



MTC200 / MT-CNC Machine Control Terminal BTV30.1

Functional Description

DOK-MTC200-BTV30.1****-FKB1-EN-P



Title	Machine control terminal BTV30.1
Documentation type	Functional Description
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Purpose of the document	This documentation serves the following purposes: <ul style="list-style-type: none">• Description of the BTV30.1 hardware functions• Connection and installation of the BTV30.1• Technical data of the BTV30.1

Revision	Date	Remarks
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1 Presentation of the System

1.1 Brief Description

The BTV30.1 is a machine control terminal in which one or several NC controllers with PLCs or one or several stand-alone PCLs can be integrated. The number of modules that can be integrated depends on their configuration (refer to the modules' ordering codes for information). Nine slots are currently available.

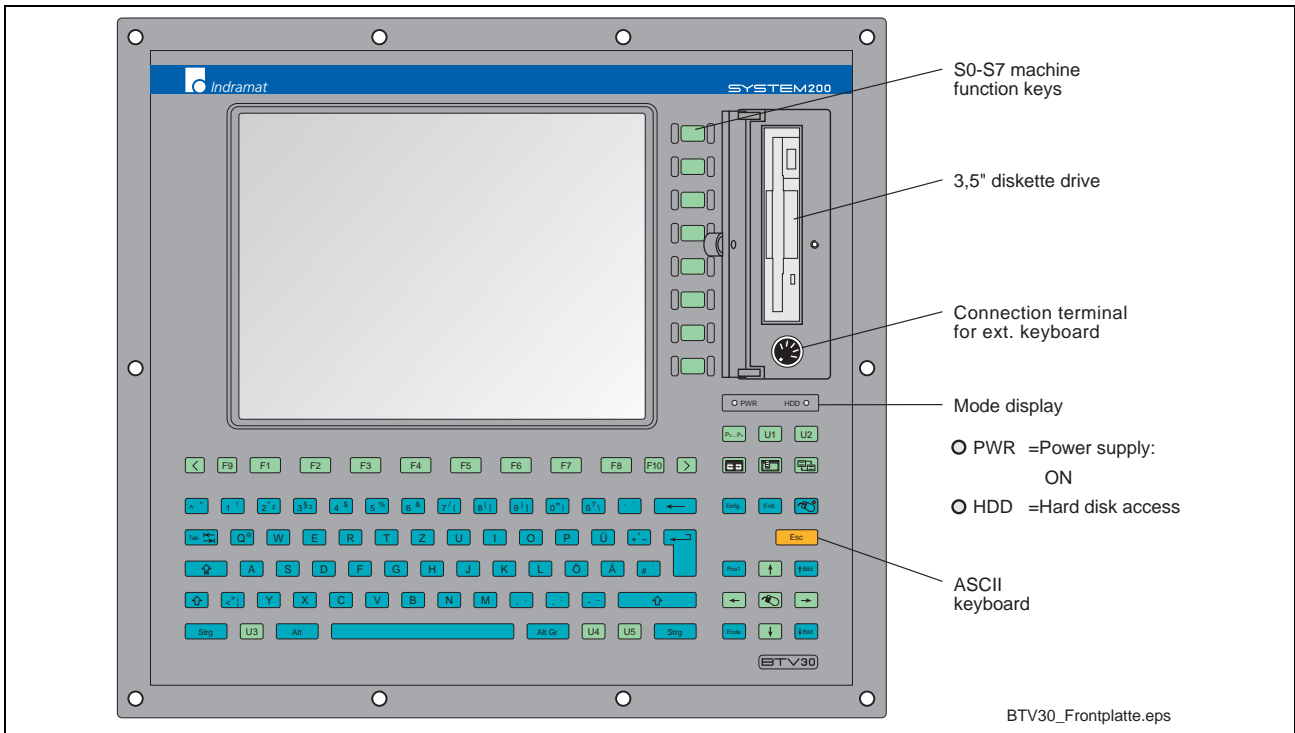


Figure 1-1: BTV30.1 front panel

1.2 Special Features

The BTV30.1 possesses the functionality and the operator controls of a complete industrial PC.

Besides the 10.4" flat color display and a complete ASCII keyboard (NFII-compatible) featuring a cursor block, a keyboard mouse and special Windows keys, it features a standard diskette drive and a connector for an external keyboard hidden behind a lockable cover.

While there are 8 PC function keys beneath the display, 8 machine function keys are located on the right of the display and can either be made externally available via a socket or - if a PLC module is integrated - are connected directly to the PLC.

Genuine key elements are recessed into the sturdy front panel made of PC/ABS to enable fatigue-free working even during the course of prolonged programming work.

The display is protected by a sturdy glass pane that conforms to EMC requirements. When the diskette cover is closed, the BTV30.1 conforms to the IP65 type of protection on the front and is resistant to all known coolants and lubricants.

The BTV30.1 is suitable for both surface and base installation. Together with the visually and dimensionally compatible machine control panels BTM15 and BTM16, a modern and attractive flat or console-type control panel can be generated.

1.3 Function Types

The following four function types of the BTV30.1 are available:

BTV30.1 P	=	Industrial PC without control systems
BTV30.1 S	=	PLC control system ISP200-P
BTV30.1 C	=	CNC control system MTC200-P
BTV30.1 E	=	CNC control system MTC200-P, export version

Refer to the ordering code (chapter 6) for further information about the configuration of the BTV30.1

1.4 Standard Configuration

- 166 MHz Pentium SLOT CPU with integrated graphics controller and 2 MB graphics memory
- 32 MB or 64 MB main memory (optional)
- At least 500 MB hard disk capacity
- 3.5" diskette drive
- 10.4" TFT color display, resolution 640 x 480 pixels
- Ethernet interface (10 Base-T)

1.5 Additional Modules

The following additional modules are currently available:

- Stand-alone PLC module featuring an INTERBUS-S interface and/or a 4-fold interface module (2 x RS232; 2 x RS485)
- PLC module featuring an INTERBUS-S interface and/or a 4-fold interface module (2 x RS232; 2 x RS485)
- CNC module featuring a Sercos drive interface

2 Floppy Drive Cover, Keyboard

2.1 Floppy Drive Cover

The floppy drive cover is locked by a snap lock. To open it, the knob is turned by approximately 180° to the left. To lock it, it suffices to press the knob to ensure that the lock engages again.

Note: IP 65 type of protection is only achieved when the floppy drive cover is closed.

The floppy drive cover can only be closed when there is no diskette in the drive.

When the floppy drive cover is open, it is possible to connect an external PC keyboard to the socket provided for this purpose. This can be used in parallel with the integrated keyboard.

2.2 Diagnostic LEDs

Under the floppy drive cover there are 2 red LEDs with the following meanings:

Power lights up as soon as the BTV30 is powered and is switched on

HDD lights up as soon as the hard disk is accessed

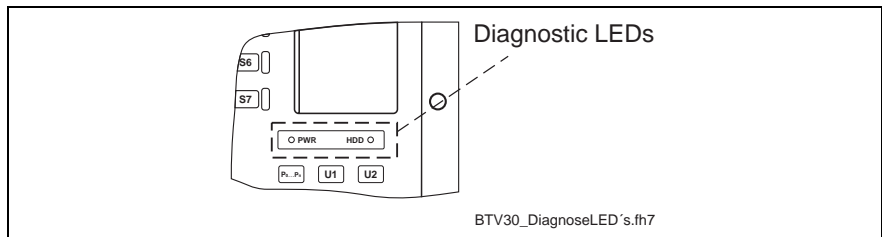


Figure 2-2: Enlargement showing the LED panel

2.3 Machine Function Keys

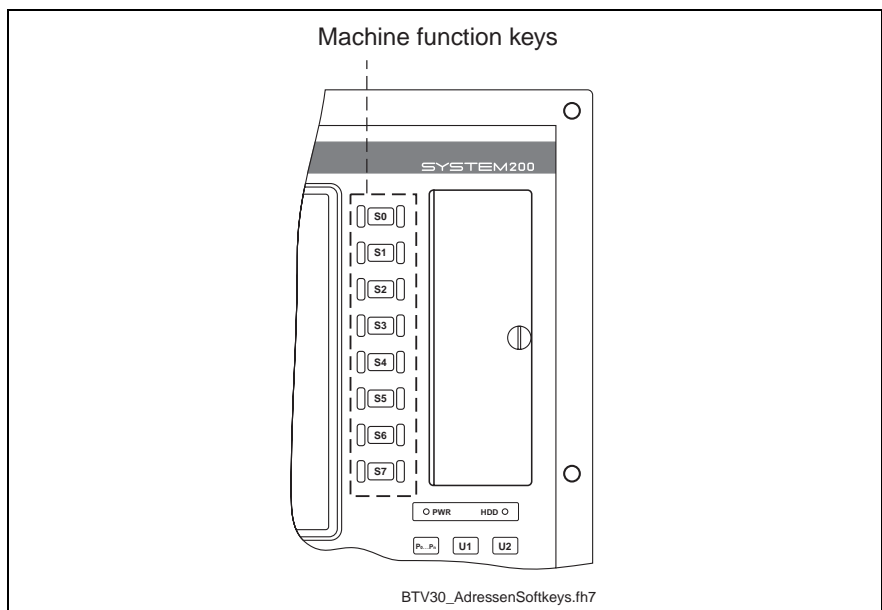


Figure 2-3: Enlargement showing the machine function keys

There are 8 vertically arranged function keys on the right of the display.

These keys are either connected directly to an integrated PLC type MTS-P or they are externally available via a 9-pole socket for connection to the I/O level of an external PC (e.g. MTS-R)

The key contacts can be operated with 5 VDC to 24 VDC. The maximum switching current is 200 mA.

Pin Assignments in the Case of BTV30.1P

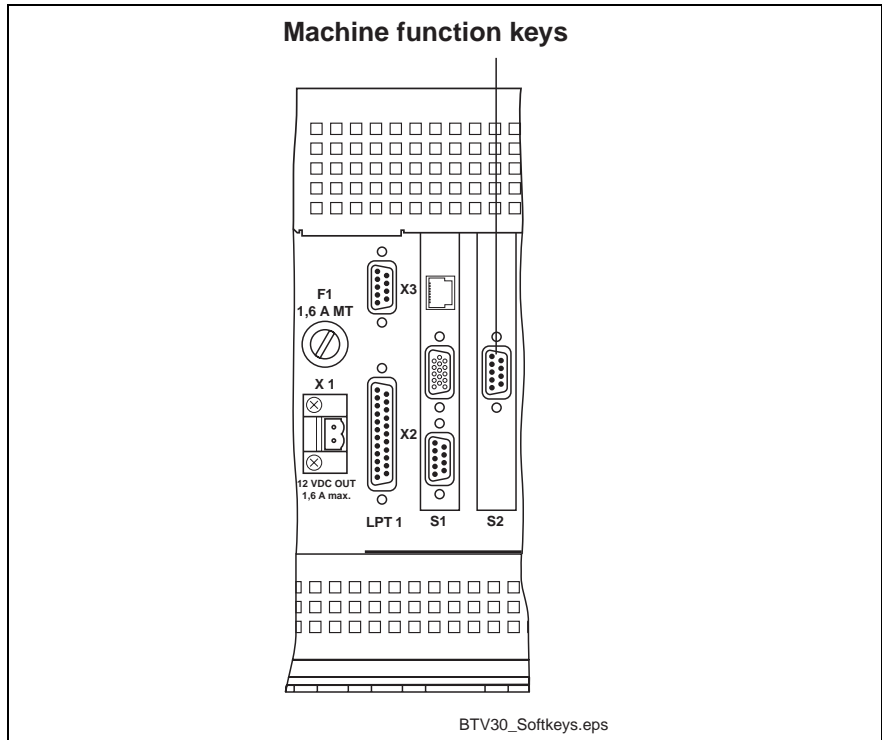


Figure 2-4: Machine function keys

If the unit consists of a pure industrial PC without an integrated controller, the 8 machine function keys are externally available via a 9-pole socket that is fitted in slot position 2.

Pin	Signal designation
1	S0
2	S2
3	S4
4	S6
5	+24V DC
6	S1
7	S3
8	S5
9	S7

Figure 2-5: Sub-D pin assignments

Addressing

Function types C, E and S of the BTV feature an integrated PLC. In this case, the machine function keys are connected directly to the PLC and can therefore be addressed directly.

Machine function key	Address
S0	%I0.991.0
S1	%I0.991.1
S2	%I0.991.2
S3	%I0.991.3
S4	%I0.991.4
S5	%I0.991.5
S6	%I0.991.6
S7	%I0.991.7

Figure 2-6: Machine function key addresses

2.4 Keyboard

The BTV30.1 features a complete ASCII keyboard with a total of 93 keys. Besides the actual ASCII block, there is a function key block under the display as well as a cursor block featuring a few special keys on the right-hand side of the BTV30.1.

Depending on the location, the BTV30.1 can be ordered with an American or a German key layout.

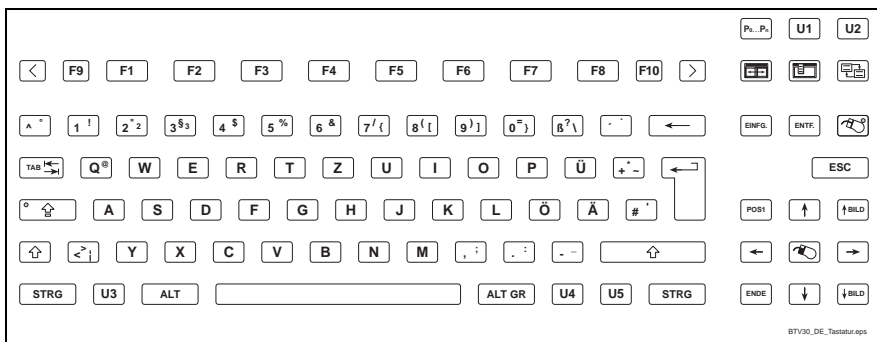


Figure 2-7: German keyboard layout

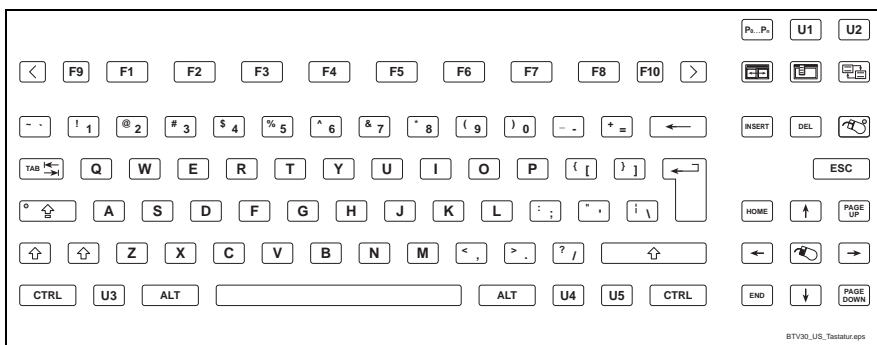


Figure 2-8: American keyboard layout

Special Keys

The BTV30.1 keyboard features 13 special keys that are not to be found on a normal PC keyboard. These keys are listed in the following table. The table also gives details of how these keys can be emulated on an external standard keyboard.











Pictogram of the key on the BTV30.1	Corresponding key on a standard keyboard
	
	
U1	currently not defined
U2	currently not defined
U3	
U4	
U5	
P0...Pn	currently not defined
	currently not defined
	currently not defined
	currently not defined
>	currently not defined
<	currently not defined

Figure 2-9: Table of special keys

Keyboard Mouse

The cursor block of the BTV30.1 can be switched over and can then be used for mouse control.

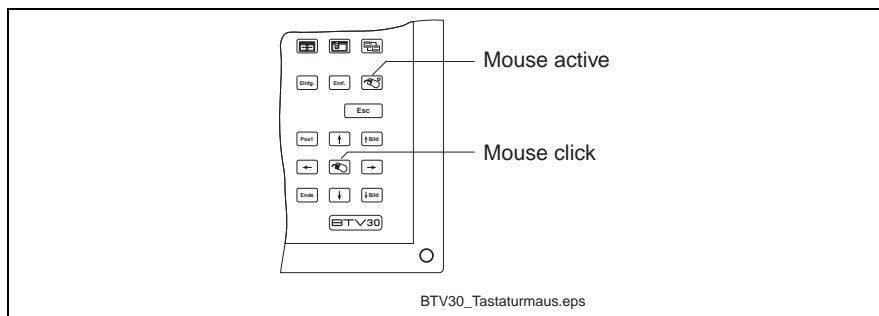

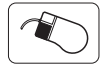


Figure 2-10: Enlargement of the cursor block showing the additional keyboard mouse keys

You can switch between mouse and cursor operation by pressing the  key. Mouse operation is active when the red LED in the key lights up.

The mouse pointer is moved horizontally, vertically or diagonally by pressing the arrow keys or PgUp, PgDn ...



You can trigger a mouse click (left mouse button) by pressing the key.

Note: The keyboard mouse function is only possible in conjunction with the Windows 95 or Windows NT operating system.

Operating System

For licensing reasons, the BTV30.1 is only supplied with the operating system installed. MS DOS version 6.22 or Windows NT 4.0 is available depending on the application.

In addition to the operating system, it is also possible to preinstall the user interface of an MTC200 CNC controller or of an ISP200 PLC controller.

MS-DOS

The following firmware configurations are available in conjunction with MS DOS version 6.22:

Firmware type	Software installed	Description
FWA-BTV30*-MSD-01VRS-DE	SWA-PC*MS*-DOS-06VRS-DE-C1,44	MS DOS operating system only, German
FWA-BTV30*-MSD-01VRS-DE-GBO	SWA-PC*MS*-DOS-06VRS-DE-C1,44 SWA-MTC200-GBO-17VRS-MS-C1,44-MS*DOS	MS DOS, German with GBO, version 17
FWA-BTV30*-MSD-02VRS-DE-GBO	SWA-PC*MS*-DOS-06VRS-DE-C1,44 SWA-MTC200-GBO-18VRS-MS-C1,44-MS*DOS	MS DOS, Germany with GBO, Version 18
FWA-BTV30*-MSD-01VRS-EN	SWA-PC*MS*-DOS-06VRS-EN-C1,44	MS DOS operating system only, English
FWA-BTV30*-MSD-01VRS-EN-GBO	SWA-PC*MS*-DOS-06VRS-EN-C1,44 SWA-MTC200-GBO-17VRS-MS-C1,44-MS*DOS	MS DOS, English with GBO version 17
FWA-BTV30*-MSD-02VRS-EN-GBO	SWA-PC*MS*-DOS-06VRS-EN-C1,44 SWA-MTC200-GBO-18VRS-MS-C1,44-MS*DOS	MS DOS, English with GBO version 18

Figure 2-11: Firmware configurations under MS DOS

Windows NT

The following firmware configurations are available in conjunction with the Windows NT operating system:

Firmware type	Software installed	Description
FWA-BTV30*-WNT-01VRS-DE-GBO	SWA-PC*MS*-WNT-03VRS-DE-CD600 SWA-MTC200-GBO-17VRS-MS-C1,44-WIN*NT	Windows NT 3.51, German with GBO version 17
FWA-BTV30*-WNT-01VRS-EN-GBO	SWA-PC*MS*-WNT-03VRS-EN-CD600 SWA-MTC200-GBO-17VRS-MS-C1,44-WIN*NT	Windows NT 3.51, English with GBO version 17
FWA-BTV30*-WNT-02VRS-DE	SWA-PC*MS*-WNT-04VRS-DE-CD600	Windows NT 4.0 only, German
FWA-BTV30*-WNT-02VRS-EN	SWA-PC*MS*-WNT-04VRS-EN-CD600	Windows NT 4.0 only, English
FWA-BTV30*-WNT-02VRS-DE-GBO	SWA-PC*MS*-WNT-04VRS-DE-CD600 SWA-MTC200-GBO-18VRS-MS-C1,44-WIN*NT	Windows NT 4.0, German with GBO, version 18
FWA-BTV30*-WNT-02VRS-EN-GBO	SWA-PC*MS*-WNT-04VRS-EN-CD600 SWA-MTC200-GBO-18VRS-MS-C1,44-WIN*NT	Windows NT 4.0, English with GBO, version 18

Figure 2-12: Firmware configurations under Windows NT

Note: Orders for firmware FWA only embrace installation of the listed software. The software products SWA or SWL to be installed must be ordered separately.

3 Technical Data

3.1 General Technical Data

Processor	Pentium 166 MHz slot PC with integrated graphics controller
Main memory	32 MB or 64 MB (optional)
Hard disk	At least 500 MB
Interfaces	2 serial (RS 232), 1 parallel (Centronics)
Display unit	10.4" TFT color display, 640 x 480 pixels
Slots	10 slots, one of which is occupied by the slot CPU
Keyboard	Full ASCII keyboard, 8 machine function keys
Type of protection	Front panel IP 65, housing IP 20 DIN 40 050, IEC 529
Front panel surface	Material: PC/ABS Color: RAL 7037 dusty gray
Slide-in module dimensions	372 x 335 x 200 mm (WxHxD)
Dimensions with front panel	407 x 370 x 220 mm (WxHxD)
Power supply	115/230 VAC \pm 15%; Autorange
Max. power consumption	\leq 250 VA
Typical heat dissipation	100 W
Max. heat dissipation	200 W
Weight	approximately 10.5 kg

Figure 3-13: General technical data of the BTV30.1

3.2 Ambient Conditions

	Operation	Storage/transport
Maximum ambient temperature	+5°C to +45°C	-20°C to +60°C
Max. temperature gradient	10 K/h	15 K/h
Relative humidity	75% on average, 80% occasionally	No condensation, DIN 40 040 class F
Barometric pressure	860 to 1060 hPa, 1500m	Corresponding to 1200 m
Max. external magnetic field	6 Gauss	6 Gauss
Max. vibration without/with FDD access	1 G / 0.5 G	1 G
Max. shock without/with FDD access	20 G / 5 G	50 G

Figure 3-14: Ambient conditions of the BTV30.1

3.3 Expendable Parts

Expendable parts for which no warranty is provided

- Fan
- Backlight tubes
- Floppy disk drive (FDD)
- Hard disk drive (HDD)

The expendable parts have an average expected life cycle of 5 years or 20,000 hours of operation.

The hard disk data applies under the following conditions	
Write/read cycles	40 cycles/day x 200 days/years
Search operations	105 cycles/day x 200 days/years
Power supply on	14 hours/day x 200 days/years
Operating hours (read/write)	8 h /day x 200 days/years
Ambient conditions	25°C; 50%RH; 100kPa; no vibration, no shock

Figure 3-15: HD loads

4 Dimensions

4.1 Housing Dimensions

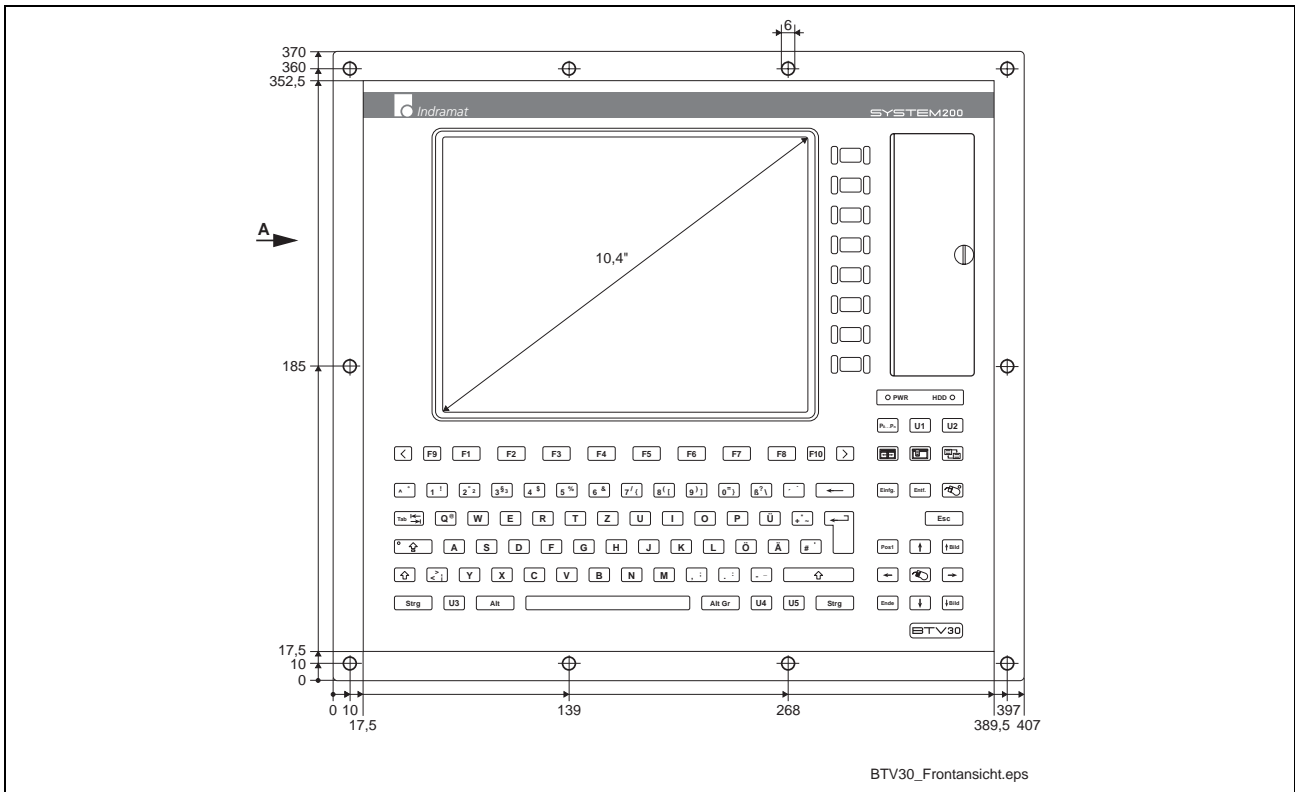


Figure 4-16: Front panel dimensions

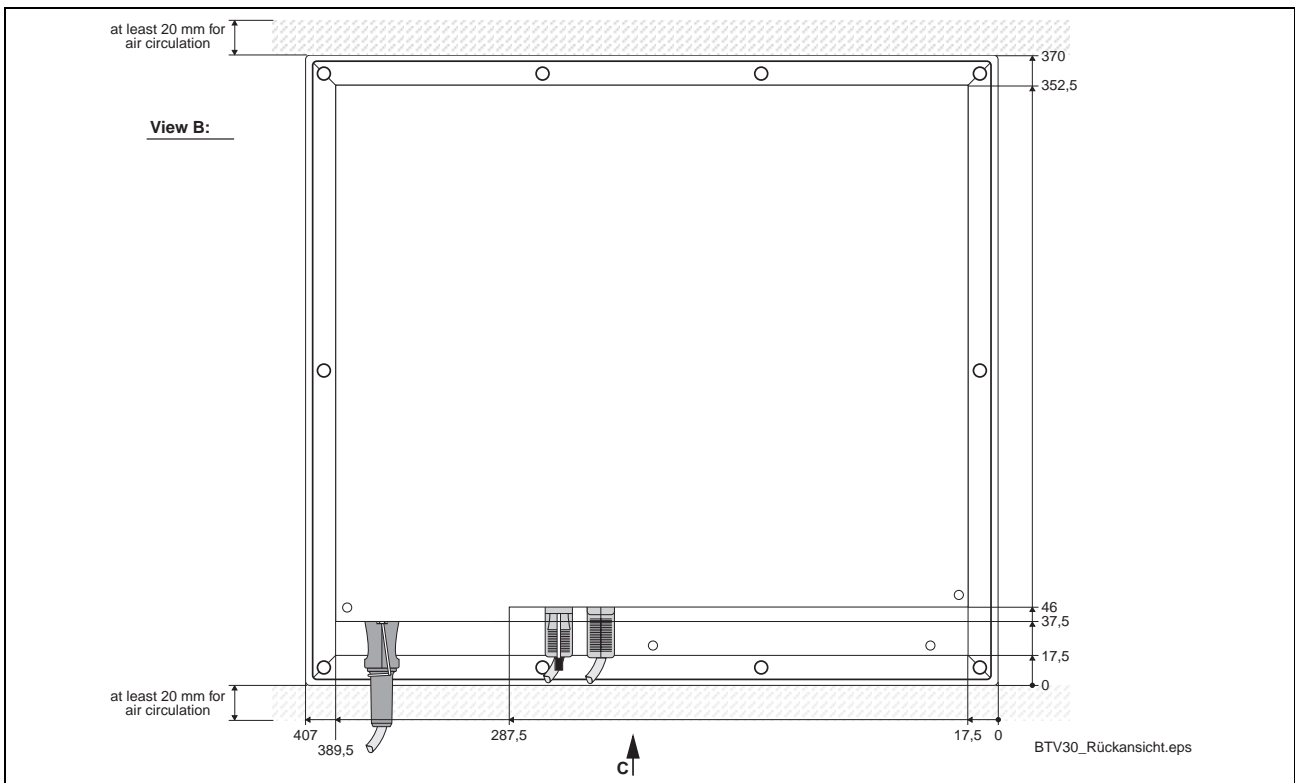


Figure 4-17: Rear view

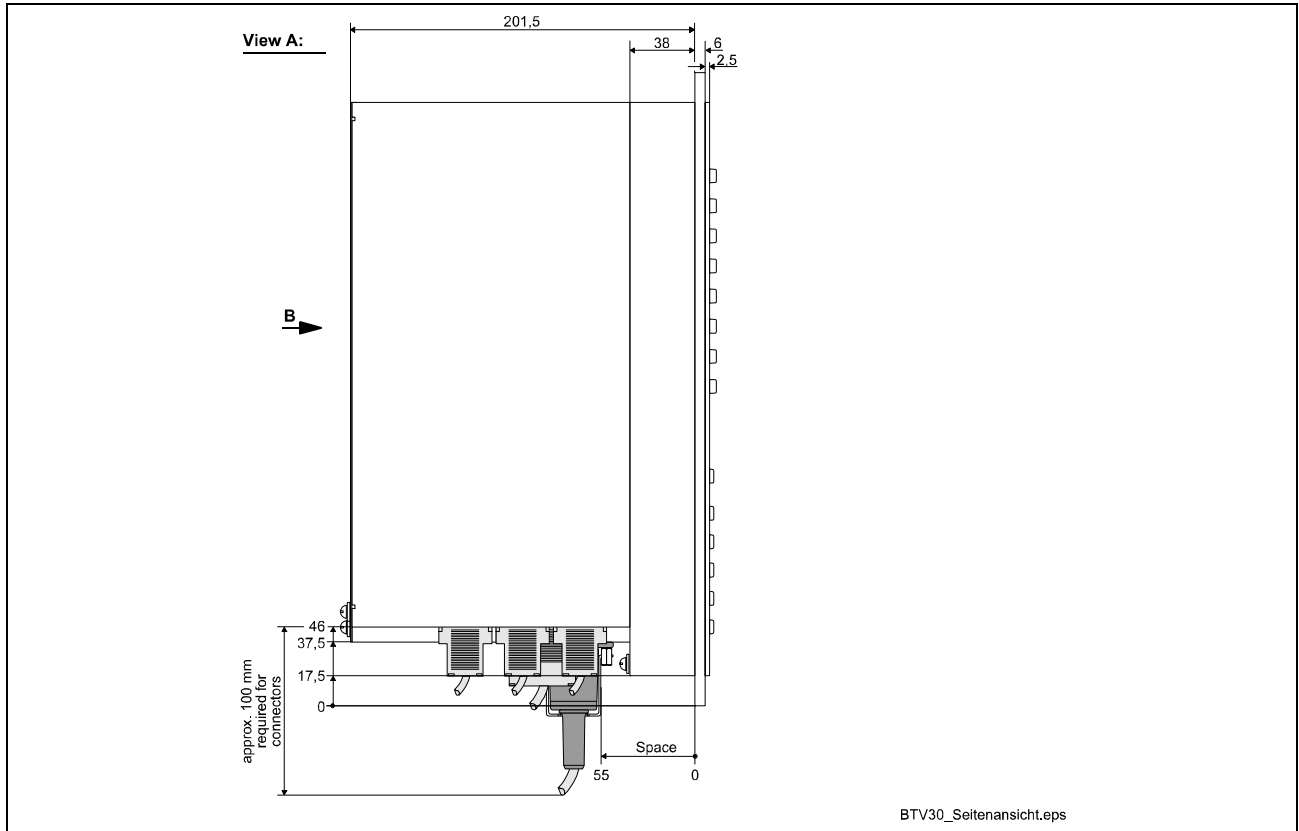


Figure 4-18: Side view

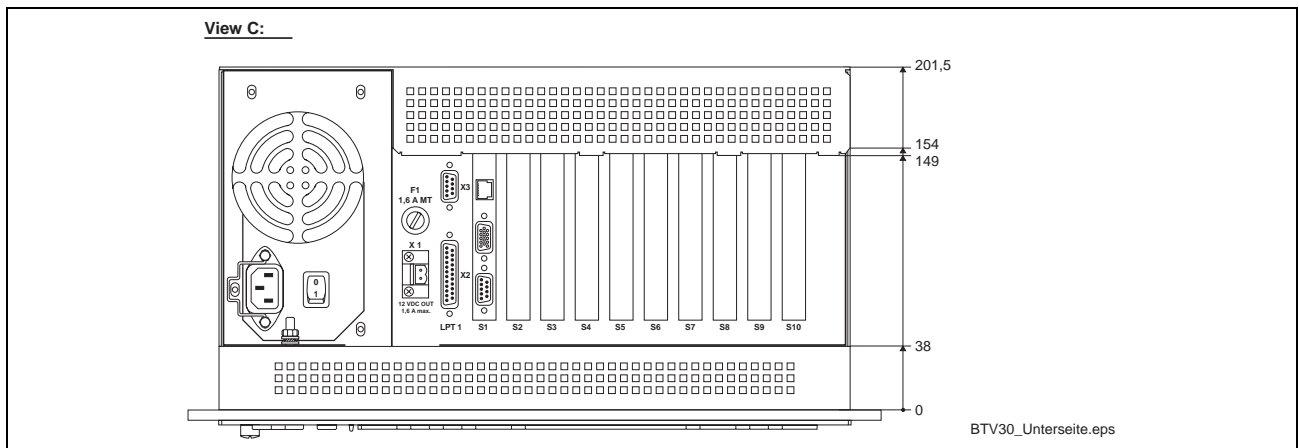


Figure 4-19: View from below

4.2 Installation Dimensions

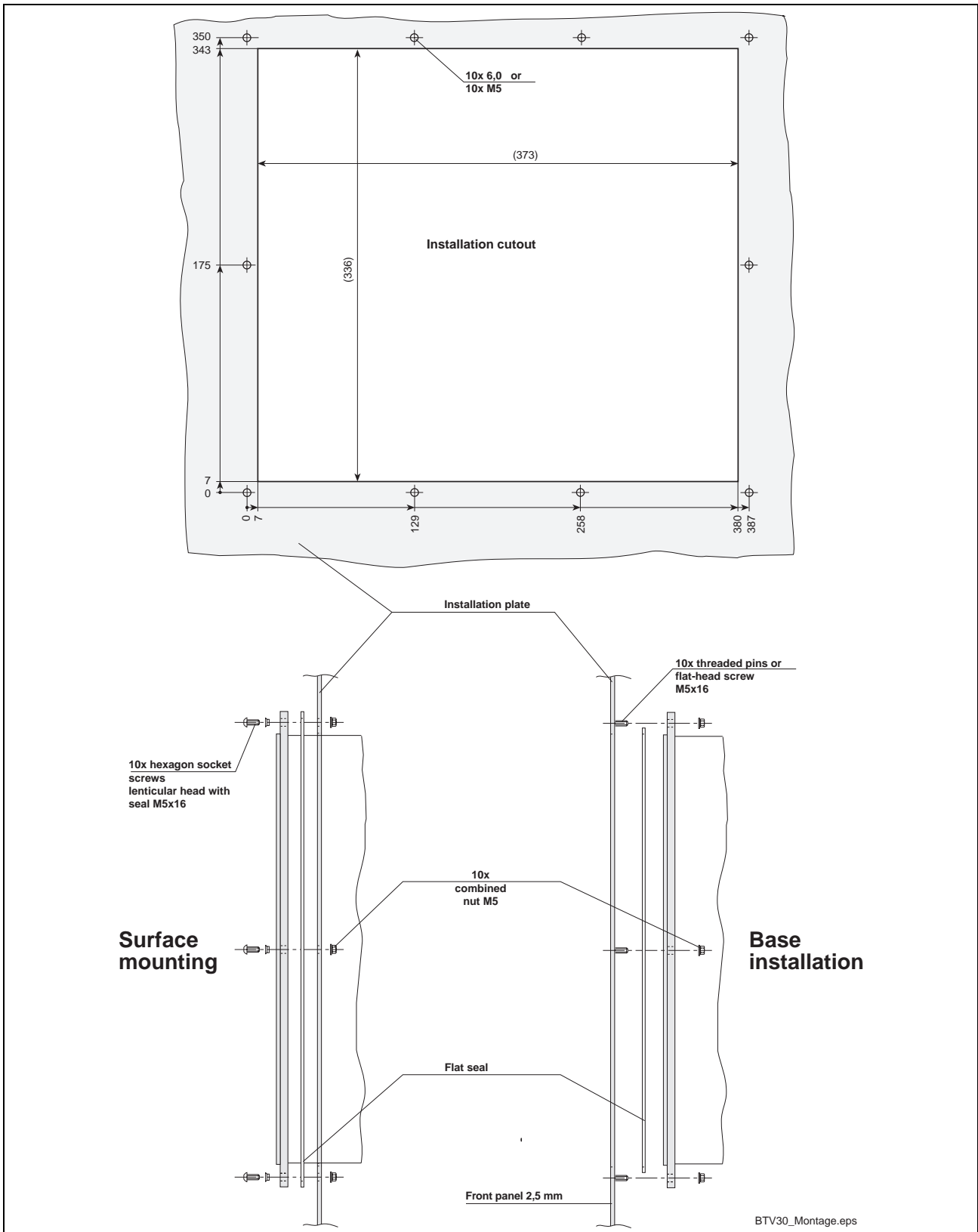


Figure 4-20: Installation cutout

5 Connection Terminals

5.1 General Connection Terminals

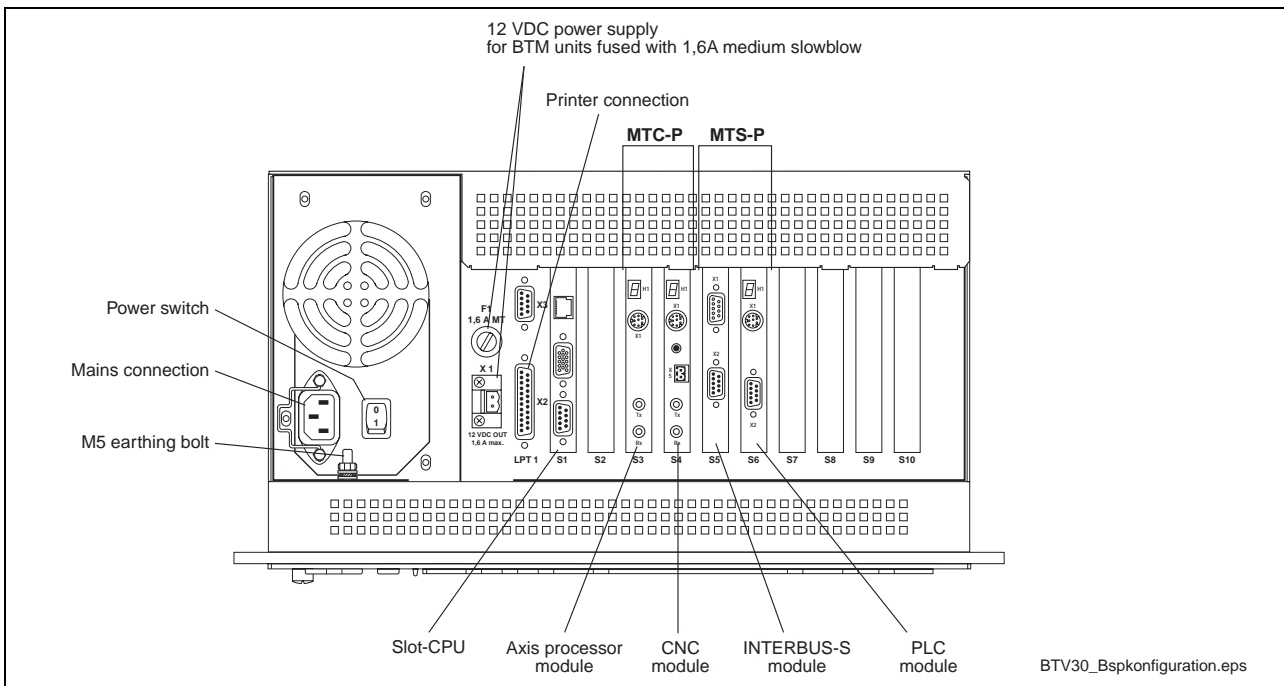


Figure 5-21: View from below in an example configuration

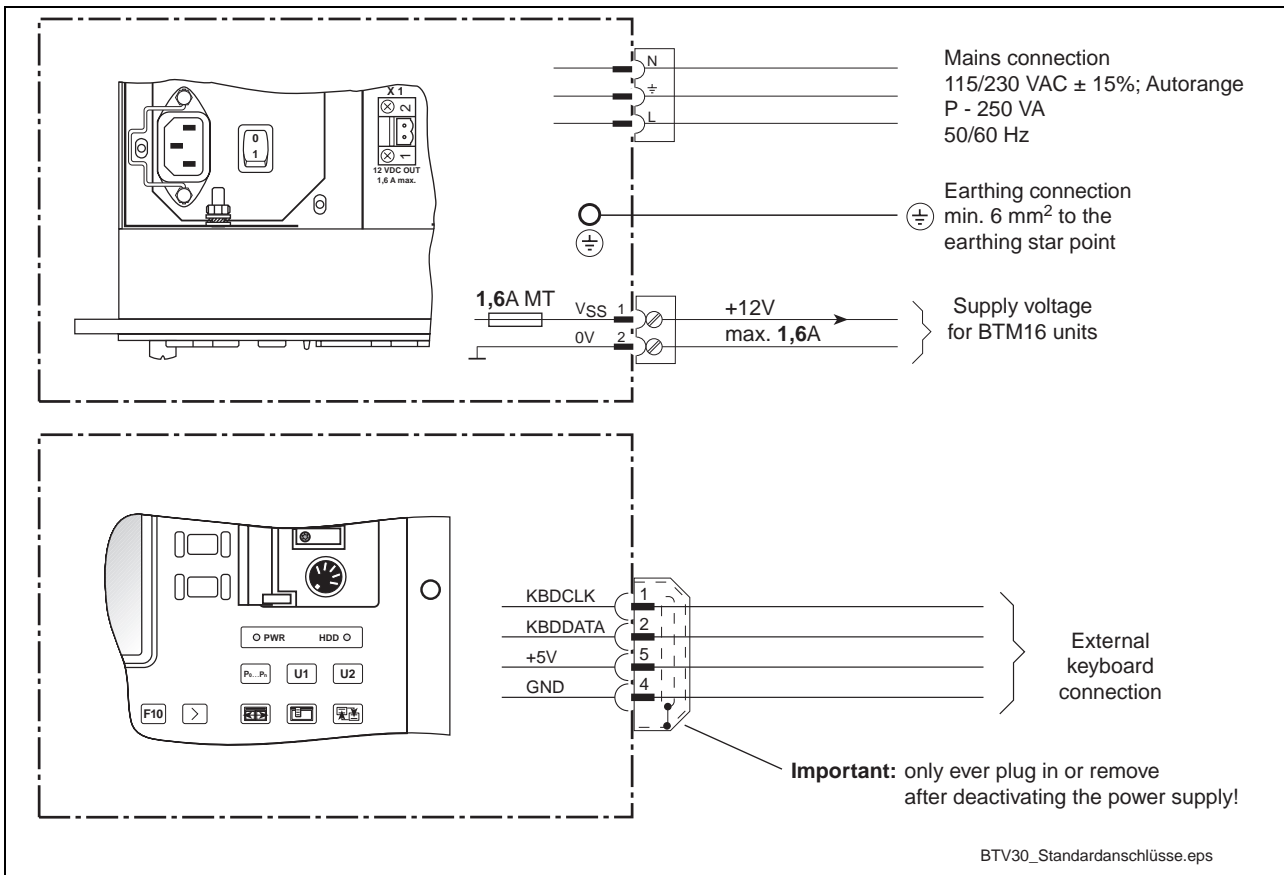


Figure 5-22: Standard connection terminals

5.2 Interfaces of the Slot CPU

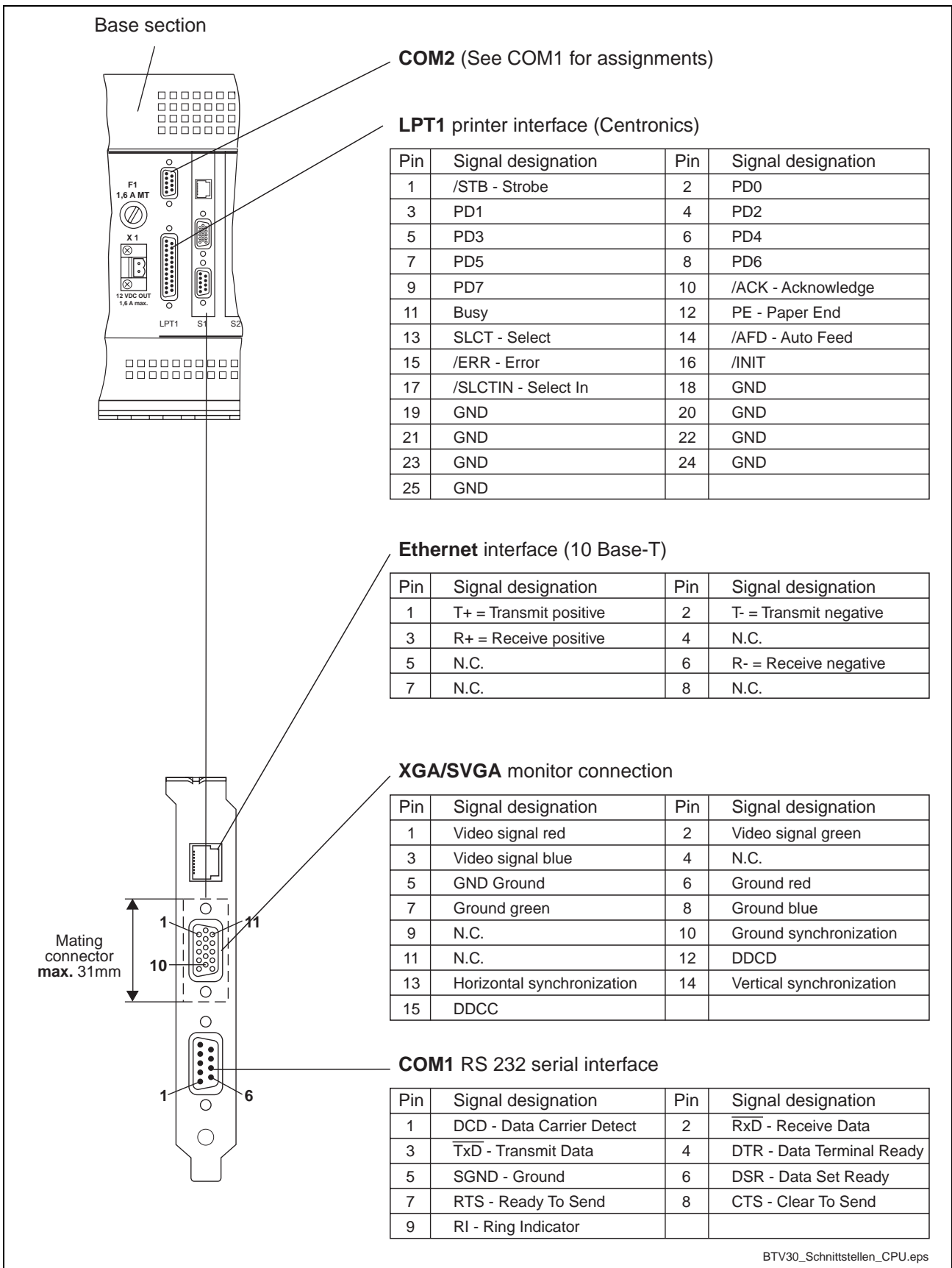


Figure 5-23: Interfaces of the slot CPU

5.3 Application Examples

Application Example for INTERBUS-S Interfacing

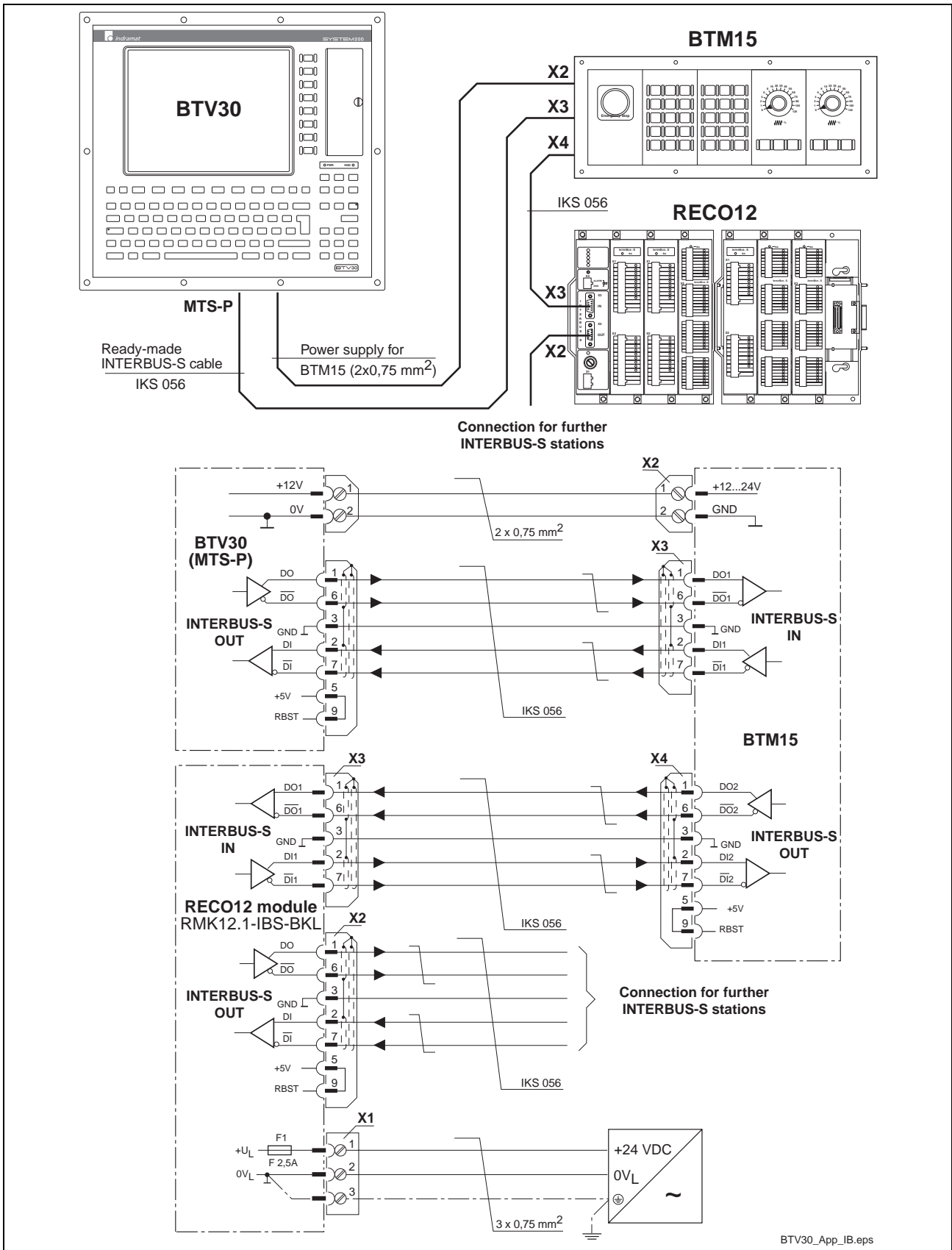


Figure 5-24: INTERBUS-S example interfacing

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