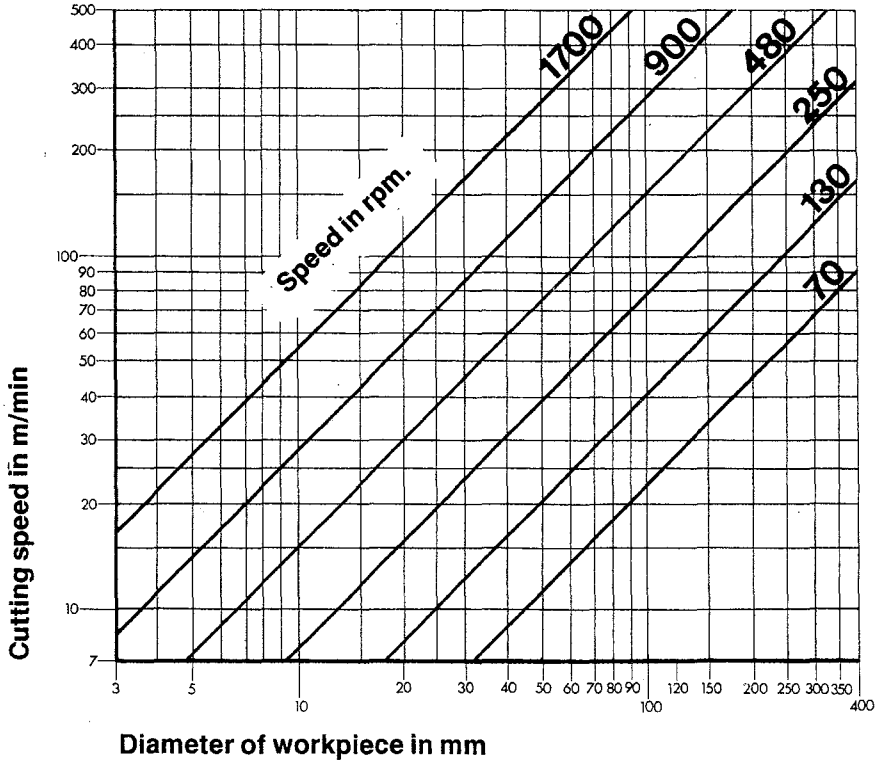
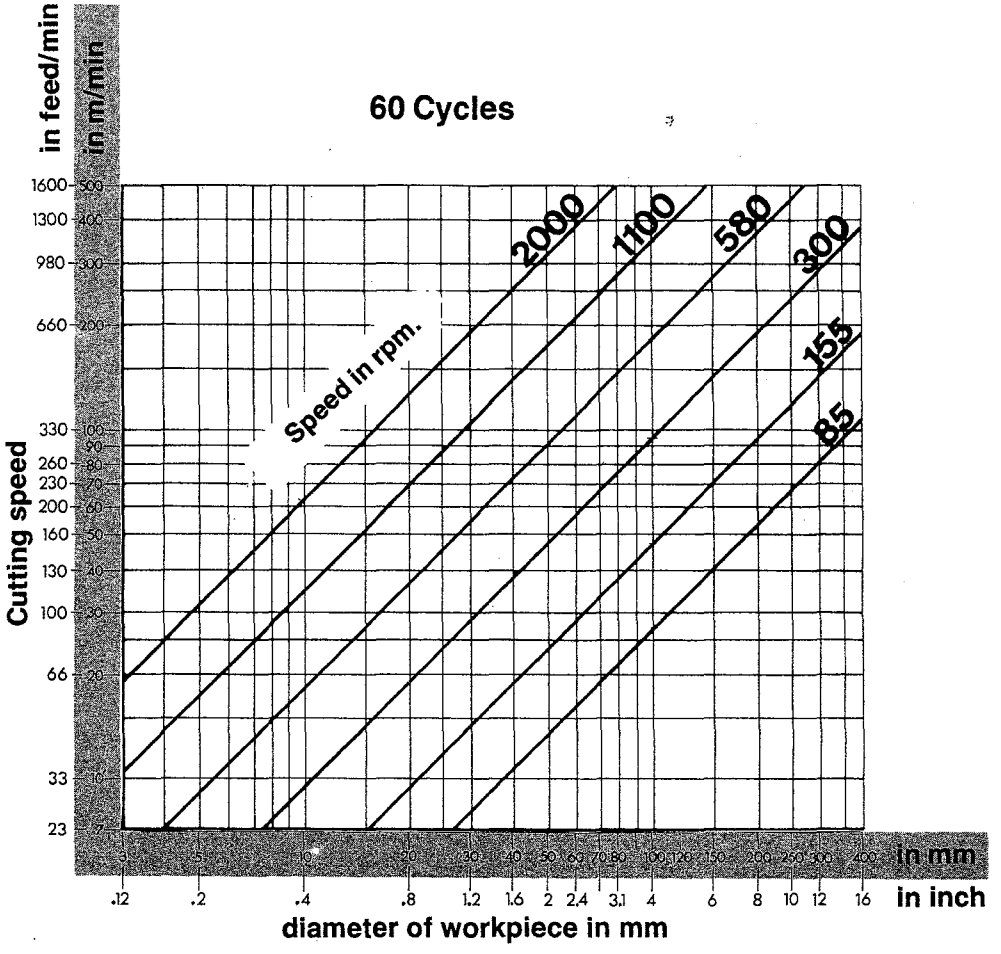
Cutting Speeds

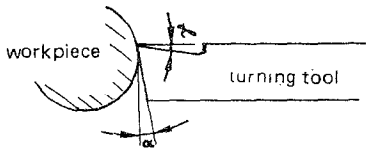
50 Cycles



60 Cycles



Approximate values for cutting speed – Cutting angle – Lubricant



Values valid for dry cutting with:

High - speed steel tools for cutting speed v60 (age 60min.)
Carbon tipped tools for cutting speed v240 (age 240min.)
Side angle χ =45°, point angle ε = 90°, angle of inclination λ = 0...8°,
for light alloy and plastic λ = 5...10°.

Cutting speed

These values hold good for cuts up to 2mm deep, over 2mm the cutting speed should be reduced by 10 - 20%.

[1]) SS = high speed steel S_1 H_1 G_1 = tipped tools E = Cutting emulsion P = paraffin L = air

Workpiece material	Tensile strength in kp/mm²	[1]) Tool	Cutting angle clearance/top α°	γ°	Feed in mm/rev. 0,1	0,2	0,4	0,8 cutting speed v m/min	Coolant and Lubricant Roughing	Finishing
Steel St 34, St 37, St 42	up to 50	SS	8	14		60	45	34	E	E or P
		S_1	5	10	280	236	200	170		
St 50, St 60	50...70	SS	8	14		44	32	24	E	E or P
		S_1	5	10	240	205	175	145		
St 70	70...85	SS	8	14		32	24	18	E	E or P
		S_1	5	10	200	170	132	106		
Cast steel	50...70	SS	8	10		34	25	19	E	dry
		S_1	5	6	118	100	85	71		
Alloyed steel	85...100	SS	8	10		24	17	12	E	E or P
		S_1	5	6	150	118	95	75		
Mn-Steel, Cr-Ni-steel, Cr-Mo-steel	100...140	SS	8	6		16	11	8	E	E or P
		S_1	5	6	95	75	60	50		
other alloyed steels	140...180	SS	8	6		9,5	6		E	E or P
		S_1	5	6	60	48	38	32		
Tool steel	150...180	SS	8	6					E	Colza oil or P
		S_1	5	6	50	40	32	27		
C.I.20,C.I.25	hardness Brinell 200...250	SS	8	0		32	18	13	dry or E	dry
		H_1	5	0	106	90	75	63		
Copper alloys	hardness Brinell 80...120	SS	8	0		125	85	56	dry,EorL	dry
		G_1	5	6	600	530	450	400		
Cast bronze		SS	8	0		63	53	43	E or L	dry
		G_1	5	6	355	280	236	200		
Light alloys aluminium		SS	12	30	400	300	200	118	E or P soap spirit	E or P soap spirit
		G_1	12	30	1320	1120	950	850		
Aluminium alloys (11...13%Si)		SS	12	18	100	67	45	30	E	Oil S II or P
		G_1	12	18	224	190	160	140		
Magnesium alloys*		SS	8	6	1000	900	800	750	dry or with non-combustible oil	dry or with non-combustible oil
		G_1	5	6	1800	1500	1250	1060		
Platics and hard rubber		SS	12	10					dry	dry
		G_1	12	10	300	280	250	224		
Bakelite, Novotext, Pertinax hard plastic		SS	12	14					dry	dry
		G_1	12	14	280	212	170	132		

*** Do not use with water or water mixtures (DANGER OF FIRE!)**

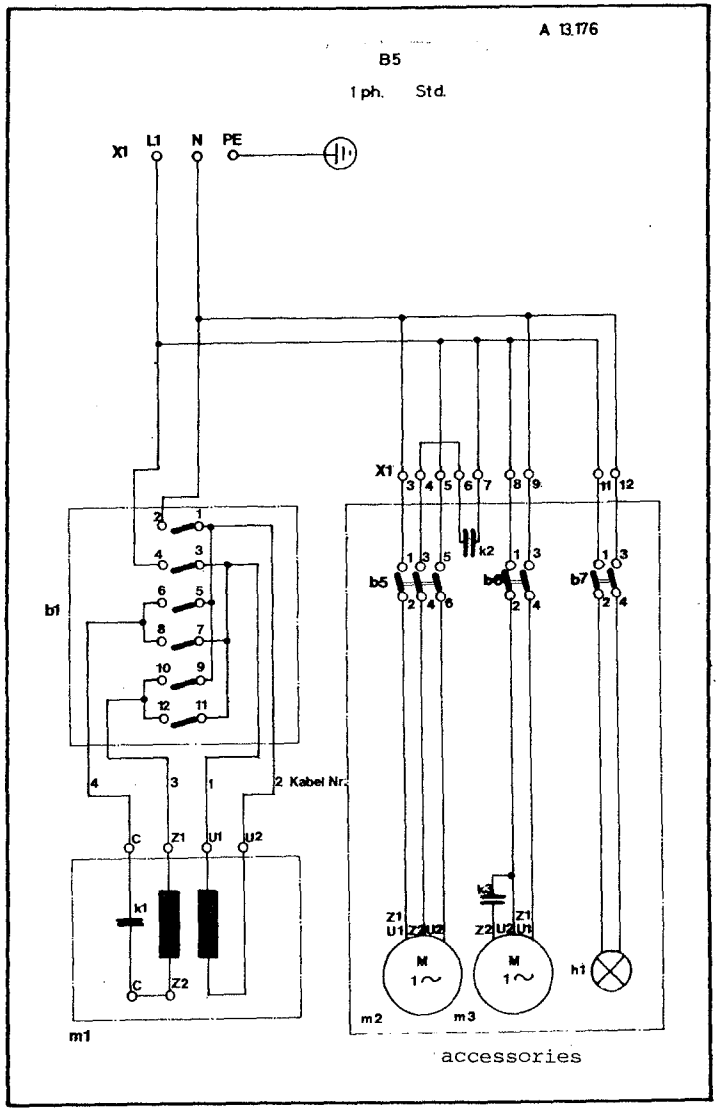
Circuit Diagrams

Electrical Equipments

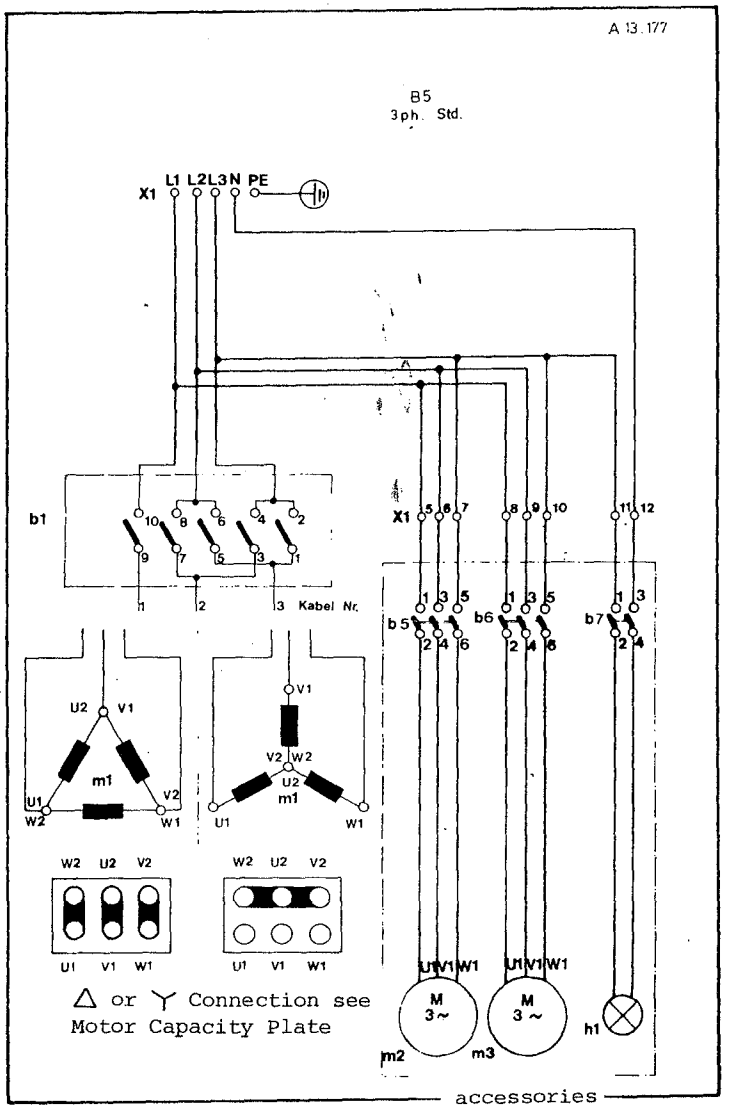
Connection Scheme

Standard-Electric Version

Wiring diagram – single-phase



Wiring diagram – three-phase



I) Electrical Equipment Standard-Electric Version COMPACT 10

b1 Main motor switch
k1 Condenser main motor (only single phase)
x1 Clamping strip
m1 Main motor
b5 Motor switch vertical unit
b6 Motor switch coolant pump
b7 Switch machine lamp
h1 Machine lamp
k2 Condenser vertical motor
k3 Condenser coolant pump
m2 Motor vertical unit
m3 Motor coolant pump

} Accessories

SINGLE-PHASE CONNECTION

X1 Clamping strip

Main motor

L1(1)	Phase R
N(2)	Neutral wire
PE	Grounding wire S1 (connected to grounding strip)

Vertical unit

3	Phase R (wire no. 1)
4	Phase S (wire no. 2)
5	Phase T (wire no. 3)
6	Condenser vertical unit
7	Condenser vertical unit

Coolant pump

8	Phase R
9	Neutral wire
10	

Machine lamp

11	Phase R
12	Neutral wire N

Note: the grounding wires are connected to the grounding strip.

THREE-PHASE CONNECTION

X1 Clamping strip

Main motor

L1(1)	Phase R
L2(2)	Phase S
L3(3)	Phase T
N(4)	Neutral wire N
PE	Grounding wire S1 (connected to grounding strip)

Vertical unit

5	Phase R (wire no. 1)
6	Phase S (wire no. 2)
7	Phase T (wire no. 3)

Coolant pump

8	Phase R
9	Phase S
10	Phase T

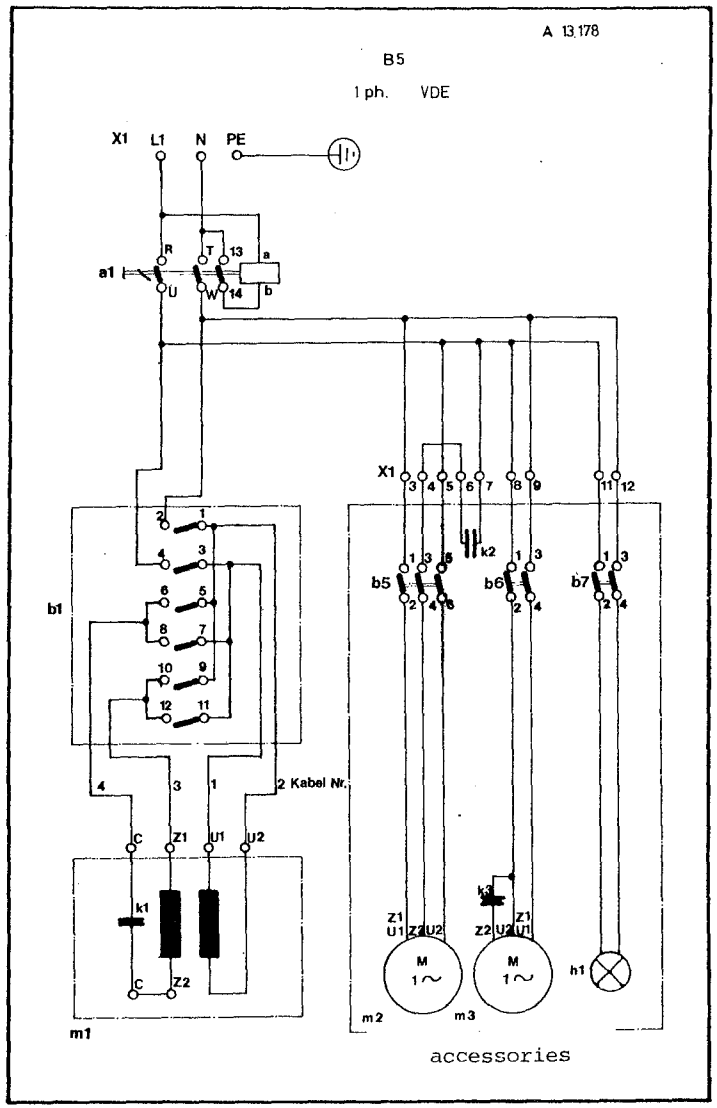
Machine lamp

11	Phase R
12	Neutral wire N

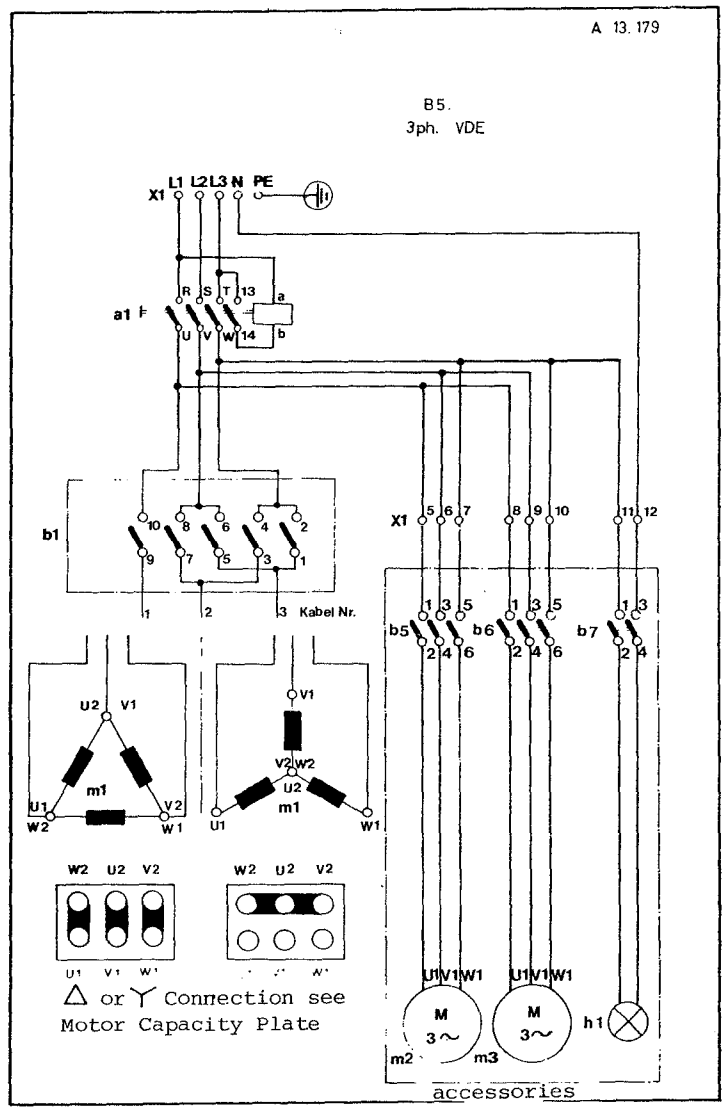
Note: the grounding wires are connected to the grounding strip.

VDE-Electric Version

Wiring diagram – single-phase



Wiring diagram – three-phase



II) Electrical Equipment VDE-Electric Version COMPACT 10

a1 Main and emergency-off switch with low-volt release (c1 - main relay)
b1 Main motor switch
k1 Condenser main motor (only single phase)
x1 Clamping strip
m1 Main motor
b5 Motor switch vertical unit
b6 Motor switch coolant pump
b7 Switch machine lamp
h1 Machine lamp
k2 Condenser vertical motor
k3 Condenser coolant pump
m2 Motor vertical unit
m3 Motor coolant pump

} Accessories

SINGLE-PHASE CONNECTION

X1 Clamping strip

Main motor

L1(1)	Phase R
N(2)	Neutral wire
PE	Grounding wire S1 (connected to grounding strip)

Vertical unit

3	Phase R (wire no. 1)
4	Phase S (wire no. 2)
5	Phase T (wire no. 3)
6	Condenser vertical unit
7	Condenser vertical unit

Coolant pump

8	Phase R
9	Neutral wire
10	

Machine lamp

11	Phase R
12	Neutral wire N

Note: the grounding wires are connected to the grounding strip.

THREE-PHASE CONNECTION

X1 Clamping strip

Main motor

L1(1)	Phase R
L2(2)	Phase S
L3(3)	Phase T
N(4)	Neutral wire N
PE	Grounding wire S1 (connected to grounding strip)

Vertical unit

5	Phase R (wire no. 1)
6	Phase S (wire no. 2)
7	Phase T (wire no. 3)

Coolant pump

8	Phase R
9	Phase S
10	Phase T

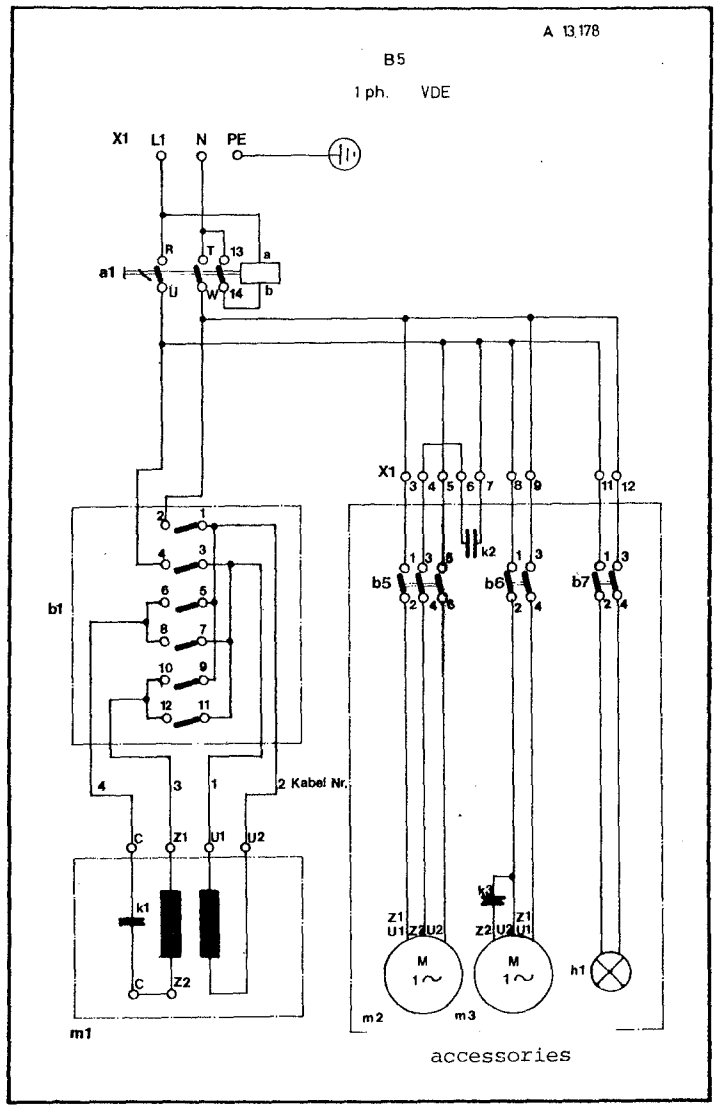
Machine lamp

11	Phase R
12	Neutral wire N

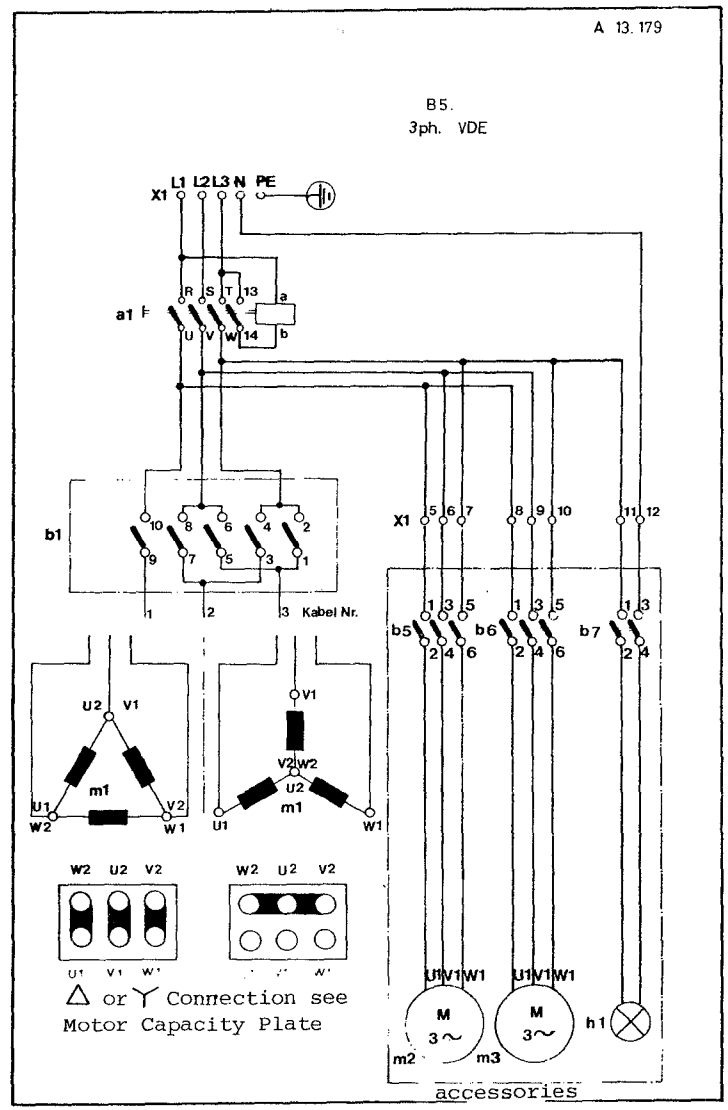
Note: the grounding wires are connected to the grounding strip.

VDE-Electric Version

Wiring diagram – single-phase

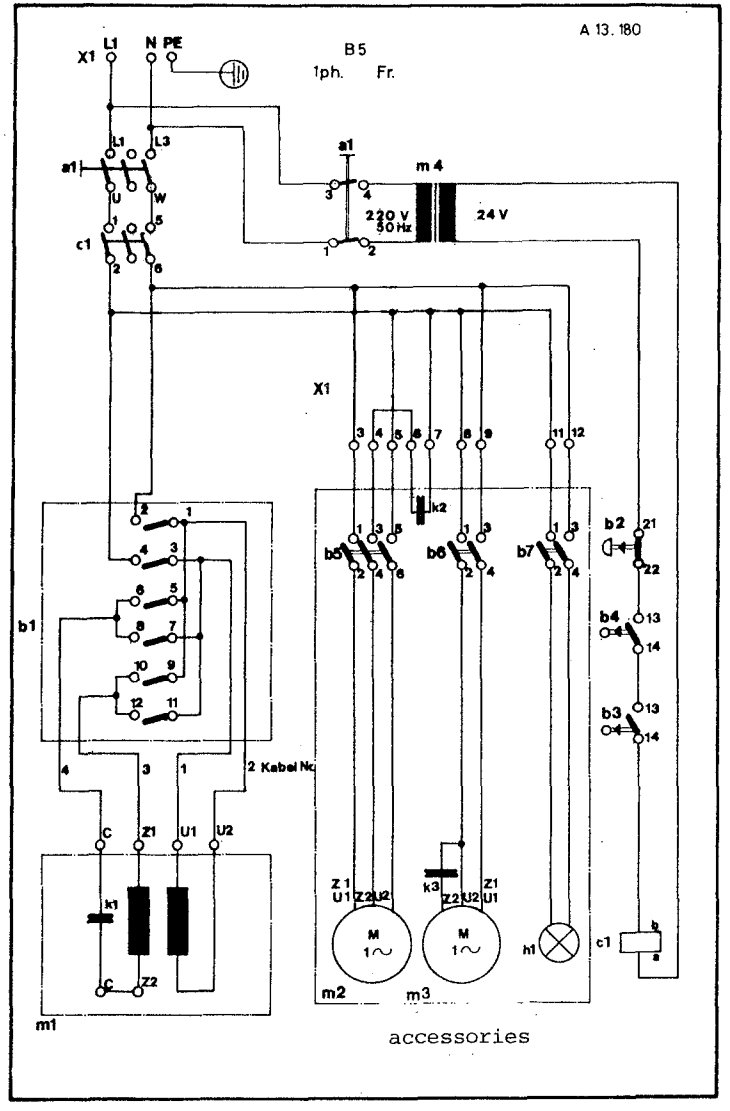


Wiring diagram – three-phase

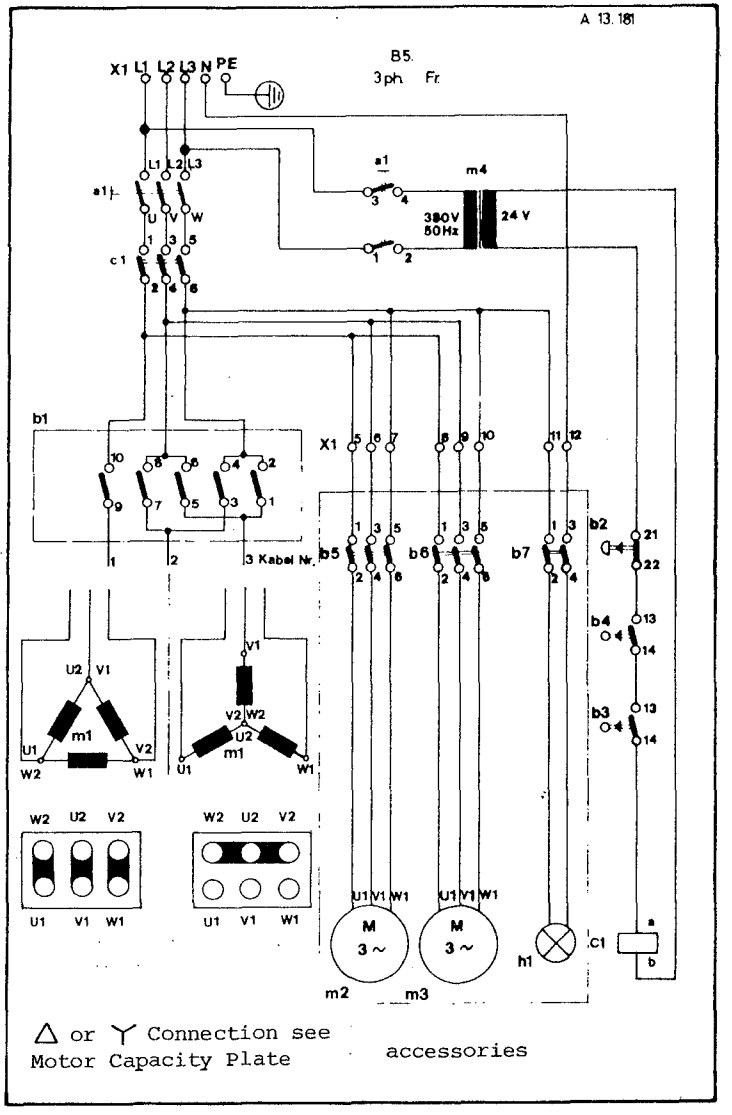


Special Safety Electric Version

Wiring diagram – single-phase



Wiring diagram – three-phase



III) Electrical Equipment Special Safety Electric Version COMPACT 10

a1 Main and emergency-off switch with low-volt release (c1 - main relay)

b1 Main motor switch

b2 Mushroom off switch

b3 Micro switch belt cover

b4 Micro switch chuck guard

k1 Condenser main motor (only single phase)

x1 Clamping strip

m1 Main motor

b5 Motor switch vertical unit

b6 Motor switch coolant pump

b7 Switch machine lamp

h1 Machine lamp

k2 Condenser vertical motor

k3 Condenser coolant pump

m2 Motor vertical unit

m3 Motor coolant pump

m4 Transformer

} Accessories

SINGLE-PHASE CONNECTION

X1 Clamping strip

Main motor

L1(1)	Phase R
N(2)	Neutral wire
PE	Grounding wire S1 (connected to grounding strip)

Vertical unit

3	Phase R (wire no. 1)
4	Phase S (wire no. 2)
5	Phase T (wire no. 3)
6	Condenser vertical unit
7	Condenser vertical unit

Coolant pump

8	Phase R
9	Neutral wire
10	

Machine lamp

11	Phase R
12	Neutral wire N

Note: the grounding wires are connected to the grounding strip.

THREE-PHASE CONNECTION

X1 Clamping strip

Main motor

L1(1)	Phase R
L2(2)	Phase S
L3(3)	Phase T
N(4)	Neutral wire N
PE	Grounding wire S1 (connected to grounding strip)

Vertical unit

5	Phase R (wire no. 1)
6	Phase S (wire no. 2)
7	Phase T (wire no. 3)

Coolant pump

8	Phase R
9	Phase S
10	Phase T

Machine lamp

11	Phase R
12	Neutral wire N

Note: the grounding wires are connected to the grounding strip.

Switching Scheme COMPACT 10

Main switch

a1		R U	S V	T W	13 14
0		—	—	—	—
		—	—	—	x
1		x	x	x	x

Main switch (only valid for A1318o + A13181)

a1		L1 U	L2 V	L3 W	1 2	3 4	5 6
0		—	—	—	—	—	—
		—	—	—	x	x	x
1		x	x	x	x	x	x

Motor switch single phase

b1	1 2	3 4	5 6	7 8	9 10	11 12
↓	x	x	x	—	—	x
0	—	—	—	—	—	—
↑	x	x	—	x	x	—

Motor switch three phase

b1	1 2	3 4	5 6	7 8	9 10
↓	x	—	—	x	x
0	—	—	—	—	—
↑	—	x	x	—	x