

Maskinsystem
Standard för val av
komponenter

Machine System
Standard for the Selection
of Components

Std 23-00

Version 5

Ändringslogg / Change log

Version	Logg	Log	Datum / Date
3	Nytt format Engelska och Svenska, ny layout	New format English and Swedish, new layout	2011-01-03
4	Nytt format + SMC ny pneumatikleverantör	New format + SMC new pneumatic supplier	2012-01-30
5	Nytt format + ABB Jokab Safety som ny säkerhetskomponent sleverantör	New format + ABB Jokab Safety as new safety component supplier	2012-11-27

Maskin Komponent Standard

För att uppnå och upprätthålla de mål som anges i SKF:s krav på tillverkningsprocesser och uppfylla kommersiella krav, är det nödvändigt att dessa normer används på samma sätt för all behörig personal.

Informationen i denna standard är "öppen" för komponentleverantörer, kopior får utfärdas till leverantörer.

En komponent standard är nödvändig för att säkerställa en hög tillförlitlighet och full utbytbarhet av reservdelar, enheter och maskiner.

Listorna för standarderna inkluderar hydraulik, pneumatik, kylvätska, smörjning, mekaniska och elektriska/elektroniska komponenter som kommer att uppdateras på begäran.

Begäran om ändringar måste skickas SKF:s gruppinköps kontor (GPO).

En arbetsgrupp som anordnas av GPO, som består av produktion, underhålls specialister, representanter från teknologiutveckling (GTD) och representant från GPO, kommer att inrättas och ansvara för uppdateringen.

Ett grupp avtal mellan SKF och leverantörerna listade som **systemleverantörer** i denna standard kommer att göras av GPO.

Om ett objekt är tillgängligt i **systemleverantörens** sortiment är detta alltid första valet för hela varugruppen (t.ex. Hydraulik). I andra hand är valet den specifika leverantör som angivits för en specifik komponent i de olika artikelgrupperna.

Tillverkarna som anges i listan är SKF:s standard och skall användas för design och inköp av nya maskiner och utrustning. När en ersättning tar plats på en befintlig maskin skall denna standard också användas.

När mer än en **systemleverantör** anges för samma komponent, skall varje fabrik/enhet sträva efter att använda endast en enda leverantör (lokal standardisering).

För att minska antalet och typer av komponenter på lager som reservdelar och därför kostnaderna för lagring, kan det vara bättre att ange en "överdimensionerad" komponent t.ex. pneumatisk cylinder, än optimera varje enskild komponent.

Machinery Component Standards

In order to achieve and maintain the objectives stated in SKF Requirements on manufacturing processes and to fulfill commercial requirements, it is necessary that these standards should be used in the same way by all authorized personnel.

The information in this standard is "open" to component suppliers, copies may be issued to suppliers.

A component standard is needed to assure a high reliability and full exchangeability of spares, units and machines.

The standard lists including hydraulic, pneumatic, coolant, lubrication, mechanical and electrical/electronic components will be updated upon demand.

Request for changes must be sent to Group Purchasing Office (GPO).

A working group organized by GPO, consisting of production, maintenance specialists, representatives from Group Technology Development (GTD) and representative from GPO, will be established and be responsible for the updating.

A Group Agreement between SKF and the suppliers listed as **System Suppliers** in this standard will be made by GPO.

If an item is available in the **System Supplier's** assortment this is always first choice for the whole commodity group (i.e. Hydraulics). Second choice is the specific supplier listed for a specific component in the different commodity groups.

The manufacturers indicated in the list are the SKF standard and shall be used for design and purchase of new machines / equipment. When a replacement takes place on a existing machine this standard shall also be used.

When more than one **System Supplier** is listed for the same component, each factory/unit should strive to use one only supplier (local standardization).

To reduce the number and types of components stocked as spare parts and therefore the storage costs, it may be better to specify an "over sized" component i.e. Pneumatic cylinder, than optimize each individual components.

1. Component list - Hydraulic

System Supplier:

- Bosch Rexroth
- Vickers

Italic style according to Swedish requirements

No	Component	Manufacturer	Std / Remarks
1	Steel pipes		DIN 2391 C
		- Bosch Rexroth - Vickers	4x1 6x1 8x1 10x1 12x1,5 15x1,5 18x1,5 22x1,5 28x1,5 35x1,5 42x1,5 For corrosive environment, use electroplated pipes.
2	Pipe couplings, compression type (another type may be chosen for increased pressure and vibration level.)		DIN 2353
		- Bosch Rexroth - Vickers - Parker/Ermeto	
3	Swivel couplings		
		- Bosch Rexroth - Vickers - Parker/Ermeto	
4	High-pressure hoses, rubber. Molded couplings		SAE 100R2A
		- Bosch Rexroth - Vickers - (Aeroquip) - (Dunlop) - (Parker)	
5	High-pressure hoses, polyamide Threaded couplings		DIN 20024
		- Bosch Rexroth - Vickers - (Tecalan)	
6	Filter washers (spindles)		
		- Bosch Rexroth - Vickers - Pall (Rigimesh)	
7	Measuring points		M16x2
		- Bosch Rexroth - Vickers - Hydrotechnik (Minimess)	

1. Component list - Hydraulic

System Supplier:

- **Bosch Rexroth**
- **Vickers**

Italic style according to Swedish requirements

No	Component	Manufacturer	Std / Remarks
8	Float switches		Electrical connection: ISO 4400 form A when applicable
		<ul style="list-style-type: none"> - Bosch Rexroth - Vickers - SKF Lubrication Solutions - Hemomatik 	
9	Cylinders		ISO 6020/1, /2, ISO 6022
		<ul style="list-style-type: none"> - Bosch Rexroth - Vickers - HEB - Parker 	
10	Locking cylinders		
		<ul style="list-style-type: none"> - Bosch Rexroth - Vickers - Hilma - Enerpac - De-sta-co - System 3R 	
11	Electrically-controlled directional valves 3/2, 4/2, 4/3		Electrical connection: ISO 4400 form A when applicable, ISO 4401 -03, -05
		<ul style="list-style-type: none"> - Bosch Rexroth - Vickers 	
12	Proportional electrically controlled directional valves 4/2, 4/3		Electrical connection: ISO 4400 form A when applicable, ISO 4401 -03, -05
		<ul style="list-style-type: none"> - Bosch Rexroth - Vickers - Moog 	(Not for SWE)
13	Manually controlled directional valves 4/2, 4/3		ISO 4401 -03
		<ul style="list-style-type: none"> - Bosch Rexroth - Vickers 	
14	Flow controls, pipe mounted		
		<ul style="list-style-type: none"> - Bosch Rexroth - Vickers - Parker - IFM 	
15	Flow controls		ISO 4401 -03
		<ul style="list-style-type: none"> - Bosch Rexroth - Vickers 	

1. Component list - Hydraulic

System Supplier:

- Bosch Rexroth
- Vickers

Italic style according to Swedish requirements

No	Component	Manufacturer	Std / Remarks
16	Flow controls, pressure compensated	- Bosch Rexroth - Vickers	
17	Proportional electrically controlled flow controls	- Bosch Rexroth - Vickers	Electrical connection: ISO 4400 form A when applicable
18	Pressure controls	- Bosch Rexroth - Vickers - Telemecanique	ISO 4401-03
19	Proportional electrically controlled pressure controls	- Bosch Rexroth - Vickers - Hydraulik Ring - Moog	Electrical connection: ISO 4400 form A when applicable, ISO 4401-03 (Not for SWE) (Not for SWE)
20	Check valves, pipe mounted	- Bosch Rexroth - Vickers - Ermeto	
21	Check valves	- Bosch Rexroth - Vickers	ISO 4401-03
22	Quick connectors	- Bosch Rexroth - Vickers - Tema - Cejn	
23	Multi quick connectors	- Bosch Rexroth - Vickers - Tema - Cejn - Stübli	

1. Component list - Hydraulic

System Supplier:

- **Bosch Rexroth**
- **Vickers**

Italic style according to Swedish requirements

No	Component	Manufacturer	Std / Remarks
24	Oil coolers	<ul style="list-style-type: none"> - Bosch Rexroth - Vickers - Alfa Laval - Oiltech 	
25	Pressure switches	<ul style="list-style-type: none"> - Bosch Rexroth - Vickers - Suco - CCS (Dual-Snap) - IFM - Herion 	Electrical connection: ISO 4400 form A when applicable
26	Pressure gauges	<ul style="list-style-type: none"> - Bosch Rexroth - Vickers - Wika - IFM 	(Not for SWE)
27	Thermometers	<ul style="list-style-type: none"> - Bosch Rexroth - Vickers - Wika 	
28	Thermostat valves	<ul style="list-style-type: none"> - Bosch Rexroth - Vickers - Danfoss 	
29	Pumps	<ul style="list-style-type: none"> - Bosch Rexroth - Vickers 	
30	Motors	<ul style="list-style-type: none"> - Bosch Rexroth - Vickers - HPI - Danfoss 	
31	Accumulators, bladder type	<ul style="list-style-type: none"> - Bosch Rexroth - Vickers - Hydac - Bosch Rexroth 	

1. Component list - Hydraulic

System Supplier:

- **Bosch Rexroth**
- **Vickers**

Italic style according to Swedish requirements

No	Component	Manufacturer	Std / Remarks
32	High-pressure boosters	<ul style="list-style-type: none"> - Bosch Rexroth - Vickers - Hydraulik Ring - Hilma 	
33	Filters, pressure drop indicators	<ul style="list-style-type: none"> - Bosch Rexroth - Vickers - Pall - Hydac 	Electrical connection: ISO 4400 form A when applicable
34	Filter inserts (slides, spindles)	<ul style="list-style-type: none"> - Bosch Rexroth - Vickers - Pall - Hydac 	
35	Power packs	<ul style="list-style-type: none"> - Bosch Rexroth - Vickers 	
36	Mini power packs	<ul style="list-style-type: none"> - Bosch Rexroth - Vickers - HPI 	max 0,01m3

2. Component list - Pneumatic

System Supplier:

- Festo
- Bosch Rexroth
- SMC

Italic style according to Swedish requirements

No	Component	Manufacturer/Std	Remarks
1	Steel pipes		DIN 2391 C 4x1 6x1 8x1 10x1 12x1,5 15x1,5 18x1,5 22x1,5 28x1,5 35x1,5 42x1,5 For corrosive environment, use electroplated pipes.
		- Festo - Bosch Rexroth - SMC	
2	Plastic pipes <0,8MPa		Polyurethane 6x1 8x1,25 10x1,5
		- Festo - Bosch Rexroth - SMC	
3	Low-pressure hoses		
		- Festo - Bosch Rexroth - SMC - Parker - Trelleborg	
4	Pipe couplings, compression type		DIN 2353
		- Festo - Bosch Rexroth - SMC - Parker/Ermeto	
5	Swivel couplings		
		- Festo - Bosch Rexroth - SMC - Parker/Ermeto - Legris	
6	High-pressure hoses, rubber. Moulded couplings		SAE 100R2A
		- Festo - Bosch Rexroth - SMC - (Aeroquip) - (Dunlop) - (Parker)	

2. Component list - Pneumatic

System Supplier:

- Festo
- Bosch Rexroth
- SMC

Italic style according to Swedish requirements

No	Component	Manufacturer/Std	Remarks
7	High-pressure hoses, polyamide 11. Threaded couplings		DIN 20024
		<ul style="list-style-type: none"> - Festo - Bosch Rexroth - SMC - (Tecalán) 	
8	Filter washers (spindels)		
		<ul style="list-style-type: none"> - Festo - Bosch Rexroth - SMC - Pall (Rigimesh) 	
9	Measuring points		M16 x 2
		<ul style="list-style-type: none"> - Festo - Bosch Rexroth - SMC - Hydrotechnik (Minimes) 	
10	Nozzles		
		<ul style="list-style-type: none"> - Festo - Bosch Rexroth - SMC - Silvent - Spraying Co 	
11	Flexible nozzles		
		<ul style="list-style-type: none"> - Festo - Bosch Rexroth - SMC - Lechler - Snap-loc - Loc-line 	
12	Pipe couplings, plastic piping type		
		<ul style="list-style-type: none"> - Festo - Bosch Rexroth - SMC - Lechler - Legris 	

2. Component list - Pneumatic

System Supplier:

- Festo
- Bosch Rexroth
- SMC

Italic style according to Swedish requirements

No	Component	Manufacturer/Std	Remarks
13	Motors	<ul style="list-style-type: none"> - Festo - Bosch Rexroth - SMC - BIAx - Parker/Atlas Copco 	
14	Cylinders	<ul style="list-style-type: none"> - Festo - Bosch Rexroth - SMC 	ISO 6431, VDMA 24562, ISO 6432
15	Locking cylinders	<ul style="list-style-type: none"> - Festo - Bosch Rexroth - SMC - De-sta-co - System 3R 	
16	Rotating actuator	<ul style="list-style-type: none"> - Festo - Bosch Rexroth - SMC 	
17	Bellows cylinders	<ul style="list-style-type: none"> - Festo - Bosch Rexroth - SMC 	
18	Electrically controlled directional valves, 5/2	<ul style="list-style-type: none"> - Festo - Bosch Rexroth - SMC 	ISO 5599/1, /2, /3, Electrical connection: ISO 4400 form A
19	Electrically controlled directional valves, 3/2, 2/2	<ul style="list-style-type: none"> - Festo - Bosch Rexroth - SMC 	Use system supplier only Electrical connection: ISO 4400 form A

2. Component list - Pneumatic

System Supplier:

- Festo
- Bosch Rexroth
- SMC

Italic style according to Swedish requirements

No	Component	Manufacturer/Std	Remarks
20	Flow controls		
		- Festo - Bosch Rexroth - SMC	
21	Pressure controls		
		- Festo - Bosch Rexroth - SMC	
22	Pressure controls		ISO 5599/1
		- Festo - Bosch Rexroth - SMC	
23	Lubricators, Micro-fog		
		- Festo - Bosch Rexroth - SMC	
24	Air filter		
		- Festo - Bosch Rexroth - SMC	
25	Proportional electrically controlled pressure controls		Electrical connection: ISO 4400 form A
		- Festo - Bosch Rexroth - SMC - Honeywell/Lucifer	(Not for SWE)
26	Pressure gauges		
		- Festo - Bosch Rexroth - SMC - IFM	
27	Vacuum pumps		
		- Festo - Bosch Rexroth - SMC - Sommer - PIAB	

2. Component list - Pneumatic

System Supplier:

- Festo
- Bosch Rexroth
- SMC

Italic style according to Swedish requirements

No	Component	Manufacturer/Std	Remarks
28	Pressure boosters, air in - air out	- Festo - Bosch Rexroth - SMC - SMC	
29	Pressure boosters, air in - liquid out	- Festo - Bosch Rexroth - SMC	
30	Filter silencers	- Festo - Bosch Rexroth - SMC - Silvent/Opus	
31	Silencers	- Festo - Bosch Rexroth - SMC - Porsilent	
32	Check valves	- Festo - Bosch Rexroth - SMC - Parker/Ermeto	
33	Quick connectors	- Festo - Bosch Rexroth - SMC - Cejn - Tema	
34	Multi quick connectors	- Festo - Bosch Rexroth - SMC - Cejn - Stübli - Legris - Harting	

2. Component list - Pneumatic

System Supplier:

- Festo
- Bosch Rexroth
- SMC

Italic style according to Swedish requirements

No	Component	Manufacturer/Std	Remarks
35	Manual shut-off valves	<ul style="list-style-type: none"> - Festo - Bosch Rexroth - SMC - Legris 	
36	Cleaning gun	<ul style="list-style-type: none"> - Festo - Bosch Rexroth - SMC - Tema 	Green
37	Pressure switches	<ul style="list-style-type: none"> - Festo - Bosch Rexroth - SMC - Siemens - Telemecanique 	Electrical connection: ISO 4400 form A when applicable
38	Flow switches	<ul style="list-style-type: none"> - Festo - Bosch Rexroth - SMC - Honsberg 	

3. Component list - Coolant Equipment

System Supplier:

- Open/None

Italic style according to Swedish requirements

No	Component	Manufacturer/Std	Remarks
1	Steel pipes		DIN 2391 C 4x1 6x1 8x1 10x1 12x1,5 15x1,5 18x1,5 22x1,5 28x1,5 35x1,5 42x1,5 For corrosive environment use electroplated pipes.
2	Swivel couplings	- Deublin - Parker/Ermeto	
3	Pipe couplings, compression type		DIN 2353
		- Parker/Ermeto	
4	High-pressure hoses, rubber Moulded couplings		SAE 100R2A
		- (Aeroquip) - (Dunlop) - (Parker)	
5	High-pressure hoses, polyamide Threaded couplings		DIN 20024
		- (Tecalan)	
6	Float switches		Electrical connection: ISO 4400 form A when applicable
		- SKF Lubrication Solutions - Hemomatik	
7	Plastic pipes <0,8MPa		6x1 8x1,25 10x1,5
		- Polyurethane	
8	Low-pressure hoses		
		- Bosch Rexroth - Parker - Trelleborg	
9	Flexible nozzles		
		- Snap-loc - Loc-line	
10	Pumps		
		- Grundfos - Desmi	

3. Component list - Coolant Equipment

System Supplier:

- Open/None

Italic style according to Swedish requirements

No	Component	Manufacturer/Std	Remarks
11	Filters	- Pall - Cuno	
12	Nozzles	- Lechler - Spraying Co - Delavan	
13	Cleaning gun	- Cejn	Blue
14	Multi quick connectors	- Cejn - Stöubli - Legris	
15	Quick connectors, G 3/4 - G1 1/2	- Ever-Tite - Walter Praezision	
16	Quick connectors	- KTR - Tema - Cejn	
17	Electro-pneum. controlled valves, 2/2. Butterfly valve range	- Gemü	Electrical connection: ISO 4400 form A
18	Electrically controlled valves, 2/2	- Elso - Gemü - Danfoss	Electrical connection: ISO 4400 form A
19	Manual shut-off valves	- Ballofix - Parker/Ermeto - Tour & Andersson	

3. Component list - Coolant Equipment

System Supplier:

- Open/None

*Italic style according to
Swedish requirements*

No	Component	Manufacturer/Std	Remarks
20	Pressure switches		Electrical connection: ISO 4400 form A, when applicable - Viton membran
		- Suco - Schneider/Telemecanique - Herion	
21	Flow switches		
		- IFM - Eletta	

4. Component list - Lubrication Equipment

System Supplier:

- SKF Lubrication
Solution

*Italic style according to
Swedish requirements*

No	Component	Manufacturer/Std	Remarks
1	Steel pipes		DIN 2391 C 4x1 6x1 8x1 10x1 12x1,5 15x1,5 18x1,5 22x1,5 28x1,5 35x1,5 42x1,5. For corrosive environment use electroplated pipes.
		- SKF Lubrication Solution	
2	Swivel couplings		
		- SKF Lubrication Solution - Parker/Ermeto	
3	Pipe couplings, compression type		DIN 2353
		- SKF Lubrication Solution - Parker/Ermeto	
4	High-pressure hoses, rubber Moulded couplings		SAE 100R2A
		- SKF Lubrication Solution - (Aeroquip) - (Dunlop) - (Parker)	
5	High-pressure hoses, polyamide Threaded couplings		DIN 20024
		- SKF Lubrication Solution - (Tecalan)	
6	Plastic pipes <7MPa		Polyamide 11 4x1 6x1.4
		- SKF Lubrication Solution	
7	Pumps		
		- SKF Lubrication Solution - Tecalemit - Tekawe	
8	Components		
		- SKF Lubrication Solution - Tecalemit - Tekawe	
9	Lubricators, Micro-fog		
		- SKF Lubrication Solution - Bosch Rexroth - Festo	
10	Float switches		Electrical connection: ISO 4400 form A when applicable
		- SKF Lubrication Solution - Tecalemit - Tekawe	

5. Component list - Mechanical Equipment

System supplier:

- SKF

*Italic style according to
Swedish requirements*

No	Component	Manufacturer/Std	Remarks
1	Dampers (industrial dampers)	- SKF - Endine - ACE	
2	Dampers (rubber dampers, vibration dampers)	- SKF - Freudenberg - Dunlop	
3	Gas-filled cylinders	- SKF - Camloc	
4	Bearings (deep-groove and roller) (thrust and needle)	- SKF - NA	
5	Plain bearings (metal)	- SKF - Johnsson	
6	Plain bearings (Glycodur type)	- SKF - Glacier	
7	Spherical plane bearings	- SKF	
8	Linear bearings (linear ball bearings) (linear guides) (rail guides)	- SKF - Schneberger - F÷hrenbach - Bosch Rexroth	
9	Ball screws (ground high- precision)	- SKF - Steinmeyer GMBH	

5. Component list - Mechanical Equipment

System supplier:

- SKF

*Italic style according to
Swedish requirements*

No	Component	Manufacturer/Std	Remarks
10	Ball screws (normal precision)	- SKF	
11	Roller screws (rolled)	- SKF - INA - Bosch Rexroth	
12	Locknuts (precisions nuts)	- SKF - Kuso	
13	Locknuts (low-precisions nuts)	- SKF - Fine-U-nut (Technos)	
14	Friction joint (for shafts)	- SKF - Bengtsson Maskin AB	SH ETP
15	Shaft couplings (precision)	- SKF - Jakob - Gerwah	
16	Shaft couplings (elastic and rigid)	- SKF - Benzler - Baeuerler	
17	Shaft couplings (elastic and rigid)	- SKF - Löbro - Nordisk Kardan - EIE	
18	Joints (ball and angular joints)	- SKF - EIE - Bühler	
19	Linear units (for motor operation)	- SKF - Wiesel	

5. Component list - Mechanical Equipment

System supplier:

- SKF

*Italic style according to
Swedish requirements*

No	Component	Manufacturer/Std	Remarks
20	Mechanical jacks	<ul style="list-style-type: none"> - SKF - Benzler - NEFF GmbH - Uni-Push 	
21	Conveyor systems (chain link)	<ul style="list-style-type: none"> - SKF - Flexlink - Carryline - Montech 	
22	Conveyor systems (vibration system)	<ul style="list-style-type: none"> - SKF - Flexlink - DETAB - Podmores 	
23	Spindles	<ul style="list-style-type: none"> - SKF - LMT - GMN - Weiss 	
24	V.belts (rubber material) (SPZ, SPA, SPB, SPC)	<ul style="list-style-type: none"> - SKF - Gates - Optibelt - Good Year 	
25	Toothed belt (PUR material)	<ul style="list-style-type: none"> - SKF - Syncroflex - Optibelt - Megadyne 	
26	Toothed belt (rubber material) (Polygrip GT & HTD)	<ul style="list-style-type: none"> - SKF - Gates - Optibelt 	
27	Poly-V belts (PUR) (J,L,M)	<ul style="list-style-type: none"> - SKF - Megadyne - Gates - Optibelt 	

5. Component list - Mechanical Equipment

System supplier:

- SKF

*Italic style according to
Swedish requirements*

No	Component	Manufacturer/Std	Remarks
28	Micro-V belts (rubber) (PJ,PL,PM)		
		- SKF - Gates - Optibelt	
29	Polyflex belts (PUR) (single and paired JB)		
		- SKF - Gates	
30	Gears (toothed & worm) (planetary & herring bone)		
		- SKF - Benzler - SEW	
31	Gears (cykloidal) reduct. & automat.)		
		- SKF - Harmonic Drive - Akim	
32	Balancing equipment (mechanical)		
		- SKF - SBS Balance System - Dittel - GT Electronica	
33	Gap eliminators (grinding & dressing contact)		
		- SKF - SBS Balance System - Dittel	
34	Dimensional measurement (contact)		
		- SKF - Marposs - Control Gauge - Renishaw	
35	Dimensional measurement (no contact)		
		Open, no standard	

5. Component list - Mechanical Equipment

System supplier:

- SKF

*Italic style according to
Swedish requirements*

No	Component	Manufacturer/Std	Remarks
36	Length measuring sensors (LVDT) (air or spring pressure)	- SKF - Feinprüf - Marposs - Tesa	
37	Length measuring sensors (half-bridge) (air or spring pressure)	- SKF - Feinprüf - Marposs - Tesa	
38	Clamping chucks (pneum.clamping)	- SKF - Röhm - Bicchi - Hainbuch	
39	Seals (O-rings, piston seals, wipers)	- SKF - Simrit - CR - Shamban	
40	Profile building systems (safety cages etc.)	- SKF - Flexlink - Item - Bosch Rexroth	
41	Suspension systems (for terminals, system 80)	- SKF - Rose - Rittal - Haseke	
42	Ventilation system Oil-mist extractors	- SKF - Absolent	

5. Component list - Mechanical Equipment

System supplier:

- SKF

*Italic style according to
Swedish requirements*

No	Component	Manufacturer/Std	Remarks
43	Cable conduits	- SKF - Igus - Kabe Schlepp	
44	Quick grippers (manual)	- SKF - De-sta-co - Rako - Halder	
45	Machine shoes	- SKF - Air-lock - Biltz	
46	Light (sealed)	- SKF - Waldmann	
47	Gas valves	- SKF - Kromschröder	

6. Component list - Electrical Equipment

System Supplier:

- Siemens
- Schneider/Telemecanique

Italic style according to Swedish requirements

No	Component	Manufacturer/Std	Remarks
1	Main circuit breakers		<i>(Schneider/Telemecanique not for SWE)</i>
		<ul style="list-style-type: none"> - Siemens - Schneider/Telemecanique - Klöchner Möller 	
2	Main control switches		
		<ul style="list-style-type: none"> - Siemens - Schneider/Telemecanique - Klöchner Möller - Kraus & Naimer 	
3	Limit switches, mechanical switches		
		<ul style="list-style-type: none"> - Siemens - Schneider/Telemecanique 	
4	Safety switches		
		<ul style="list-style-type: none"> - Siemens - Schneider/Telemecanique - Euchner - Schmersal - ABB Jokab Safety 	
5	Multiple limit switches		
		<ul style="list-style-type: none"> - Siemens - Schneider/Telemecanique - Balluff 	
6	Micro switches		
		<ul style="list-style-type: none"> - Siemens - Schneider/Telemecanique - Balluff 	
7	Encoders and linear scales		
		<ul style="list-style-type: none"> - Siemens - Schneider/Telemecanique - Litton - Heidenhain - Sony 	<i>Not for SWE</i>

6. Component list - Electrical Equipment

System Supplier:

- Siemens
- Schneider/Telemecanique

Italic style according to Swedish requirements

No	Component	Manufacturer/Std	Remarks
8 Inductive proximity switches			
		<ul style="list-style-type: none"> - Siemens - Schneider/Telemecanique - Pepperl&Fuchs - Balluff - Turck - IFM 	Plug connection, PUR - cable and 3 wire. <i>Not for SWE</i>
9 Cable, connectors for proximity switches			
		<ul style="list-style-type: none"> - Siemens - Schneider/Telemecanique - Lumberg - Murrelektronik 	
10 Panel switches and pushbuttons			
		<ul style="list-style-type: none"> - Siemens - Schneider/Telemecanique - Kraus & Naimer - Cema - Olten - Schneider/Telemecanique 	diam.= 22,5
10a Sensor box			
		<ul style="list-style-type: none"> - Siemens - Schneider/Telemecanique - Lumberg 	
11 Indicator lights			
		<ul style="list-style-type: none"> - Siemens - Schneider/Telemecanique - Cema - Olten - Rafi - Sirena 	diam. = 22,5. <i>Not for SWE</i> <i>Not for SWE</i> <i>Not for SWE</i>
12 Control relays			
		<ul style="list-style-type: none"> - Siemens - Schneider/Telemecanique - Finder - Weidmüller 	

6. Component list - Electrical Equipment

System Supplier:

- Siemens
- Schneider/
Telemecanique

*Italic style according to
Swedish requirements*

No	Component	Manufacturer/Std	Remarks
13	Safety relays	<ul style="list-style-type: none"> - Siemens - Schneider/Telemecanique - Pilz - ABB Jokab Safety 	
14	Phase control relays	<ul style="list-style-type: none"> - Siemens - Schneider/Telemecanique - Dold - Crouzet 	<i>Not for SWE</i>
15	Time relays	<ul style="list-style-type: none"> - Siemens - Schneider/Telemecanique - Finder 	
16	Time counters	<ul style="list-style-type: none"> - Siemens - Schneider/Telemecanique 	
17	Photo-cells	<ul style="list-style-type: none"> - Siemens - Schneider/Telemecanique - Celet - IFM 	
18	Impulse counters	<ul style="list-style-type: none"> - Siemens - Schneider/Telemecanique - Hengstler - Sodeco 	
19	Contactors	<ul style="list-style-type: none"> - Siemens - Schneider/Telemecanique 	
20	Thermistor motor protection units	<ul style="list-style-type: none"> - Siemens - Schneider/Telemecanique 	
21	Star-delta starters	<ul style="list-style-type: none"> - Siemens - Schneider/Telemecanique 	

6. Component list - Electrical Equipment

System Supplier:

- Siemens
- Schneider/
Telemecanique

*Italic style according to
Swedish requirements*

No	Component	Manufacturer/Std	Remarks
22	Motors AC		Observe vibration level demands.
		<ul style="list-style-type: none"> - Siemens - Schneider/Telemecanique - ATB Bauknecht - Schorch - ABB - SEW 	
23	Motors with worm gears		
		<ul style="list-style-type: none"> - Siemens - Schneider/Telemecanique - Groschopp & el Co - Zürrer - SEW - Bonfiglioli 	
24	AC servo and spindle motors		
		<ul style="list-style-type: none"> - Siemens - Schneider/Telemecanique - Indramat - GMN - SKF 	
25	Step motors		
		<ul style="list-style-type: none"> - Siemens - Schneider/Telemecanique - Berger/Lahr - Warner Electric 	
26	Tachometer generators		
		<ul style="list-style-type: none"> - Siemens - Schneider/Telemecanique - Hubner 	
27	HF-converters		
		<ul style="list-style-type: none"> - Siemens - Schneider/Telemecanique - Acomel - Refu - Control Technique 	
28	Frequency converters		
		<ul style="list-style-type: none"> - Siemens - Schneider/Telemecanique - Danfoss - Lust - Control Technique - SKF 	

6. Component list - Electrical Equipment

System Supplier:

- Siemens
- Schneider/Telemecanique

Italic style according to Swedish requirements

No	Component	Manufacturer/Std	Remarks
29	Soft starters	<ul style="list-style-type: none"> - Siemens - Schneider/Telemecanique - Lust 	
30	DC Motor brakes	<ul style="list-style-type: none"> - Siemens - Schneider/Telemecanique - Dold - Hilger & Kern 	
31	Panel meters	<ul style="list-style-type: none"> - Siemens - Schneider/Telemecanique - Cewe - Gossen 	
32	Flexible conduits	<ul style="list-style-type: none"> - Siemens - Schneider/Telemecanique - Lapp - Helu - Anaconda - Flexa - PMA Electro AG Schweiz - Treotham 	
33	Fuse switch disconnectors	<ul style="list-style-type: none"> - Siemens - Schneider/Telemecanique 	
34	Mini circuit breakers	<ul style="list-style-type: none"> - Siemens - Schneider/Telemecanique 	
35	Connectors	<ul style="list-style-type: none"> - Siemens - Schneider/Telemecanique - Amphenol - Cannon - Harting - Contact - AMP - Tuchel - Lemo - Ilme 	

6. Component list - Electrical Equipment

System Supplier:

- Siemens
- Schneider/Telemecanique

Italic style according to Swedish requirements

No	Component	Manufacturer/Std	Remarks
36	Terminal adapters	<ul style="list-style-type: none"> - Siemens - Schneider/Telemecanique - Wieland - Weidmüller 	
37	Heat exchangers and air conditioners	<ul style="list-style-type: none"> - Siemens - Schneider/Telemecanique - Häwa - Rittal - Cosmot 	
37a	Air Conditioners	<ul style="list-style-type: none"> - Siemens - Schneider/Telemecanique - Rittal 	
38	Terminal blocks	<ul style="list-style-type: none"> - Siemens - Schneider/Telemecanique - Weidmüller 	
39	Control systems PLC	<ul style="list-style-type: none"> - Siemens - Schneider/Telemecanique - Siemens S7 	
40	Numeric controller CNC	<ul style="list-style-type: none"> - Siemens - Schneider/Telemecanique - Siemens 840D - Fanuc 	
41	Electrical temperature controller	<ul style="list-style-type: none"> - Siemens - Schneider/Telemecanique - Hartmann & Braun - Gräf - Omron 	