

Instruction Manual

Ws+ Pump

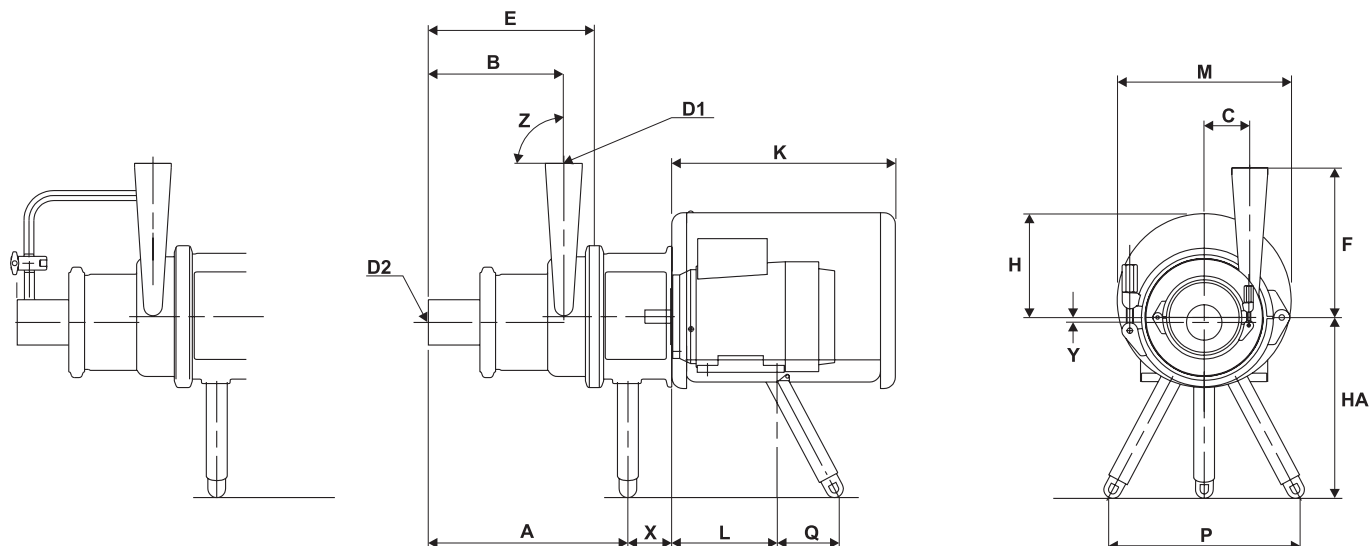
Spare Parts List



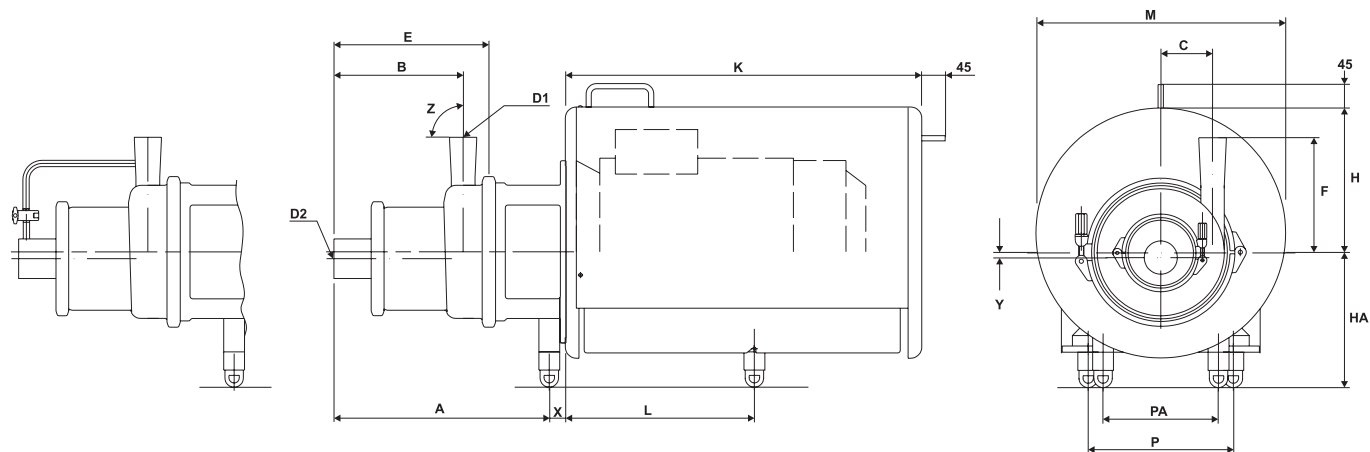
7. Pumpens mål og vægt / Pump dimensions and weights

Ws+

TG.1
Motor 90S - 132M



TG.2
Motor 160M-180L



Tolerances:	B, +0 mm	F +5 mm	D1, D2 Nominal	Z 90° ± 1.5°	K ± 5 mm	Others ± 2 mm
Tolerancer:	-5 mm	-0 mm	Norminel			Andre

7. Pumpens mål og vægt / Pump dimensions and weights

Ws+

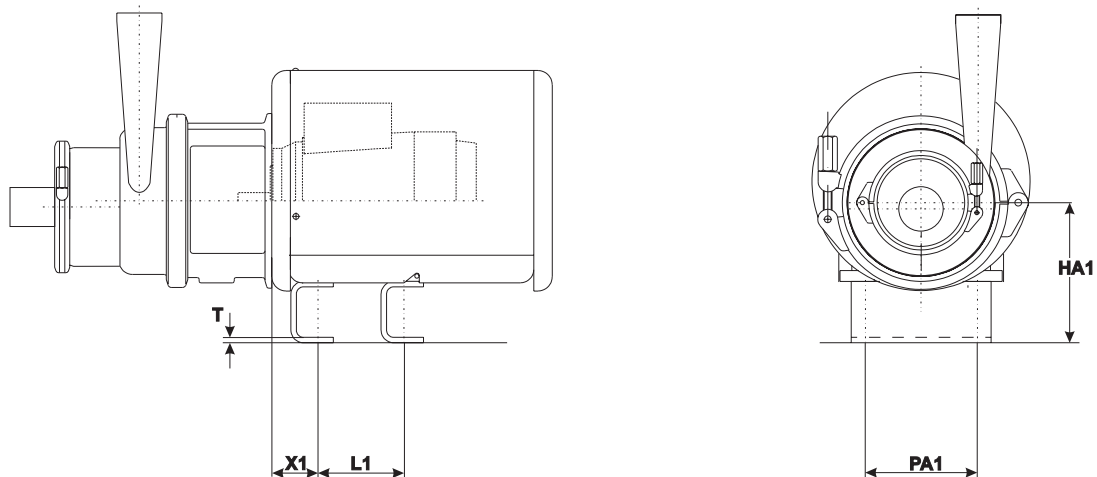
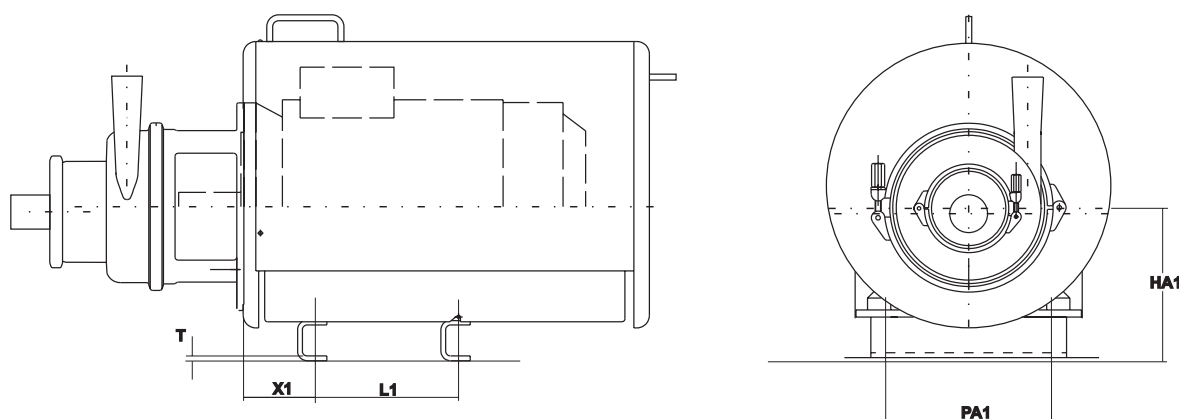
Mål / Dimension

	Ws+20/15					Ws+30/30					Ws+44/50					
	Motor															
	90S	90L	100L	112M	132S	100L	112M	132S	160M	160L	132S	160M	160L	180M	180L	
A	280					271				259		354	404		405	
B	190					193					248.5					
C	66					83					100					
D1	51					51					51					
D2	63.5					63.5					76					
E	228					231					297					
F	215					230					220					
Y	8					10					13					
H	138	138	181.5	212	193	181.5	212	193	255	255	193	255	255	277	277	
HA	260	260	260	260	260	260	260	260	260	260	260	260	260	305	305	
K	321	321	394	482	482	394	482	482	588	588	482	588	588	688	688	
L	156	181	230	210	252	203	210	252	318	362	252	318	318	362	362	
M	250	250	305	360	360	305	360	360	450	450	360	450	450	480	480	
P	276	276	276	276	276	276	276	276	254	254	276	254	254	279	279	
PA	-	-	-	-	-	-	-	-	-	-	-	222	222	222	222	
Q	84	84	79	72	62	79	72	62	-	-	-	-	-	-	-	
X	62	62	62	62	62	56	56	56	43	43	39	43	43	43	43	
Z	90°															

Egenvægt, kg. / Net weight, kg.

Motor	90S,L	90LB	100L	100LB	112M	112MB	132S;M	132SC		160L	160LB	180M	180LB
kW@50Hz	1,5; 2,2	2,7	3	4	4	5,5	5,5 ; 7,5	11	11 ; 15	18,5	22	22	30
kW@60Hz	1,7; 2,5	3,1	3,5	4,6	4,6	6,3	6,3 ; 8,6	12,7	12,7 ; 17,2	21,3	25,3	25,3	34,5
Pump type													
Ws+20/15	37,4	42,9	50,4	51,1	56,7	58,4	73,2	84,2	-	-	-	-	-
Ws+30/30	-	-	56,5	57,2	62,8	64,5	83,4	94,4	119,9	130,9	135,9	-	-
Ws+44/50	-	-	-	-	-	-	92,7	103,7	133,9	144,9	151,1	173,4	190,4

7. Pumpens mål og vægt / Pump dimensions and weights

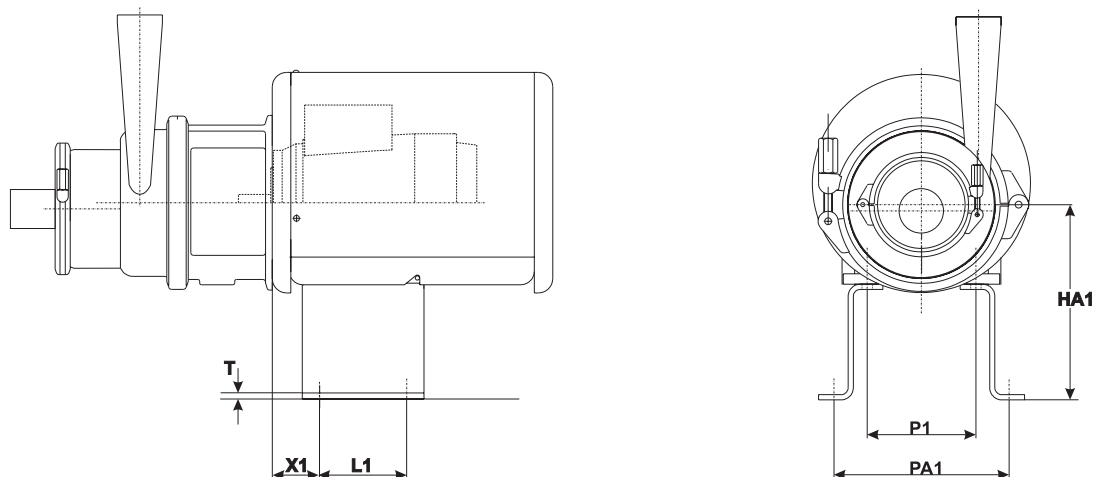
Ws+
Motor 90-132M type A

Motor 160M - 180L type A

Med konsol type A
With bracket type A
Motor 90 - 180L

	90S	90L	100L	112M	132S	160M	160L	180M	180L
X1	56	56	63	70	112	108	108	121	121
L1	100	125	140	140	140	210	254	241	279
PA1	140	140	160	190	216	254	254	279	279
T	6	6	6	6	6	6	6	6	6
HA1	170	170	180	192	212	240	240	260	260

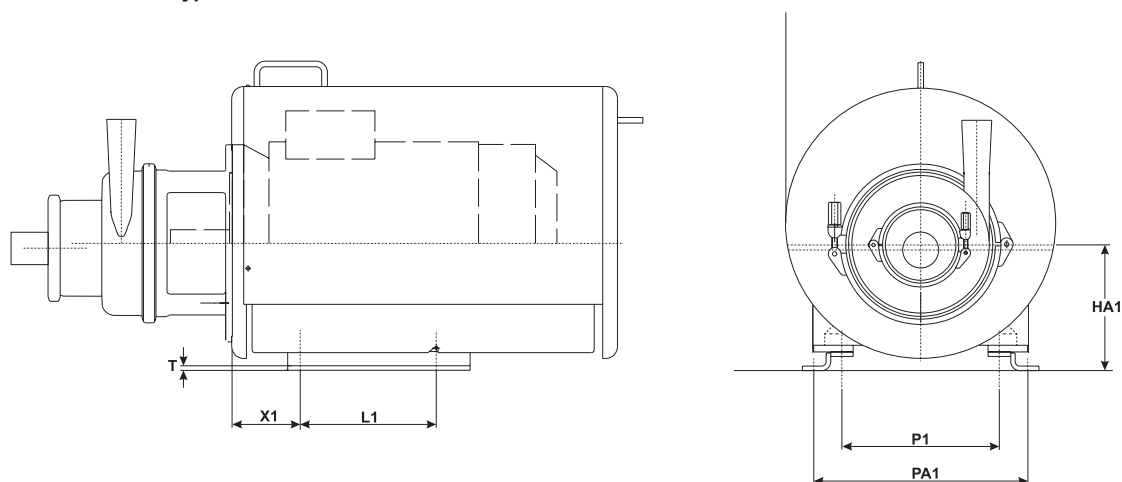
7. Pumpens mål og vægt / Pump dimensions and weights

Ws+

Motor 90 - 132M type B



Motor 160M - 180L type B

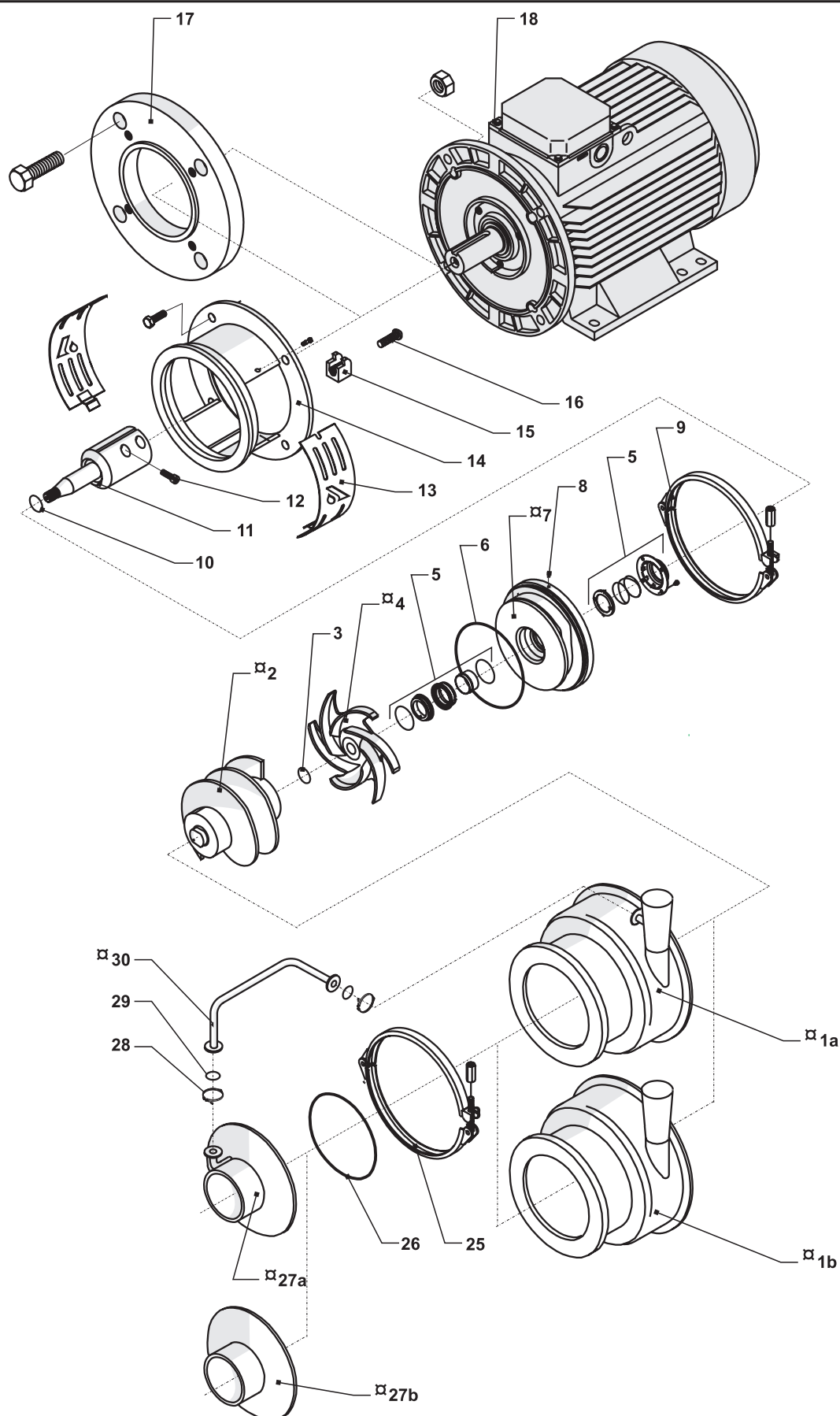


Med konsol type B With bracket type B Motor 90 - 180L

	90S	90L	100L	112M	132S	132M	160M	160L	180M	180L
X1	56	56	63	70	112	112	108	108	121	121
L1	125	125	140	140	178	178	254	254	279	279
P1	140	140	160	190	216	216	254	254	279	279
PA1	216	216	236	266	292	292		358		379
T	6	6	6	6	6	6	6	6	6	6
HA1	225	225	225	225	225	225	225	225	225	225

7. Pumpe komplet / Pump complete

Standard Ws+



7. Pumpe komplet / Pump complete

Standard Ws+

				Pumpe type / Pump type					
				Standard					
				Ws+20/15	Ws+30/30	Ws+44/50	Ws+20/15	Ws+30/30	Ws+44/50
Pos	Stk/Qty	Benævnelse	Description	Del nr. / Part No.					
α 1a	1	Pumpehus	Pump housing	L804656	L804657	L804658	L804669	L804670	L804671
α 1b	1	Pumpehus	Pump housing	L182849	L182847	L182848	L182857	L182858	L182859
α 2	1	Luft skrue	Air screw	L804663	L804664	L804662	L804675	L804676	L804677
3	1	O-ring	O-Ring	s/p40	s/p40	s/p40	s/p40	s/p40	s/p40
α 4	1	Løbehjul	Impeller	s/p36	s/p36	s/p36	s/p36	s/p36	s/p36
5	1	Akseltætning	Shaft seal	s/p37	s/p37	s/p37	s/p37	s/p37	s/p37
6	1	O-ring	O-ring	s/p40	s/p40	s/p40	s/p40	s/p40	s/p40
α 7	1	Bagflange	Back plate	L261566**	L260935	L260940	L260948**	L260950	L260954
8	1	Stift	Pin	---	L772493	L772493	---	L772493	L772493
9	1	Clampring	Clamp ring	L188430	L188436	L188432	L188430	L188436	L188432
10	1	O-ring EPDM FPM (Viton)	O-ring EPDM FPM (Viton)						
11	1	Aksel	Shaft	s/p41	s/p41	s/p41	s/p41	s/p41	s/p41
12	2	Skrue	Screw	s/p41	s/p41	s/p41	s/p41	s/p41	s/p41
13	2	Afdækning	Shaft guard	s/p42-43	s/p42-43	s/p42-43	s/p42-43	s/p42-43	s/p42-43
14	1	Mellemflange	Extension frame	s/p42-43	s/p42-43	s/p42-43	s/p42-43	s/p42-43	s/p42-43
15	2	Beslag (Skrue)	Bracket (Screw)	---	L268499	L268499	---	L268499	L268499
16	2	Skrue	Screw	---	L701942	L701942	---	L701942	L701942
17	1	Skive	Spacer flange	s/p42	s/p42	s/p42	s/p42	s/p42	s/p42
18	1	Motor	Motor	---	---	---	---	---	---
α 25	1	Clampring	Clamp ring	L169050	L188430	L804665	L169050	L188430	L804665
26	1	O-ring	O-ring	s/p40	s/p40	s/p40	s/p40	s/p40	s/p40
27a	1	Frontdæksel	Front cover	L804659	L804660	L804661	L804672	L804673	L804674
α 27b	1	Frontdæksel	Front cover	L808291	L808285	L808287	L808296	L808297	L808298
28	2	Clampring	Clamp ring	L771837	L771837	L771837	L771837	L771837	L771837
29	2	Gummipakning	Gasket	s/p40	s/p40	s/p40	s/p40	s/p40	s/p40
30	1	Recirkulationsrør	Recirculationpipe	L808288	L808289	L808290	L808288	L808289	L808290
---	---	Stativ	Frame	s/p44-45	s/p44-45	s/p44-45	s/p44-45	s/p44-45	s/p44-45
---	---	Kappe	Shroud	s/p47	s/p47	s/p47	s/p47	s/p47	s/p47

s/pxx = se side

s/pxx = see page

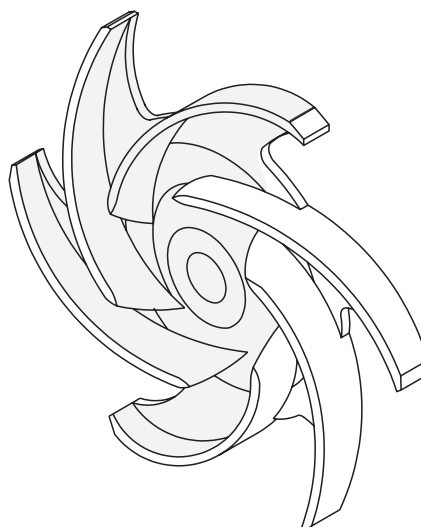
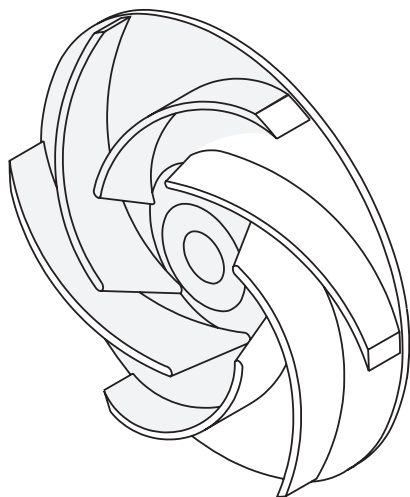
** Intergreret med mellemflange pos. 14

Integrated with extension fame pos. 14

NB! Ovenstående α varenumre, dækker ikke pumper solgt med 3.1 certifikat.
For 3.1 reservedele, kontakt APV.
α Part No. mentioned above, do not cover pumps sold with 3.1 certificate.
For 3.1 spare parts, contact APV.

7. Løbehjul / Impeller

Standard Ws+



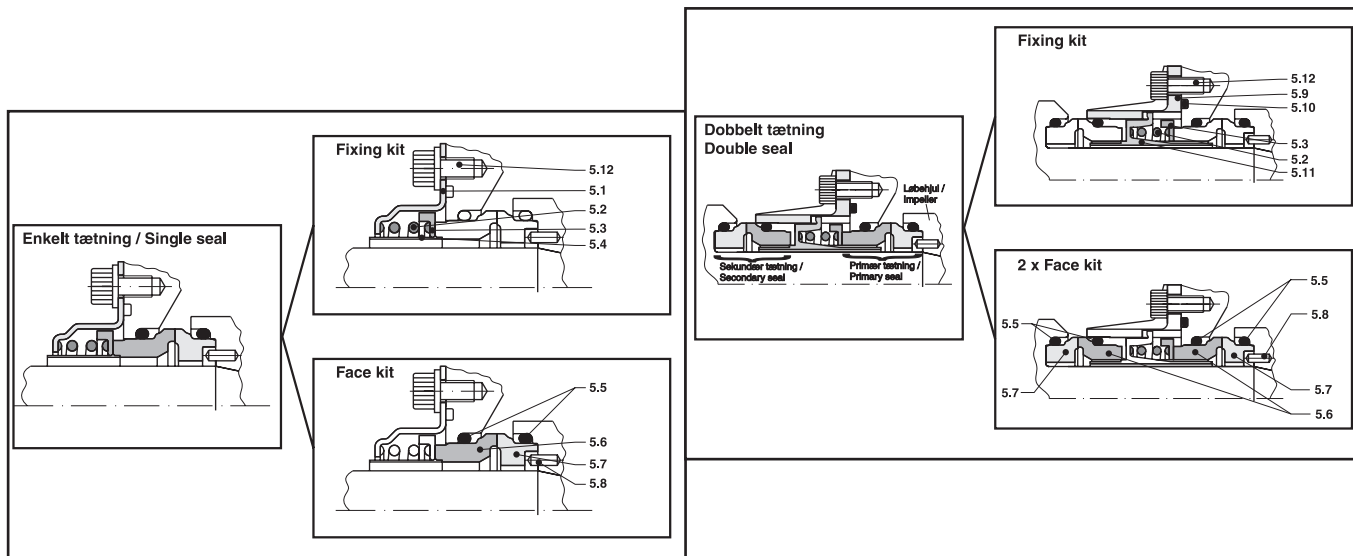
Løbehjul/ Impeller DIA	Pumpe type / Pump type			
	Standard			
	Ws+20/15	Ws+30/30	Ws+20/15	Ws+30/30
	Del nr. / Part No.			
Ø175		L253739		L267000
Ø170		L267481		L267001
Ø165		L267482		L267002
Ø160		L267483		L267003
Ø155		L267484		L267004
Ø150		L267485		L267005
Ø145		L267486		L267006
Ø140	L253737*	L267487	L253767*	L267007
Ø135	L267460	L267488	L253768	L267008
Ø130	L267461	L267489	L253769	L267009
Ø125	L267462	L267490	L253770	L267010
Ø120	L267463	L267491	L253771	L267011
Ø115	L267464		L253772	
Ø110	L267465		L253773	
Ø105	L267466		L253774	
Ø100	L267467		L253775	
Ø95	L267468		L253776	

* Ø142

Løbehjul/ Impeller DIA	Pumpe type / Pump type	
	Standard	
	Ws+44/50	Ws+44/50
	Del nr. / Part No.	
Ø220	L253744	L253777
Ø215	L267523	L253778
Ø210	L267524	L253779
Ø205	L267525	L253780
Ø200	L267526	L253781
Ø195	L267527	L253782
Ø190	L267528	L253783
Ø185	L267529	L253784
Ø180	L267530	L253785
Ø175	L267531	L253786
Ø170	L267532	L253787
Ø165	L267533	L253788
Ø160	L267534	L253789

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7. Akseltætning / Shaft seal

Ws+


** Pumpetype se side 41 for aksel
 Pump type see page 41 for shaft

				Akselstørrelse / Shaft size	
				Ø25**	Ø35**
Pos./Item	Benævnelse	Description	Materiale / Material	Del nr. / Part no.	
5.1	Fixing kit enkelt tætning:	Fixing kit single seal:		L772460	L772465
5.2	Tætningshus	Seal housing	AISI 316		
5.3	Fjeder	Spring	AISI 316		
5.4	Trykring	Pressure ring	AISI 316	(L773100)	(L773101)
5.4	Drænrør	Drain pipe	PTFE		
5.12	4 stk. skruer (M6x10)	4 screws (M6x10)	AISI 316	L770496	L770496
5.2	Fixing kit dobbelt tætning:	Fixing kit double seal:		L194448	L194449
5.3	Fjeder	Spring	AISI 316		
5.9	Trykring	Pressure ring	AISI 316		
5.9	Tætningshus	Seal housing	AISI 316		
5.11	Trykring	Pressure ring	AISI 316		
-	Vinkelforskrining	Union elbow	-		
5.10	1 stk. O-ring	1 off O-ring	EPDM	L772470	L771362
5.12	4 stk. skruer (M6x10)	4 screws (M6x10)	AISI 316	L770496	L770496

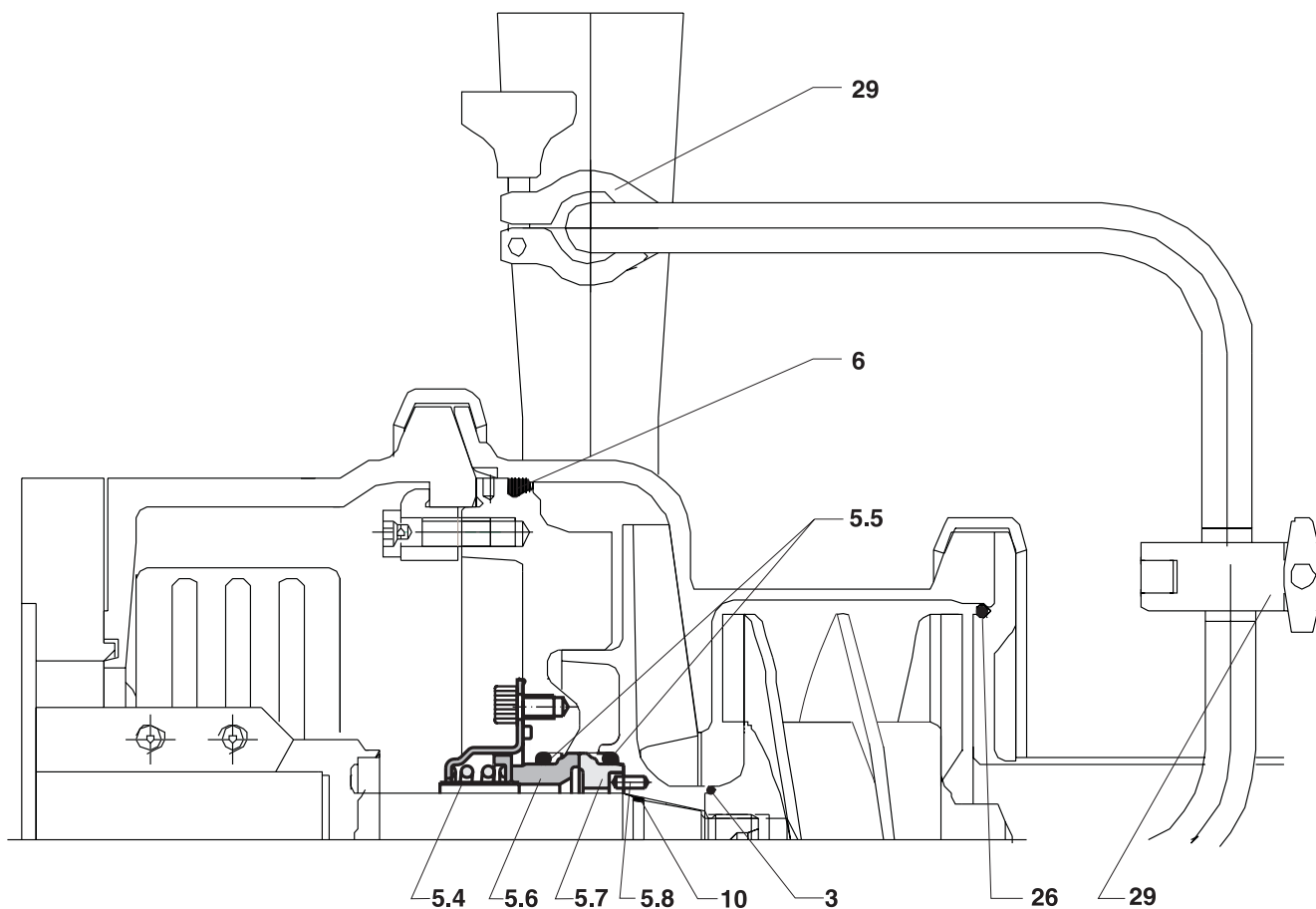
				Akselstørrelse / Shaft size	
				Ø25**	Ø35**
Pos./Item	Benævnelse	Description	Materiale / Material	Del nr. / Part no.	
	Face kit komplet:	Face kit complete:		L772461	L772466
	SiC/Kul tætningsringe	SiC/Carbon seal rings	EPDM O-ring	L772462	L772467
	SiC/Kul tætningsringe	SiC/Carbon seal rings	FPM(Viton) O-ring	L772463	L772468
	SiC/SiC tætningsringe	SiC/SiC seal rings	EPDM O-ring	L772464	L772469
	SiC/SiC tætningsringe	SiC/SiC seal rings	FPM(Viton) O-ring		
5.5	Indeholdende:	Containing:			
5.6	2 stk. O-ring	2 off O-rings	EPDM or FPM(Viton)		
5.7	Statorring	Stationary seal face	Carbon or SiC		
5.8	Rotorring	Rotary seal face	SiC		
5.8	Stift	Pin	AISI 316		

Enkelt akseltætning komplet /	Single shaft seal complete:	1xFixing kit (enkelt / single) + 1xFace kit + 1xPos. 5.12
Dobbelt tætning komplet * /	Double seal complete *:	1xFixing kit (dobbelt / double) + 2xFace kit + 1xPos. 5.10 + 1xPos. 5.12
Sliddele enkelt akseltætning /	Wear parts single shaft seal:	1xFace kit
Sliddele dobbelt akseltætning * /	Wear parts double shaft seal *:	2xFace kit
Ombygning fra enkelt til dobbelt tætning* / Rebuild from single to double seal *:		1xFixing kit (dobbelt / double) + 1xFace kit + 1xPos. 5.10
Ombygning fra dobbelt til enkelt tætning / Rebuild from double to single seal:		1xFixing kit (enkelt / single)

* APV anbefaler at SiC/Kul benyttes som sekundær tætningsring / APV recommend the use of SiC/Carbon as secondary seal

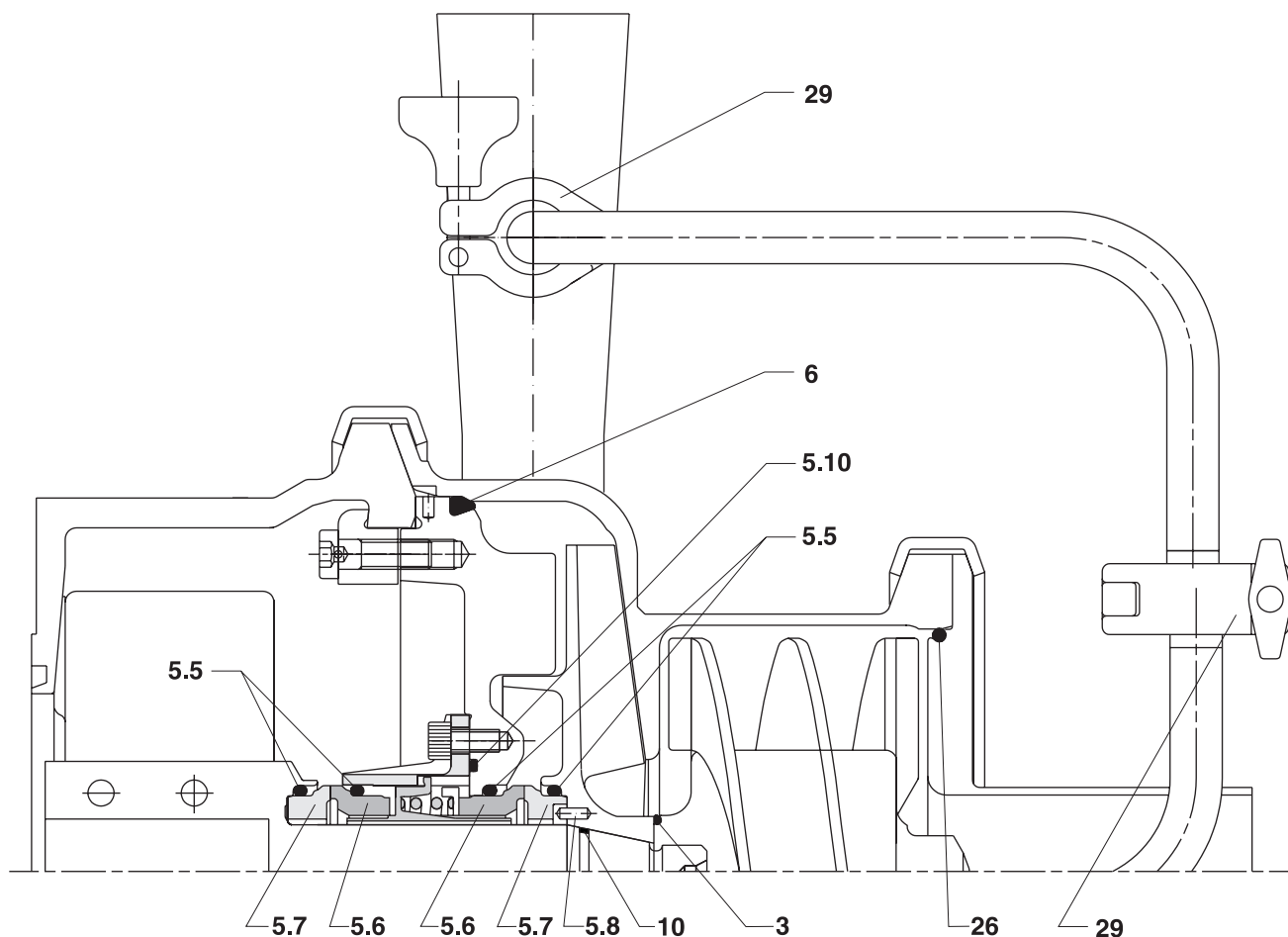
7. Komplet tætningssæt, enkelt / Complete seal kit, single

Ws+



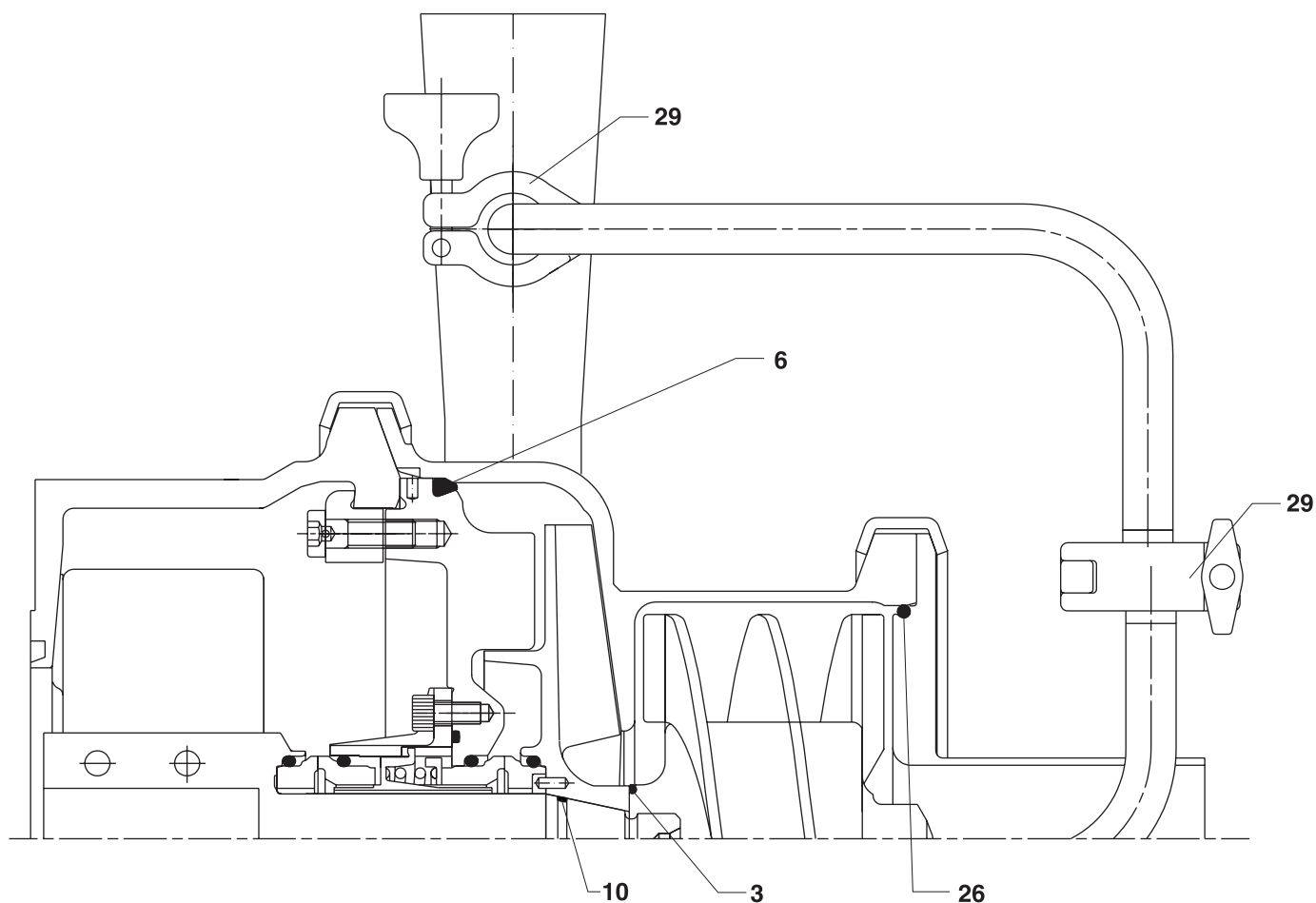
Pos. / Item	Materiale / Material	Pumpetype / Pump type		
		Ws+20/15	Ws+30/30	Ws+44/50
		Del nr. / Part No.		
3, 6, 10, 26, 29 x 2, 5.4, 5.5 x 2, 5.6, 5.7, 5.8	EPDM - SiC/SiC	L808325	L808326	L808327
3, 6, 10, 26, 29 x 2, 5.4, 5.5 x 2, 5.6, 5.7, 5.8	EPDM - SiC/Carbon	L808328	L808329	L808330
3, 6, 10, 26, 29 x 2, 5.4, 5.5 x 2, 5.6, 5.7, 5.8	FPM(Viton) - SiC/SiC	L808331	L808332	L808333
3, 6, 10, 26, 29 x 2, 5.4, 5.5 x 2, 5.6, 5.7, 5.8	FPM(Viton) - SiC/Carbon	L808334	L808335	L808336

7. Komplet tætningssæt, dobbelt / Complete seal kit, double

Ws+


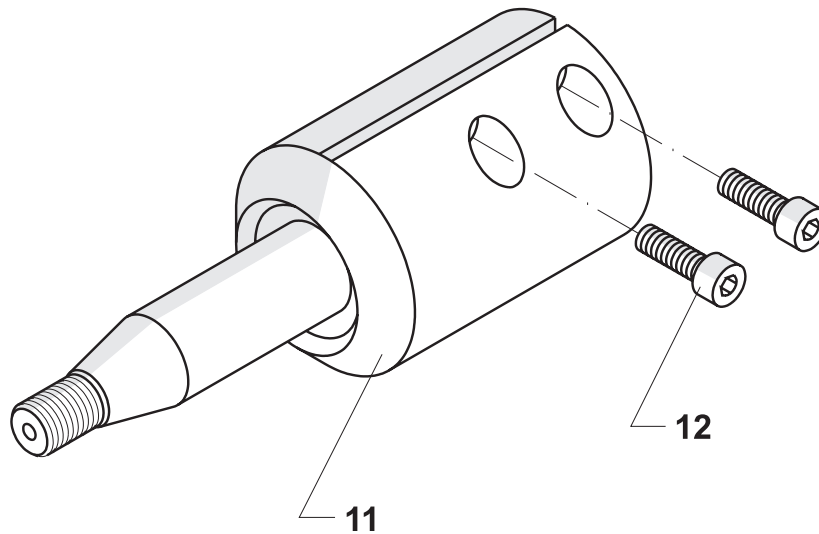
Pos. / Item	Materiale / Material	Pumpetype / Pump type		
		Ws+20/15	Ws+30/30	Ws+44/50
		Del nr. / Part No.		
3, 6, 10, 26, 29 x 2, 5.5 x 2, 5.6 x 2, 5.7 x 2, 5.8, 5.10	EPDM - SiC/SiC - SiC/Carbon	L808551	L808555	L808559
3, 6, 10, 26, 29 x 2, 5.5 x 2, 5.6 x 2, 5.7 x 2, 5.8, 5.10	EPDM - SiC/Carbon - SiC/Carbon	L808552	L808556	L808534
3, 6, 10, 26, 29 x 2, 5.5 x 2, 5.6 x 2, 5.7 x 2, 5.8, 5.10	FPM(Viton) - SiC/SiC - SiC/Carbon	L808553	L808557	L808535
3, 6, 10, 26, 29 x 2, 5.5 x 2, 5.6 x 2, 5.7 x 2, 5.8, 5.10	FPM(Viton) - SiC/Carbon - SiC/Carbon	L808554	L808558	L808536

7. O-rings sæt / O-rings kit

Ws+


Pos. / Item	Materiale / Material	Pumpetype / Pump type		
		Ws+20/15	Ws+30/30	Ws+44/50
		Del nr. / Part No.		
3, 6, 10, 26 & 29 x 2	EPDM	L808619	L808620	L808621
3, 6, 10, 26 & 29 x 2	FPM(Viton)	L808622	L808623	L808624

7. Aksel / Shaft

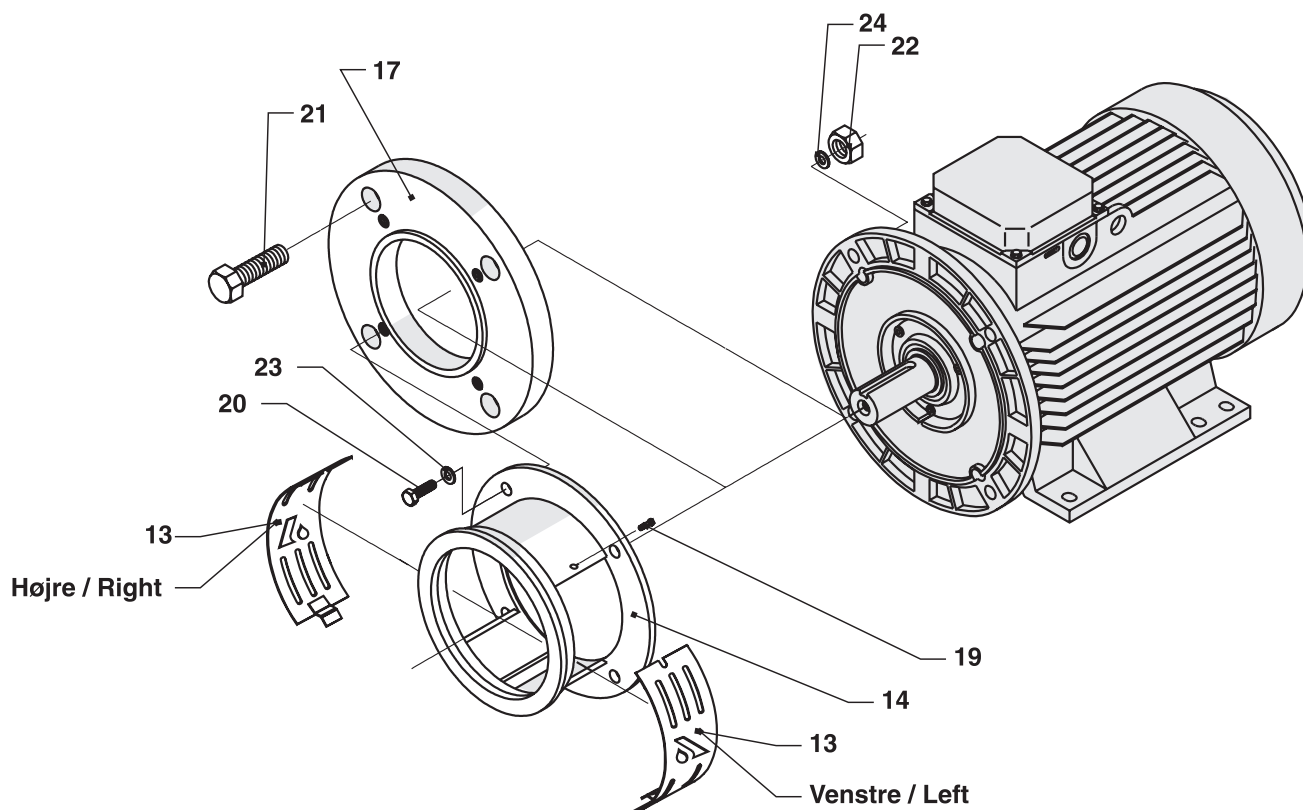
Ws+

Aksel Ø25 / Shaft Ø25

Pumpetype	Motor				
	90	100	112	132	160
Ws+20/15	L261559	L261560	L261560	L261547	
Ws+30/30		L261560	L261560	L261547	L261548
Pos. 12					
Stk./Qty	1	2	2	2	2
Skrue/Screw	L771199	L771199	L771199	L771199	L771199

Aksel Ø35 / Shaft Ø35

Pumpetype	Motor		
	132	160	180
Ws+44/50	L261550	L261551	L261563
Pos. 12			
Stk./Qty	2	2	2
Skrue/Screw	L771199	L771199	L771199

7. Mellemflange - Afdækning / Extension frame - Shaft guard

Ws+


Pos 14
Mellemflange - Extension frame

Pumpetype Pump type	Motor					
	90	100	112	132*	160	180
	Del nr / Part No.					
Ws+20/15	L261566#	L261566#	L261566#	L261566#		
Ws+30/30		L261565	L261565	L261565	L261564	
Ws+44/50				L261567	L261568	L261568

Integreret med bagflange pos. 7
Integrated with backplate fame pos. 7

Pos 17 Skive - Washer

*	L267665
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7. Mellemflange - Afdækning / Extension frame - Shaft guard

Ws+

Pos 13 - Afdækning - Shaft guard

Pumpe type/ Pump type	Stk. Qty	Motor					
		90	100	112	132	160	180
		Del nr / Part No.					
Ws+20/15	2 R/L	L188334	L188334	L188334	L188334		
Ws+30/30	1 R		L188333	L188333	L188333		
	1 L		L188285	L188285	L188285		
	2 R/L					L188259	
Ws+44/50	1 R				L188339		
	1 L				L188597		
	2 R/L					L188335	L188335

R=Højre / Right L=Venstre / Left

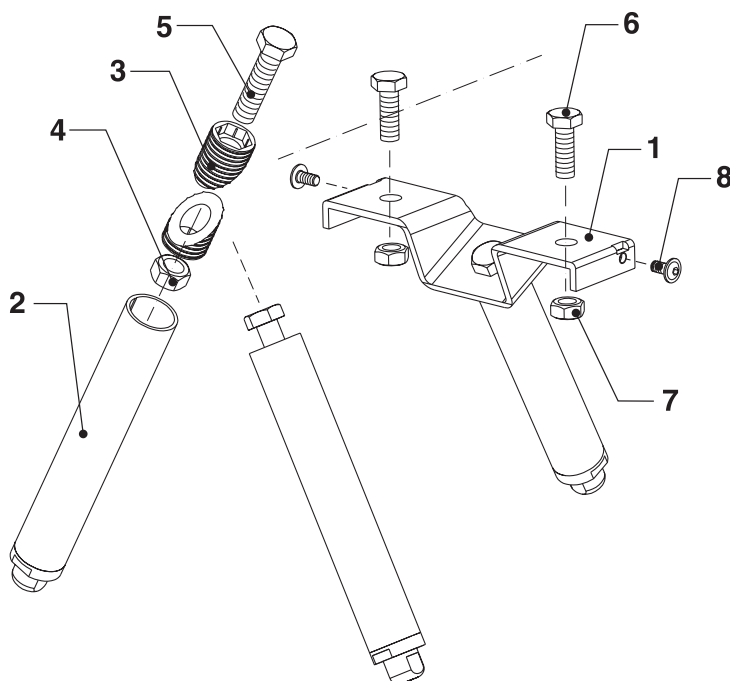
Pos 19 - 24

Skruer, møtrikker og skiver - Screws, nuts and washers

Beskrivelse/ Description	Pos	Stk Qty	Motor					
			90	100	112	132	160	180
			Del nr / Part No.					
Skrue/Screw	19	2	L700420	L700420	L700420	L700420	L700420	L700420
Skrue/Screw	20	4	L700234	L700234	L700234	L700234	*L771944	*L771944
Skrue/Screw	21	4				L701078		
Møtrik/Nut	22	4					L701387	L701387
Skive/Washer	23	4	L771425	L771425	L771425	L771425		
Skive/Washer	24	4					L701254	L701254

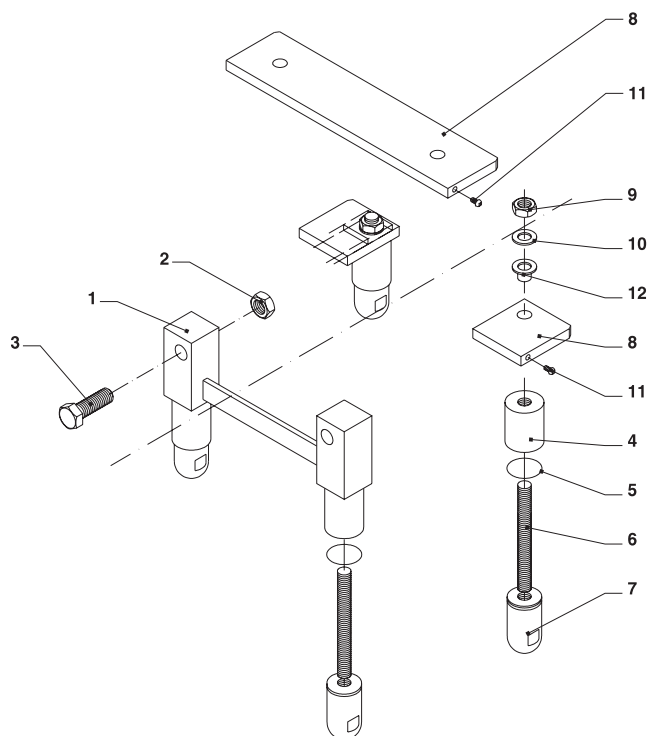
* 2 stk. skruer ved stativ / 2 off screws for frame

7. Stativ / Frame for motor 90 - 132M

Ws+


				Motor			
				90	100	112	132
				Centerhøjde / Centreheight			
				260			
Pos	Stk/Qty	Benævnelse	Description	Del nr. / Part No.			
-	-	Komplet - understøtning	Complete - frame	L808802	L808803	L808804	L808805
1	1	Stativ	Frame	L809055	L809056	L809057	L809058
2	2	Ben, komplet	Leg, complete	L809061	L809061	L809061	L809061
3	4	Klembøsning	Split bushing	L282473	L282473	L282473	L282473
4	2	Møtrik	Nut	L700242	L700242	L700242	L700242
5	2	Skrue	Screw	L701981	L701981	L701981	L701981
6	2	Skrue	Screw	L701380	L701380	L701380	L700238
7	2	Møtrik	Nut	L700864	L700864	L700864	L700242
8	2	Skrue, flangehoved	Screw, flange head	L700420	L700420	L700420	L700420

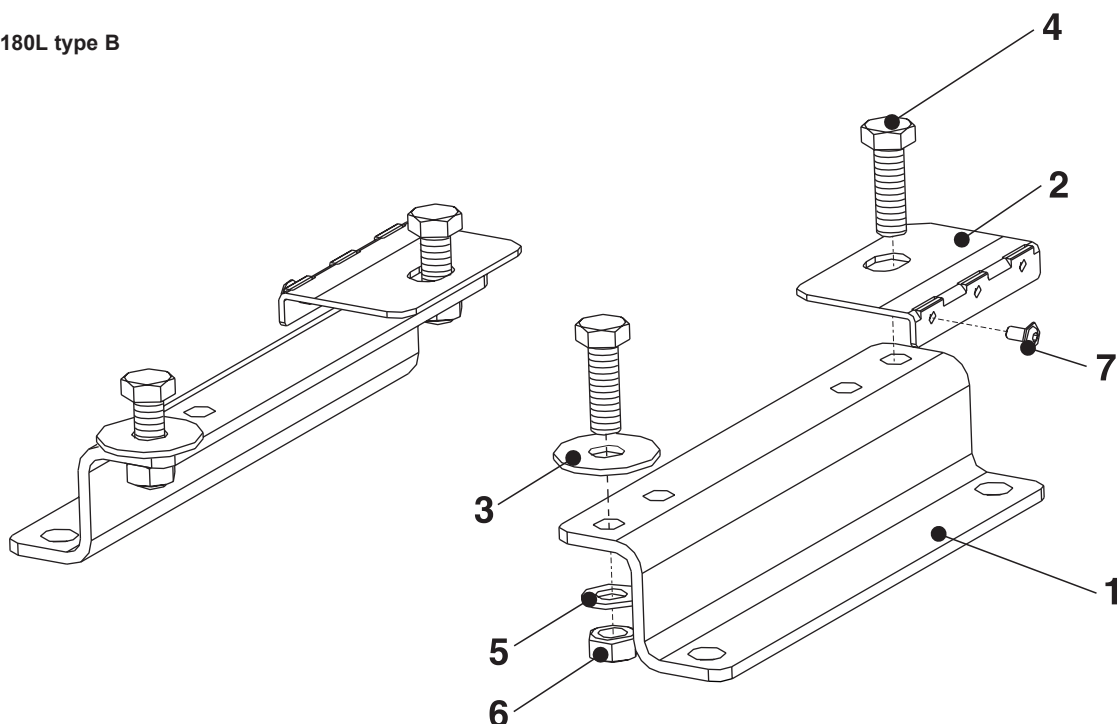
7. Stativ / Frame for motor 160M - 180L

Ws+


				Motor					
				160M - 160L			180M - 180L		
				Centerhøjde / Centreheight					
				260	305	350	260	305	350
Pos	Stk/Qty	Benævnelse	Description	Del nr. / Part No.			Del nr. / Part No.		
-	-	Komplet - understøtning	Complete - frame	L808806	L808807	L808808	L808809	L808810	L808811
1	1	Stativ f/forben	Frame f/front leg	L279962	L279962	L279962	L279962	L279962	L279963
2	2	Vinkelbeslag	Angle plate	L282488	L282488	L282488	L282488	L282488	L282488
3	4	Ben, komplet	Leg, complete	L809063	L809051	L809061	-- -- --	-- -- --	-- -- --
3	2	Ben for, komplet	Leg front, compl.	-- -- --	-- -- --	-- -- --	L809063	L809051	L809066
4	2	Ben bag, komplet	Leg back, compl.	-- -- --	-- -- --	-- -- --	L809062	L809060	L809049
5	8	Klembøsning	Split bushing	-- -- --	L282473	L282473	-- -- --	L282473	L282473
6	4	Møtrik	Nut	-- -- --	L700242	L700242	-- -- --	L700242	L700242
7	2	Skrue	Screw	L701265	L703141	L703141	L701265	L703141	L703141
8	2	Skive	Washer	L701475	L701475	L701475	L701475	L701475	L701475
9	2	Skrue	Screw	L702996	L771697	L771697	L702996	L771697	L771697
10	2	Skærmskive	Washer	L781058	L781058	L781058	L781058	L781058	L781058
11	2	Skrue, fl. hoved	Screw, fl. head	L700420	L700420	L700420	L700420	L700420	L700420
20	2	Skrue	Screw	L701474	L701474	L701474	L701474	L701474	L701474

Ws+

7. Konsol / Bracket

Ws+
Motor 90 - 180L type B


**Med konsol type B
With bracket type B
Motor 90 - 132**

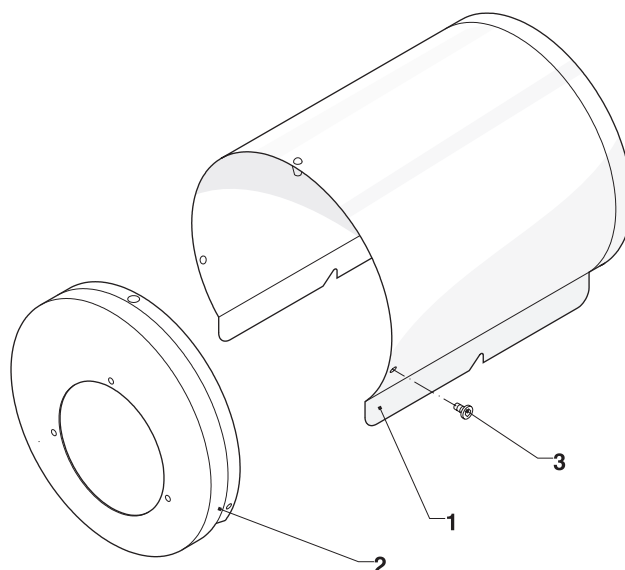
				Motor			
				90	100	112	132
				Centerhøjde/Centreheight			
				225	225	225	225
Pos	Stk/Qty	Benævnelse	Description	Del nr. / Part No.			
-	-	Komplet konsol	Complete bracket	L809098	L809099	L809100	L809101
1	2	Konsol	Bracket	L279988	L279989	L279990	L279991
2	2	Vinkelbeslag	Angle plate	---	L282503	L282503	L282503
3	2	Skærmskive	Washer	---	L781058	L781058	L781058
4	4	Bolt	Bolt	L756001	L701669	L701669	L702996
5	4	Skive	Washer	L701479	L701479	L701479	L701475
6	4	Møtrik	Nut	L700864	L700864	L700864	L700242
7	2	Skrue, fl. hoved	Screw, fl. head	L700420	L700420	L700420	L700420

**Med konsol type B
With bracket type B
Motor 160M - 180L**

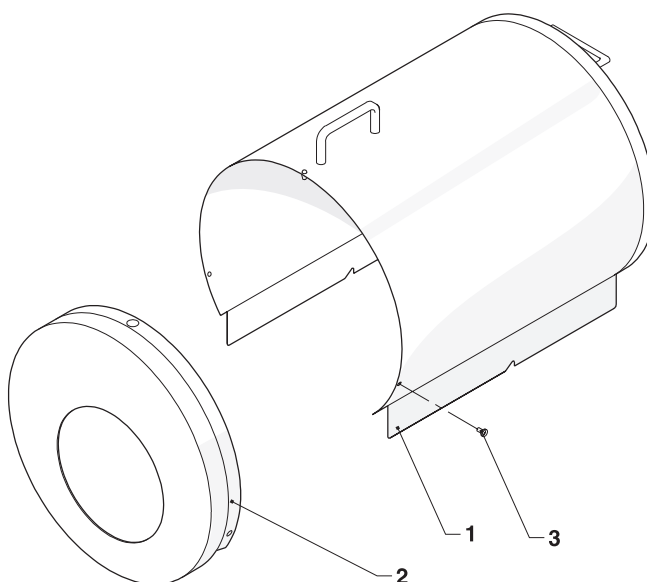
				Motor	
				160M-L	180M-L
				Centerhøjde / Centreheight	
				225	225
Pos	Stk/Qty	Benævnelse	Description	Del nr. / Part No.	
-	-	Komplet konsol	Complete bracket	L809102	L809103
1	2	Konsol	Bracket	L279992	L279993
2	2	Vinkelbeslag	Angle plate	L282488	L282488
3	2	Skærmskive	Washer	L781062	L781062
4	4	Bolt	Bolt	L773643	L773643
5	4	Skive	Washer	L772450	L772450
6	4	Møtrik	Nut	L772449	L772449
7	2	Skrue, fl. hoved	Screw, fl. head	L700420	L700420

7. Dæksel og kappe / Collar and shroud

Ws+



				Motor			
				90	100	112	132
Pos	Stk/Qty	Benævnelse	Description	Del nr. / Part No.			
1	1	Kappe	Shroud	L188445	L188446	L188447	L188447
2	1	Dæksel	Collar	L194421	L194422	L194472	L194424
3	2	Skrue	Screw	L773113	L773113	L773113	L773113



2

				Motor	
				160	180
Pos	Stk/Qty	Benævnelse	Description	Del nr. / Part No.	
1	1	Kappe	Shroud	L188448	L188449
2	1	Dæksel	Collar	L194425	L194426
3	4	Skrue	Screw	L773113	L773113



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For more information about our worldwide locations, approvals, certifications, and local representatives, please visit www.apv.com.

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