Order data sheet explanations for tap-changer type UBB

Scope

This product information gives some more explanations to the order data sheet for tap-changer type UBB.
The documents that references are made to can be found on the documentation CD or at the ABB web site (www.abb.com/electricalcomponents).

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

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AA Type

AA Type	
	☐ Network ☐ Generator step-up (GSU) ☐ Booster ☐ Other

- **GSU**
  Regulating on HV-side = output side. Pay attention to definition of “raise / lower”

- **Booster**
  Pay attention to the step voltage and current. They should be the one that the tap-changer will be subject to.

AB Rated power

AB Rated power	
	Rated power ____ MVA

This should be the rated power of the transformer that the tap-changer is placed in.

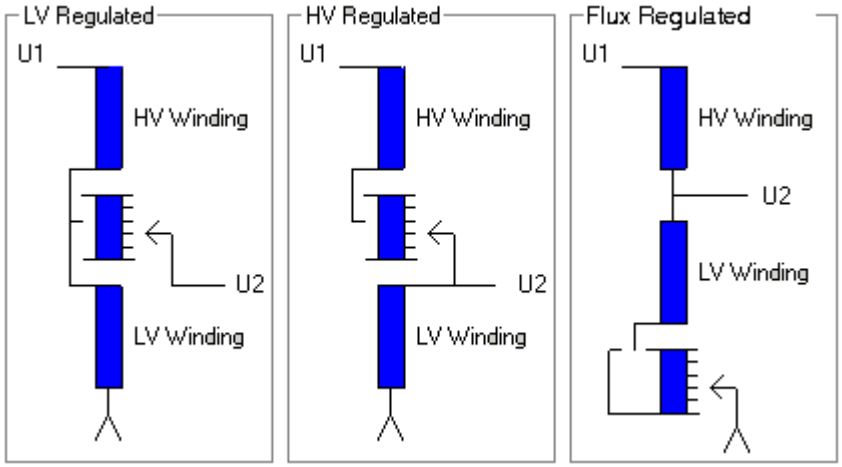
AC Electrical data

AC Electric data	
	System Voltage (HV / LV): HV / LV kV Frequency 60 Hz
	Regulating range: +/- a / b x p % of ☒ HV ☐ LV winding
	Connections (HV): ☒ Y ☐ D
	Connections (LV): ☐ Y ☒ D
	Auto ☐ LV regulated ☐ HV regulated ☐ Flux regulated

a = steps that will add voltage (from the nominal position) to the winding that is connected to the regulating winding.
b = steps that will subtract voltage (from the nominal position) to the winding that is connected to the regulating winding.
p = steps in % of the winding HV or LV winding that is connected to the regulating winding. For flux regulated auto transformer, fill in the average step length.

Booster transformers (series transformers)
For booster transformers, pay attention to the step voltage and current. They should be the one that the tap-changer will be subject to.

Auto transformers

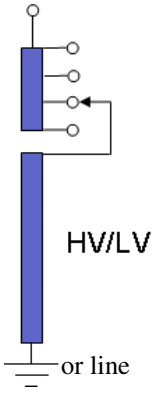


For flux regulated (regulation at the neutral point) the connection table (with tap-changer position and voltages) should be sent to ABB Components.

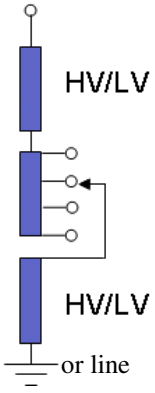
AD OLTC is placed

AD OLTC is placed	The OLTC is placed: ☐ in the line end of ☐ in the middle of ☐ in the neutral point of ☐ the HV winding ☐ the LV winding

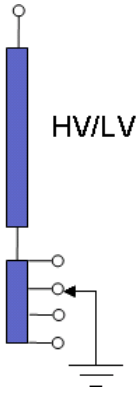
- Fill in placement of OLTC/regulating winding.



Line end



Middle of



Neutral point

- Fill in which main winding the regulating winding is connected to.

AE OLTC insulation levels

AE OLTC insultaion level	Note: Values given in the Technical Guide for the chosen OLTC must not be exceeded Fill in LI - AC Insulation level to earth: g2 LI - AC kV Between phases: b1 - kV Across regulating winding: a2 - kV

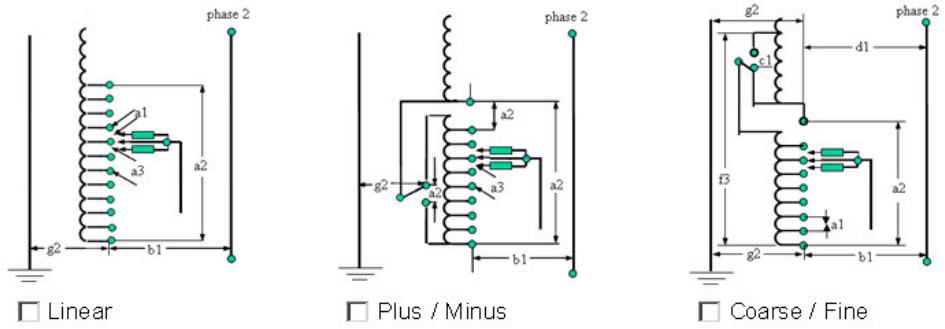
Also check the distances the tap-changer distances in the figure in point AG

- In the first box fill in the LI=Lightning impulse level.
- In the second box fill in the AC level

Observe that the withstand values shall be the one that the tap-changer shall withstand, including for instance up-swings and stresses during tests.

AG Type of switching

AG Type of switching



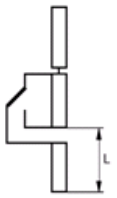
☐ Linear ☐ Plus / Minus ☐ Coarse / Fine

Linear, Plus/Minus or Coarse/Fine: Self explanatory from the ordering data sheet.

AH Leakage inductance

AH Leakage inductance

Specify the leakage inductance through the coarse and fine windings in series (L) _____ mH



Fill in the leakage induction for coarse/fine connection when the tap-changer is placed in mid position.
An alternative is to send the winding layout with dimensions, current direction and the connection to ABB Components. In that case ABB Components will calculate the leak inductance with the help of a FEM program that will give the most accurate result.
See product information 5492 0031-100, for more information.

BA OLTC type designation

BA OLTC type designation

UBB *RN* *350* / *500* A (According to Technical Guide)

Fill in the following:
1.1 First square first fill in the type of switch:

- L=Linear
- R= Plus/Minus
- D= Coarse/Fine

1.2 First square secondly fill in the type of connection:
N=Three-phase star point
T=Three-phase fully insulated

2 Second square fill in impulse withstand (LI, BIL) to earth 200kV or 350kV that the tap-changer shall withstand.

3 Third square fill in the maximum rated through current 150, 400A or 500A

BC Electrical positions

BC Electrical positions	Number of electrical positions:

Electrical positions =Number of tap-changer positions that gives a winding ratio change.
- Linear, max 10 positions
- Plus/Minus, max 27 positions
- Coarse/Fine, max 27 positions

BD Rated voltage

BD Rated voltage	Rated phase step voltage: V

If the phase step voltage is varying over the range the connection table (with tap-changer position and voltages) should be sent to ABB Components.

BE Rated current

BE Rated current	Rated through current (=max phase current in the OLTC winding) A

Highest current in any position under rated power conditions.

BF Overload requirements

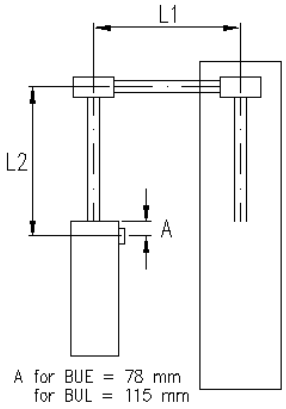
BF Overload requirements	☐ According to IEC 60076-7 ☐ According to IEEE C57.91-1995	☐ Other requirements:

ABB tap-changers fulfil IEC 60214 and IEEE C 57.131.1995. (The temperature rise test is performed at 1,2 times the maximum rated through current). This means that the tap-changer with its rated through current also fulfil overloading of a transformer with the same rating according to the transformer standard IEC 60076-7 and ANSI/IEEE C57.91.

BG Position of motor-drive

BG Position of motor-drive	Note: Compare with Technical Guide regarding lengths L1 and L2 The customer cuts the shaft to exact dimensions at assembly ☐ 500 < L1 ≤ 1700 ☐ 1700 < L1 ≤ 3200 ☐ 525 < L2 ≤ 1800 ☐ 1800 < L2 ≤ 3300

The dimensions L1 and L2 are shown below.



BH Effective number of turns

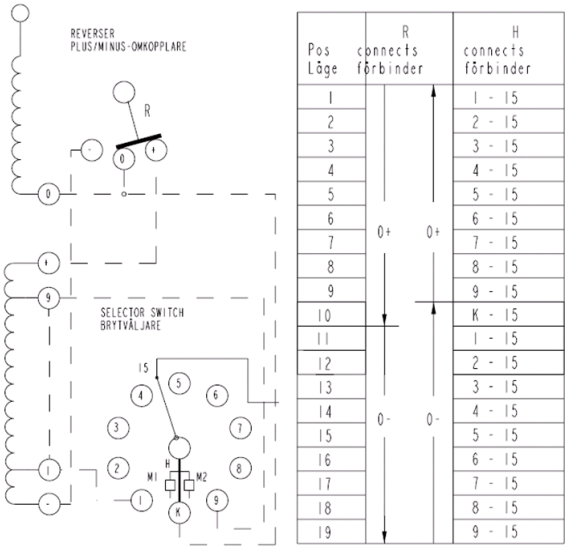
BH (CF) Effective number of turns	Note: Marking of mechanical position indicator. 3 standard alternatives: (1 .. N) (Ln .. N .. Rn) (-n .. 0 .. +n) Linear Plus/minus Coarse/fine max turns min turns max turns min turns max turns min turns Position named

The name of the position when a maximum and minimum turns are connected to the main winding shall be filled in for the appropriate type of switch chosen.
Example

This connection diagram is named “Max turns” as position 1 has a max turns connected to the main winding.

This connection diagram is named “Min turns” as position 1 has a min turns connected to the main winding.

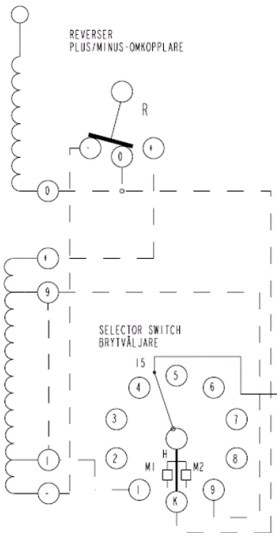
Max turns



Pos Läge	R connects förbinder	H connects förbinder
1	0+	1 - I5
2		2 - I5
3		3 - I5
4		4 - I5
5		5 - I5
6		6 - I5
7		7 - I5
8		8 - I5
9		9 - I5
10		K - I5
11	0-	1 - I5
12		2 - I5
13		3 - I5
14		4 - I5
15		5 - I5
16		6 - I5
17		7 - I5
18		8 - I5
19		9 - I5

Max turns in position 1.
Min turns in position 19.

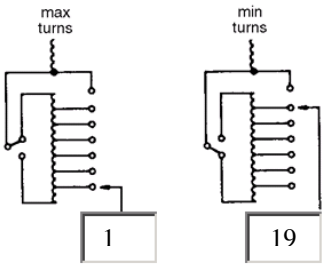
Min turns



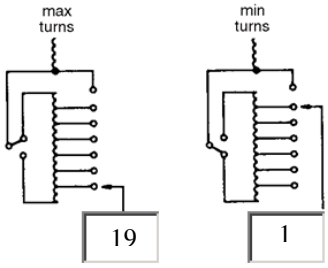
Pos Läge	R connects förbinder	H connects förbinder
1	0-	9 - I5
2		8 - I5
3		7 - I5
4		6 - I5
5		5 - I5
6		4 - I5
7		3 - I5
8		2 - I5
9		1 - I5
10		K - I5
11	0+	9 - I5
12		8 - I5
13		7 - I5
14		6 - I5
15		5 - I5
16		4 - I5
17		3 - I5
18		2 - I5
19		1 - I5

Max turns in position 19.
Min turns in position 1.

Plus/Minus



Plus/Minus



BJ Short circuit current

BJ Short circuit current	☐ Rms value max 8 kA, 3 s Peak value max 20 kA

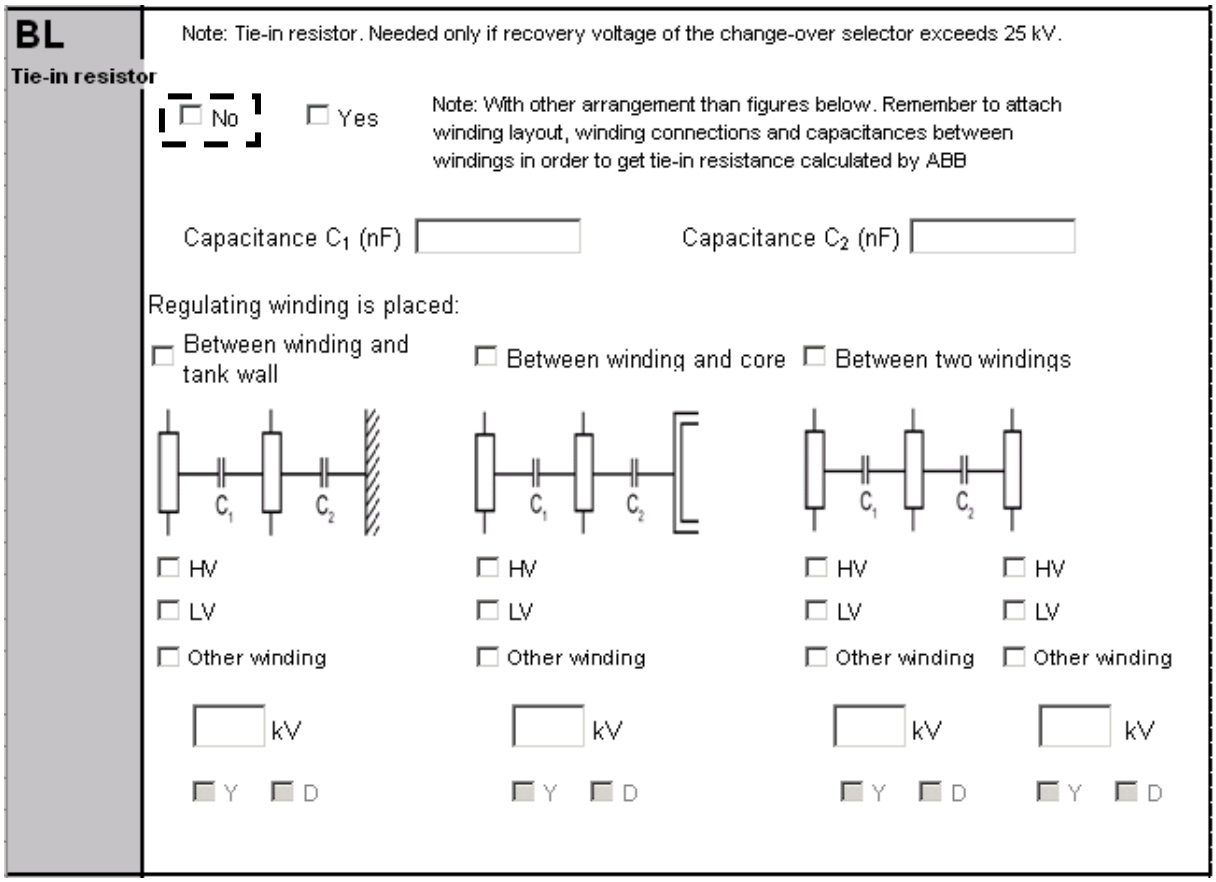
The tap-changer fulfils 8kA during 3 seconds with a peak value of 20kA. For short circuits under a longer time t_2 a calculation can be made to find out the maximum current I_2 using:

$$I_2^2 \cdot t_2 = I_1^2 \cdot t_1$$

I_1 and t_1 shall be taken from the table above.

$t_2 > t_1$

BL Tie-in resistor



When using plus/minus and coarse/fine connection the regulating winding will be galvanicly free "floating" during the time when the pre-selector is open. The regulating winding will receive a potential that is determined by the surrounding capacitances and voltages and in some cases also of the leads. If the recovery voltage over the change-over selector exceeds 25kV, a tie-in resistor is needed to reduce the recovery voltage.

Program
To check if a tie-in resistor is needed, the **"**Tie-in Resistor Calculation Program" provided on the documentation CD can be used.

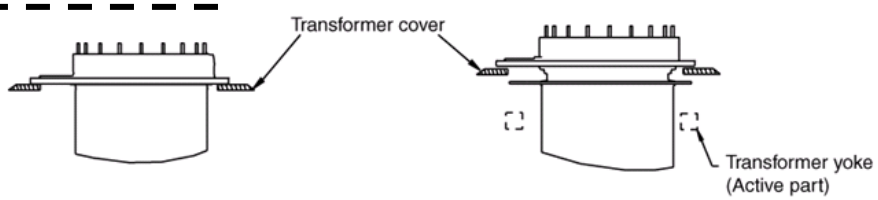
Calculation of tie-in resistor value
If a tie-in resistor is needed, all information in the BL section must be filled in so ABB can make the calculation.

BO Top section

BO
Top section

☐ Cover mounting

☐ Yoke mounting on transformer's active part



- Cover mounting need the cover as support all the time.
- Yoke mounting is supported by the active part during process, but shall then be supported by the cover in service.

BT Supervision devices

BT
Supervisory devices

Vertical distance H between the pressure relay device and the oil level in the conservator
_____ m

Note: One-way breather influence the set point level on our safety devices.
Please add theoretically 4m to real distance H if one-way breather is used.

Pressure relay ☐ No ☐ Yes, double contacts

Note: Pressure relay and/or oil flow relay must be choosen.

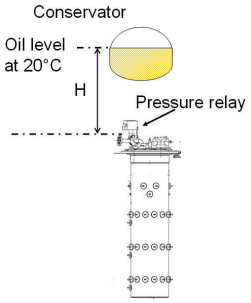
Oil flow relay ☐ No ☐ Yes

Pressure relief device ☐ No (prepared for 130 mm is standard)
Yes, 130 mm ☐ Single contact ☐ Double contacts
Yes, 50 mm ☐ Single contact ☐ Double contacts

Temperature switch ☐ No
☐ Only housing
☐ Temperature switch +90 degrees C
☐ Temperature switch +80 degrees C
☐ Temperature switch -25 degrees C
☐ Temperature switch -40 degrees C

Prepared for TEC (Pt100) ☐ No ☐ Yes

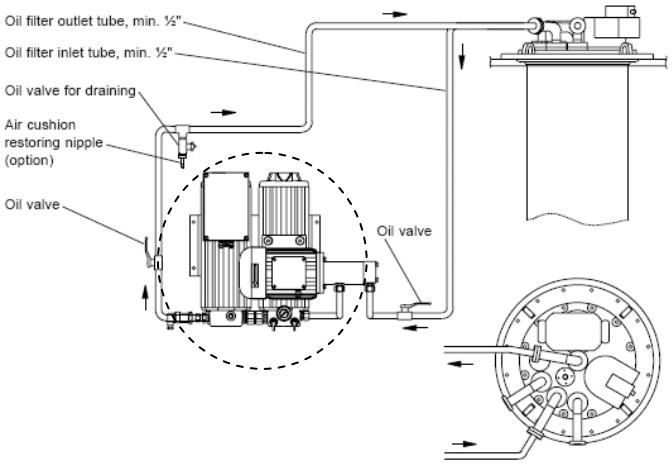
- For the distance H everything refers to the tap-changer, oil level in conservator and pressure relay device.



- Standard option is a pressure relay.
- The tap-changer must be equipped with either a pressure relay or an oil flow relay device that should be connected to trip the transformer.
- Single contact means that the device has one dry contact for output signal. Double contact means that the device has two dry contacts that act simultaneously.
- Temperature switch has two dry contacts acting at the specific temperature.
- The dry contacts can be connected either as NO or NC.
- Prepared for TEC means that the tap-changer will be delivered with Pt100 temperature sensor in the diverter switch housing. TEC (Transformer Electronic Control) is ABB's monitoring & diagnostic and control system for transformers and components.

BU Oil filter unit

BU **Oil filter unit**	☐ No	☐ Yes Voltage for motor: ☐ 3~50 Hz 220-250 V ☐ 3~50 Hz 380-433 V ☐ 3~50 Hz 500 V ☐ 3~60 Hz 208-277 V ☐ 3~60 Hz 360-480 V ☐ 1~50/60 Hz 110-127 V ☐ 1~50/60 Hz 220-240 V

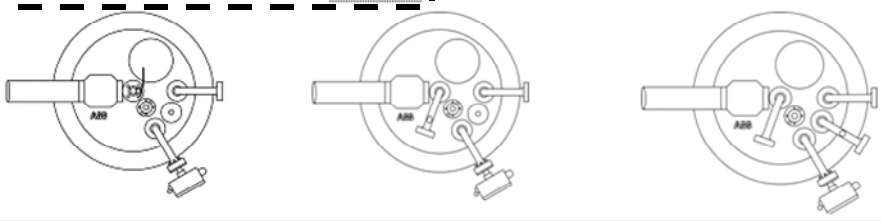


Oil filter unit for UB tap-changer

BZ Pipe connection alternatives

BZ
Pipe connection alternatives

☐ Standard ☐ Draining ☐ Oil filtering



The tap-changer has bolted covers on the outlets that not are used.

DA Documentation, BUE and BUL

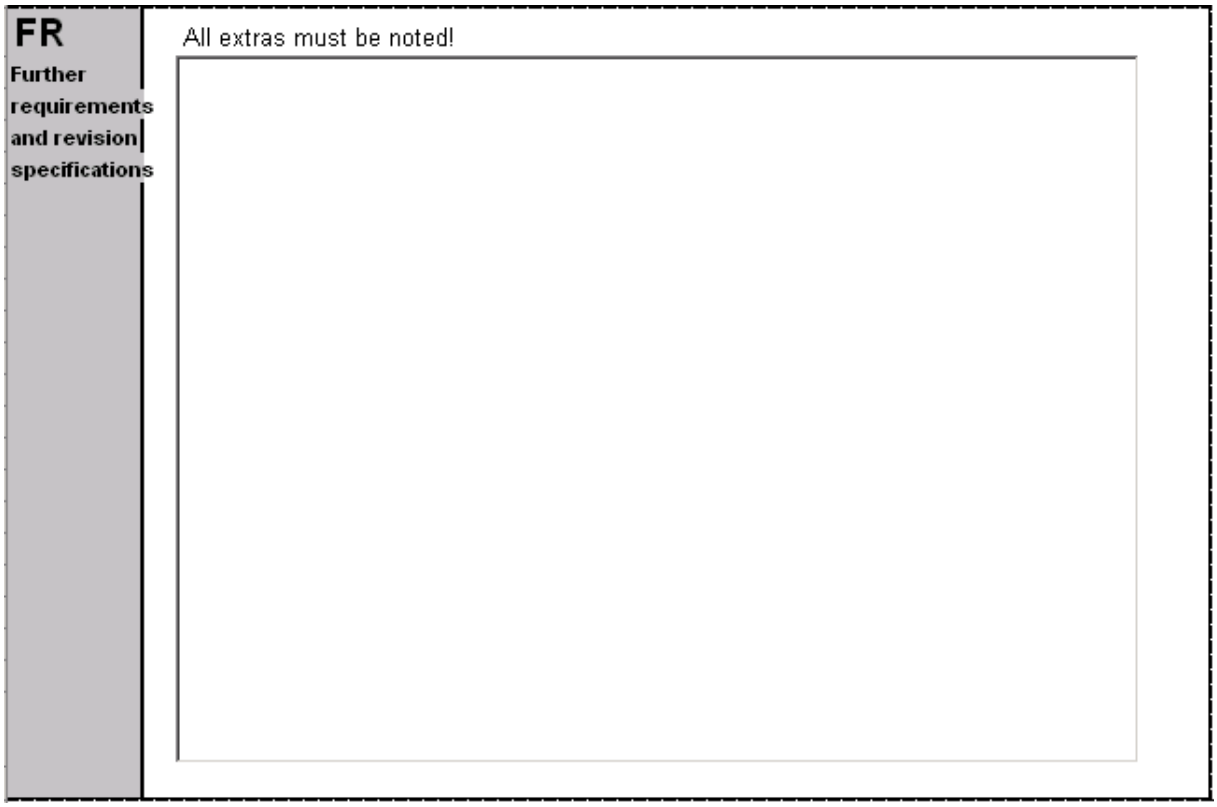
DA
Documents

Documents required in ____ sets.

Note: More than 3 sets will be charged for!

Observe that up to 3 sets are delivered free of charge

FR Further requirements



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