Order data sheet explanations for motor-drive mechanism type BUE and BUL

Scope

This product information gives some more explanations to the order data sheet for motor drive of the type BUE and BUL. In this information the differences between the two different motor-drives can be seen. The more generous space in BUE makes it possible to put in more functionality compared to BUL that is much more standardised product. BUE is also more mechanically strong which makes it suitable to operate tap-changer types.

Possible use of BUE and BUL motor-drives

	OLTC connection	
OLTC type	**Star point, single phase**	**Three phase group and controlling 2 OLTC's (B)**
UBB	BUE, BUL	N/A
UCG, UCL	BUE, BUL	BUE
UCC, UCD	BUE	1 BUE /OLTC

The documents that references are made to, can be found on the documentation CD or at the ABB web site (www.abb.com/electricalcomponents)

Motor-drive, type BUE

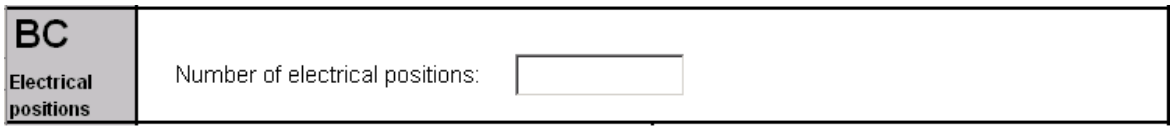
Motor-drive, type BUL

Selections inside of this bracket are included in the base price and require no extra delivery time.

Postal adress
ABB AB, Components
SE-771 80 LUDVIKA, Sweden

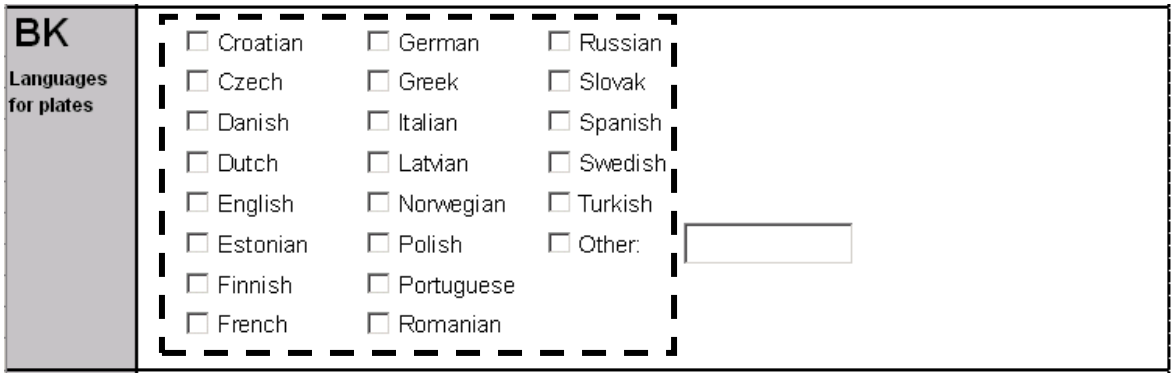
Telecopier
Nat 0240 – 121 57
Int +46 240 121 57

BC Electrical position, BUE and BUL



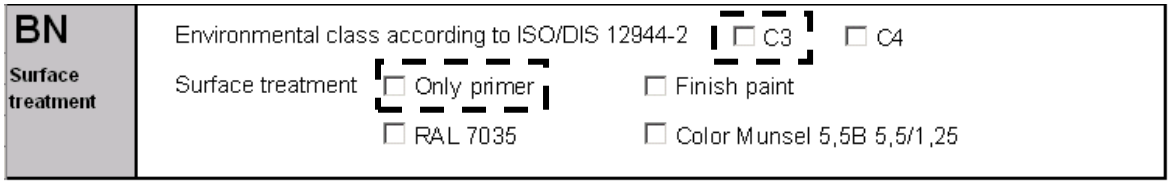
Amount of tap-changer position that gives a unique winding ratio in the transformer.

BK Language on plates, BUE and BUL



The plates referred to here are the once sitting in the motor-drive mechanism. The language on the tap-changer rating plate is selected under the tap-changer BK. The tap-changer rating plate is placed outside the motor-drive mechanism.

BN Surface treatment, BUE



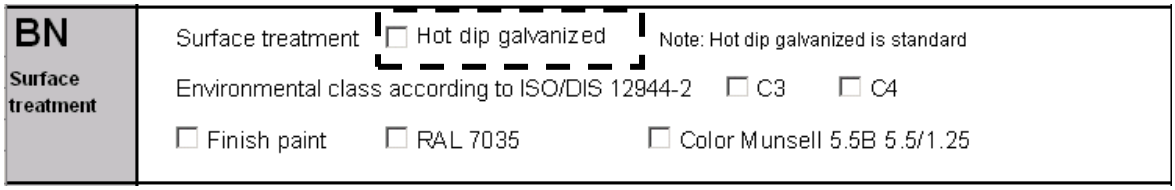
First select environmental class and then if there only should be primer on the cabinet or if it also should have a finish paint. There are 2 different standard options for the finish paint. Other finish paints are also available but this will increase the price as well prolong the delivery time.
The internal part will have the same surface treatment as the external.

- Guide to environmental class

Category and corrosivity	**Example of typical environments in a temperate climate.** Normal font outdoor *Italic font, indoor.*
C3 Medium	Atmosphere with low salinity or moderate pollution. Urban and lightly industrialised areas. Areas with some coastal influence. *Spaces with moderate condensation frequency and some pollution from production processes, e.g. food processing plants, breweries, dairies, and laundries.*
C4 High	Atmosphere with moderate salinity or high pollution. Industrial and costal areas. *Spaces with high condensation frequency and high pollution from production processes, e.g. chemical, swimming halls, coastal ship- and boat yards*

- For finish paint also fill in the colour.
  - RAL 7035 is light gray
  - Munsell 5.5B5.5/1.25 is gray blue.

BN Surface treatment, BUL

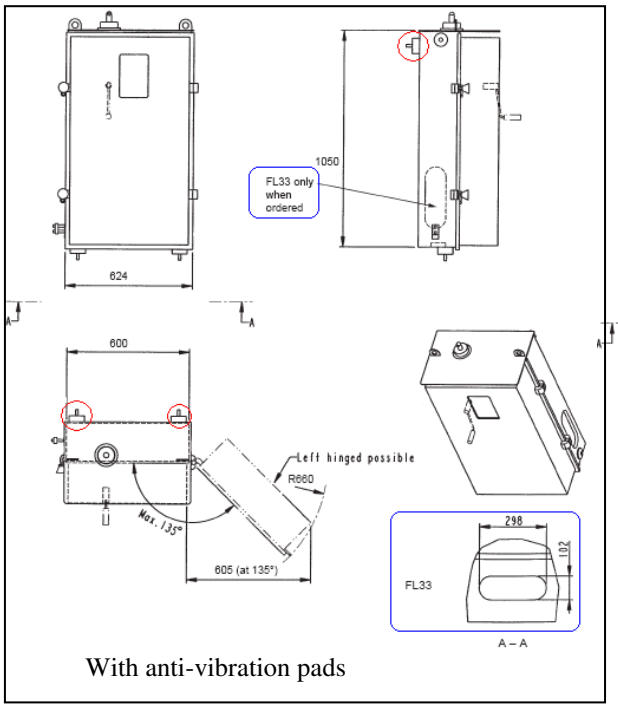


Select first if the standard solution with hot dip galvanized shall be used. If this is the case no further need to be filled under this point.
If the cabinet should be painted start to fill in environmental class and then finish paint. There are 2 different standard options for the finish paint. Other finish paints are also available but this will increase the price as well prolong the delivery time.
The internal part will have the same surface treatment as the external.

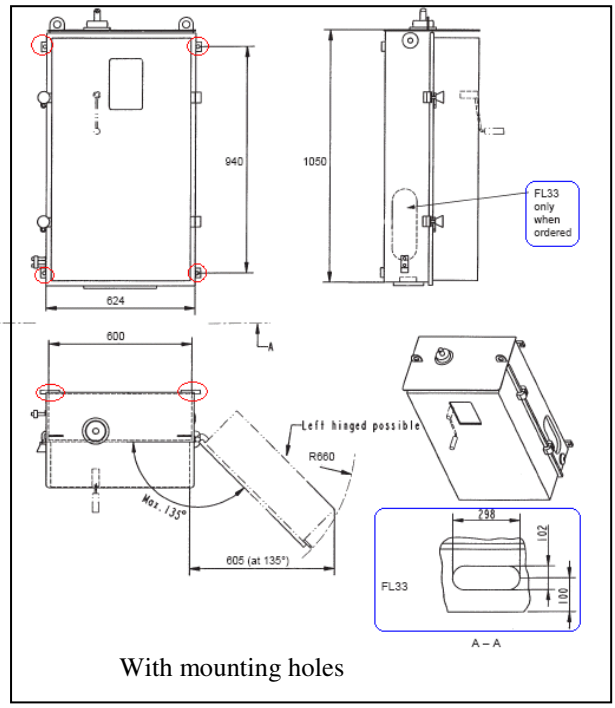
CB Type of cabinet, BUE

CB Cabinet						
	Type of cabinet	☐ Mounted on anti-vibration pads		☐ With mounting holes		
	Extra flange FL 33 (right side)	☐ No	☐ Yes	Door holder	☐ No	☐ Yes
	Inside cabinet Anti-condensation coverage	☐ No	☐ Yes			

- Type of cabinet for BUE



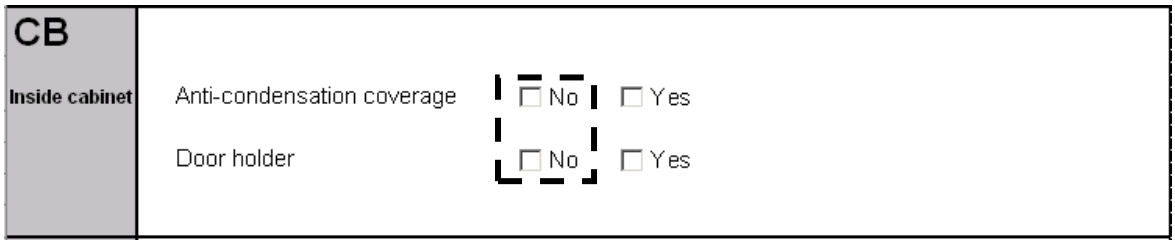
With anti-vibration pads



With mounting holes

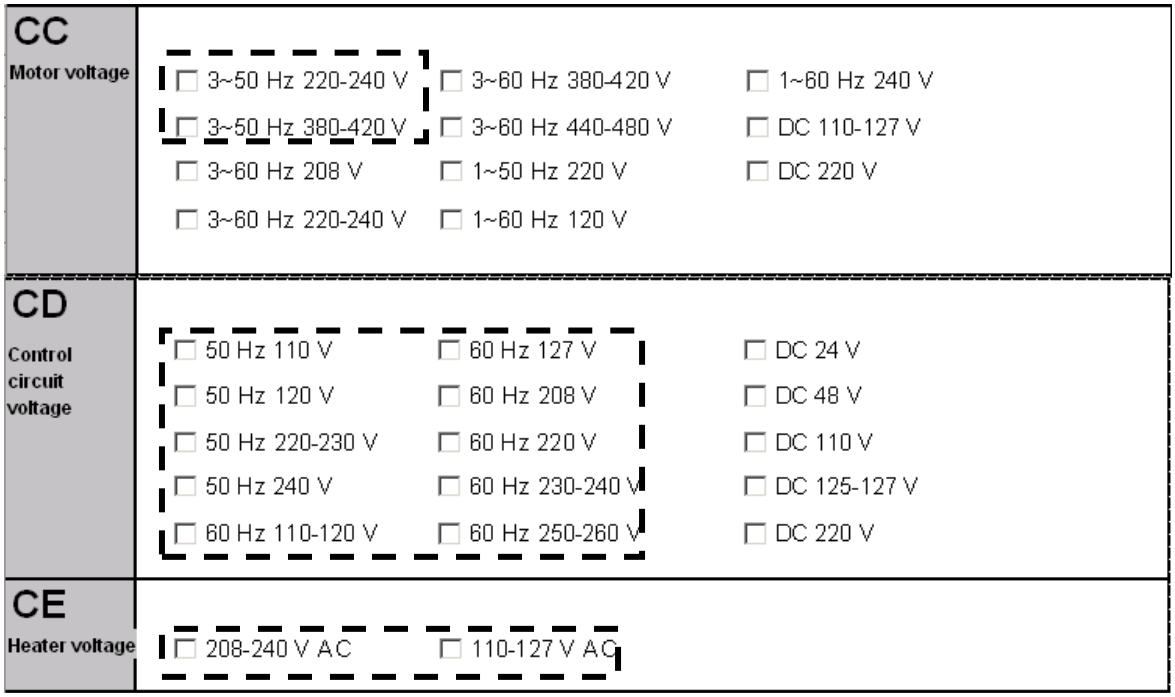
- Anti-condensation coverage is a layer of insulating material that will insulate the cabinet better at cold ambient conditions. It will also further prevent condensation of moisture in the cabinet.
  Anti condensation coverage is required if the ambient temperature is colder than -45 °C.
- Extra flange FL 33 see above drawings. This flange can be used for cable connections.
- With the door holder, the door can be held in an open position.

CB Type of cabinet, BUL



- Anti-condensation coverage is a layer of insulating material that will insulate the cabinet better at cold ambient conditions. It will also further prevent condensation of moisture in the cabinet.
- Anti condensation coverage is required if the ambient temperature is colder than -45 °C.
- With the door holder, the door can be held in an open position.

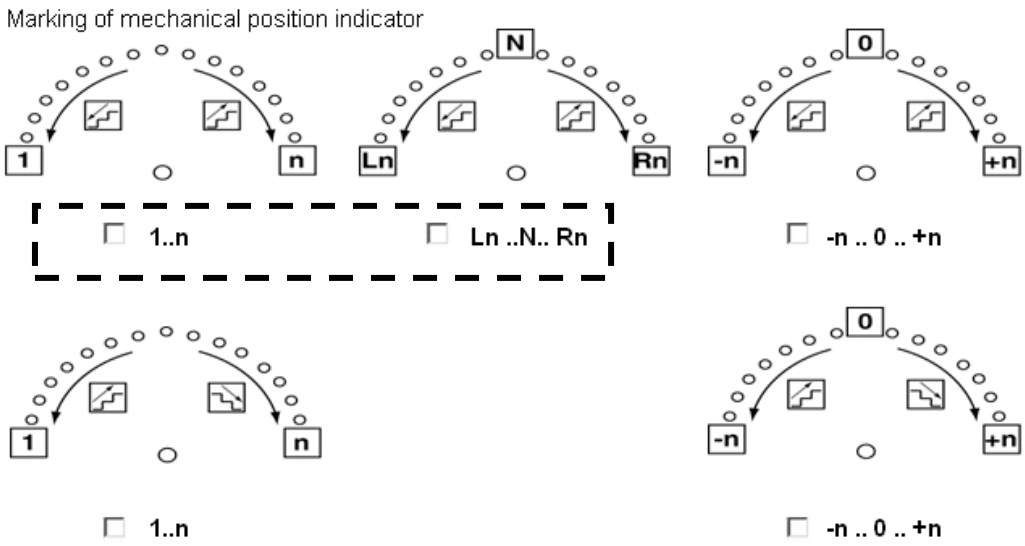
CC, CD, CE Voltage to the cabinet, BUE and BUL



The motor drive is designed in a way that makes it possible to have different supply voltages to the motor, control circuit and the heater.
The motors can operate at 85-110% of the rated AC voltage or at 80-110% of the rated DC voltage.

CF Mechanical position indicator, BUE and BUL

CF
Mechanical position indicator



Compare with the tap-changer BH and the example with attached connection diagrams. Other alternatives are also possible, but will have an extra cost and prolonged delivery time.

CG Terminal blocks, BUE

CG
Terminal blocks

	Manufacturer	Type	
☐	Phönix	UK 5N	Screw clamp terminal
☐	Weidmüller	SAK4	Screw clamp terminal
☐	Phönix	URTK/S Ben 10	Screw clamp terminal, disconnectable
☐	Phönix	URTK/S	Screw clamp terminal, disconnectable
☐	Phönix	OTTA 6T	Ring lug terminal, disconnectable
☐	Phönix	OTTA 6	Ring lug terminal
☐	Weidmüller	RSF1	Hook lug terminal, spring loaded
☐	General Electric	EB-25	Ring lug terminal

These are the standard options. Other can also be supplied, but they will increase the price and could also prolong the delivery time.

CG Terminal blocks, BUL

CG Terminal blocks

	Manufacturer	Type	
☐	Phönix	UK 5N	Screw clamp terminal
☐	Weidmüller	SAK4	Screw clamp terminal
☐	Phönix	URTK/S Ben 10	Screw clamp terminal, disconnectable
☐	Phönix	URTK/S	Screw clamp terminal, disconnectable
☐	Phönix	OTTA 6T	Ring lug terminal, disconnectable
☐	Phönix	OTTA 6	Ring lug terminal
☐	Weidmüller	RSF3	Hook lug terminal, spring loaded

These are the standard options. Other can also be supplied, but they will increase the price and could also prolong the delivery time.

CK Extra heater, BUE and BUL

CK Extra heater

☐ No

Yes, with ☐ Thermostat ☐ Humidistat ☐ Switch in series with the thermostat and/or humidistat

One heater is supplied as standard.
If an extra heater is required, it has the following options to be controlled by a thermostat and/or humidistat (moisture). It is also possible to have a manual switch in series with the thermostat and humidistat.
For ambient temperatures colder than -40 °C an extra heater is required. It shall be controlled with a thermostat.

CL Convenience outlet, BUE

CL Convenience outlet

☐ No
☐ Yes, DIN (16 A) 50Hz 230V
☐ Yes, ANSI(15A) 60Hz 120V (NEMA 5-15R)
☐ Yes, ANSI(15A) 60Hz 220V (NEMA 6-15R)
☐ Yes, ANSI(20A) 60Hz 120V (NEMA 5-20R)

CL Convenience outlet BUL

CL Convenience outlet

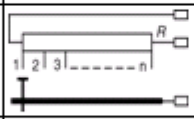
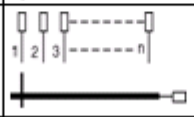
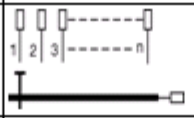
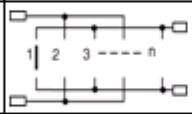
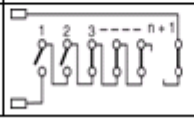
☐ No

☐ Yes, DIN (16 A) 50Hz 230V

CN Position switches, BUE

CN Multi-position

Total number of required multi-position switches must be noted

Type	Symbol	Occupies space for contact rows	Required number of switches
Potentiometer position transmitter		1	☐
Break before make		1	☐
Make before break		1	☐
Potentiometer for TEC use		1	☐
Odd/even (step switch)		2	☐
Follower switch for parallel control		2	☐

Max number of contact rows for BUE:

- 12 without through position
- 11 with through position

Check also “CT Coder” and “CU Remote position indicator” that also requires contact rows

CN Position switches

The following tap-changer types have trough position as standard (is included in delivery and price)

Type	Number of electrical positions	Remark
UBBR, UBBD	15, 17 21, 25	BUE, BUL
UCGR/C, CGD/C	11, 17, 21, 25	BUE, BUL
UCGR/I, UCGD/I	11, 15, 17, 21, 25, 29, 33	BUE, BUL
UC.R/III,UC.D/III	17, 21, 25, 29, 33	BUE, BUL
UCCR, UCCD	17, 21, 25, 29, 33	BUE

Potentiometer position transmitter
This is a resistor bridge that has an increasing resistance in one tap-changer direction. The first ordered potentiometer position transmitter is included in the base price.

Break before make
Has one contact from each tap-changer position. During switching from one position to another it will have no contact for a while.

Make before break
Has one contact from each tap-changer position. During switch from one position to another it will have contact with both positions for a while.

Potentiometer for TEC
This is a resistor bridge suited for TEC that has an increasing resistance in one tap-changer direction. It is connected directly to TEC to indicate the tap-changer position.

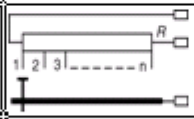
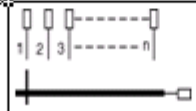
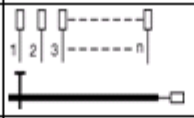
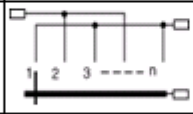
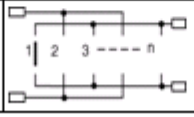
Odd/even (step switch)
It gives a signal when the tap-changer is in odd position and another signal when it is in even position
The switches are used for master/follower control scheme also named master/slave or simultan method. It gives a signal when the tap-changer is in odd position and another signal when it is in even position. On transformer controls one or more other transformers. The tap-changers must also be standing in the same position at energising of the transformers.
This step switch is not needed for the a-eberle voltage regulator.

Special follower switch for parallel control
This is s special version of master/follower method that has been used by some customers. Normally all motor-drive mechanisms have both a control and one follower contact. The control contact is BBM. The follower contact has all positions closed except for the actual position and one position higher. At energising of the transformer all tap-changer will position themself in the same position as the master.

CN Position switches, BUL

CN
Multi-position

Total number of required multi-position switches must be noted

Type	Symbol	Occupies space for contact rows	Required number of switches
Potentiometer position transmitter		1	☐
Break before make		1	☐
Make before break		1	☐
Potentiometer for TEC use		1	☐
Type 1: Odd/even (step switch)		1	☐
Type 2: Odd/even (step switch) for parallel control		2	☐

Max number of contact rows for BUL:

- 5 without through position
- 4 with through position

Check also “CT Coder” and “CU Remote position indicator” that also requires contact rows

CN Position switches

The following tap-changer types have trough position as standard (is included in delivery and price)

Type	Number of electrical positions	Remark
UBBR, UBBD	15, 17 21, 25	BUE, BUL
UCGR/C, CGD/C	11, 17, 21, 25	BUE, BUL
UCGR/I, UCGD/I	11, 15, 17, 21, 25, 29, 33	BUE, BUL
UC.R/III,UC.D/III	17, 21, 25, 29, 33	BUE, BUL
UCCR, UCCD	17, 21, 25, 29, 33	BUE

Potentiometer position transmitter
This is a resistor bridge that has an increasing resistance in one tap-changer direction. The first ordered potentiometer position transmitter is included in the base price.

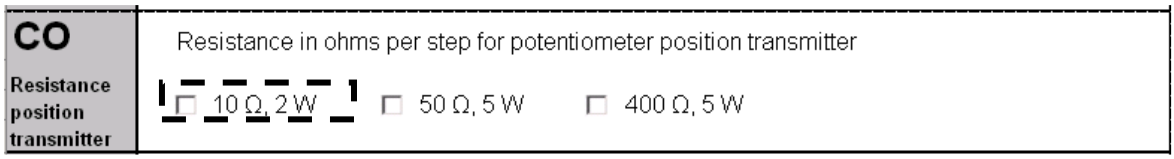
Break before make
Has one contact from each tap-changer position. During switch from one position to another it will have no contact for a while.

Make before break
Has one contact from each tap-changer position. During switch from one position to another it will have contact with both positions for a while.

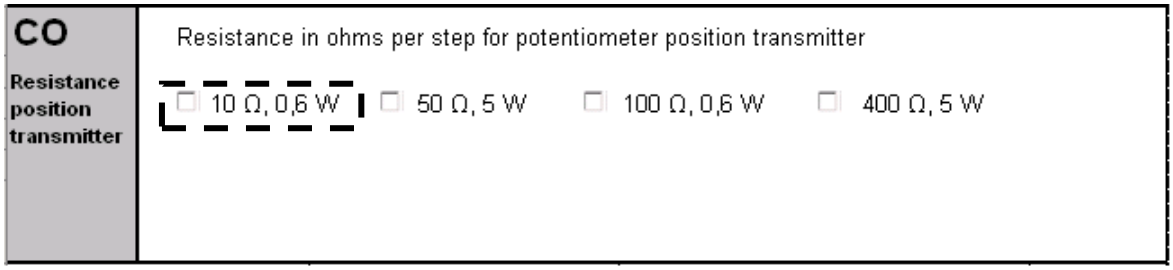
Potentiometer for TEC
This is a resistor bridge suited for TEC that has an increasing resistance in one tap-changer direction. It is connected directly to TEC to indicate the tap-changer position.

Odd/even (step switch)
It gives a signal when the tap-changer is in odd position and another signal when it is in even position
The switches are used for master/follower control scheme also named master/slave or simultan method. It gives a signal when the tap-changer is in odd position and another signal when it is in even position. On transformer controls one or more other transformers. The tap-changers must also be standing in the same position at energising of the transformers.
Type 1. For 2 transformers in parallel, both motor-drive mechanisms need to have this control.
Type 2. For more then 2 transformers in parallel, all motor-drive mechanisms need to have this control.
This step switch is not needed for the Eberle AVR (automatic voltage regulator).

CO Resistance position transmitter BUE



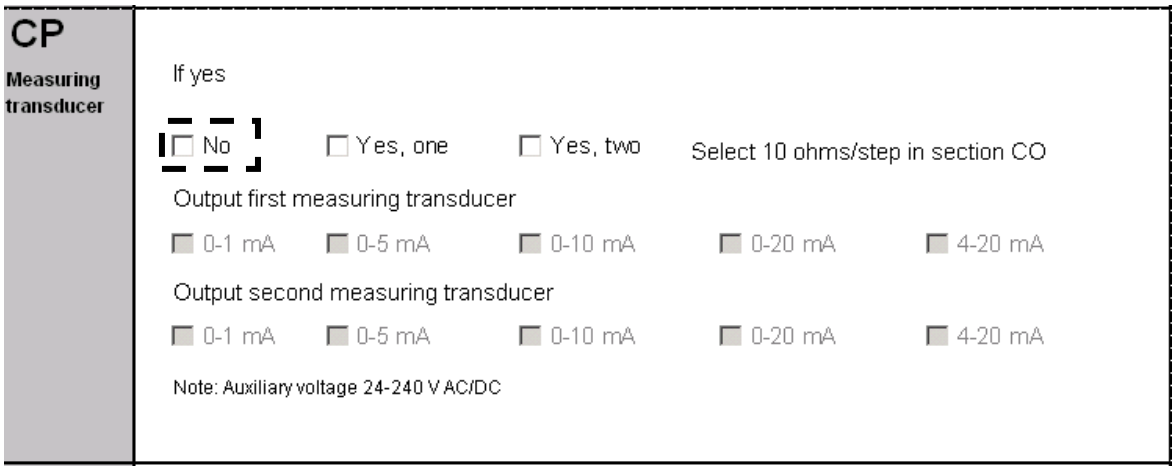
CO Resistance position transmitter, BUL



Potentiometer position transmitter
If a measuring transmitter shall be used, see below CP, 10Ω shall be chosen.

Resistance for TEC potentiometer
Will automatically be delivered with a suitable resistance for TEC

CP Measuring transducer, BUE and BUL



Converts the resistance from the potentiometer to a current. (It is not needed for TEC applications.) The resistance 10Ω per step, shall be selected at CO.

CT Coder, BUE and BUL

CT Coder	☐ No ☐ Yes, BCD, coded, 1, 2, 4, 8, 10, 20 ☐ Yes, Binary Coder (BC) 1, 2, 4, 8, 16, 32 Note: One BBM-switch for the coder will also be supplied

The coder will occupy:
- 1 contact row in BUE
- 2 contact row in BUL

The coder includes all necessary devices to generate an output code. It is also protected by varistors.

CU Remote position indicator, BUE and BUL

CU Remote position indicator	☐ No ☐ Yes, number of indicators: ☐ Analog position indicator ☐ Size 96x96 ☐ Size 144x144 **OR:** ☐ Digital with analog input (from measuring transducer, section CP), size 96x48 Auxiliary voltage: ☐ AC 110-240 V ☐ DC 12-48 V Output: ☐ No ☐ BCD Open collector ☐ BCD TTL ☐ Analog 0-1 V, 0-5 V, 0-10 V, 1-5 V, 4-20 mA **OR WITH:** ☐ Digital with BCD input (section CT) size 96x24. Auxiliary voltage: DC 24 V

If yes is filled in, you should either connect a:

Analogue position indicator
or
Digital with analogue input
or
Digital with BCD input

Analogue position indicator

- Requires that a potentiometer position transmitter is selected under CN.
- Requires that a 10Ω resistor is selected under CO.
- Requires that a measuring transducer is selected under CP.

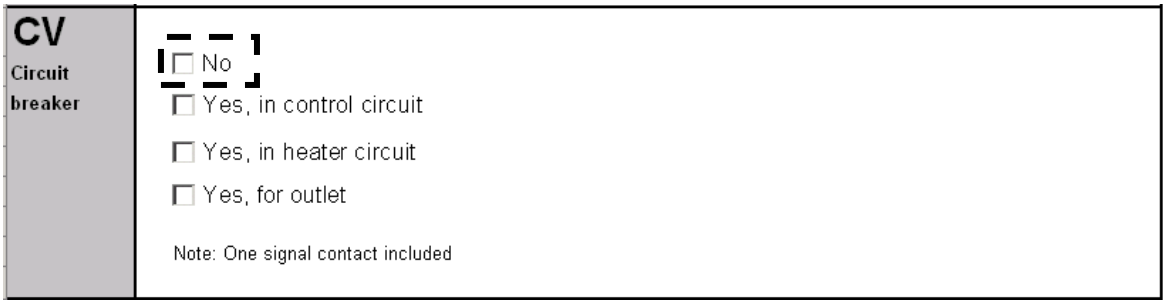
Digital with analogue input

- Select supply voltage of AC 110-240V AC or DC 12-48V.
- Requires that a potentiometer position transmitter is selected under CN.
- Requires that a 10Ω resistor is selected under CO.
- Requires that a measuring transducer is selected under CP.

Digital with BCD input

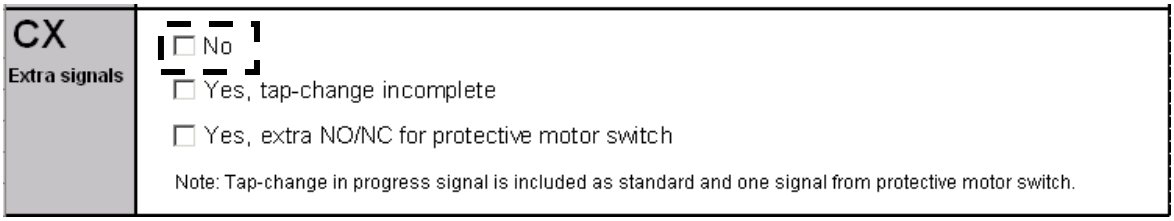
- Requires that a BCD coder is selected under CT
- Requires a supply voltage of DC 24V

CV Circuit breaker, BUE and BUL



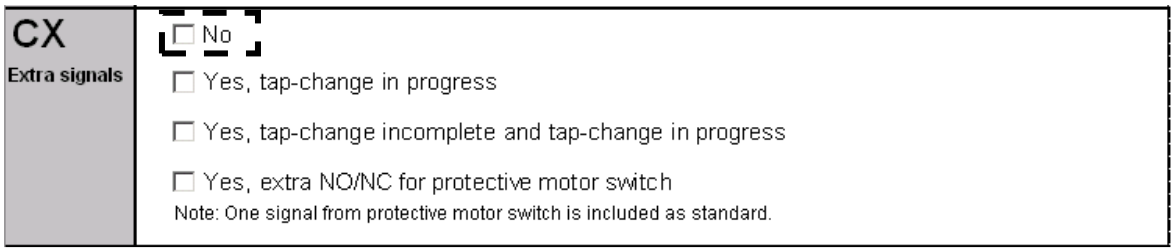
The circuit breaker is a resettable fuse.
Gives a signal when the circuit breaker has been tripped.

CX Extra signals, BUE



- Tap-change incomplete gives a signal if the motor-drive is not in position after a preset time.
- Extra NO/NC for protective motor switch, gives an extra signal from the motor protection. (One signal contact is included)

CX Extra signals, BUL

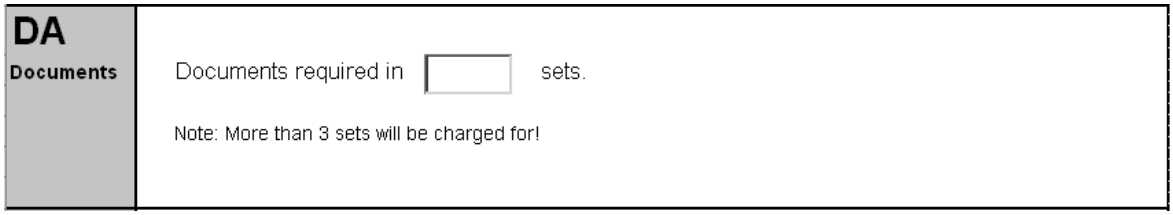


- Tap-change in progress gives a signal when the motor-drive is in operation.
- Tap-change incomplete gives a signal if the motor-drive is not in position after a preset time.
- Extra NO/NC for protective motor switch, gives an extra signal from the motor protection. (One signal contact is included)

CY Under voltage relay, BUE and BUL

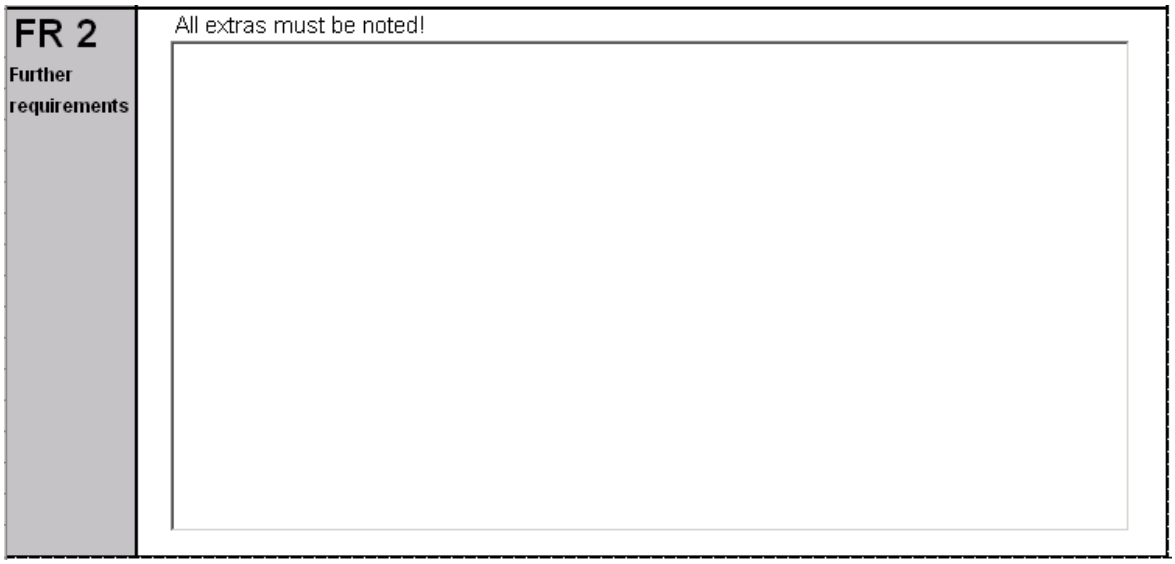
As the motor and control circuits are separate an undervoltage relay can be placed in each of the circuits as an option. This will give a signal in case of a voltage lower than the limit for the motor or devices.

DA Documentation, BUE and BUL



Observe that up to 3 sets are delivered free of charge

FR 2 Further requirements, BUE and BUL



All extras must be noted here. In many cases it will be extra cost and/or delivery time.