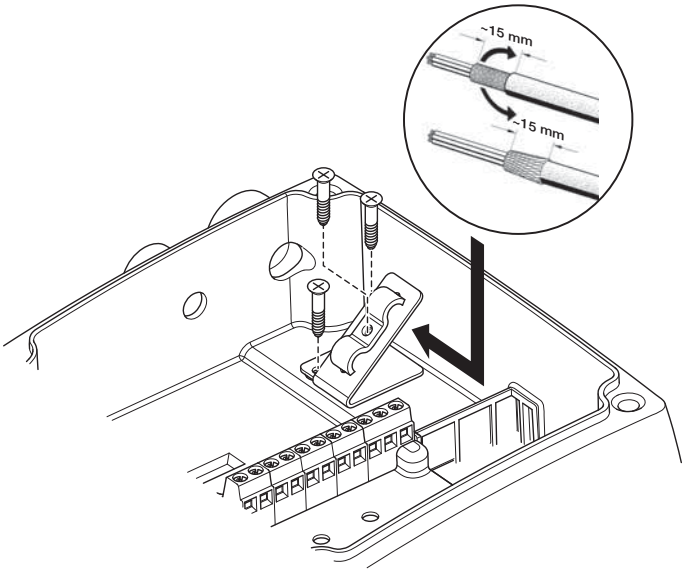


Fig.4c:

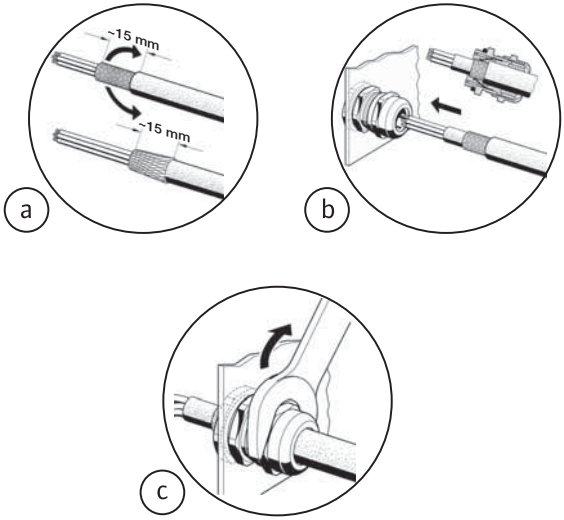


Fig.5a: IF-Modul Stratos LON

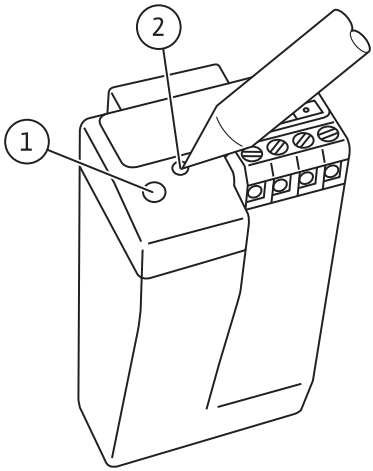
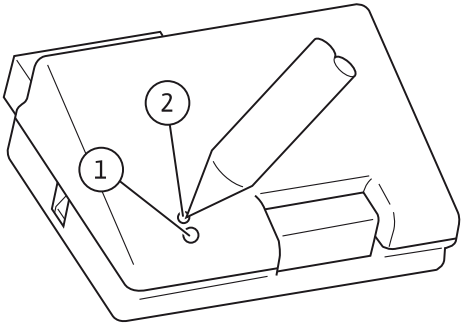


Fig.5b: IF-Modul LON



1 General

1.1 About this document

The language of the original operating instructions is German. All other languages of these instructions are translations of the original operating instructions.

These installation and operating instructions are an integral part of the product. They must be kept readily available at the place where the product is installed. Strict adherence to these instructions is a precondition for the proper use and correct operation of the product.

These installation and operating instructions correspond to the relevant version of the product and the underlying safety regulations and standards valid at the time of going to print.

These Installation and operating instructions are intended as supplement to the Installation and operating instructions for the pumps connected to the LON bus.

2 Safety

These instructions contain important information which must be followed when installing and operating the pump. These operating instructions must therefore be read before assembly and commissioning by the installer and the responsible operator.

2.1 Indication of instructions in the operating instructions

Symbols:

General danger symbol

Danger due to electrical voltage

NOTE: ...

Signal words:

DANGER!

Acutely dangerous situation.

Non-observance will result in death or serious injuries.

WARNING!

The user may suffer (serious) injuries. 'Warning' implies that (serious) injury to persons is likely if this information is disregarded.

CAUTION!
There is a risk of damaging the pump/unit. 'Caution' implies that damage to the product is possible if this information is disregarded.

NOTE:
Useful information on using the product. It also draws attention to potential problems.

Information that appears directly on the product, such as
- Direction of rotation arrow,
- Connection marks,
- Rating plate,
- Warning sticker

must be strictly complied with and kept in legible condition.

2.2 Personnel qualifications

The installation, operating and maintenance personnel must have the appropriate qualifications for this work. Area of responsibility, terms of reference and monitoring of the personnel are to be ensured by the operator. If the personnel are not in possession of the necessary knowledge, they are to be trained and instructed. This can be accomplished if necessary by the manufacturer of the product at the request of the operator.

2.3 Danger in the event of non-observance of the safety instructions

Non-observance of the safety instructions can result in risk of injury to persons and damage to the environment and the product/unit. Non-observance of the safety instructions results in the loss of any claims to damages.
In detail, non-observance can, for example, result in the following risks:
- Danger to persons due to electrical, mechanical and bacteriological factors
- Damage to the environment due to leakage of hazardous materials
- Property damage
- Failure of important product/unit functions
- Failure of required maintenance and repair procedures

2.4 Safety consciousness on the job

The safety instructions included in these installation and operating instructions, the existing national regulations for accident prevention together with any internal working, operating and safety regulations of the operator are to be complied with.

2.5 Safety instructions for the operator

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
Children should be supervised to ensure that they do not play with the appliance.

- If hot or cold components on the product/the unit lead to hazards, measures must be taken onsite to guard them against touching.
- Guards protecting against touching moving components (such as the coupling) must not be removed whilst the product is in operation.
- Leakages (e.g. from a shaft seal) of hazardous fluids (e.g. explosive, toxic or hot) must be conveyed away so that no danger to persons or to the environment arises. National statutory provisions are to be complied with.
- Highly flammable materials are always to be kept at a safe distance from the product.
- Danger from electrical current must be eliminated. Local directives or general directives [e.g. IEC, VDE etc.] and instructions from local energy supply companies must be adhered to.

2.6 Safety instructions for installation and maintenance work

The operator must ensure that all installation and maintenance work is carried out by authorised and qualified personnel who are sufficiently informed from their own detailed study of the operating instructions.
Work on the product/unit may only be carried out when the system is at a standstill. It is mandatory that the procedure described in the installation and operating instructions for shutting down the product/unit be complied with.
Immediately on conclusion of the work, all safety and protective devices must be put back in position and/or recommissioned.

2.7 Unauthorised modification and manufacture of spare parts

Unauthorised modification and manufacture of spare parts will impair the safety of the product/personnel and will make void the manufacturer's declarations regarding safety.
Modifications to the product are only permissible after consultation with the manufacturer. Original spare parts and accessories authorised by the manufacturer ensure safety. The use of other parts will absolve us of liability for consequential events.

2.8 Improper use

The operating safety of the supplied product is only guaranteed for conventional use in accordance with Section 4 of the operating instructions. The limits values must on no account fall under or exceed those specified in the catalogue/data sheet.

3 Transport and interim storage

Inspect the pump/system for transport damage immediately upon arrival. Any transport damage found must be reported to the carrier within the prescribed periods.

CAUTION! Risk of damage to the IF-module!
Risk of damage due to improper handling during transport and storage.

- **The IF-modules should be protected against humidity, frost and mechanical damage during transport and temporary storage.**
- **They must not be exposed to temperatures outside the range of - 10 °C to + 70 °C.**

4 Intended use

The IF-module LON/Stratos LON is used to connect electronically controlled glandless or glanded pumps to a LON. The pump can be preset with setpoints, operating modes and data from external sensors. Current operating data and fault signals can be transferred from the pump via the LON bus.
At the same time the IF-module LON/Stratos LON allows two pumps to be connected to form a double pump via an additional DP interface. This interface is a separate device. It is not a LON-based interface. That is why the LON bus for the double pump interface is not put under strain and the slave pump can be equipped with an inexpensive IF-module PLR.

4.1 Compatibilty of Pump firmware

For interoperation with this module, the following (or higher) firmware versions of the pump are required.

Pump	Firmware version	Remarks
Wilo-Stratos	1.00	Full functionality for software versions 5.11 or higher. Relates to the following variables: nvoCurrentErrorM nvoCurrentErrorS nvoPumpStatusM nvoPumpStatusS nvoPumpType
Wilo-TOP-E	4.00	The following variables are not supported: nvoCurrentErrorM nvoCurrentErrorS nvoPumpStatusM nvoPumpStatusS nvoPumpType
Wilo-Stratos GIGA	1.00	-
Wilo-Stratos GIGA B	1.00	-
Wilo-CronoBloc-BL-E	1.00	-
Wilo-VeroLine-IP-E	2.00	LC Display
Wilo-VeroTwin-DP-E	2.00	LC Display
Wilo-CronoLine-IL-E	1.29	LC Matrix Display
Wilo-CronoLine-IL-E	3.02	LC segment Display
Wilo-CronoTwin-DL-E	1.29	LC Matrix Display
Wilo-CronoTwin-DL-E	3.02	LC segment Display
Wilo-Helix EXCEL	1.00	-
Wilo-Multivert MVIE (1,1... 4,0 kW)	2.00	LC Display
Wilo-Multivert MVISE (1,1... 4,0 kW)	2.00	LC Display
Wilo-Economy MHIE (1,1... 4,0 kW)	2.00	LC Display
Wilo-Multivert MVIE (5,5... 7,5 kW)	1.29	LC Matrix Display
Wilo-Multivert MVISE (5,5... 7,5 kW)	1.29	LC Matrix Display
Wilo-Helix VE (1,1... 4,0 kW)	2.00	LC Display
Wilo-Helix VE (5,5... 7,5 kW)	1.29	LC Matrix Display

Tab. 1: Compatibility of pump firmware

5 Product information

5.1 Type key

Example: Wilo-Control IF-module LON		
Control	Series designation	
	Type designation:	IF-module LON IF-module Stratos LON

5.2 Technical specification

Property	Value
Interface	TP/FT10
Terminal cross-section	2,5 mm^2
Bus cable	twisted in pairs, shielded
Max. bus cable length	• 900 m with bus topology with max. 3 m long spur line9F:FF:CC:51:14:06:04:05s • 450 m with free topology, with max. 250 m between 2 inter-communicating nodes
Program ID (software)	9F:FF:CC:51:14:06:04:05
Software version	3.00 or higher (older versions not compatible)
Firmware version	19

Tab. 2: Technical specification

5.3 Standards

The IF-module LON complies with the following standards:

- LonMark Application Layer Interoperability Guidelines Version 3.4
- LonMark Layers 1-6 Interoperability Guidelines Version 3.4
- LonMark node object 0000_20
- LonMark pump controller object 8120_10
- LonMark Resource Files Version 13.04

The entire document can be found online at www.wilo.de/automation.

5.4 Scope of delivery

- IF-module LON or IF-module Stratos LON
- Metal threaded cable connection Pg 7 (only for IF-Module Stratos LON)
- Metal threaded cable connection Pg 9 (only for IF-Module Stratos LON)
- Installation and operating instructions
- CD with supplementary information

5.4.1 Delivery condition

According to the LonMark Application Layer Interoperability Guidelines, the IF-module LON is delivered in “application unconfigured” condition.
In this condition, the IF-module LON can be addressed via the LON bus, but the application which normally establishes the communication with the pump is not yet in operation. There is therefore no activity yet after connecting the IF-module LON and switching on the power supply of the pump. This is signalized by flashing of the green LED.

6 Description and function

6.1 Description of the objects

Two objects, the node object and pump object, are implemented in the IF-module LON. The node object is used to control individual objects within the node; errors which occur in the individual objects are also indicated centrally here.
Fig. 1a shows the node object with the corresponding network variables,
Fig. 1b shows the pump controller object with the corresponding network variables.

NOTE:

- Double pumps should always be equipped with the integrated double pump management.
- At double pumps, the IF-module LON is connected to the master.
- If the integrated double pump management is not used for double pumps, the two drives should be treated as two separate individual pumps. In this case, two LON IF modules are necessary.
- The control functions apply to the double pump as entire unit.

6.2 Description of the network variables

6.2.1 Value ranges and resolutions of the input network variables

Input network variable	Mand. / opt.	NVT	Object	No.	Receive heartbeat	Data range and units	Resolution	Default value	Invalid data	Data range and effective resolution WILO
nviRequest	M	SNVT_obj_request	0	1	no	-	-	-	-	.object_id: 0 – 1 .object_request: RQ_NORMAL RQ_DISABLED RQ_ENABLE RQ_UPDATE_STATUS RQ_REPORT_MASK RQ_CLEAR_STATUS
nviPumpSetpoint	M	SNVT_switch	1	1	no	.state: 0 – 1 .value: 0.0 – 100.0%	-	SCPTsetpoint	-	.state: 0 – 1 .value: 0.0 – 100.0%
nviPumpOpMode	M	SNVT_hvac_mode	1	2	no	enum 0 ... 17 (hvac_t)	-	HVAC_AUTO	0xFF (HVAC_NUL)	HVAC_AUTO HVAC_MRNG_WRMUP HVAC_PRE_COOL HVAC_ECONOMY
nviPumpOvdStop	O	SNVT_switch	1	6	no	.state: 0 – 1 .value: 0.0 ... +100.0%	-	.state: 0xFF .value: 0xFF	.state: 0xFF	.state: 0 – 1 .value: 0.0 – 100.0%
nviOvdSpeed	O	SNVT_lev_percent	1	7	no	-163.84 ... +163.83 %	0.005 %	0x7FFF	0x7FFF	0 - 100% Eff. resolution: 0.5%
nviOvdPress	O	SNVT_press	1	8	no	-3276.8 ... +3276.6 kPa	0.1 kPa	0x7FFF	0x7FFF	Range depends on pump type. Eff. resol.: 0.981 kPa
nviRemotePress	O	SNVT_press	1	10	yes	-3276.8 ... +3276.6 kPa	0.1 kPa	0x7FFF	0x7FFF	0 – 3276.6 kPa Eff. resol.: 0.981 kPa
nviRemoteTemp	O	SNVT_temp_p	1	12	yes	-273.17 ... +327.66 °C	0.01°C	0x7FFF	0x7FFF	-273.1 – 327.6 °C Eff. resol.: 0.1°C

Tab. 3: Value ranges and resolutions of the input network variables

6.2.2 Value ranges and resolutions of the output network variables

Output network variable	Mand. / opt.	NVT	Obj	No.	Send heartbt / Ack	Min. send time	Data range and units	Resolution	Invalid data	Range and effective resolution WILO	Send when value changes more than
nvoStatus	M	SNVT_obj_status	0	2	yes	yes			-	invalid_id invalid_request disabled electrical_fault unable_to_measure manual_control in_alarm	Send upon nviRequest: update
nvoFileDirectory	O	SNVT_address	O	8	no	no					
nvoPumpCapacity	M	SNVT_lev_percent	1	3	yes	yes	-163.84 – 163.83 %	0.005 %	0x7FFF	0 – 100.0% Res: 0.2%	5 % of nroPumpChar.pressMax or 2 % of nroPumpChar.speedMax resp., control mode changes
nvoPressure	O	SNVT_press	1	14	no	yes	-3276.8 – 3276.6 kPa	0.1 kPa	0x7FFF	Range depends on pump type Res.: 0.981 kPa	5 % of nroPumpChar.pressMax
nvoFlow	O	SNVT_flow_p	1	15	no	yes	0 – 655.34 m^3/h	0.01 m^3/h	0xFFFF	Range depends on pump type Res.: 0.1 m^3/h	5 % of nroPumpChar.flowMax
nvoEnergyConsum	O	SNVT_elec_kWh	1	24	no	yes	0 – 65535 kWh	1 kWh	-	0 – 65535 kWh Res.: 1 kWh	1 kWh
nvo Power	O	SNVT_power	1	22	no	yes	0 – 6553.5 W	0.1 W	-	0 – 6553W Res.: min. 1 W	10 % of max. power
nvoPowerKilo	O	SNVT_power_kilo	1	23	no	yes	0 – 6553.5 kW	0.1 kW	-	0 – 65.5 kW Res.: 0.1 kW	10 % of max. power
nvoRuntime	O	SNVT_time_hour	1	18	no	yes	0 – 65535 h	1 h	-	0 – 65535 h Res.: 10 h	10 h
nvoSpeed	O	SNVT_rpm	1	16	no	yes	0 – 65535 rpm	1 rpm	-	0 – 65535 rpm Res.: min. 1 rpm	2 % of nroPumpChar.speedMax
nvoFluidTemp	O	SNVT_temp_p	1	21	no	yes	-273.17 – 327.66 °C	0.01 °C	0x7FFF	-50 °C – 205°C Res.: min. 0.1 °C	5 °C
nvoControlMode	M	SNVT_dev_c_mode	1	5	yes	yes	ENUM 0 – 29 (device_c_mode_t)	-	0xFF	DCM_SPEED_CONST DCM_PRESS_CONST DCM_PRESS_COMP DCM_PRESS_AUTO DCM_NUL	Immediately

Tab. 4: Value ranges and resolutions of the output network variables

Tab. 4: Value ranges and resolutions of the output network variables (continuation)

Output - Networkvariable	Mand. Opt.	NVT	Obj	No.	Send Heartbt / Ack	Min. Send Time	Data Range and Units	Resolution	Invalid Data	Range and effective resolution WILO	Send when value changes more than
nvoMaintenance	O	SNVT_dev_maint	1	20	no	yes	bitset	-	-	service_required	immediately
nvoPumpFault	O	SNVT_dev_fault	1	19	no	yes	bitset	-	-	sf_voltage_low sf_voltage_high sf_phase sf_no_fluid df_motor_temp df_motor_failure df_pump_blocked df_elect_temp df_elect_failure_nf df_elect_failure df_sensor_failure	immediately
nvoPumpStatus	O	SNVT_dev_status	1	13	yes	yes	bitset	-	-	device_fault supply_fault speed_low speed_high setpt_out_of_range local_control running remote_press remote_temp	immediately
nvoEffOpMode	M	SNVT_hvac_mode	1	4	yes	yes	ENUM 0 – 17 (hvac_t)	-	0xFF	HVAC_AUTO HVAC_MRNG_WRMUP HVAC_PRE_COOL HVAC_ECONOMY HVAC_NUL	immediately
nvoPumpOverride	O	SNVT_switch	1	17	no	yes	.state: 0 – 1 .value: 0.0-100.0%,	-	.state: 0xFF	.state: 0 – 1 .value: 0.0%, 100.0%, 0xFF	immediately
nvoCurrent ErrorM	O	SNVT_count	1	38	no	yes		-	0xFFFF	Error Codes WILO	immediately
nvoCurrent ErrorS	O	SNVT_count	1	39	no	yes		-	0xFFFF	Error Codes WILO	immediately
nvoPumpStatusM	O	SNVT_dev_status	1	40	no	yes	bitset	-	-	device_fault supply_fault running	immediately
nvoPumpStatusS	O	SNVT_dev_status	1	41	no	yes	bitset	-	-	device_fault supply_fault running	immediately
nvoPumpType	O	SNVT_count	1	42	no	yes		-	-	Pump Type List WILO	after reset

6.2.3 Value ranges and resolutions of the configuration input network variables

Input configuration variable	Mandatory / optional / user	CPT / NVT	Object	Number	Data range and effective resolution WILO
nciMaxStsSendT	O	SCPTmaxSndT	0	22	0–0d17h59m59s Eff. res: 1 s
nciLocation	O	SCPTlocation	0	17	-
nciRcvHrtBt	O	SCPTmaxRcvTime	1	48	0–6553 s Eff. res: 1 s
nciSndHrtBt	M	SCPTmaxSendTime	1	49	0–6553s Eff. res: 1 s
nciMinOutTm	O	SCPTminSendTime	1	52	0–6553 s Eff. res: 1 s
nciControlMode	O	SCPTdeviceControlMode	1	238	DCM_SPEED_CONST DCM_PRESS_CONST DCM_PRESS_COMP DCM_PRESS_AUTO
nciRemMinPress	O	SCPTminRemotePressureSetpoint	1	239	0 – 3276.7 kPa Eff. res: 0.981 kPa
nciRemMaxPress	O	SCPTmaxRemotePressureSetpoint	1	240	0 – 3276.7 kPa Eff. res: 0.981 kPa
nciRemMinTemp	O	SCPTminRemoteTempSetpoint	1	243	-273.1 – 327.6 °C Eff. res: 0.1°C
nciRemMaxTemp	O	SCPTmaxRemoteTempSetpoint	1	244	-273.1 – 327.6 °C Eff. res: 0.1°C
nciPressTemp	U	UCPTPressTemp	1		.TempMin, .TempMax: 0 – 110 °C Eff. res: 0.1°C .PressMin, .PressMax: 0 – 3276.7 kPa Eff. res: 0.981 kPa
nciSetpPreset	O	SCPTsetpoint	1	213	.state: 0–1 .value: 0–255
nciBusCommandTm	U	UCPTbusCommandTimer	1		.state: -1,1 .value: 0–9

Tab. 5: Value ranges and resolutions of the configuration input network variables

6.2.4 Value ranges and resolutions of the configuration output network variables

Output configuration variable	Mandat./ optional	CPT / NVT	Object	Number	Value
nciDevMajVer	O	SCPTdevMajVer	0	165	03
nciDevMinVer	O	SCPTdevMinVer	0	166	00
nroPumpChar	M	SCPTpumpCharacteristic	1	233	Depends on pump type
nciObjMajVer	O	SCPTobjMajVer	1	167	03
nciObjMinVer	O	SCPTobjMinVer	1	168	00

Tab. 6: Value ranges and resolutions of the configuration output network variables

6.2.5 Description of the network variables

Object request
network input SNVT_obj_request nviRequest

This input network variable triggers various operations concerning the node and object status. It consists of 2 bytes, the ID byte and the value byte. The ID byte indicates the number of the object to which the request applies. The ID value 0 refers to the node object; in this case requests may also affect all other objects. The ID value 1 refers to the pump-controller object.

Value range:

Value	Function with ID = 0	Function with ID = 1
RQ_NORMAL	Normal operation of all objects	Normal operation of pump controller
RQ_DISABLED	Stops all objects	Stops the pump controller
RQ_ENABLE	Enables the node object	Enables the pump controller
RQ_UPDATE_STATUS	Updates the node object status (OR operation for all objects)	Updates the pump controller status
RQ_REPORT_MASK	Supported node object status signals (OR operation for all objects)	Supported pump controller status signals
RQ_CLEAR_STATUS	Deletes certain status signals in all objects	Deletes certain pump controller status signals

Object status

network output SNVT_obj_status nvoStatus

This output network variable provides status information on the individual objects. The information is bit-coded. All bits are deleted after a reset.

Value range:

Bit	Function
invalid_id	A non-existent object was addressed.
invalid_request	An unknown request was sent.
disabled	The object in concern is switched off.
electrical_fault	The pump controller object indicates an electrical error.
unable_to_measure	The pump controller object cannot communicate with the pump.
comm_failure	For the node object only
manual_control	The pump controller object is disabled for controlling by the hardware settings at the pump (ext. off, ext. min, IR monitor)
in_alarm	The pump controller object indicates an error.
report_mask	Indicates that nvoStatus contains the status mask, i.e. the list of all supported bits, due to a preceding RQ_REPORT_MASK request.

File Directory Address

network output SNVT_address nvoFileDirectory

This network variable specifies the start address of the configuration file directory.

Additional information can be found in the LonMark documentation pertaining to the node object..

Maximum status send time

network input config SNVT_elapsed_tm nciMaxStsSendT

This optional input configuration network variable defines a time cycle in which the object statuses are automatically updated. The status of the node object is updated in alternation with that of the pump controller object.

Value range:
0d0h0m0s0ms – 0d17h59m59s999ms (in 1 s increments). The value 0d0h0m0s0ms disables the automatic update function.
Initial value: 0d0h0m0s0ms (automatic update function disabled)

SCPT reference: SCPTmaxSendT (22)

Device major version
network output config unsigned short nciDevMajVer

This optional output configuration network variable provides the high byte of the module version.

SCPT reference: SCPTdevMajVer (165)

Device minor version
network output config unsigned short nciDevMinVer

This optional output configuration network variable provides the low byte of the module version.

SCPT reference: SCPTdevMinVer (166)

Location label
network input config SNVT_str_asc nciLocation

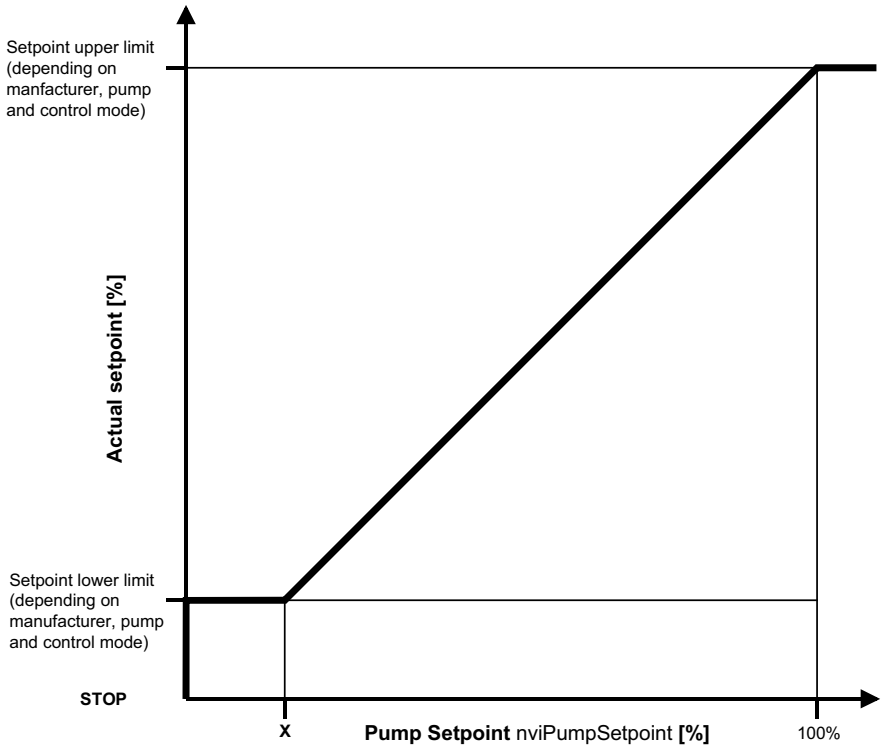
This optional input configuration network variable can be used to save information about the installation location of the pump which goes beyond the information string stored in the Neuron chip, which only consists of 6 Byte.

Value range:
Optional NUL-terminated ASCII string of max. 31 bytes length (incl. NUL)

Default value:
ASCII string which only consists of NUL (“\0”)

SCPT reference: SCPT_location (17)

Pump setpoint
network input SNVT_switch nviPumpSetpoint



X = (Setpoint lower limit / setpoint upper limit) * 100%

This input network variable is used to switch the pump on and off and specify a setpoint.
The network variable consists of a status byte in which the switch-on condition is transmitted and a value byte in which the setpoint is transmitted.
If a status byte of 0 is set, the pump is switched off. If a status byte of 1 is set, the switch-on condition depends on the value byte.
If a setpoint of 0% is preset, the pump is switched off. If a setpoint greater than 0% is preset, the pump is switched on if the status byte is 1. The setpoint can be changed in steps of 0.5%.
If setpoints greater than the upper setpoint limit value are set, they are reduced to the upper setpoint limit value. Accordingly setpoints below the lower setpoint limit value are raised to the lower setpoint limit value.

The upper and lower setpoint limit values may change if the pump is operated with an external sensor (see nviRemotePress, nciRemMinPress and nciRemMaxPress).

Value range:

Status	Value	Function
0	0 – 255	STOP
1	0	STOP
1	1 – 200	0.5 – 100.0%
1	201 – 255	100.0%

Default value:
status = 1, value = 200 = 100.0%. The default value corresponds to the setting which can be stored in the SCPTsetpoint configuration parameter in a non-volatile manner.

Requested pump operating mode
network input SNVT_hvac_mode nviPumpOpMode

This input network variable is used to set an operating mode. If an operating mode is set which is not defined or invalid, the pump remains in the current mode.

Value range:

Value	Function	Comments
HVAC_AUTO	Normal operation	Setpoint via nviPumpSetpoint
HVAC_MRNG_WRMUP	Warm-up mode	Maximum speed
HVAC_PRE_COOL	Cooling mode	Maximum speed
HVAC_ECONOMY	Energy-saving mode	Setback operation speed (pump type specific)
HVAC_NUL	Invalid	

Default value:
HVAC_AUTO

Pump Capacity
network output SNVT_lev_percent nvoPumpCapacity

This output network variable provides the current operating point of the pump as percentage of the maximum setpoint.
When using an external pressure or temperature sensor, this variable provides the sensor value as a percentage of the maximum sensor value.

Value range:
-163.840% – 163.830% (in 0,02% steps). 163.835% is an invalid value.

Transmission:
This value is transmitted automatically if it deviates from the value transmitted last by more than 5% of the value in nroPumpChar.pressMax (with differential pressure control) or 2% of the value in nroPumpChar.speedMax (with speed controller). Furthermore, this value is regularly transmitted if the nciSndHrtBt configuration input was described with a valid clock. This value is also transmitted if the control mode has been changed by overriding settings or the connection of an external sensor.

Transmission frequency:
The minimum network variable transmission interval can be set by describing the nciMinOutTm configuration input with a valid clock.

Preset service type: acknowledged

Effective operating mode
network output SNVT_hvac_mode nvoEffOpMode

This output network variable provides the current operating mode of the pump. This value corresponds to the setting in the nviPumpOpMode input network variable, provided a different operating mode has not been forced by local settings at the pump (ext. off, ext. min or IR monitor).

Value range:

Value	Function	Comments
HVAC_AUTO	Normal operation	Setpoint via nviPumpSetpoint
HVAC_MRNG_WRMUP	Warm-up mode	Maximum speed
HVAC_PRE_COOL	Cooling mode	Maximum speed
HVAC_ECONOMY	Energy-saving mode	Setback operation speed (pump type specific)
HVAC_OFF	Offline mode	Ext. off or manual operation mode via IR monitor
HVAC_NUL	Invalid	

Transmission:
This value is automatically transmitted whenever a change is made. Furthermore, this value is transmitted regularly if the nciSndHrtBt configuration input was described with a valid clock.

Transmission frequency:
The minimum network variable transmission interval can be set by describing the nciMinOutTm configuration input with a valid clock.

Preset service type: acknowledged

Effective device control mode
network output SNVT_dev_c_mode nvoControlMode

This output network variable provides the current control mode of the pump.

Value range:

Value	Function
DCM_SPEED_CONST	Constant speed mode
DCM_PRESS_CONST	Constant pressure mode
DCM_PRESS_COMP	Compensated pressure mode
DCM_PRESS_AUTO	Temperature-dependent differential pressure

Transmission:
This value is automatically transmitted whenever a change is made.
Furthermore, this value is transmitted regularly if the nciSndHrtBt configuration input was described with a valid clock.

Transmission frequency:
The minimum network variable transmission interval can be set by describing the nciMinOutTm configuration input with a valid clock.

Preset service type: acknowledged

Pump override stop command
network input SNVT_switch nviPumpOvdStop

This optional input network variable provides an overriding switch-on/switch-off function and is intended for maintenance work, for example. The network variable consists of a status byte and a value byte.
The “OVDSTOP” setting has priority over the setpoint set in nviPumpSetpoint and the overriding setpoints set in nviOvdSpeed and nviOvdPress.
An overriding setting is indicated in the nvoPumpOverride output network variable.

Value range:

Status	Value	Function
0	0 – 255	NORMAL
1	0	NORMAL
1	1 – 255	OVDSTOP
255	0 – 255	Invalid (NORMAL)

Default value:
status = 255, value = 255

Override setpoint for speed
network input SNVT_lev_percent nviOvdSpeed

This optional input network variable is used for the overriding setting of a speed setpoint, e.g. for maintenance work. The value is set as a percentage of the maximum value of the pump. If a valid range is received, the setpoint set via nviPumpSetpoint or nviOvdPress is overwritten and speed controller mode automatically set.
The pump is reset to normal condition by an invalid value in all overriding nviOvdSpeed and nviOvdPress setpoint settings and a “Normal” setting via nviPumpOvdStop.
An overriding setting is indicated in the nvoPumpOverride output network variable.

Value range:
-163.84% – 163.83% (in 0.005% steps). 163.835% is an invalid value.
Values lower than 0% or higher than 100% are limited accordingly and nvoPumpStatus.pump_ctrl.setpt_out_of_range is set.

Default value:
163.835%

Override setpoint for pressure
network input SNVT_press nviOvdPress

This optional input network variable is used for the overriding setting of a differential pressure setpoint, e.g. for maintenance work. The value is set as a percentage of the maximum value of the pump. If a valid range is received, the setpoint set via nviPumpSetpoint or nviOvdSpeed is overwritten and the constant differential pressure control mode is automatically set.
The pump is reset to normal condition by an invalid value in all overriding nviOvdSpeed and nviOvdPress setpoint settings and a “Normal” setting via nviPumpOvdStop.
An overriding setting is indicated in the nvoPumpOverride output network variable.

Value range:
-3276.8 – 3276.6 kPa (in 0.1 kPa steps). 3276.7 kPa is an invalid value.
Values outside the valid range for the respective pump are limited accordingly and nvoPumpStatus.pump_ctrl.setpt_out_of_range is set.

Default value:
3276.7 kPa

Remote pressure sensor input
network input SNVT_press nviRemotePress

This optional input network variable allows an external differential pressure sensor to be used to control the pump. If a valid value is received, the pump automatically switches to constant differential pressure control mode.
Control by means of an external sensor is indicated in the nvoPumpStatus.pump_ctrl.remote_press network variable.
The nvoPumpCapacity output network variable then indicates the current actual sensor value as a percentage of the maximum value of the sensor range.
The nvoPressure output network variable always provides the actual differential pressure value determined internally by the pump, which may vary from the sensor value. This is used to analyse the system behaviour. The differential pressure setpoint is still preset via the nviPumpSetpoint input network variable if the nviRemotePress network input variable is used.
If an invalid value is sent to the nviRemotePress input network variable or no value has been received for longer than defined in nciRcvHrtBt, the pump returns to internal control and the control mode defined in nciControlMode.
The overriding nviOvdSpeed setpoint input also overrides the control with external sensor.
nviRemotePress has priority over nviRemoteTemp.
Caution: To ensure stable control, nviRemotePress must be sent every 3 s. Even in this case, stable control of all pump types cannot be ensured however.

Value range:
-3276.8 – 3276.6 kPa (in 0.1 kPa steps). 3276.7 kPa is an invalid value.

Default value:
3276.7 kPa.

Remote temperature sensor input
network input SNVT_temp_p nviRemoteTemp

This optional input network variable allows an external temperature sensor to be used to control the pump. If a valid value is received, the pump automatically switches to temperature-dependent differential pressure control mode. Control by means of an external sensor is indicated in the nvoPumpStatus.pump_ctrl.remote_temp network variable.
The nvoPumpCapacity output network variable then indicates the current actual sensor value as a percentage of the upper limit of the sensor range. If an invalid value is sent to the nviRemoteTemp input network variable or no value is received for longer than defined in nciRcvHrtBt, the pump returns to internal control and to the control mode defined in nciControlMode.
The overriding nviOvdSpeed and nviOvdPress setpoint inputs also override control by means of an external sensor.
nviRemotePress has priority over nviRemoteTemp.

Value range:
-273.17 ... +327.66 °C (in 0.01 °C steps). 327.67 °C is an invalid value.

Default value:
327.67 °C.

Pump status diagnostic information
network output SNVT_dev_status nvoPumpStatus

This output network variable provides bit-coded information about the pump status.

Value range:

Bit	Description
device_fault	Pump error (see nvoPumpFault for detailed information)
supply_fault	Supply error (mains voltage, phase missing, dry run, etc. See nvoPumpFault for detailed information)
speed_low	Lower control limit (pump is running at minimum speed, which is why the required operating point cannot be achieved)
speed_high	Upper control limit (pump is running at maximum speed, which is why the required operating point cannot be achieved)
setpt_out_of_range	Setpoint exceeded/fallen short of
local_control	Local operation (by ext. off, ext. min or IR monitor)
running	Pump is running
remote_press	Control by means of external pressure sensor
remote_temp	Control by means of external temperature sensor

Transmission:
This value is automatically transmitted whenever a change is made. Furthermore, this value is transmitted regularly if the nciSndHrtBt configuration input was described with a valid clock.

Transmission frequency:
The minimum network variable transmission interval can be set by describing the nciMinOutTm configuration input with a valid clock.

Preset service type: acknowledged

Pump Pressure
network output SNVT_press nvoPressure

This optional output network variable provides the differential pressure between the pump flanges determined internally by the pump.

Value range:
0 – 3276.6 kPa (in 0.1 kPa steps). 3276.7 kPa is an invalid value.

Transmission:
This value is automatically transmitted if it deviates from the value transmitted last by more than 5% of the value in nroPumpChar.pressMax.

Transmission frequency:
The minimum network variable transmission interval can be set by describing the nciMinOutTm configuration input with a valid clock.

Preset service type: unacknowledged

Pump flow
network output SNVT_flow_p nvoFlow
This optional output network variable provides the flow rate determined by the pump.

Value range:
0 - 655.34 m^3/h (in 0.01 m^3/h steps). 655.35 m^3/h is an invalid value.

Transmission:
This value is automatically transmitted if it deviates from the value transmitted last by more than 5% of the value in nroPumpChar.flowMax.

Transmission frequency:
The minimum network variable transmission interval can be set by describing the nciMinOutTm configuration input with a valid clock.

Preset service type: unacknowledged

Pump speed
network output SNVT_rpm nvoSpeed

This optional output network variable provides the speed of the pump.

Value range:
0 – 65535 rpm (in 1 rpm steps).

Transmission:
This value is automatically transmitted if it deviates from the value transmitted last by more than 2% of the value in nroPumpChar.speedMax.

Transmission frequency:
The minimum network variable transmission interval can be set by describing the nciMinOutTm configuration input with a valid clock.

Preset service type: unacknowledged

Pump override active
network output SNVT_switch nvoPumpOverride

This optional output network variable provides the status of the overriding settings.

Value range:

Status	Value	Function
0	0	NORMAL
1	200	OVERRIDE
255	0 – 255	Invalid

Transmission:
This value is transmitted whenever a change is made.

Transmission frequency:
The minimum network variable transmission interval can be set by describing the nciMinOutTm configuration input with a valid clock.

Preset service type: unacknowledged

Current Error Master
network output SNVT_count nvoCurrentErrorM

This optional output network variable specifies the current error code of the master pump.

Value range:
0 - 65534, see Wilo error codes list.

Transmission:
This value is transmitted whenever a change is made.

Transmission frequency:
The minimum network variable transmission interval can be set by describing the nciMinOutTm configuration input with a valid clock pulse.

Preset service type: unacknowledged

Availability depending on pump type and software version.

Current Error Slave
network output SNVT_count nvoCurrentErrorS

This optional output network variable specifies the current error code of the slave pump.

Value range:
0 - 65534, see Wilo error codes list.

Transmission:
This value is transmitted whenever a change is made.

Transmission frequency:
The minimum network variable transmission interval can be set by describing the nciMinOutTm configuration input with a valid clock pulse.

Preset service type: unacknowledged

Availability depending on pump type and software version.

Pump Status Master
network output SNVT_dev_status nvoPumpStatusM

This output network variable supplies bit coded information relating to the pump status of the master pump.

Value range:
device_fault = pump fault
(see nvoPumpFault for more detailed information)
supply_fault = supply fault
(mains voltage, phase missing, dry running, etc.
See nvoPump-Fault for more detailed information)
running = pump running

Transmission:
This value is automatically transmitted whenever a change is made.

Transmission frequency:
The minimum network variable transmission interval can be set by describing the nciMinOutTm configuration input with a valid clock pulse.

Preset service type: unacknowledged

Availability depending on pump type and software version.

Pump Status Slave
network output SNVT_dev_status nvoPumpStatusS

This output network variable supplies bit coded information relating to the pump status of the slave pump.

Value range:
device_fault = pump fault
(see nvoPumpFault for more detailed information)
supply_fault = supply fault
(mains voltage, phase missing, dry running, etc.
See nvoPump-Fault for more detailed information)
running = pump running

Transmission:
This value is transmitted whenever a change is made.

Transmission frequency:
The minimum network variable transmission interval can be set by describing the nciMinOutTm configuration input with a valid clock pulse.

Preset service type: unacknowledged

Availability depending on pump type and software version.

Pump Type
network output SNVT_count nvoPumpType

This optional output network variable specifies the current pump type.

Value range:
0 - 65534, see list of Wilo pump types

Transmission:
This value is transmitted whenever a change is made.

Transmission frequency:
The minimum network variable transmission interval can be set by describing the nciMinOutTm configuration input with a valid clock pulse.

Preset service type: unacknowledged

Availability depending on pump type and software version.

Runtime
network output SNVT_time_hour nvoRuntime

This optional output network variable provides the operating hours of the pump, or with double pumps, the time during which at least one pump was running. The counter is reset to 0 h after 65535 h.

Value range:
0 – 65535 h (in 10 h steps), (max. 2730 d or 7.48 a).

Transmission:
This value is transmitted whenever a change is made.

Transmission frequency:
The minimum network variable transmission interval can be set by describing the nciMinOutTm configuration input with a valid clock.

Preset service type: unacknowledged

Fault states of the pump
network output SNVT_dev_fault nvoPumpFault

This optional output network variable provides bit-coded error information of the pump. Errors can be device errors or supply errors.

Value range:

Bit	Description
sf_voltage_low	Supply error, mains voltage too low
sf_voltage_high	Supply error, mains voltage too high
sf_phase	Supply error, phase missing
sf_no_fluid	Supply error, dry running
df_motor_temp	Device error, excess motor temperature
df_motor_failure	Device error, motor defective
df_pump_blocked	Device error, pump blocked
df_elect_temp	Device error, excess temperature
df_elect_failure_nf	Device error, electronic error
df_elect_failure	Device error, electronics defective
df_sensor_failure	Device error, sensor defective

Transmission:
This value is transmitted whenever a change is made.

Transmission frequency:
The minimum network variable transmission interval can be set by describing the nciMinOutTm configuration input with a valid clock.

Preset service type: unacknowledged

Maintenance states
network output SNVT_dev_maint nvoMaintenance

This optional output network variable provides bit-coded service information of the pump.

Value range:
service_required = service required

Transmission:
This value is transmitted whenever a change is made.

Transmission frequency:
The minimum network variable transmission interval can be set by describing the nciMinOutTm configuration input with a valid clock.

Preset service type: unacknowledged

Fluid temperature
network output SNVT_temp_p nvoFluidTemp

This optional output network variable provides the fluid temperature.

Value range:
-273.17 – 327.66 °C (in 0.01 °C steps). 327.67 °C is an invalid value.

Transmission:
This value is automatically transmitted if it deviates from the value transmitted last by more than 5 °C.

Transmission frequency:
The minimum network variable transmission interval can be set by describing the nciMinOutTm configuration input with a valid clock.

Preset service type: unacknowledged

Power consumption in watts
network output SNVT_power nvoPower

This optional output network variable provides the power consumption of the pump or, in the event of double pumps, the total power output of the master and slave.

Value range:
0 – 6553,5 W (in 0,1 W steps).

Transmission:
This value is automatically transmitted if it deviates from the value transmitted last by more than 10% of the maximum power consumption of the pump.

Transmission frequency:
The minimum network variable transmission interval can be set by describing the nciMinOutTm configuration input with a valid clock.

Preset service type: unacknowledged

Power consumption in Kilowatts
network output SNVT_power_kilo nvoPowerkilo

This optional output network variable provides the power consumption of the pump or, in the event of double pumps, the total power output of the master and slave.

Value range:
0 – 6553.5 kW (in 0.1 kW steps).

Transmission:
This value is automatically transmitted if it deviates from the value transmitted last by more than 10% of the maximum power consumption of the pump.

Transmission frequency:
The minimum network variable transmission interval can be set by describing the nciMinOutTm configuration input with a valid clock.

Preset service type: unacknowledged

Energy consumption
network output SNVT_elec_kwh nvoEnergyConsum
This optional output network variable provides the energy consumption of the pump or, in the case of double pumps, the total energy consumption of the master and slave. The counter is reset to 0 kWh after 65535 kWh.

Value range:
0 – 65535 kWh (in 1 kWh steps).

Transmission:
This value is transmitted whenever a change is made.

Transmission frequency:
The minimum network variable transmission interval can be set by describing the nciMinOutTm configuration input with a valid clock.

Preset service type: unacknowledged

Control mode for normal operation
network input config SNVT_dev_c_mode nciControlMode
This optional input network variable defines the control mode for normal operation of the pump if no external sensors are used and no overriding settings are active.

Value range:

Value	Function
DCM_SPEED_CONST	Constant speed mode
DCM_PRESS_CONST	Constant pressure mode
DCM_PRESS_COMP	Compensated pressure mode
DCM_PRESS_AUTO	Temperature-dependent differential pressure

Default value:
DCM_PRESS_COMP

SCPT reference: SCPTdeviceControlMode (238)

PressTemp
network input config UCPTpressTemp nciPressTemp
This WILO-specific input network variable defines the characteristic curve for the DCM_PRESS_AUTO control mode. This variable is stored in the EEPROM. If the LON IF-module is connected to a pump with other pump characteristics . The default values are reset.

Value range:
The value range depends on the individual network variable types which are used in the following data field:
typedef struct
{
 SNVT_temp_p TempMin
 SNVT_temp_p TempMax
 SNVT_press PressMin
 SNVT_press PressMax
}
UCPTPressTemp

Default values:
TempMin = 50 °C
TempMax = 90 °C
PressMin = nroPumpChar.pressMax / 2
PressMax = nroPumpChar.pressMax / 2 + 9.8 kPa

SCPT reference: none; implemented as UCPT

Remote pressure sensor minimum value
network input config nciRemMinPress

This optional input configuration network variable defines the lower limit value of an external differential pressure sensor. This network variable is not currently assigned any function.

Value range:
-3276.8 – 3276.6 kPa (in 0.1 kPa steps). 3276.7 kPa is an invalid value.

Default value:
<nciRemMinPress> = 3276.7 kPa

SCPT reference: SCPTminRemotePressureSetpoint (239)

Remote pressure sensor maximum value
network input config nciRemMaxPress

This optional input configuration network variable defines the upper limit value of an external differential pressure sensor. This network variable has an influence on the relative setpoint settings via nviPumpSetpoint and on the value supplied by nvoPumpCapacity if the preset value is smaller than nroPumpChar.pressMax. Larger values are always limited internally to nroPumpChar.pressMax.

Value range:
-3276.8 – 3276.6 kPa (in 0.1 kPa steps). 3276.7 kPa is an invalid value.

Default value:
<nciRemMaxPress> = 3276.7 kPa

SCPT reference: SCPTmaxRemotePressureSetpoint (240)

Remote temperature sensor minimum value
network input config nciRemMinTemp

This optional input configuration network variable is currently not assigned to any function.

Value range:
-273.17 – 327.66 °C (in 0.01 °C steps). 327.67 °C is an invalid value.

Default value:
<nciRemMinTemp> = 327.67 °C

SCPT reference: SCPTminRemoteTempSetpoint (243)

Remote temperature sensor maximum value
network input config nciRemMaxTemp

This optional input configuration network variable is currently not assigned to any function.

Value range:
-273.17 – 327.66 °C (in 0.01 °C steps). 327.67 °C is an invalid value.

Default value:
<nciRemMaxTemp> = 327.67 °C

SCPT reference: SCPTmaxRemoteTempSetpoint (244)

Pump Characteristic
network output config nroPumpChar

This output configuration network variable provides a data field with the pump characteristics.

Value range:
The value range depends on the individual network variable types which are used in the following data field:

```
typedef struct {
  SNVT_rpm  speedMax;
  SNVT_press  pressMax;
  SNVT_flow_p  flowMax;
} SCPT_PumpCharacteristic;
```

Default value:
The default values depend on the respective pump types.

SCPT reference: SCPTpumpCharacteristic (233)

Receive heartbeat
network input config SNVT_time_sec nciRcvHrtBt

This optional input configuration network variable defines a clock for the reception of the nviRemotePress and nviRemoteTemp network variables. If the network variables in concern are not updated at least once within the clock specified here, the pump assumes the default values, i. e. local control until a valid value is received for nviRemotePress or nviRemoteTemp.

Value range:
0.0 – 6553.4 s (in 0.1 s steps). The value 0.0 s switches off the reception monitoring function. The invalid value 6553.5 s has the same effect as the value 0.0 s.

Default value:
0.0 s (reception monitoring function switched off)

SCPT reference: SCPTmaxRcvTime (48)

Setpoint preset
This additional input configuration network variable stores the setpoint setting for the pump (nviPumpSetpoint) in the EEPROM of the IF-module LON in a non-volatile manner. The pump runs with this value after an interruption to the power supply until a valid value is set for nviPumpSetpoint via the LON.

Value range:
See PumpSetpoint

Default value:
Status = 1, value = 200 = 100%.

SCPT reference: SCPTSetpoint (213)

Bus Command Timer
network input config nciBusCommandTm

The behavior of the pump upon LON failure can be determined by the configuration variable nciBusCommandTm. This feature is available for firmware version 2.02 or higher.

Value range:
State: -1,1
Value: 0-9
SNVT reference: SNVT_switch ()

Value range:

State	Value	Description
-1	0	Local operation is blocked (factory setting) [4]
1	2	Local operation is blocked for 10 min after a write access to nvlPumpSetpoint or nviPumpOpMode [1] [2] [3] [4] [5]
1	5	Local operation is enabled after 5 min. No further write requests will be executed. [1] [2] [3] [6]
1	6	Local operation is blocked for 10 min after a write request to nviPumpSetpoint or nviPumpOpMode. If LON fails (time between two write reqests as above), then the values of nciSetpointPreset will be used. [1] [2] [3] [5]
1	9	Local operation is enabled after 5 min. No further write requests will be accepted by the pump. The values of nciSetpointPreset will be used for control. [1] [2] [3] [6]

[1] The bit *unable_to_measure* (NodeStatus) will be set after 5 min.
[2] The bit *manual_control* (NodeStatus) will be set after 5 min.
[3] E050 will be displayed and can be acknowledged after 10 min.
[4] nviPumpSetpoint (or any nviOvd___) is valid.
[5] The communication between pump and IF-module is stopped after 5 min. Also no reaction on the wink command.
[6] The communication between pump and IF-module is stopped. Also no reaction on the wink command.

All other values are undefinded and may cause unwanted behavior. Those values are reserved for future use.

Send heartbeat
network input config SNVT_time_sec nciSndHrtBt

This input configuration network variable defines a clock at which certain output network variables are automatically sent (nvoPumpCapacity, nvoEffOpMode, nvoControlMode and nvoPumpStatus). A different network variable is sent with each clock.

Value range:
0.0 – 6553.4 s (in 0.1 s steps). The value 0.0 s switches automatic sending off. The invalid value 6553.5 s has the same effect as the value 0.0 s.

Default value:
0.0 s (automatic sending switched off)

SCPT reference: SCPTmaxSendTime (49)

Minimum send time
network input config SNVT_time_sec nciMinOutTm

This optional input configuration network variable defines a minimum clock for the automatic transmission of network variables. The network variables are normally transmitted automatically if they have changed or if they have been changed at least by a certain amount. This network variable now has the effect that two transmission procedures are performed only at the specified interval. This is used, for example, to reduce the system load. The individual network variables are sent cyclically.

Value range:
0.0 – 6553.4 s (in 0.1 s steps). The value 0.0 s switches off the minimum clock. The invalid value 6553.5 s has the same effect as the value 0.0 s.

Default value:
0.0 s

SCPT reference: SCPTminSendTime (52)

Object major version

network output config unsigned short nciObjMajVer
This output configuration network variable provides the high byte for the software version.

SCPT reference: SCPTobjMajVer (167)

Object minor version
network output config unsigned short nciObjMinVer

This output configuration network variable provides the low byte for the software version.

SCPT reference: SCPTobjMinVer (168)

7 Installation and electrical connection

The installation and electrical connections should be performed only by skilled staff in compliance with local regulations!

WARNING! Danger of injury!
The existing accident prevention regulations should be observed.

WARNING! Danger from electric shock!
Any hazards from electrical current should be ruled out.
Any local or general directives [e.g. IEC, VDE etc.] and directives of the local power supply companies should be observed.

7.1 Installation and electrical connection of the IF-module

NOTE:
The IF-module LON is equipped with a Neuron ID double sticker. One sticker remains on the IF-module, the other sticker can, for example, be stuck on the system plan in the position of the corresponding pump. The Neuron ID from the system plan can be read in with a barcode scanner or entered manually during binding.

CAUTION! Risk of damage to the IF-module!
The IF-module LON may only be conneceted or disconneceted if the pump is electrically isolated.

- Electrically isolate the pump.
- Remove the terminal box cover after undoing the screws.
- Connect the IF-module to the circuit board interface:
  - Stratos/-D/-Z/-ZD ..... Fig. 3a
  - IP-E/DP-E ..... Fig. 3b
  - Helix VE (1,1...4,0 kW) ..... Fig. 3b
  - MVIE (1,1...4,0 kW) ..... Fig. 3b
  - MHIE ..... Fig. 3b
  - MVISE ..... Fig. 3b
  - IL-E/DL-E ..... Fig. 3c
  - Helix VE (5,5...7,5 kW) ..... Fig. 3c
  - MVIE (5,5...7,5 kW) ..... Fig. 3c
  - All other pumps .... see pump operating manual.

NOTE:
In order to adhere to the EMC standards specified in the installation and operating instructions for the Stratos series, a shielded cable should be used to connect the LON interface.
To apply this cable shield at the pump properly, use the metallic cable connections supplied with the IF-module Stratos LON .
To install this cable connection and the corresponding cable, proceed as follows (Fig. 4):

- Remove the plastic cable connection and the corresponding parts from the cable feed of the control module (Fig. 4, pos. 4a).
- Screw the metallic cable connection into the cable feed of the control module (Fig. 4, pos. 4b).
- Separate 10...15 mm of the outer cable sheath of the shielded cable and fold the cable shield over the outer sheath (Fig. 4, pos. 4c).
- Insert the cable in the cable connection until the folded cable shield is held securely by the contact springs (Fig. 4, pos. 4d).
- Connect the individual wires to the “LON” terminals of the IF-module.

NOTE:
The two “LON” terminals at the IF-module are protected against twisting, i.e. the individual wires can be connected to any of these terminals.

- Tighten the cap nuts of the cable connection with a suitable tool (Fig. 4, pos. 4e).

If the space in the terminal room of the pump is cramped, an alternative type of installation may make sense:

- Insert the cable through the cable connection.
- Apply the individual wires to the terminals of the IF-module (IF-module is not yet connected).
- Bunch the individual wires of the cable to form a loop and install the IF-module.
- Fit the terminal box cover.

8 Commissioning

CAUTION!
The installation and operating instructions of the pump should be observed during commissioning.
Commissioning is described by the example of a pump with IF-module LON.
If there are several pumps with IF-module LON, proceed accordingly.

- Switch on the mains voltage of the pump(s).
- A network management tool or the “Nodeutil.exe” program from Echelon is used to configure the IF-module LON and switch it online.
- The network variables should be linked to the network variables of other nodes during the installation.
- The identification of the IF-module LON required for the installation is performed with the sticker with the 128 barcode of the Neuron ID. One half of the sticker can be stuck onto the system plan for example.

- The IF-module LON uses self documentation, i.e. the description of the network variables contained in the IF-module is stored in the IF-module and evaluated by network management tools. Furthermore, corresponding XIF and XFB files are available. The network management tools for non-LonMark-defined data types are supported by device-resource files.
- According to the LonMark Application Layer Interoperability Guidelines, the IF-module LON is delivered in “application unconfigured” condition. If the IF-module receives a “wink” command via the LON bus, a corresponding command is sent to the pump also in this condition and the “Id on/off” menu is displayed at the pump for 30 s.
- The IF-module has a button (Fig. 5a/5b, pos. 2) which can be operated with a pointed object (e.g. a ballpoint pen). When this button is actuated, the IF-module sends a network message in which the Neuron ID is transmitted.
  An LED (Fig. 5a/5b, pos.1) goes on briefly if the IF-module is configured and switched online after switching on the pump or after a reset.
- Once the LON IF-module has been configured and switched online, a double arrow appears on the pump display (Fig. 6, pos. 1) to indicate the existing communication. Local operation of the pump with the red button is disabled.
  Exceptions:
  - Settings for the peak load or main/standby operation double pump functions
  - You can access the “Id” menu by turning the red button. A network message is sent in which the Neuron ID is transmitted by pressing the red button in this menu item.

NOTE:
The IF-module LON no longer works if there is an interruption to the power supply of the pump. All input network variables (nvi...) are reset to their default values when the power supply is switched on again.

9 Maintenance

Have maintenance and repair work carried out by qualified skilled personnel only!

WARNING! Danger from electric shock!
Any danger from electrical current should be ruled out.
The pump should be electrically isolated and secured against unauthorised switch-on during any maintenance or repair work.

NOTE:
The IF-module LON has a program memory which can be deleted and overwritten to allow subsequent software updates to be loaded into this memory via the LON bus.
If an IF-Module LON or Stratos LON is replaced with an older software version (prior to 3.00), a node replacement is not sufficient. The module has a new program ID and a new link must be created within the project.

10 Faults, causes and remedies

10.1 Connection between Wilo error codes and LON bus fault signals

WILO	WILO	nvoPumpFault	nvoPumpStatus	nvoMaintenance	nvoStatus
LCD code	signification	set bits	set bits	set bits	Signal
E04	Mains undervoltage	pump_ctrl.sf_voltage_low	pump_ctrl.supply_fault pump_ctrl.device_fault		electrical_fault in_alarm
E05	Mains overvoltage	pump_ctrl.sf_voltage_high	pump_ctrl.supply_fault pump_ctrl.device_fault		electrical_fault in_alarm
E06	2-phase operation	pump_ctrl.sf_phase	pump_ctrl.supply_fault pump_ctrl.device_fault		electrical_fault in_alarm
E10	Blocking	pump_ctrl.df_pump_blocked	pump_ctrl.device_fault	pump_ctrl.service_required	in_alarm
E11	Motor idling	pump_ctrl.sf_no_fluid	pump_ctrl.device_fault		in_alarm
E12	Impeller/rotor difficult to move	pump_ctrl.df_pump_blocked	pump_ctrl.device_fault	pump_ctrl.service_required	in_alarm
E16	Bearing wear	pump_ctrl.df_motor_failure	pump_ctrl.device_fault	pump_ctrl.service_required	in_alarm
E20	Excess winding temperature	pump_ctrl.df_motor_temp	pump_ctrl.device_fault		in_alarm
E21	Motor overload	pump_ctrl.df_motor_failure	pump_ctrl.device_fault	pump_ctrl.service_required	electrical_fault in_alarm
E23	Short circuit/earth leakage	pump_ctrl.df_motor_failure	pump_ctrl.device_fault	pump_ctrl.service_required	electrical_fault in_alarm
E24	Winding fault	pump_ctrl.df_motor_failure	pump_ctrl.device_fault	pump_ctrl.service_required	electrical_fault in_alarm
E25	Contact error/winding open	pump_ctrl.df_motor_failure	pump_ctrl.device_fault	pump_ctrl.service_required	electrical_fault in_alarm
E26	Winding temp. probe open	pump_ctrl.df_motor_failure	pump_ctrl.device_fault	pump_ctrl.service_required	electrical_fault in_alarm
E27	Speed sensor defective	pump_ctrl.df_sensor_failure	pump_ctrl.device_fault	pump_ctrl.service_required	in_alarm
E30	Excess module temperature	pump_ctrl.df_elect_temp	pump_ctrl.device_fault		in_alarm
E31	Excess power section temp.	pump_ctrl.df_elect_temp	pump_ctrl.device_fault		in_alarm
E34	Module/pump assignment	pump_ctrl.df_elect_failure_nf	pump_ctrl.device_fault	pump_ctrl.service_required	in_alarm
E36	Loading relay/PFC defective	pump_ctrl.df_elect_failure	pump_ctrl.device_fault	pump_ctrl.service_required	in_alarm
E37	Intermediate gyrocompass defective	pump_ctrl.df_elect_failure	pump_ctrl.device_fault	pump_ctrl.service_required	in_alarm
E38	Medium temp. sensor	pump_ctrl.df_sensor_failure	pump_ctrl.device_fault	pump_ctrl.service_required	in_alarm
E40	Ext. pressure sensor defective	pump_ctrl.df_sensor_failure	pump_ctrl.device_fault	pump_ctrl.service_required	in_alarm
E41	Ext. vibration sensor defective	pump_ctrl.df_sensor_failure	pump_ctrl.device_fault	pump_ctrl.service_required	in_alarm
E50	GLT timeout	pump_ctrl.df_elect_failure	pump_ctrl.device_fault	pump_ctrl.service_required	unable_to_measure in_alarm
E52	DP timeout	pump_ctrl.df_elect_failure_nf	pump_ctrl.device_fault		in_alarm

Tab. 7: Connection between Wilo error codes and LON bus fault signals

NOTE:
The installation and operating instructions for the respective pumps should be observed during error diagnostics.
If the pump/IF-module malfunction is unable to be rectified, please contact a specialist or the nearest Wilo customer service or representative.

11 Disposal

Proper disposal and recycling of this product prevents damage to the environment and risks to personal health.

1. Use public or private disposal organisations when disposing of all or part of the product.
2. For more information on proper disposal, please contact your local council or waste disposal office or the supplier from whom you obtained the product.

NOTE:
The product or any of its parts must not be disposed of with household waste!
For further information on recycling, go to:
www.wilo-recycling.com

Subject to change without prior notice!

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