



SYSTEM200 BTA10.1

Functional Description

SYSTEM200

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What is the purpose of this document? The following documentation describes

- the hardware functions of the BTA10 unit
- the specifications of the BTA10 unit
- the connection of a BTA10 unit

Course of modifications

Document identification of previous and present output	Release Date	Comments
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1 System Presentation

1.1 Brief Description

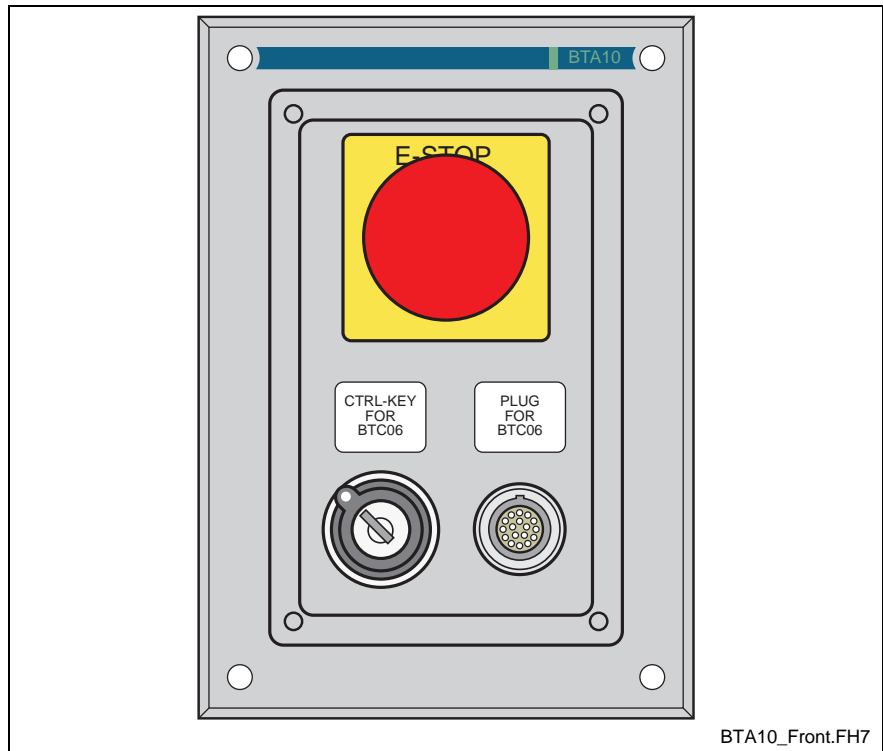


Figure 1-1: BTA10 front with NB module

The BTA10 unit is a modified variant of the BTA20 unit (own documentation available - Mat-Nr. 280652). Here, a single module location of the BTA20 unit was produced as a separate unit. Different modules are available that can be configured according to the requirements of the application.

1.2 Peculiarities of the BTA10 Unit

The design of the BTA10 unit requires little space. The possibility of interconnecting up to eight units permits a relative flexible handling of a large system. Controlling is possible from several locations. The possibility of connecting manual control units permits mobile utilization of a machine. The communication between the units is implemented via RS422 interfaces.

2 Structure of the Modules, Pin Assignments

2.1 Base Module

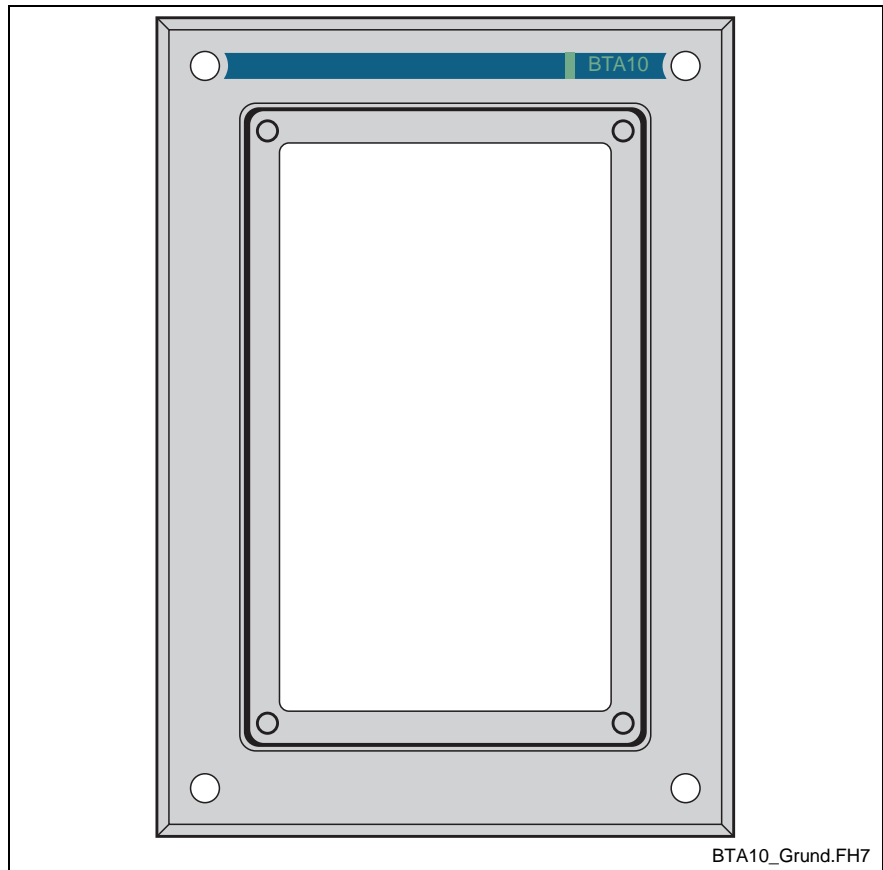


Figure 2-1: Base module

The base module is equipped with a printed circuit board that contains interface drivers and all necessary connectors. Any available module can easily be plugged in.

The entire electronic system and the switching contacts of the individual modules are enclosed by a housing made from stainless steel.

The BTA10 unit needs an external 24 VDC power supply that must be connected at the rear side of the unit.

Four retaining screws are enclosed in the delivery that permit easy front panel installation.

2.2 Emergency Stop Module Type NB

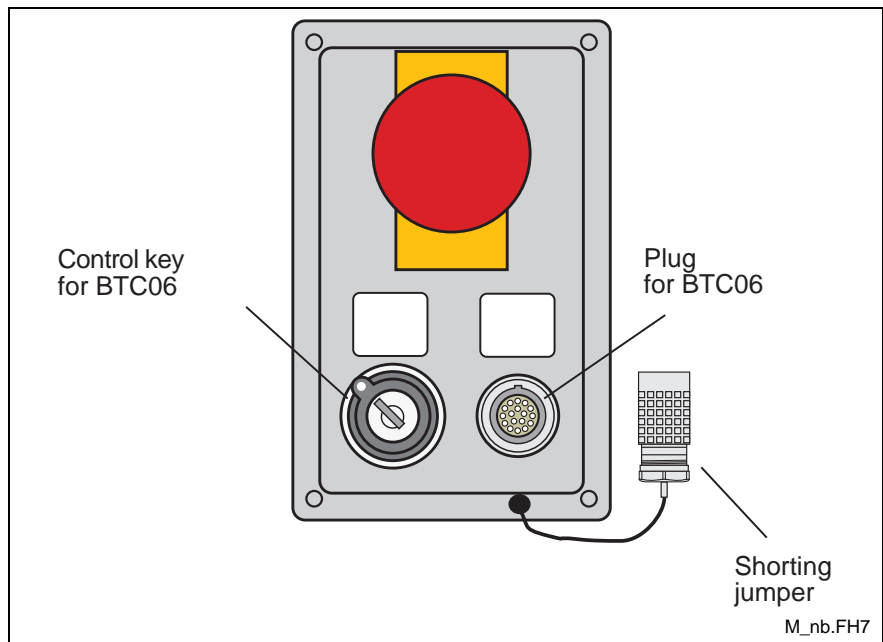


Figure 2-2: Emergency stop module type NB

This module features an emergency stop pushbutton, a keyswitch, and a connector for a BTC06 manual control unit.

An NC contact of the emergency stop pushbutton is looped into each emergency stop circuit. Another NC contact is connected to the X4 connector as an auxiliary contact.

The connection for the manual control unit BTC06 features two emergency stop circuits. In normal operation, these circuits are jumpered by a shunting jumper. To connect a manual control unit, the emergency stop contacts of the socket are bypassed via the adjacent keyswitch pushbutton. This version employs only two confirmation circuits. The third one is brought out to the X3b connector.

Address assignments

Inputs

Switching element / position	External connector pin assignments
Emergency stop auxiliary contact	X4 pin 6
Auxiliary contact for keyswitch	Internally wired
Confirmation circuit 3 via keyswitch	X3b pins 1 and 2

Figure 2-3: Pin assignments of the auxiliary contact in the emergency stop module

Note: The BTC06 switch at the rear of the unit must be set to "YES".

Switch positions of the Keyswitch pushbutton

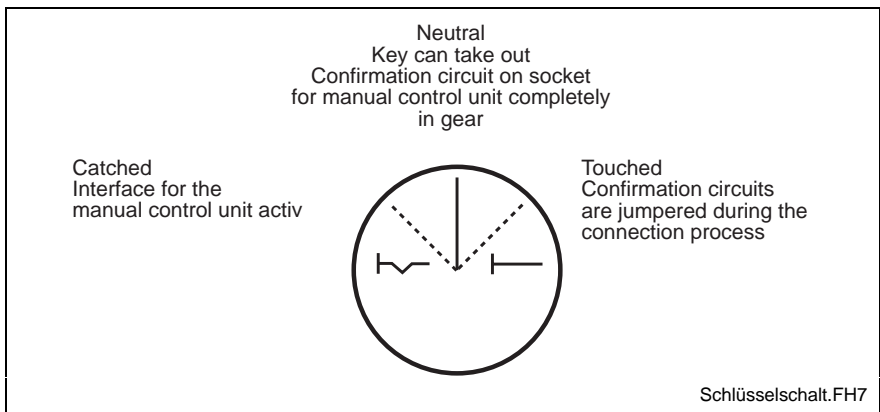


Figure 2-4: Switch positions of the Keyswitch pushbutton

2.3 Feed Module Type VA

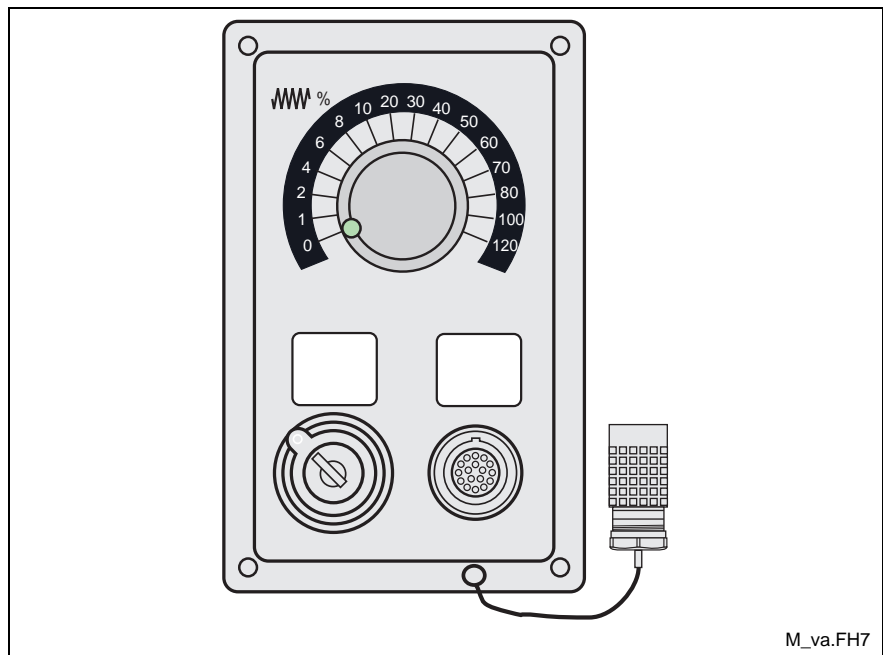


Figure 2-5: Feed module type VA

This module features a Gray code override switch, a keyswitch, and a connector for a BTC06 manual control unit.

The connection for the manual control unit BTC06 includes two emergency stop circuits. In normal operation, these circuits are jumpered by a shorting jumper. To connect a manual control unit, the emergency stop contacts of the socket are jumpered with the adjacent keyswitch push-button. This version employs only two confirmation circuits. The third one is brought out to the X3b connector.

Address assignments

Inputs	Switching element / position	External connector pin assignments
	Override bit 0	X4 pin 6
	Override bit 1	X4 pin 7
	Override bit 2	X4 pin 8
	Override bit 3	X4 pin 9
	Auxiliary contact for keyswitch	Internally wired
	Confirmation circuit 3 via keyswitch	X3b pins 1 and 2

Figure 2-6: Address of the override switch

Note: The BTC06 switch at the rear of the unit must be set to "YES".

**Switch positions of
the Keyswitch pushbutton**

Chapter 2.2 Emergency Stop Module Type NB Figure 2-4

Gray code table

The output signal of the override switch is a 4-bit Gray code with the following assignments:

ale value	Bit 0	Bit 1	Bit 2	Bit 3
0 %				
1 %	X			
2 %	X	X		
4 %		X		
6 %		X	X	
8 %	X	X	X	
10 %	X		X	
20 %			X	
30 %			X	X
40 %	X		X	X
50 %	X	X	X	X
60 %		X	X	X
70 %		X		X
80 %	X	X		X
100 %	X			X
120 %				X

Figure 2-7: Graycode table

2.4 Feed Module Type VB

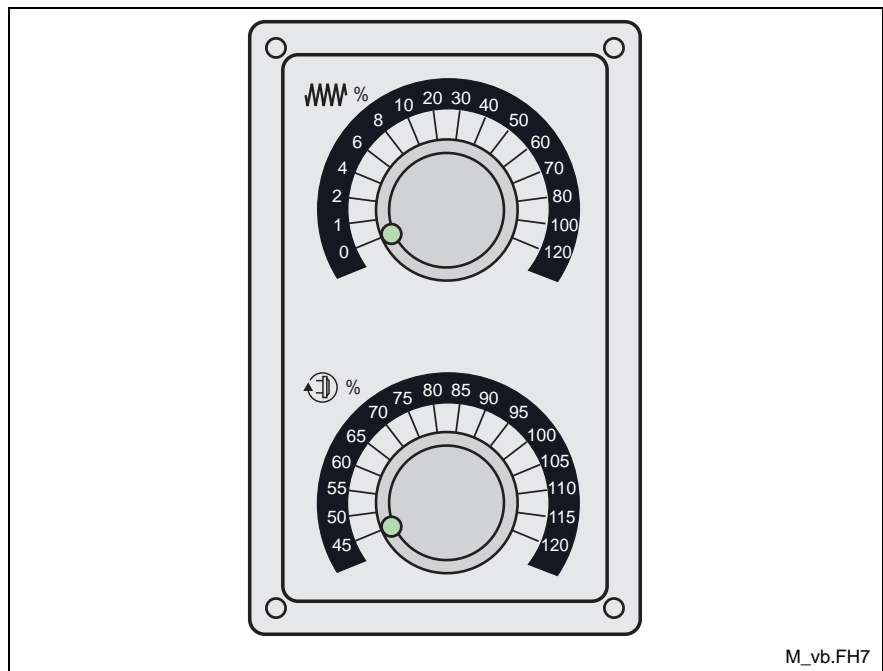


Figure 2-8: Feed Module Type VB

This feed module for special machines features two Gray code override switches for feed and spindle.

Address assignments

Inputs

Switching element / position	Address
Override feed bit 0	X4 pin 6
Override feed bit 1	X4 pin 7
Override feed bit 2	X4 pin 8
Override feed bit 3	X4 pin 9
Override spindle bit 4	X4 pin 10
Override spindle bit 5	X4 pin 11
Override spindle bit 6	X4 pin 12
Override spindle bit 7	X4 pin 13

Figure 2-9: Addresses of the override switches

Note: The BTC06 switch at the rear of the unit must be set to "NO".

Gray code table The output signal of the two override switches is a 4-bit Gray code with the following assignments

Scale value Spindle (Bit 0-3)	Scale value Feed (Bit 4-7)	Bit 0 / 4	Bit 1 / 5	Bit 2 / 6	Bit 3 / 7
45 %	0 %				
50 %	1 %	X			
55 %	2 %	X	X		
60 %	4 %		X		
65 %	6 %		X	X	
70 %	8 %	X	X	X	
75 %	10 %	X		X	
80 %	20 %			X	
85 %	30 %			X	X
90 %	40 %	X		X	X
95 %	50 %	X	X	X	X
100 %	60 %		X	X	X
105 %	70 %		X		X
110 %	80 %	X	X		X
115 %	100 %	X			X
120 %	120 %				X

Figure 2-10: Graycode table

3 Specifications

3.1 General Specifications

Weight	approximately 1.2 kg
Protection rating	Base module front panel IP65 Enclosure IP20 DIN40 050, IEC 529
Maximum ambient temperature	Operation +5°C to +45°C Transport -20°C to +60°C
Atm. pressure (operation)	860 to 1060 hPa, 1500m
Max. heat loss	5 W
Power supply	24V ±20%
Front panel surface	Aluminum varnished and full surface covered with chemically resistant polyester film
Color	RAL 7035 light gray

3.2 Specifications of the Interface

Baud rate	0 to 38400 bits/s
RS422 input voltage	0/5 V, 5V diff
RS422 output voltage	0/5 V, 5V diff.
+5V output for bus termination	max. 50mA

4 Connections

4.1 Connector Locations

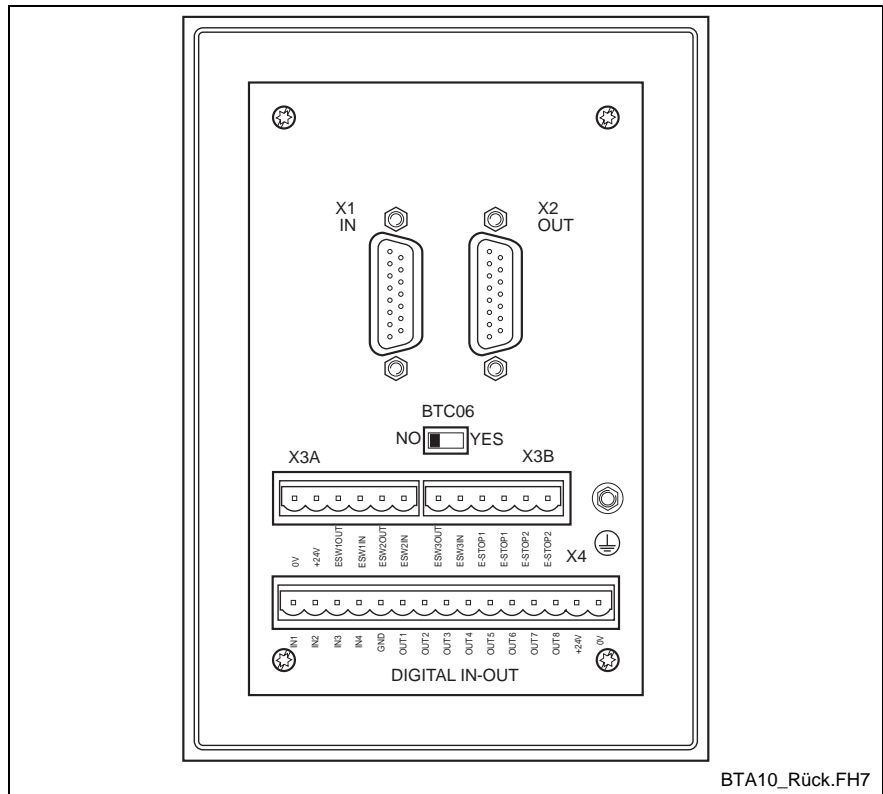


Figure 4-1: Rear view of BTA10 unit

4.2 Connector Pin Assignments of the Confirmation and Emergency Stop Circuits

X3A		X3B	
PIN	Signal name	PIN	Signal name
1	0V	1	Confirmation circuit 3 OUT
2	24V	2	Confirmation circuit 3 IN
3	Confirmation circuit 1 OUT	3	Emergency stop 1 OUT
4	Confirmation circuit 1 IN	4	Emergency stop 1 IN
5	Confirmation circuit 2 OUT	5	Emergency stop 2 OUT
6	Confirmation circuit 2 IN	6	Emergency stop 2 IN

Figure 4-2: Connector pin assignments of the confirmation and emergency stop circuits

Connector: Phoenix, large, 5.0

Note: The return message to the SPS that indicates that a BTC06 unit is active must be implemented via the output of confirmation circuit 3 (X3B, pins 1 and 2).

4.3 Connector Pin Assignments of the Digital Inputs and Outputs (X4)

PIN	Signal name	PIN	Signal name
1	In1	2	In2
3	In3	4	In4
5	GND	6	Out1
7	Out2	8	Out3
9	Out4	10	Out5
11	Out6	12	Out7
13	Out8	14	+24V
15	0V		

Figure 4-3: Connector pin assignments - digital In-Out

4.4 Indramat Standard Interface RS422 (X1 IN, X2 OUT)

PIN	Signal name	PIN	Signal name
1	N.C.	2	N.C.
3	N.C.	4	RxD +
5	RxD-	6	N.C.
7	Signal Ground	8	N.C.
9	TxD+	10	Ground
11	TxD-	12	+5 V
13	N.C.	14	N.C.
15	N.C.		

Figure 4-4: RS422 interface to Indramat standard

Note: The outgoing interface on the last BTA10 unit must be fitted with a bus termination element. A matching INS645 connector is available under the material number 282040. It must be ordered additionally.

Note: Connectors with screened shells must be used.

5 Dimensions

5.1 Enclosure Dimensions

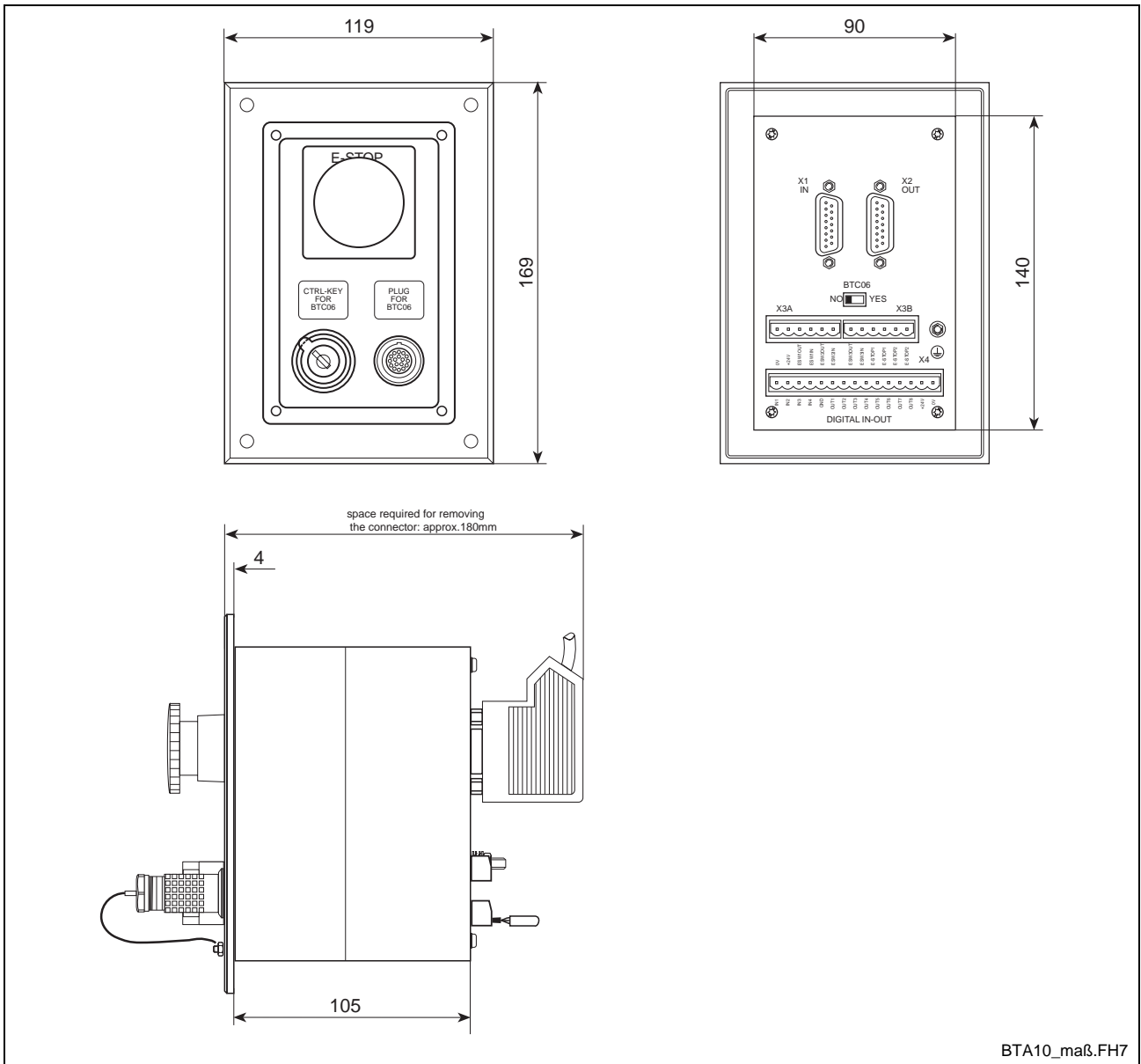


Figure 5-1: Enclosure dimensions

5.2 Mounting dimensions

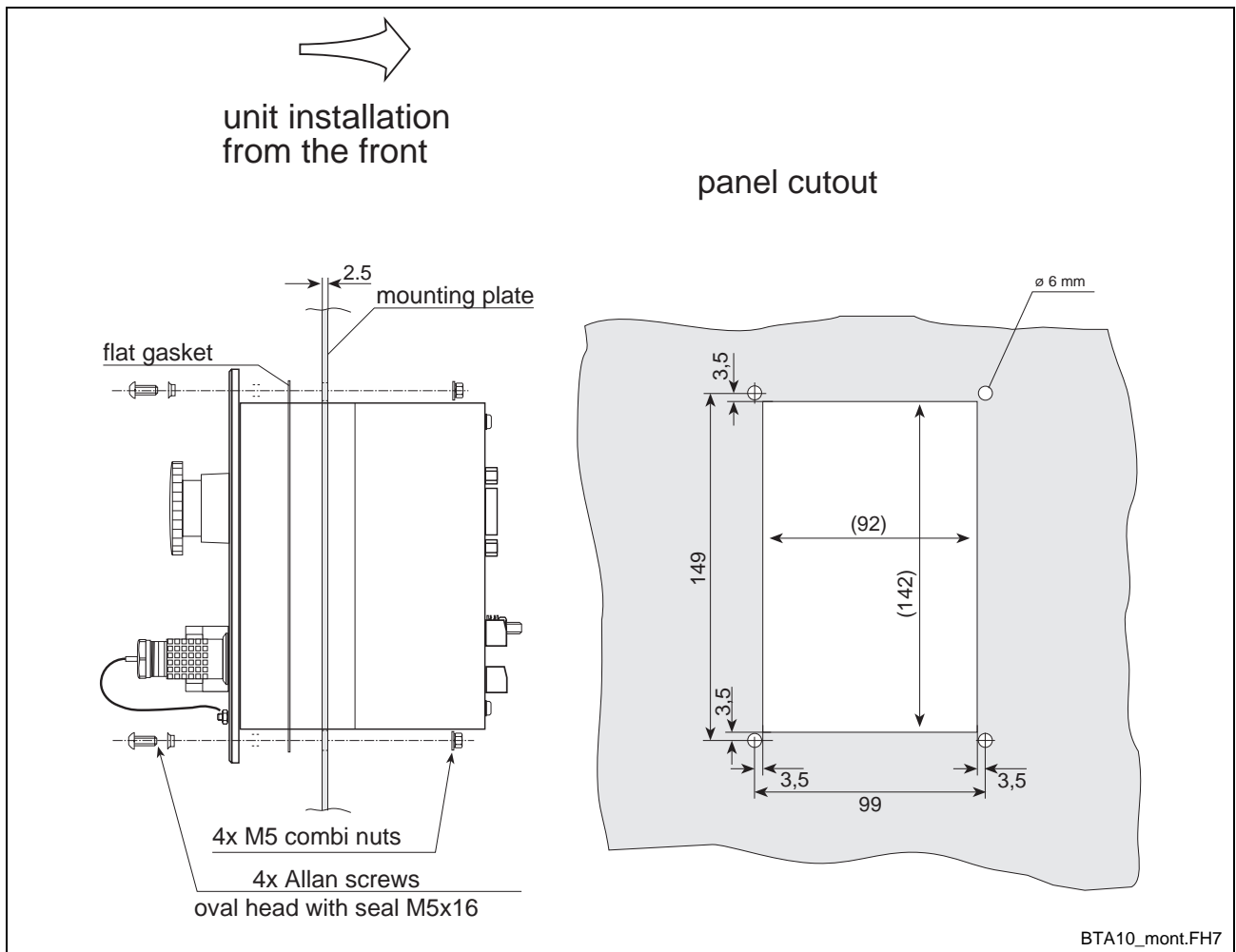


Figure 5-2: Mounting dimensions

6 Typical Applications

6.1 Assembly of the Required Cables

IKB0015 connecting cable

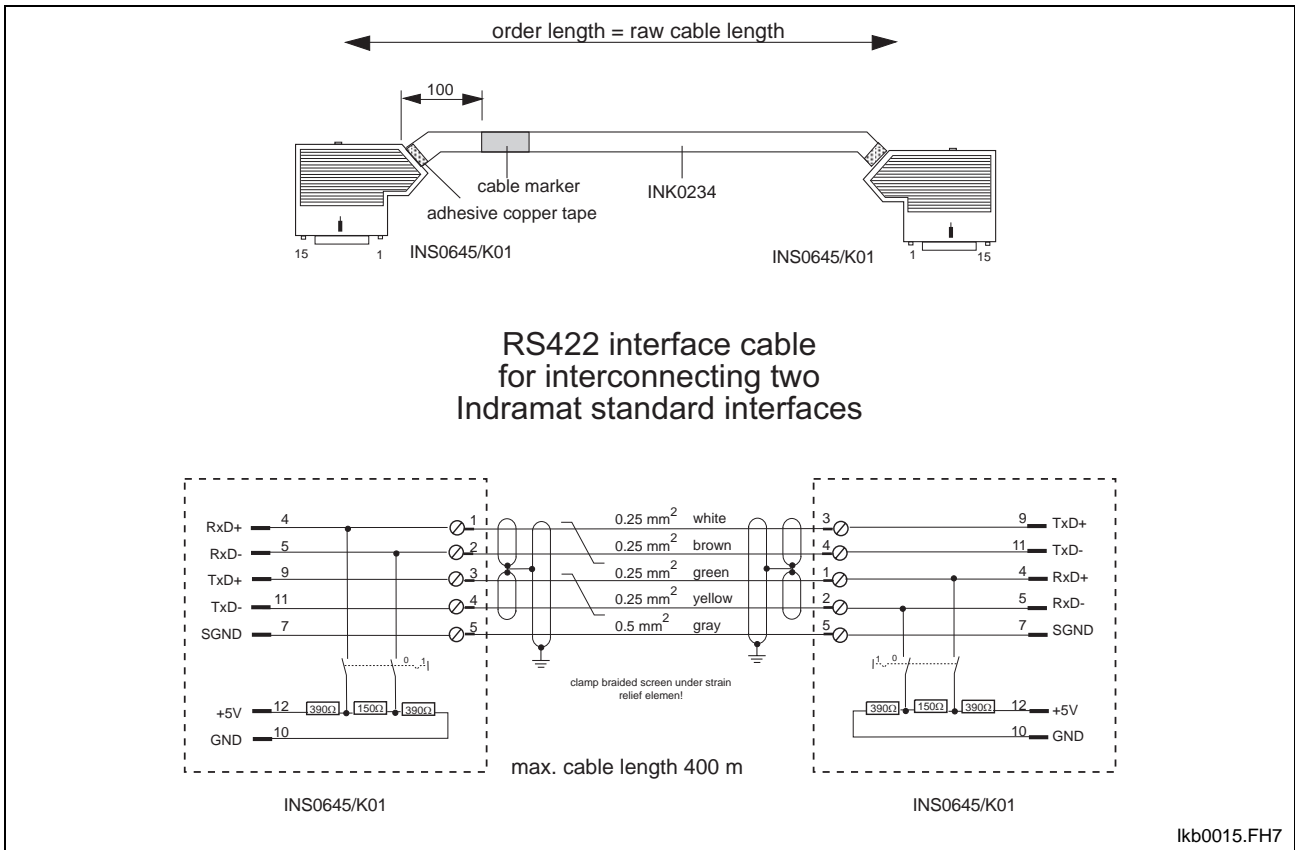


Figure 6-1: IKB0015

The IKB0015 cable is used as the connection between two BTA10 units or one BTA10 unit and another unit with an Indramat standard interface and RS422 pin assignments.

IKB0016 connecting cable

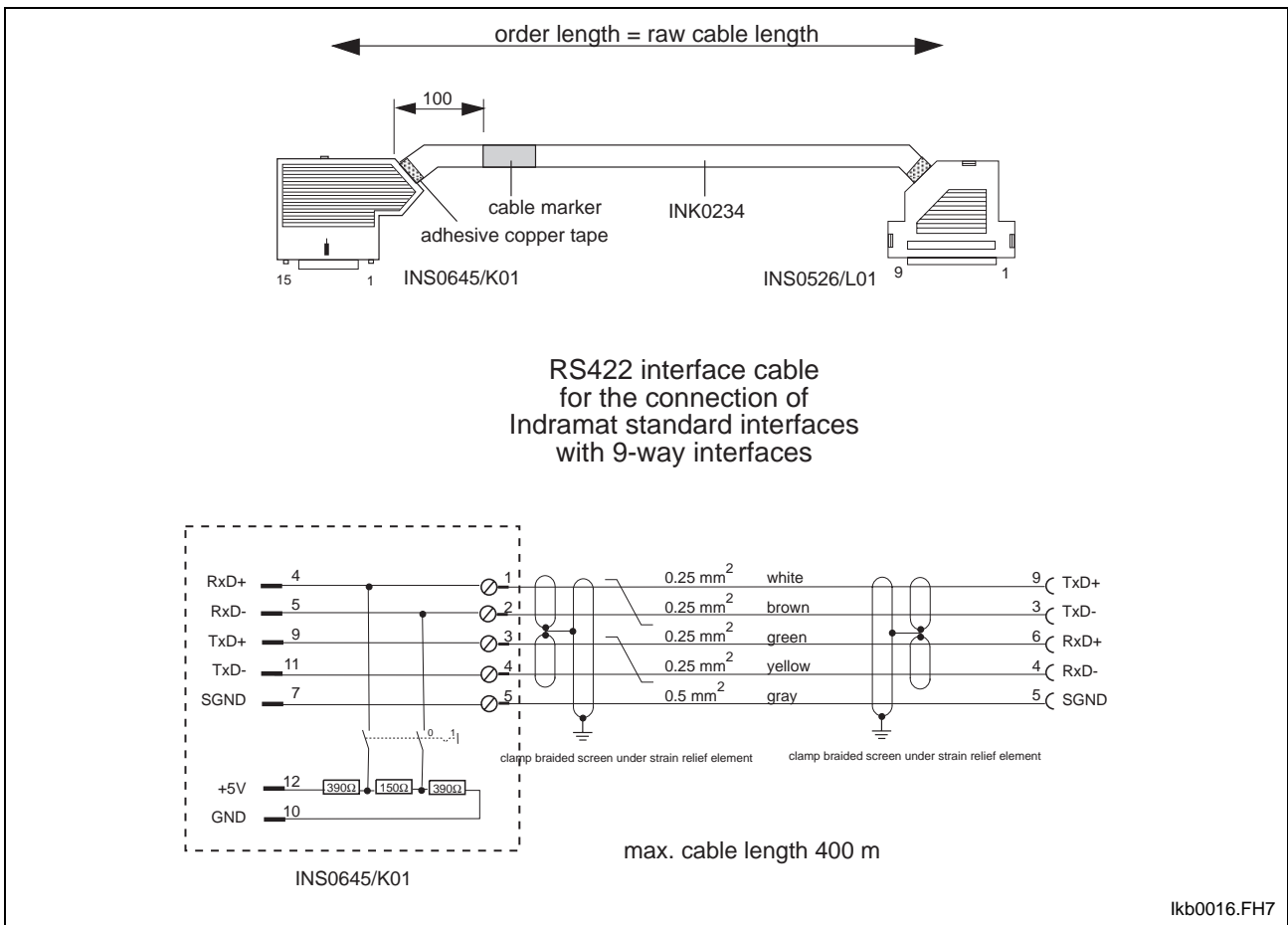


Figure 6-2: IKB0016

The IKB0016 cable is used for connecting the BTA10 unit with the BTV20 unit. The SPS module MTS-P in the BTV20 unit must be equipped with RS422 interfaces. This can be done, for example, via the option „BB-S4-“ (serial interface module).

IKS0190 connecting cable

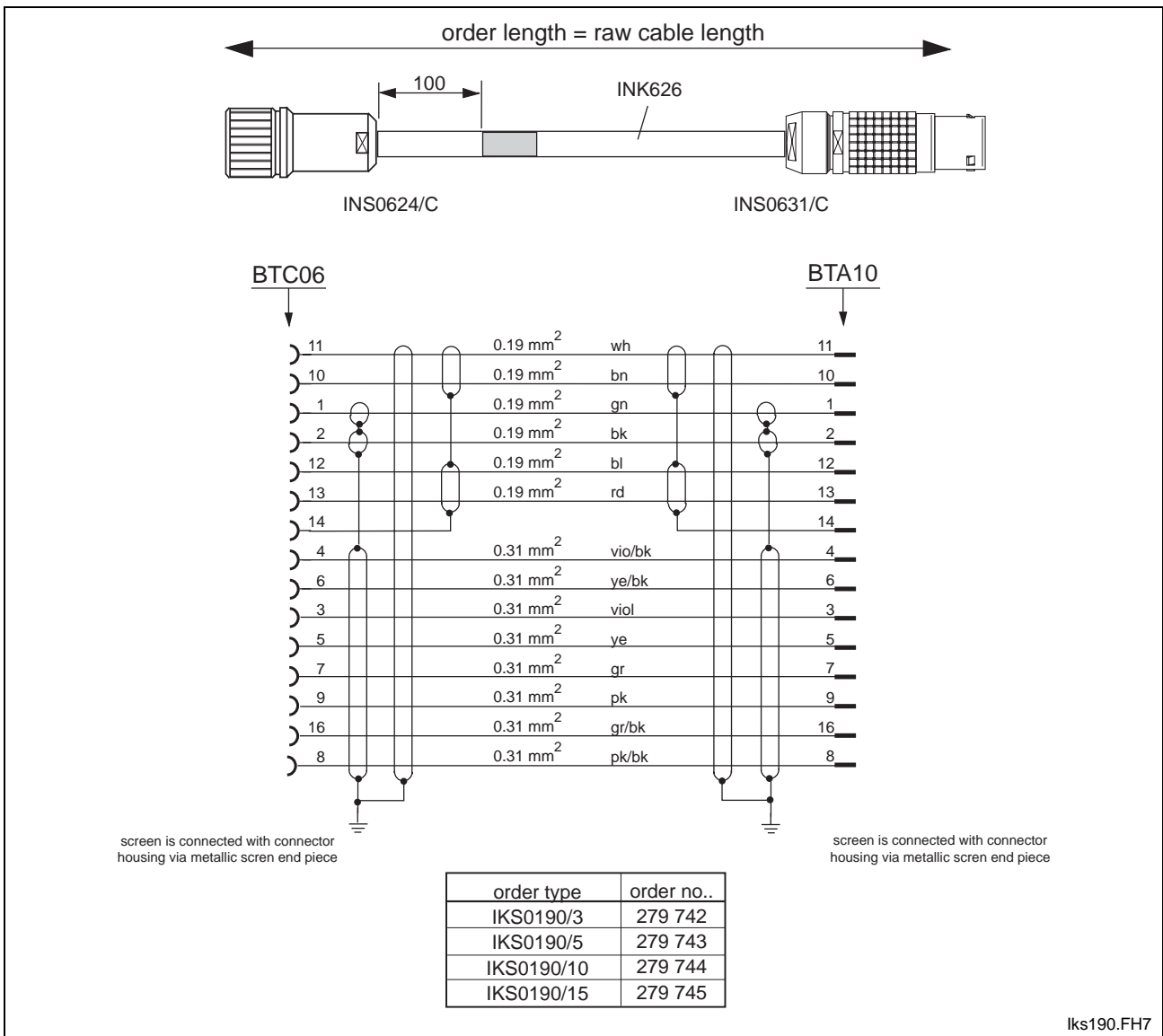


Figure 6-3: IKS0190

The IKB0190 cable is used for establishing the connection to the BTC06 manual control unit.

6.2 BTA10 with BTV/BTA20 and BTC06

The following is a typical application with the components BTV and BTA20 and the BTC06 manual control unit.

The RS422 connection between BTV20 and BTA10 is established from the „SIO“ (serial input/output) plug-in module via the IKB0016 connecting cable. The SIO plug-in module for the BTV20 unit must be ordered additionally.

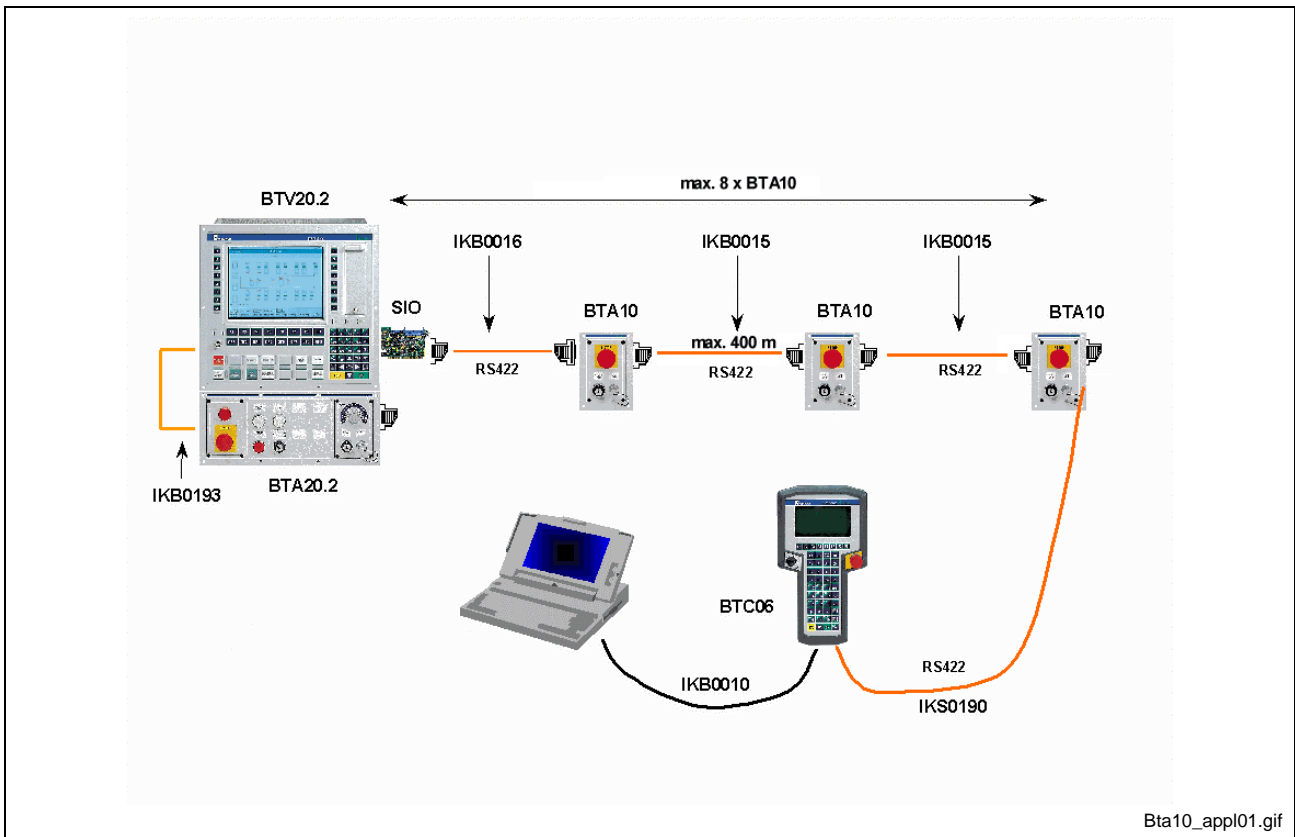


Figure 6-4: Typical application with BTV/BTA20 and BTC06

7 Ordering Information

7.1 BTA10 Type code

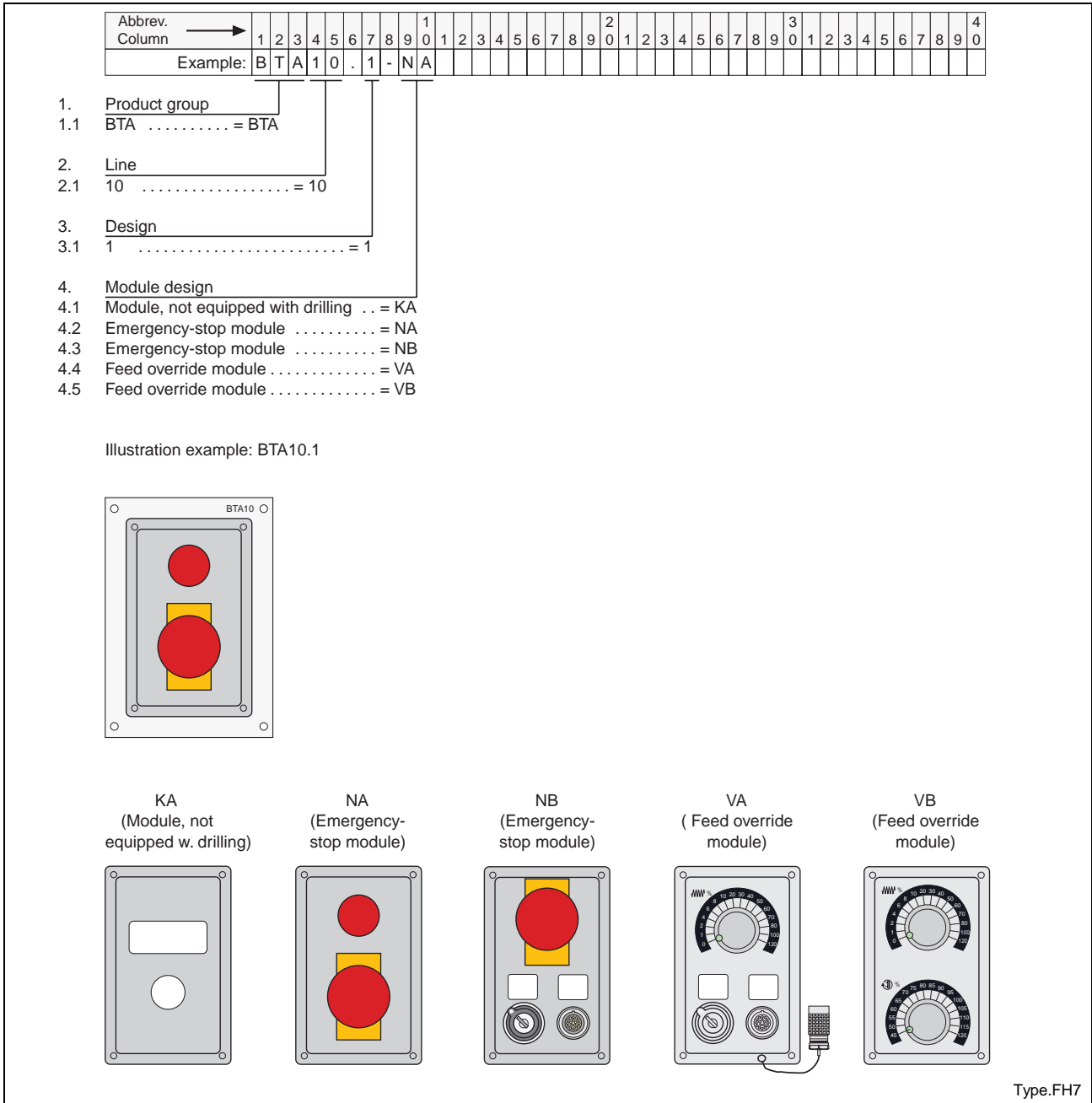


Figure 7-1: BTA10 type code

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