Rexroth
Bosch Group

Digital axis control

RE 30139/08.12 1/20
Replaces: 10.11

Type VT-HNC100

CE


H7642

Component series 3X

Table of contents

Features

The digital axis control VT-HNC100...3X is a programmable NC control for up to four controlled axes. It complies with the specific requirements for closed-loop control of hydraulic drives.

The VT-HNC100...3X is designed for being used in rough industrial environments as regards to interference immunity, mechanical vibration, shock, and climate resistance.

Fields of application

- Machine tools
- Plastics processing machines
- Special machines
- Presses
- Transfer systems

Technology functions

- Sequence programming
- Positioning
- Pressure/force control
- Differential pressure control
- Synchronization
- Curves
- Cams

Hydraulic axes

- Measurement system:
  - Incremental or absolute (SSI)
  - Analog 0 to ±10 V and 4 to 20 mA
- Actuating variable output voltage or current
- Freely configurable controller variants
  - Position/pressure/force/velocity controller
  - Path-dependent braking
  - Substitutional closed-loop control (position/force)
  - Synchronization control of up to 4 axes also in groups

Programming

- User programming using a PC
- NC language with subroutine technology and conditional jumps
- 1 NC program per axis for functional sequences
- 1 axes-spanning auxiliary routine
- Variable setting of the NC processing velocity
- Variable setting of the controller scan times
- Password protection

Operation

- Comfortable administration of the machine and measuring data on a PC

Service interface

- RS 232
- TCP/IP (not available with Version Compact)

Process connection

- Digital inputs and outputs,
- Analog inputs and outputs,
- PROFIBUS DP, PROFIBUS DP in Motorola format, CANopen for the communication with a superior control (for CANopen, there is no standard EDS file available)
- PROFINET RT
- EtherNet/IP

Assembly

- Top hat rail 35 mm

CE conformity

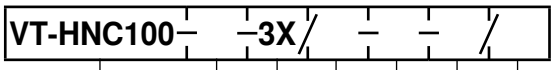
- CE conformity according to EMC directive 2004/108/EC and EMVG (Act on electro-magnetic compatibility of operating media) from February 26, 2008

  Applied harmonized standards:
  EN 61000-6-2:2005
  EN 61000-6-3:2007

More information

www.boschrexroth.com/hnc100

Ordering code



VT-HNC100 = Serial unit

Version Compact for 1 axis **= C**
Version for 1 hydraulic axis **= 1**
Version for 2 hydraulic axes **= 2**
Version for 3 hydraulic axes **= 3**
Version for 4 hydraulic axes **= 4**

Component series 30 to 39 **= 3X**
(30 to 39: unchanged technical data and pinout)

Option
000 = without synchronization
G02 = Synchronization 2-axis version
G03 = Synchronization 3-axis version
G04 = Synchronization 4-axis version

00 = No fitting
E0 = TCP/IP [1]

Position transducer
I = Incremental/SSI
(not in connection with Compact version)

S = SSI
(only in connection with Compact version)

Bus connection [2]
P = PROFIBUS DP
C = CANopen
N = PROFINET RT
(not in connection with Compact version)
E = EtherNet/IP
(not in connection with Compact version)

Included within the scope of delivery:

Mating connector for

- X1S (Type Phoenix Mini Combicon 3-pole),
- X2D (Type Phoenix Micro Combicon 8-pole or Phoenix Mini Combicon 12-pole),
- X2A (Type Phoenix Micro Combicon 8-pole or HD-SUB 15-pole),
- X8M (Type Phoenix Micro Combicon 8-pole or HD-SUB 15-pole)

[1] Only specify "E0" if the Ethernet service interface is desired for "PROFIBUS DP"

[2] Versions without bus connection are not available.

Recommended accessories (can be ordered separately)

Description	Material number
Interface cable RS232 (1:1), length 3 m	**R900776897**
USB-RS232 converter	**R901066684**
Cable set VT17220-1X/HNC100-3X, length 2 m, for analog signals (connection X2A) or digital position measurement systems (connection X8M) with HD connector and open breakout cable for: VT-HNC100-1-3X, VT-HNC100-2-3X, VT-HNC100-3-3X, VT-HNC100-4-3X	**R901189300**
Cable set VT17220-1X/HNC100-3X length 2 m, for analog signals (connection X2A) or digital position measurement systems (connection X8M) with FK-MC connector and open breakout cable for VT-HNC100-C-3X	**R901189302**
Plug-in connector type 6ES7972-0BA42-0XA0 for PROFIBUS DP	**R901312863**

Software project planning

Project planning

Developing application-specific data sets forms the basis for the function of the VT-HNC100...3X. These data sets are generated on the PC and sent to VT-HNC100...3X. The connection of user program and data sets is called project. This software project planning is implemented according to fix steps:

1. The tasks of the VT-HNC100...3X are defined and recorded in a flow chart. In this connection, the meaning of the inputs and outputs and the used parameters is defined.
2. The functions of the flow chart are implemented in a series of NC commands.
3. The machine data (selection of transducers and controllers) and the parameters of the NC program are defined.
4. The data is sent to the VT-HNC100...3X.
5. The setting and the program sequence are optimized at the machine.

For detailed information on the generation of a project please refer to the document “First steps”.

PC programs “WIN-PED 7” and “WIN-PED 6”

For the implementation of the project planning tasks, two WIN-PED programs are available to the user.

WIN-PED 7 is suitable for all HNC variants mentioned in this document except for CANopen.

WIN-PED 6 is suitable for all HNC variants mentioned in this document except for the options PROFINET RT, EtherNet/IP and PROFIBUS DP with TCP/IP.

Projects generated with WIN-PED 6 are not compatible with WIN-PED 7 and vice-versa.

Scope of delivery for WIN-PED:

- Comfortable dialog functions for setting the machine data online or offline
- NC editor with integrated syntax test and program compiler
- Support for the definition of the parameters used in the NC program
- Dialog window for setting the parameter values online
- Comprehensive options for displaying process variables, digital inputs, outputs, and markers
- Recording and graphical presentation of up to 16 process variables with great selection of trigger options
- Dialog for the graphical definition of special functions (determination of the function via polygonal sequence)
- Bus manager for the configuration of data exchange (PROFIBUS DP, PROFINET RT, EtherNet/IP) with superior control

System requirements:

- IBM PC or compatible system
- Windows XP or Windows 7 for WIN-PED 6
- Windows XP or Windows 7 for WIN-PED 7
- Random access memory (512 MB recommended)
- 100 MB free hard disk capacity as per control type
- RS 232 interface for the connection of VT-HNC100...3X, for the PROFINET RT, EtherNet/IP or PROFIBUS DP, also the network interface TCP/IP can be used

Note:

The WIN-PED 6/WIN-PED 7 is **not** included in the scope of delivery. It can be downloaded from the Internet free of charge, or ordered as CD, Material number R900725471.

Download in the Internet: www.boschrexroth.com/hnc100

Inquiries: support.nc-systems@boschrexroth.de

Overview of the controller functions

Position controller:

- PDT1 controller
- Linear amplification characteristic curve
- Direction-dependent gain adaptation
- Gain modification via the NC program possible
- Adaptation of the valve characteristic curve
- Fine positioning
- Residual voltage principle
- Compensation of zero point errors
- State feedback via
  - Pressure,
  - Pressure differential
  - Position
- Command value provision
- Limitation of the actuating variable via the NC program
- “Path-dependent braking”
- Intermediate electronics when using commercially available NC controls
- Synchronization control

Pressure/force controller:

- PIDT1 controller
- I component switchable via window
- Pressure differential analysis
- Own scan time

Velocity controller:

- PI controller
- I component switchable via window

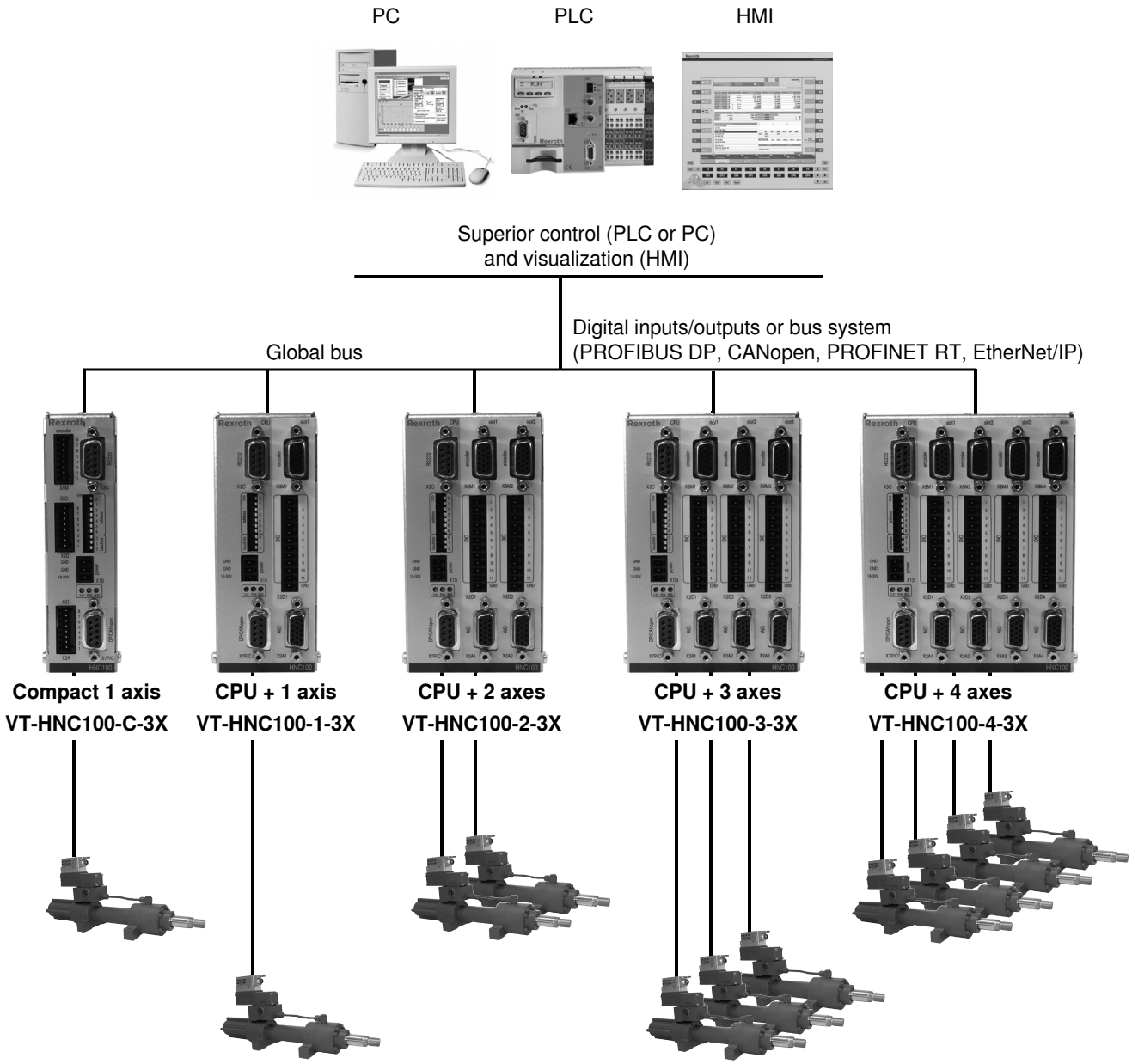
Synchronization controller (up to 4 axes):

- Master-slave principle
- Mean principle

Monitoring functions:

- Dynamic tracking error monitoring
- Traversing range limits (electronic limit switches)
- Cable break monitoring for incremental and SSI encoder
- Cable break monitoring for sensors with output 4 to 20 mA

System overview (example)



System overview, interfaces (example)

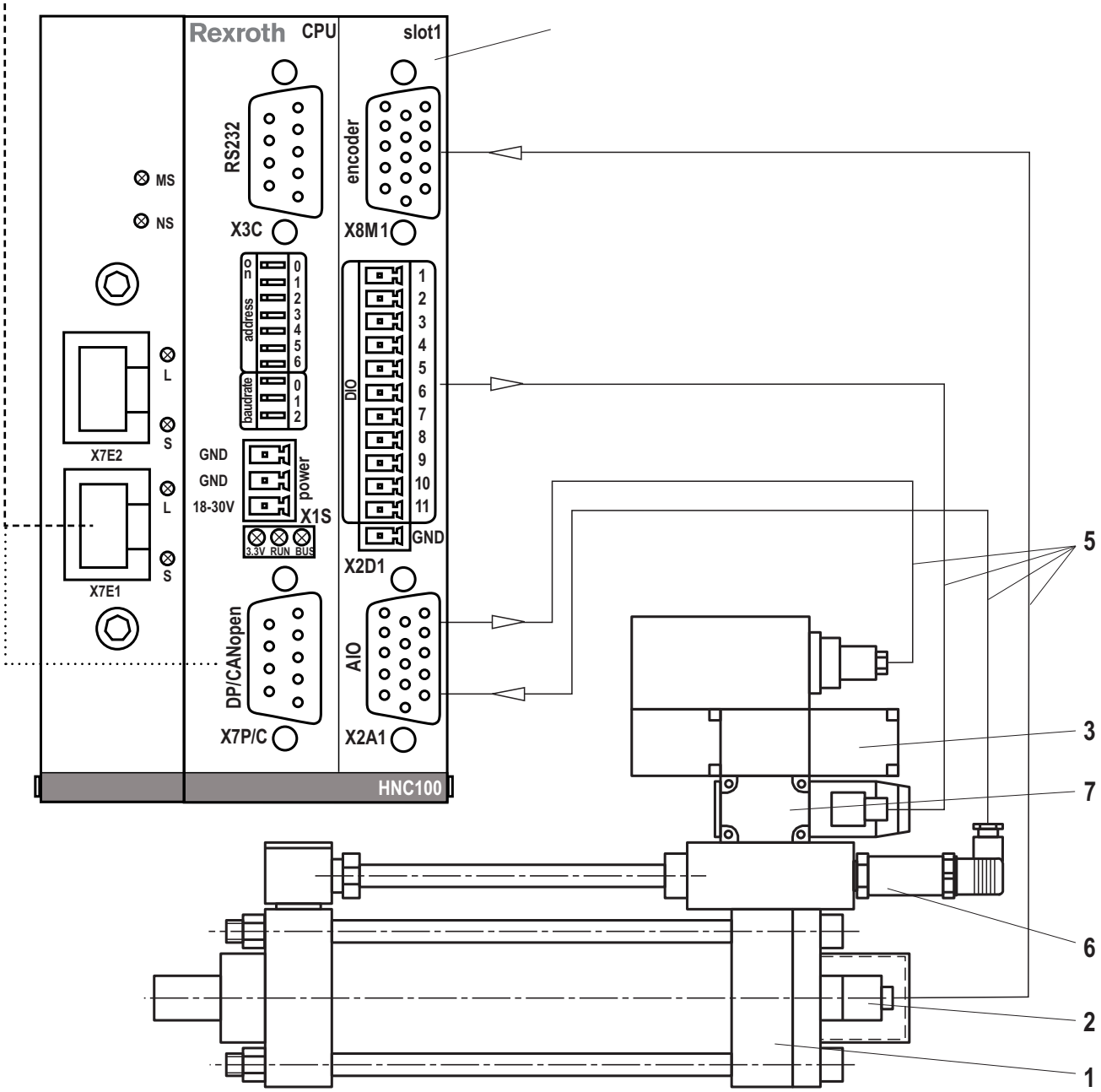
Superior control

Possible interfaces with VT-HNC100...3X:

- Analog signals
- Digital inputs / outputs
- Serial interface RS232
- Bus systems (PROFIBUS DP, CANopen, PROFINET RT, EtherNet/IP)
- Ethernet service interface

Example:

VT-HNC100-**1**-3X/N... / VT-HNC100-1-3X/E… with hydraulic cylinder axis



1 Single-rod cylinder

2 Integrated position measurement system

3 Proportional servo valve with integrated control electronics

4 VT-HNC100-1-3X/N...

5 Connection cable

6 Pressure transducer

7 Sandwich plate isolator valve (with plug-in switching amplifier)

Technical data VT-HNC100-C-3X (Compact)

Operating voltage [1]	U_B	18 to 30 VDC, residual ripple < 1.5 V_{pp}
Current consumption at 24 VDC	I	approx. 500 mA
Processor		32 bit power PC
Interface for WIN-PED 6, WIN-PED 7		RS232
Bus interface		PROFIBUS DP (max. 12 MBaud according to IEC 61158), CANopen
Analog inputs (AI):		
– Voltage input (reference to AGND - Analog ground)		
• Channel number		1
• Input voltage	U_E	max +12 V to –12 V (+10 V to –10 V measurable)
• Input resistance	R_E	200 kΩ ± 5 %
• Resolution		5 mV
• Non-linearity		< 0.2 %
• Calibration tolerance [2]		max. 40 mV (with factory settings)
– Current inputs		
• Channel number		2
• Input current	I_E	4 mA to 20 mA
• Input resistance	R_E	225 Ω at 20 °C (100 Ω measuring resistance)
• Leakage current	I_V	0.1 to 0.4 % (at 100 Ω between pin 2 or pin 3 (Cin1+ or Cin2+) and “AGND”
• Resolution		5 µA
– Voltage supply for analog sensors via the VT-HNC100-C-3X	U	U_B at X2A, Pin 7 (+24 Vsens)
Analog outputs (AO):		
– Voltage outputs		
• Channel number		2
• Output voltage	U_{nom}	–10 V to +10 V (max. –10.7 V to +10.7 V)
• Output current	I_{max}	±10 mA
• Load	R_{min}	1 kΩ
– Resolution		1.25 mV
– Non-linearity		
• In the range –9.5 V to +9.5 V		< 0,1 %
• In the range –10 V to –9.5 V and +9.5 V to +10 V		< 0,2 %

[1] If a 24 V transducer supply is implemented directly via the VT-HNC100...3X (supply voltage is looped in), the transducer specification has to be observed.

[2] If the factory settings are insufficient, the measurement technology can be calibrated on site via software in a system-specific way.

Technical data VT-HNC100-C-3X (Compact) continued

Gate inputs (DI)	Quantity	4
	Logic level	log 0 (low) ≤ 5 V; log 1 (high) ≥ 10 V to U_B, I_e = 20 mA at U_B = 24 V
	Port	Flexible conductor up to 1.5 mm²
Gate outputs (DO)	Quantity	2
	Logic level	log 0 (low) ≤ 2 V; log 1 (high) ≤ U_B; I_{max} = 20 mA, Maximum load capacity C = 0.047 µF
	Port	Flexible conductor up to 1.5 mm²
Reference potential for all signals		DGND
Digital position transducers (encoders):		
– SSI transducer (Due to the higher control quality, an SSI transducer with clock synchronization should be used.)		
• Coding		Gray-Code
• Data width		Adjustable up to max. 28 Bit
• Line receiver / line driver		RS485
• Voltage supply via the VT-HNC100-C-3X	*U*	U_B
– Reference potential for all signals		EGND
Dimensions		See page 16
Assembly		Top hat rail TH 35-7.5 or TH 35-15 according to EN 60715
Admissible operating temperature range	ϑ	0 to 50 °C
Storage temperature range	ϑ	–20 to +70 °C
Protection class according to EN 60529:1991		IP 20
Weight:	*m*	440 g
CE conformity		See page 2

Further technical details upon request.

Note:

Information on the **environment simulation testing** for the areas EMC (electromagnetic compatibility), climate and mechanical load see data sheet 30139-U.

Technical data VT-HNC100-...-3X (CPU + axis electronics)

Operating voltage [1]	U_B	18 to 30 VDC, residual ripple < 1.5 V_{pp}
Current consumption at 24 VDC	I	1 to 4 A (depending on the HNC variant and the additionally supplied components)
Processor		32 bit power PC
Interface for WIN-PED 6 interface for WIN-PED 7 Bus interface		RS232 RS232, optional TCP/IP PROFIBUS DP (max. 12 MBaud according to IEC 61158), CANopen, PROFINET RT, EtherNet/IP
PROFINET RT, EtherNet/IP		
• Minimum cycle time		2 ms
• Max. size of the cyclic I/O data		992 byte (max. 496 496 byte per direction)
• Transmission rate		100 Mbit/s, full-duplex
Analog inputs (AI) per axis electronics:		
– Voltage inputs (differential inputs)		
• Channel number		2
• Input voltage	U_E	max +12 V to –12 V (+10 V to –10 V measurable)
• Input resistance	R_E	200 kΩ ± 5 %
• Resolution		5 mV
• Non-linearity		< 0.2 %
• Calibration tolerance [2]		max. 40 mV (with factory settings)
– Current inputs		
• Channel number		2
• Input current	I_E	4 mA to 20 mA
• Input resistance	R_E	350 Ω at 20 °C (100 Ω measuring resistance)
• Leakage current	I_V	0.1 to 0.4 %
• Resolution		5 µA
– Voltage supply for analog sensors via the VT-HNC100...3X	U	U_B at X2A1 to X2A4, Pin 14 (+24 Vsens)
Analog outputs (AO) per axis electronics: [3]		2 (1)
– Non-linearity		
• In the range –9.5 V to +9.5 V		< 0.1 %
• In the range –10 V to –9.5 V and +9.5 V to +10 V		< 0.2 %
– Voltage output		
• Output voltage	U_{nom}	–10 V to +10 V (max. –10.7 V to +10.7 V)
• Output current	I_{max}	±10 mA
• Load	R_{min}	1 kΩ
• Residual ripple		±60 mV (without noise)
• Resolution		1.25 mV
– Current output		
• Output current Standardized	I_{nom}	4 mA to 20 mA
• Load	R_{max}	500 Ω
• Resolution		0,625 µA

[1] If a 24 V transducer supply is implemented directly via the VT-HNC100...3X (supply voltage is looped in), the transducer specification has to be observed.

[2] If the factory settings are insufficient, the measurement technology can be calibrated on site via software in a system-specific way.

[3] Configurable as current or voltage output.
Axis electronics slot 1 and axis electronics slot 2 have two voltage outputs Vout1 and Vout2. The axis electronics slot 3 and slot 4 only have one voltage output Vout1.

Technical data VT-HNC100-...-3X (CPU + axis electronics), continued

Gate inputs (DI) or outputs (DO) per axis electronics (settable via software)	Quantity	11 [1]
Gate inputs (DI)	Logic level	log 0 (low) ≤ 5 V; log 1 (high) ≥ 10 V to U_B, I_e = 20 mA at U_B = 24 V
	Port	Flexible conductor up to 1.5 mm²
Gate outputs (DO)	Logic level	log 0 (low) ≤ 2 V; log 1 (high) ≤ U_B; I_{max} = 20 mA, Maximum load capacity C = 0.047 µF
	Port	Flexible conductor up to 1.5 mm²
Reference potential for all signals		DGND
Digital position transducers (encoder) per axis electronics:		
– Incremental transducer (transducer with TTL output)		
• Input voltage	log 0	0 to 1 V
	log 1	2.8 to 5.5 V
• Input current	log 0	–0.8 mA (with 0 V)
	log 1	0.8 mA (with 5 V)
• Max. frequency referring to Ua1	f_{max}	250 kHz
• Voltage supply for incremental Transducer via the VT-HNC100...3X	U	5.25 V ±1 %, max. 400 mA total current across all axes at X8M1 to X8M4, pin 12 (+5 Venc)
– SSI transducer (Due to the higher control quality, an SSI transducer with clock synchronization should be used.)		
• Coding		Gray-Code
• Data width		Adjustable up to max. 28 Bit
• Line receiver / line driver		RS485
• Voltage supply for SSI encoders via the VT-HNC100...3X	U	U_B at X8M1 to X8M4, pin 14 (+24 Venc)
Reference potential for all signals		EGND
Reference voltage per axis electronics	U_{ref}	+10 V ± 25 mV (20 mA)
Dimensions		See page 16
Assembly		Top hat rail TH 35-7.5 or TH 35-15 according to EN 60715
Admissible operating temperature range	ϑ	0 to 50 °C
Storage temperature range	ϑ	–20 to +70 °C
Protection class according to EN 60529:1991		IP 20
Weight:		
– VT-HNC100-1-3X	m	585 g
– VT-HNC100-2-3X	m	690 g
– VT-HNC100-3-3X	m	850 g
– VT-HNC100-4-3X	m	960 g
with Ethernet	m	223 g more
CE conformity		See page 2

Further technical details upon request.

[1] Maximally, 20 digital outputs can be connected

Note:

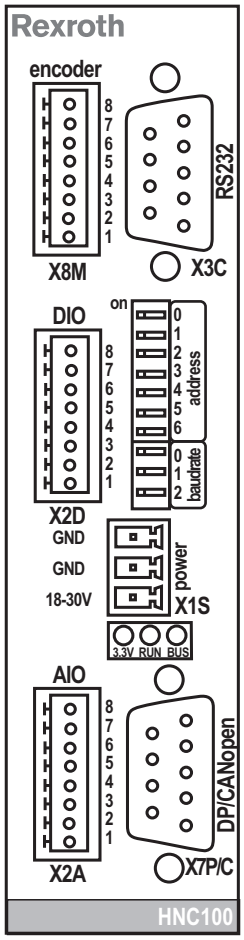
Information on the **environment simulation testing** for the areas EMC (electromagnetic compatibility), climate and mechanical load see data sheet 30139-U.

Pinout VT-HNC100-C-3X/... (Compact)

X8M	Encoder
Pin	
8	shield
7	24 Venc
6	+5 V
5	– Clk
4	+ Clk
3	– Data
2	+ Data
1	EGND

X2D	DIO (digital)
Pin	
8	shield
7	OUT2
6	OUT1
5	IN4
4	IN3
3	IN2
2	IN1
1	DGND

X2A	AIO (analog)
Pin	
8	shield
7	24 Vsens
6	Vout1 +
5	Vout2 +
4	Vin1
3	Cin2 +
2	Cin1 +
1	AGND



X3C	RS232
Pin	
1	
2	TxD
3	RxD
4	reserved
5	GND
6	reserved
7	reserved
8	reserved
9	

X1S	Power
Pin	
1	GND
2	GND
3	18 – 30 V

X7P	PROFIBUS DP
Pin	
1	reserved
2	reserved
3	RxD/TxD-P
4	CNTR-P
5	DGND
6	VP
7	reserved
8	RxD/TxD-N
9	reserved

X7C	CANopen
Pin	
1	reserved
2	CAN_L
3	CAN_GND
4	reserved
5	reserved
6	reserved
7	CAN_H
8	reserved
9	reserved

Note:

The pins marked with **“reserved”** are reserved and must not be wired.

Pinout VT-HNC100-1-3X/... (1-axis version)

X3C	RS232
Pin	
1	
2	TxD
3	RxD
4	reserved
5	GND
6	reserved
7	reserved
8	reserved
9	

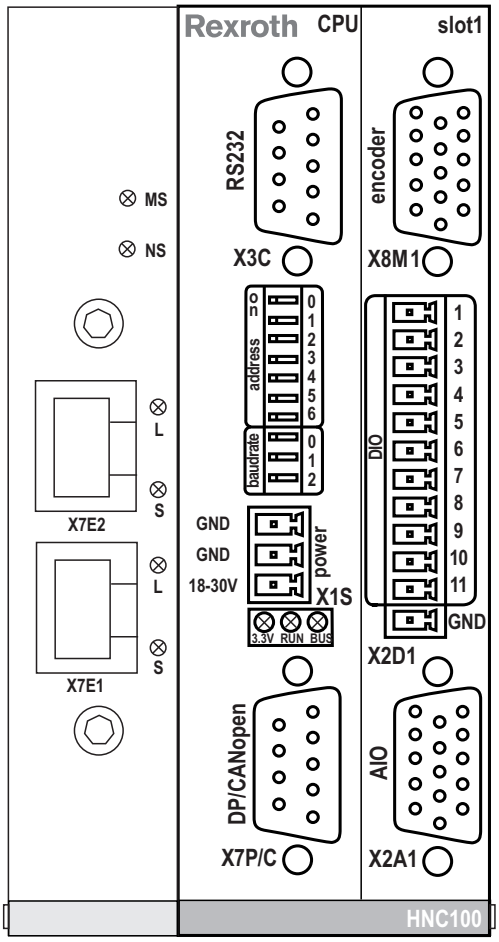
X1S	Power
Pin	
1	GND
2	GND
3	18 – 30 V

X7E1, X7E2
Ethernet connection

X7P	PROFIBUS DP
Pin	
1	reserved
2	reserved
3	RxD/TxD-P
4	CNTR-P
5	DGND
6	VP
7	reserved
8	RxD/TxD-N
9	reserved

X7C	CANopen
Pin	
1	reserved
2	CAN_L
3	CAN_GND
4	reserved
5	reserved
6	reserved
7	CAN_H
8	reserved
9	reserved

Slot 1 X8M1	Encoder	
	Incremental	SSI
Pin 1	– B (Inc)	
2		+ CLK (SSI)
3	+ R (Inc)	
4	– R (Inc)	
5	+ A (Inc)	
6	– A (Inc)	
7		– CLK (SSI)
8	+ B (Inc)	
9		– Data (SSI)
10	EGND	
11		+ Data (SSI)
12	+5 Venc	
13	+10 Vref	
14	+24Venc	
15	reserved	



Slot 1 X2D1	DIO (digital)
Pin 1	I/O 1
2	I/O 2
3	I/O 3
4	I/O 4
5	I/O 5
6	I/O 6
7	I/O 7
8	I/O 8
9	I/O 9
10	I/O 10
11	I/O 11
12	DGND

Slot 1 X2A1	AIO (analog)
Pin 1	Vin1 +
2	Vin1 –
3	Vin2 +
4	Vin2 –
5	Cin1 +
6	Cin1 –
7	Cin2 +
8	Cin2 –
9	reserved
10	AGND
11	Vout1 +
12	Vout2 +
13	Cout1
14	+24 Vsens
15	reserved

Note:

The pins marked with **"reserved"** are reserved and must not be wired.

Pinout VT-HNC100-2-3X/... (2-axis version)

X3C	**RS232**
Pin	
1	
2	TxD
3	RxD
4	reserved
5	GND
6	reserved
7	reserved
8	reserved
9	

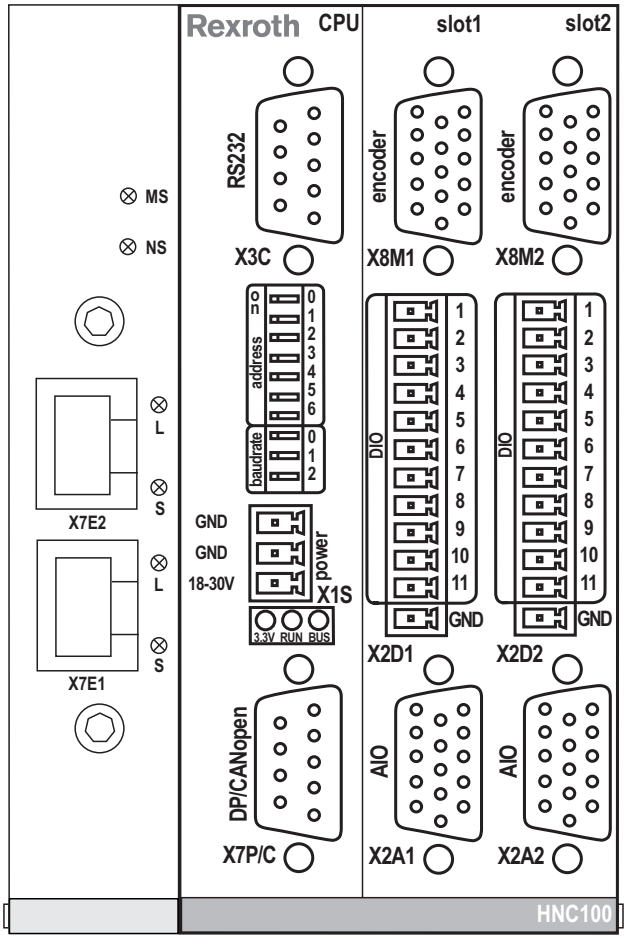
X1S	**Power**
Pin	
1	GND
2	GND
3	18 – 30 V

X7E1, X7E2
Ethernet connection

X7P PROFIBUS DP	
Pin	
1	reserved
2	reserved
3	RxD/TxD-P
4	CNTR-P
5	DGND
6	VP
7	reserved
8	RxD/TxD-N
9	reserved

X7C	**CANopen**
Pin	
1	reserved
2	CAN_L
3	CAN_GND
4	reserved
5	reserved
6	reserved
7	CAN_H
8	reserved
9	reserved

Slot 1 **X8M1** Slot 2 **X8M2**		**Encoder**	
		Incremental	SSI
Pin	1	– B (Inc)	
	2		+ CLK (SSI)
	3	+ R (Inc)	
	4	– R (Inc)	
	5	+ A (Inc)	
	6	– A (Inc)	
	7		– CLK (SSI)
	8	+ B (Inc)	
	9		– Data (SSI)
	10	EGND	
	11		+ Data (SSI)
	12	+5 Venc	
	13	+10 Vref	
	14	+24Venc	
	15	reserved	



Slot 1 **X2D1** Slot 2 **X2D2**		**DIO** [1] (digital)
Pin	1	I/O 1
	2	I/O 2
	3	I/O 3
	4	I/O 4
	5	I/O 5
	6	I/O 6
	7	I/O 7
	8	I/O 8
	9	I/O 9
	10	I/O 10
	11	I/O 11
	12	DGND

Slot 1 **X2A1** Slot 2 **X2A2**		**AIO** (analog)
Pin	1	Vin1 +
	2	Vin1 –
	3	Vin2 +
	4	Vin2 –
	5	Cin1 +
	6	Cin1 –
	7	Cin2 +
	8	Cin2 –
	9	reserved
	10	AGND
	11	Vout1 +
	12	Vout2 +
	13	Cout1
	14	+24 Vsens
	15	reserved

[1] Maximally, 20 digital outputs can be connected.

Note:

The pins marked with **"reserved"** are reserved and must not be wired.

Pinout VT-HNC100-3-3X/... (3-axis version)

X3C	RS232
Pin	
1	
2	TxD
3	RxD
4	reserved
5	GND
6	reserved
7	reserved
8	reserved
9	

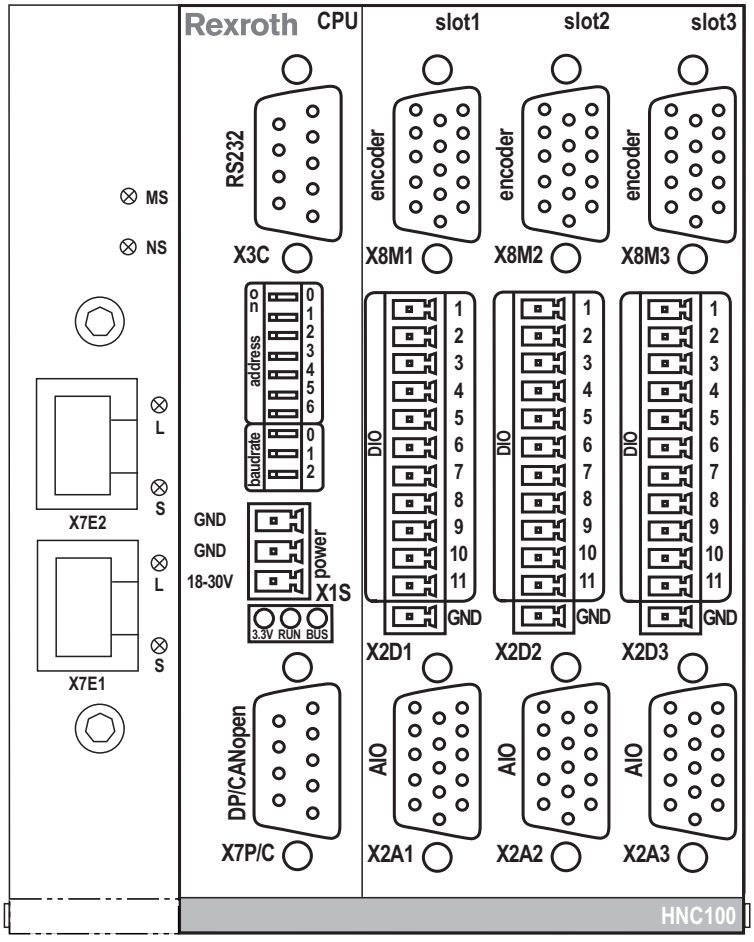
X1S	Power
Pin	
1	GND
2	GND
3	18 – 30 V

X7E1, X7E2
Ethernet connection

X7P PROFIBUS DP	
Pin	
1	reserved
2	reserved
3	RxD/TxD-P
4	CNTR-P
5	DGND
6	VP
7	reserved
8	RxD/TxD-N
9	reserved

X7C	CANopen
Pin	
1	reserved
2	CAN_L
3	CAN_GND
4	reserved
5	reserved
6	reserved
7	CAN_H
8	reserved
9	reserved

Slot 1 **X8M1** Slot 2 **X8M2** Slot 3 **X8M3**		**Encoder**	
		Incremental	SSI
Pin	1	– B (Inc)	
	2		+ CLK (SSI)
	3	+ R (Inc)	
	4	– R (Inc)	
	5	+ A (Inc)	
	6	– A (Inc)	
	7		– CLK (SSI)
	8	+ B (Inc)	
	9		– Data (SSI)
	10	EGND	
	11		+ Data (SSI)
	12	+5 Venc	
	13	+10 Vref	
	14	+24Venc	
	15	Reserved	



Slot 1 **X2D1** Slot 2 **X2D2** Slot 3 **X2D3**		**DIO** [1] (digital)
Pin	1	I/O 1
	2	I/O 2
	3	I/O 3
	4	I/O 4
	5	I/O 5
	6	I/O 6
	7	I/O 7
	8	I/O 8
	9	I/O 9
	10	I/O 10
	11	I/O 11
	12	DGND

Slot 1 **X2A1** Slot 2 **X2A2** Slot 3 **X2A3**		**AIO** (analog)
Pin	1	Vin1 +
	2	Vin1 –
	3	Vin2 +
	4	Vin2 –
	5	Cin1 +
	6	Cin1 –
	7	Cin2 +
	8	Cin2 –
	9	reserved
	10	AGND
	11	Vout1 +
	12	Vout2 + [2]
	13	Cout1
	14	+24 Vsens
	15	reserved

[1] Maximally, 20 digital outputs can be connected.

[2] Not available with slot 3 (reserved)

Note:

The pins marked with **"reserved"** are reserved and must not be wired.

Pinout VT-HNC100-4-3X/... (4-axis version)

X3C	**RS232**
Pin	
1	
2	TxD
3	RxD
4	reserved
5	GND
6	reserved
7	reserved
8	reserved
9	

X1S	**Power**
Pin	
1	GND
2	GND
3	18 – 30 V

X7E1, X7E2
Ethernet connection

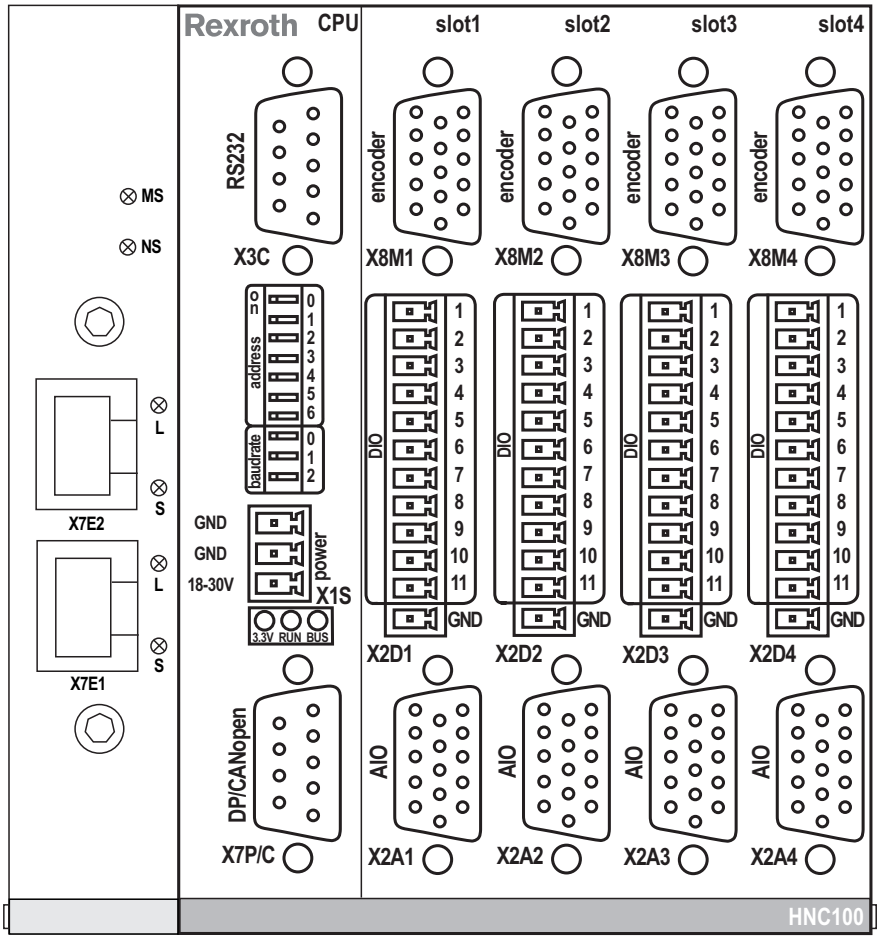
X7P PROFIBUS DP	
Pin	
1	reserved
2	reserved
3	RxD/TxD-P
4	CNTR-P
5	DGND
6	VP
7	reserved
8	RxD/TxD-N
9	reserved

X7C	**CANopen**
Pin	
1	reserved
2	CAN_L
3	CAN_GND
4	reserved
5	reserved
6	reserved
7	CAN_H
8	reserved
9	reserved

Slot 1 **X8M1** Slot 2 **X8M2** Slot 3 **X8M3** Slot 4 **X8M4**		**Encoder**	
		Incremental	SSI
Pin	1	– B (Inc)	
	2		+ CLK (SSI)
	3	+ R (Inc)	
	4	– R (Inc)	
	5	+ A (Inc)	
	6	– A (Inc)	
	7		– CLK (SSI)
	8	+ B (Inc)	
	9		– Data (SSI)
	10	EGND	
	11		+ Data (SSI)
	12	+5 Venc	
	13	+10 Vref	
	14	+24Venc	
	15	reserved	

Slot 1 **X2D1** Slot 2 **X2D2** Slot 3 **X2D3** Slot 4 **X2D4**		**DIO** [1] (digital)
Pin	1	I/O 1
	2	I/O 2
	3	I/O 3
	4	I/O 4
	5	I/O 5
	6	I/O 6
	7	I/O 7
	8	I/O 8
	9	I/O 9
	10	I/O 10
	11	I/O 11
	12	DGND

Slot 1 **X2A1** Slot 2 **X2A2** Slot 3 **X2A3** Slot 4 **X2A4**		**AIO** (analog)
Pin	1	Vin1 +
	2	Vin1 –
	3	Vin2 +
	4	Vin2 –
	5	Cin1 +
	6	Cin1 –
	7	Cin2 +
	8	Cin2 –
	9	reserved
	10	AGND
	11	Vout1 +
	12	Vout2 + [2]
	13	Cout1
	14	+24 Vsens
	15	reserved



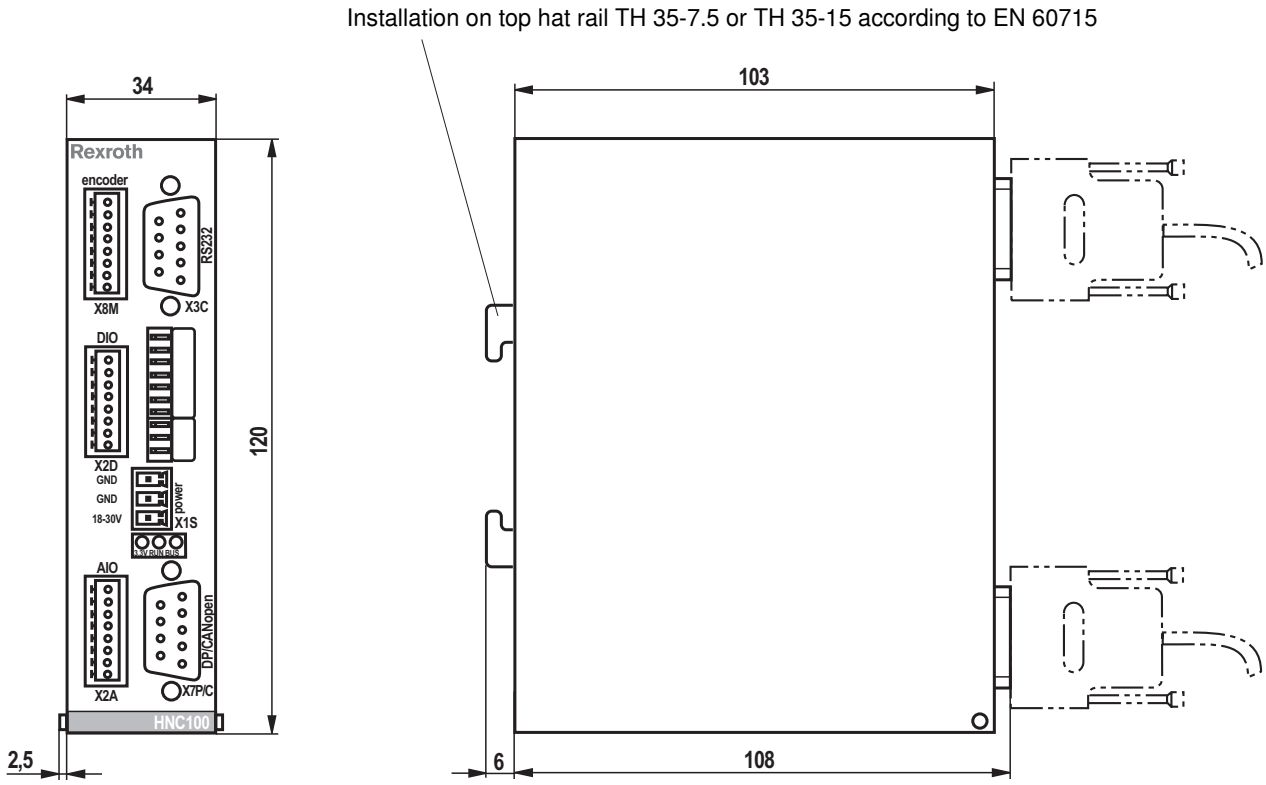
[1] Maximally, 20 digital outputs can be connected.

[2] Not available with slot 3 and slot 4 (reserved)

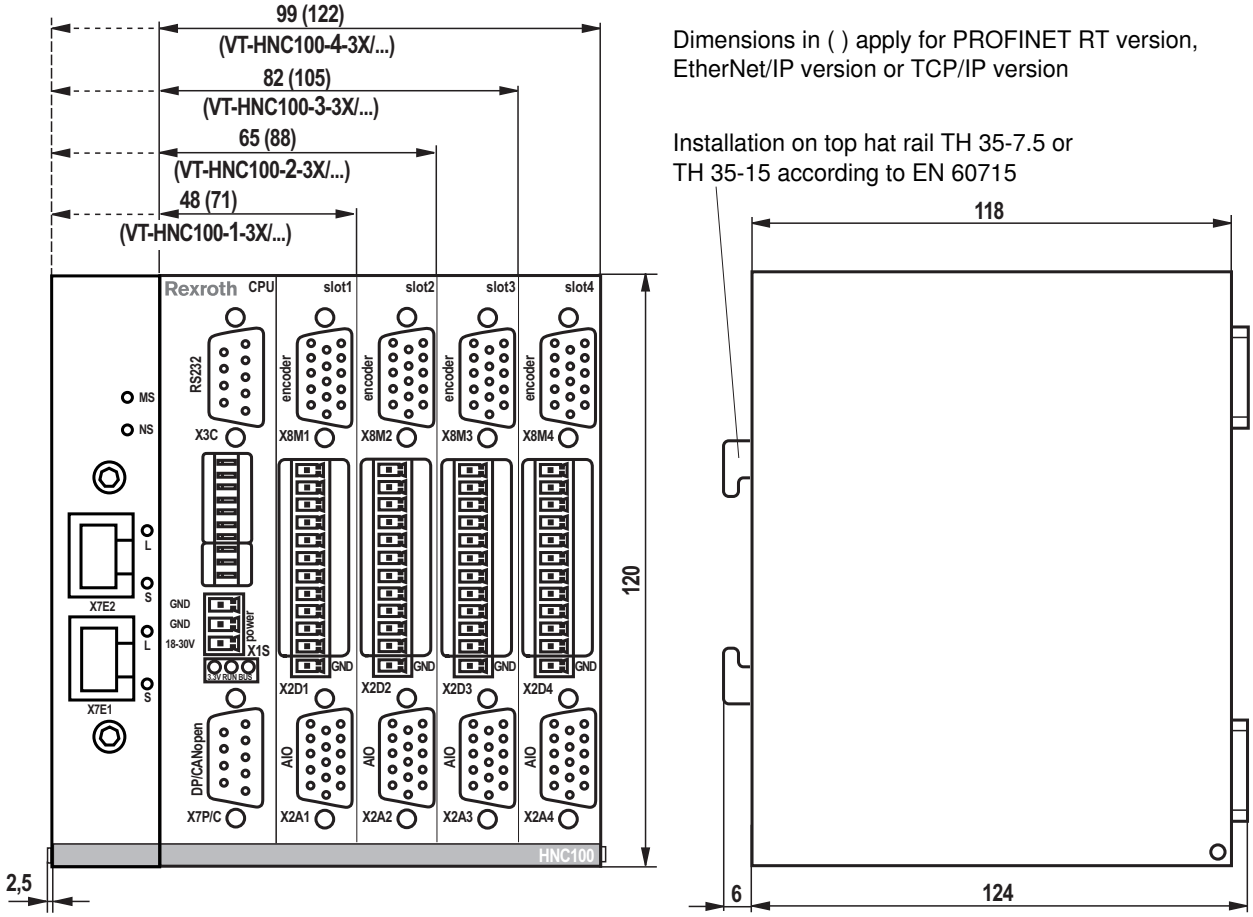
Note:

The pins marked with **"reserved"** are reserved and must not be wired.

Unit dimensions VT-HNC100-C-3X/… (dimensions in mm)



Unit dimensions of all axis versions (dimensions in mm)



Project Planning / Maintenance Instructions / Additional Information

Product documentation for VT-HNC100...3X

- **Product information 09956**
- **Data sheet 30139**
- **Operating instructions 30139-B**
- **Declaration on environmental compatibility 30139-U**
- **WIN-PED 6 / WIN-PED 7**
  - **First steps**
  - **Online help**
    - Machine data
    - NC commands
    - Parameter
    - CANopen (only with WIN-PED 6)
    - PROFIBUS DP (PROFIBUS DP with TCP/IP only with WIN-PED 7)
    - PROFINET RT (only with WIN-PED 7)
    - EtherNet/IP (only with WIN-PED 7)
- **General Information on the maintenance and commissioning of hydraulic components 07800 / 07900**

Commissioning software and documentation on the Internet: www.boschrexroth.com/HNC100

Maintenance instructions:

- The devices have been tested in the plant and are supplied with default settings.
- Only complete units can be repaired. The repaired units will be supplied with default settings. User-specific settings are not maintained. The operator will have to re-transfer the corresponding user parameters and programs.

Notes:

- Electric signals taken out via control electronics (e.g. signal “No error”) may not be used for the actuation of safety-relevant machine functions. (See also the European standard “Safety requirements for fluid power systems and their components - Hydraulics”, EN 982.)
- If electromagnetic interference must be expected, take appropriate measures to safeguard the function (depending on the application, e.g. screening, filtration).
- Wiring information
  - Largest spatial separation of signal and load lines possible
  - Don't lead signal lines through magnetic fields
  - If possibly, lay signal lines without intermediate terminals.
  - Don't lay signal lines parallely to load lines
- For more information refer to the WIN-PED 6 and WIN-PED 7 online help and the 30139-B operating instructions
- The upper and lower ventilation slots must not be concealed by adjacent units in order to provide for sufficient cooling.

Notes

Notes

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