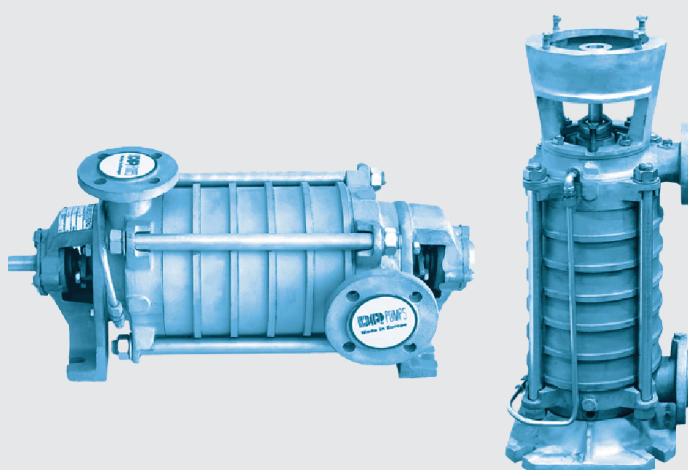
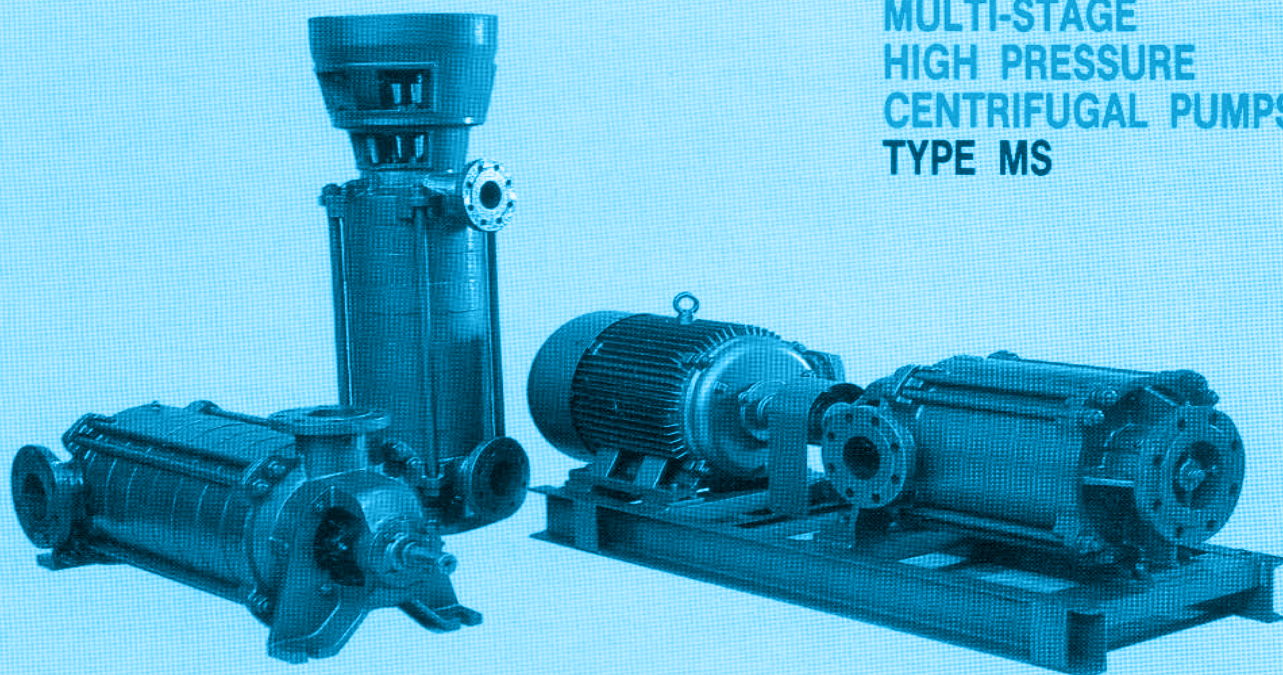




MS, MS-E

CENTRIFUGAL MULTISTAGE PUMPS

MULTI-STAGE HIGH PRESSURE CENTRIFUGAL PUMPS TYPE MS



Applications

In waterworks, in irrigation and sprinkler installations. As a recirculating pump for cooling and heating water and also as a fire-fighting, boiler feed or pressure boosting pump.

The MS type pumps are used for handling clean or only lightly contaminated media, for oils up to 150 mm²/sec (cst) and for non-aggressive liquids.

Hydraulic Data

- Capacity up to 550 m³/h
- Total head up to 300 m
- Temperature -20° C to 140° C.
- Max casing pressure of 30 bar (suction pressure + shut-off head).

Max. permissible no. of stages

Pump models	1450 RPM	2900 RPM
MS 80 L - H, V, AS	9 (6)	2
MS 80 H - H, AS	13 (9)	4
MS 100 H, AS	10 (6)	3
MS 100 V	8	1
MS 125 H, AS	8 (5)	
MS 125 V	6	
MS 150 H, AS	5 (3)	
MS 150 V	3	

The values in the brackets are valid for 60 Hz, 1750 RPM

Design

The pump casing consists of a number of sectional stages, held together by large - diameter tie bolts. All impellers are balanced. Axial thrust is compensated for by balance holes in each impeller.

The pump shaft is protected against wear by sleeves through the stuffing box.

The pump features bronze wearing rings on both sides of the impellers.

All wearing parts such as impellers and shaft sleeves are easily replaceable and the glands are readily accessible. The by-pass arrangement relieves the pressure on the delivery side stuffing box and provides a perfect water seal in the suction stuffing box, even at maximum suction lift.

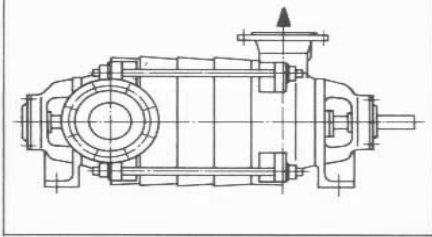
Gland packing or mechanical seal can be selected for sealing

Branches: PN 16 DIN 2533
PN 40 DIN 2535

TECHNICAL DATA

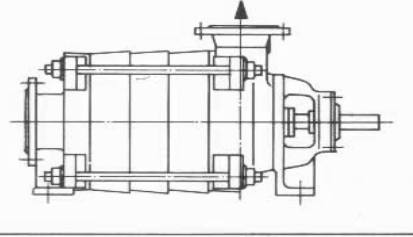
Available configurations

Form H



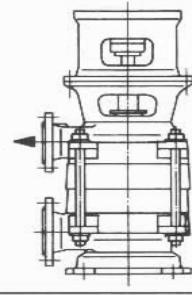
Horizontal pump with radial branches.
Shaft supported in suction and delivery side roller bearings.
Bearing lubrication with grease.
Delivery side drive end standard.
Suction side drive end optional.
Shaft sealing on both sides.

Form AS



Horizontal pump with axial suction branch and radial delivery branch.
Shaft supported in bronze bearing on suction side and in ball bearings on delivery side. Bearing lubrication with grease.
Delivery side drive end and shaft sealing.

Form V



Vertical pump with radial branches.
Shaft supported in bronze journal bearing on suction side and in ball bearing on delivery side.
Bronze journal bearing lubrication with pumped liquid.
Ball bearing lubrication with grease.
Delivery side drive end and shaft sealing.
Pump and motor shaft connected with a flexible coupling.

Maximum transmissible power

$$P \text{ (KW)} = a \times N \text{ (RPM)}$$

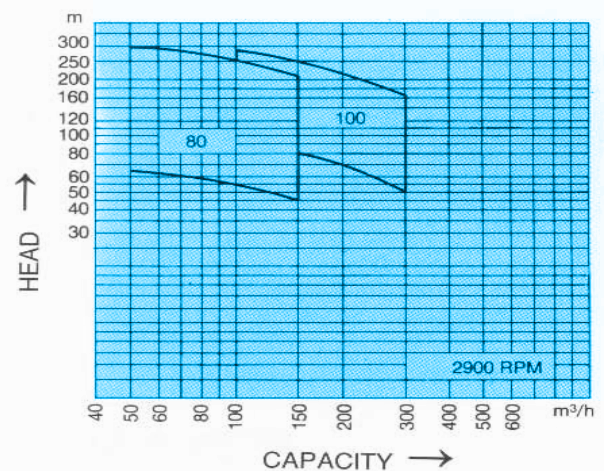
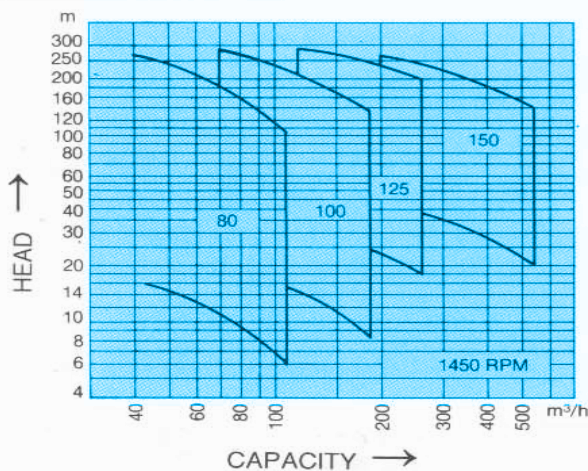
Shaft-end diameter	Coefficient a		
	1.0632	1.4021	1.4401
32		0,044	0,024
35		0,060	0,033
40	0,066	0,095	0,053
42	0,080	0,116	0,064
45	0,094	0,136	0,075
50	0,133	0,190	0,107
60	0,206	0,294	0,165

For diesel engine driver above coefficients must be reduced by 20%.

Bearing type

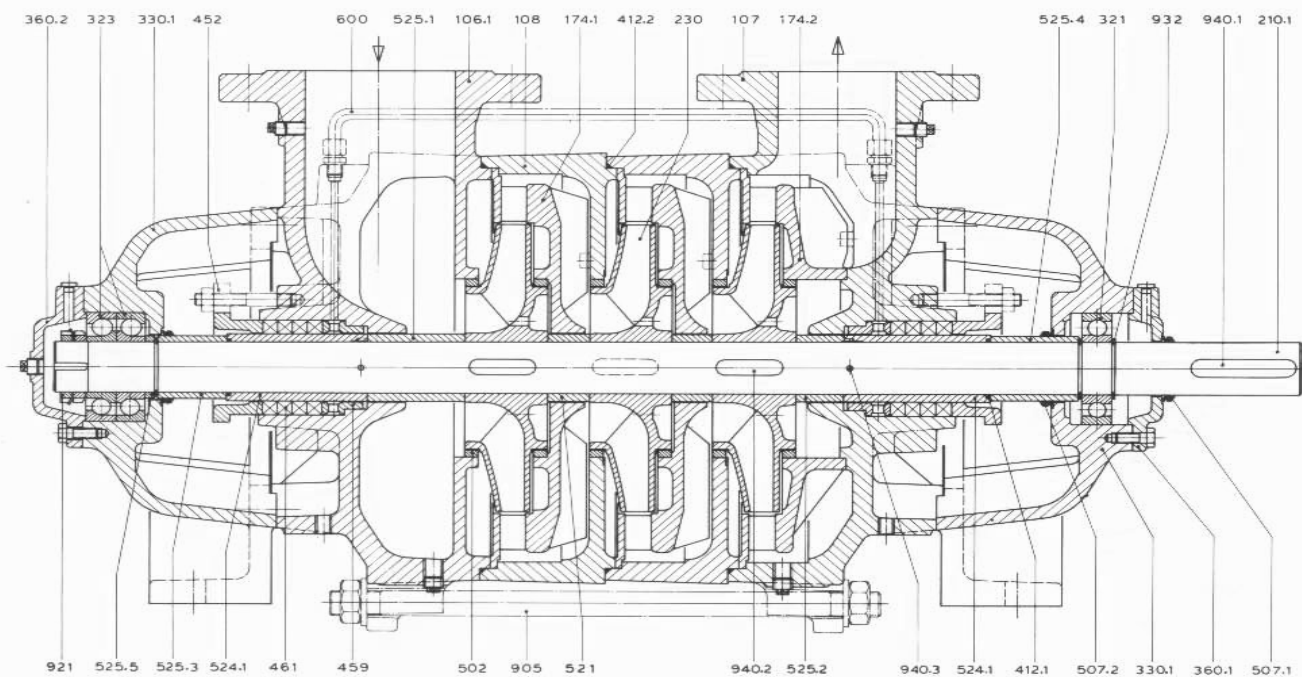
Pump model	Suction side	Delivery side
MS 80 L - H	6407 C3	6407 C3
MS 80 L - AS		6407 C3
MS 80 L - V	2x7308 B.UA	6310 ZZ
MS 80 H - H		6308 C3
MS 80 H - AS	2x7309 B.UA	2x7308 B.UA
MS 100 H		6309 C3
MS 100 AS, V	2x7311 B.UA	2x7309 B.UA
MS 125 H		6311 C3
MS 125 AS, V	2x7313 B.UA	2x7311 B.UA
MS 150 H		6313 C3
MS 150 AS, V		2x7313 B.UA

Performance range

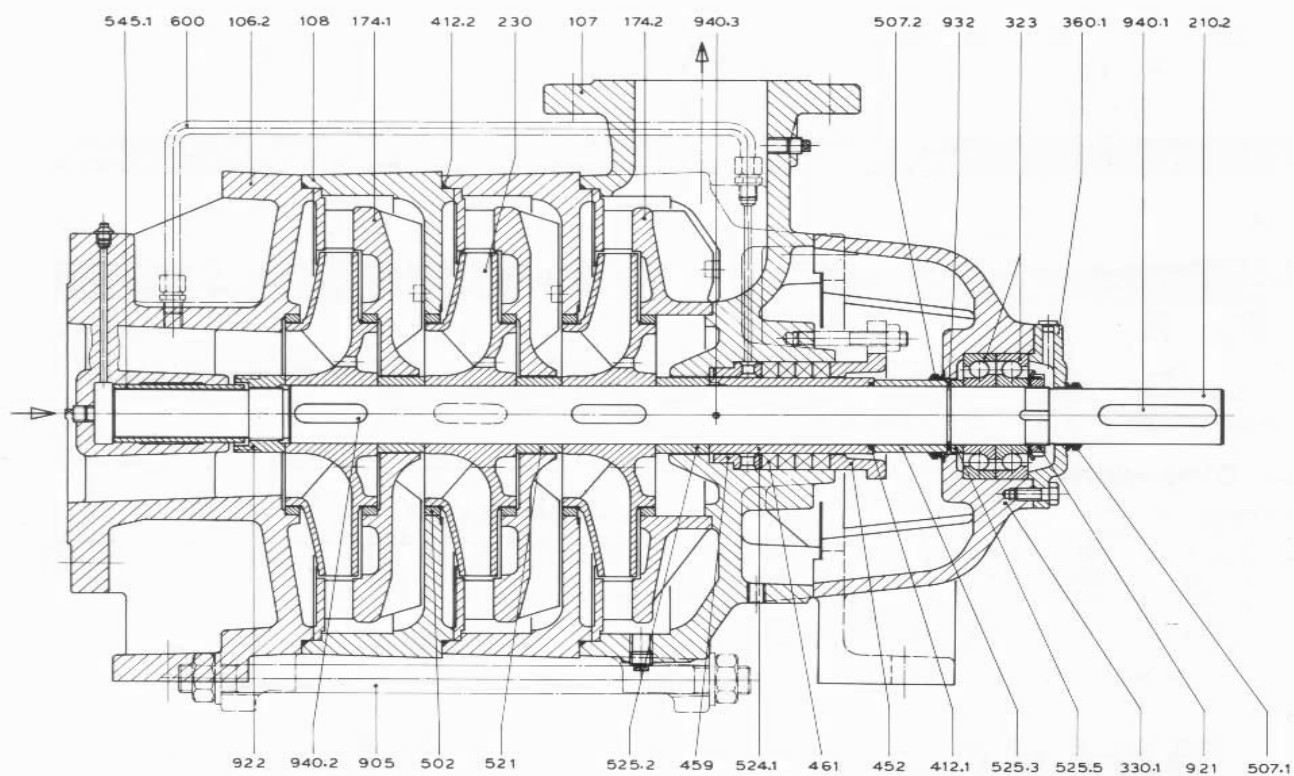


SECTIONAL VIEWS

Form H

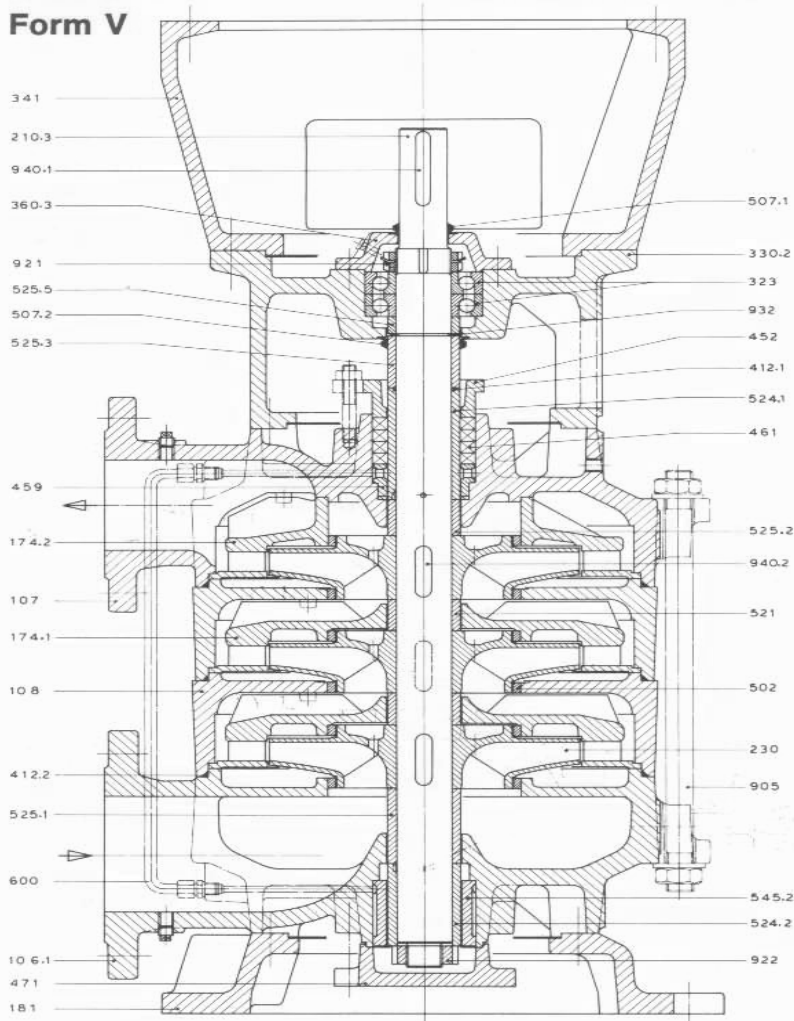


Form AS



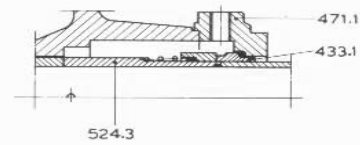
SECTIONAL VIEWS

Form V

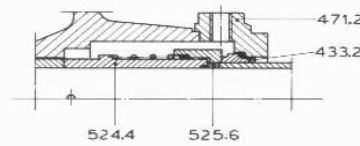


Mechanical seal

• Unbalanced



• Balanced



MS 80

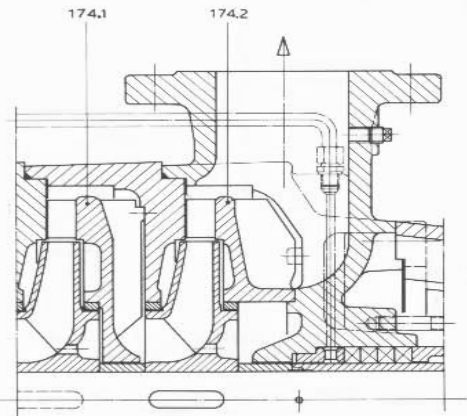


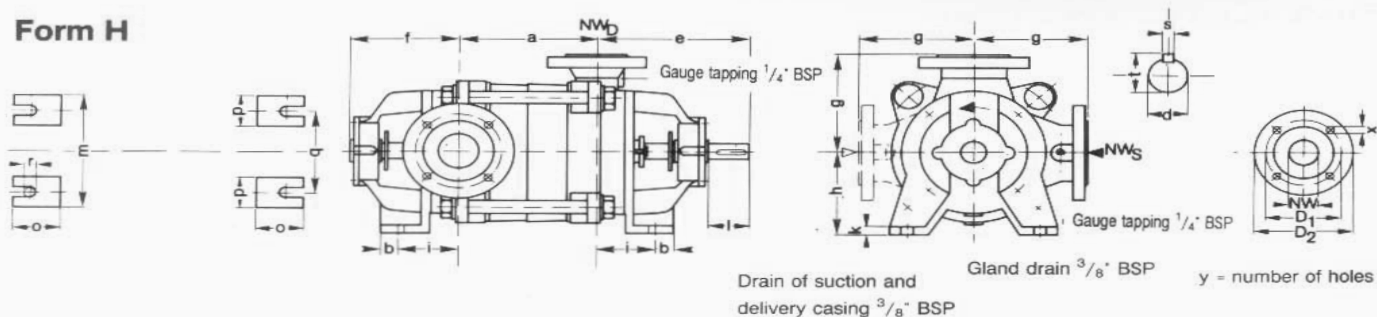
Table of materials for all forms

Part No	Part name	Construction Materials	
		Standard	Special
106.1	Suction casing	CI	G-CuSn 10
106.2	Suction casing	CI	G-CuSn 10
107	Delivery casing	CI	G-CuSn 10
108	Interstage casing	CI	G-CuSn 10
174.1	Diffuser	CI	G-CuSn 10
174.2	Diffuser discharge casing	CI	G-CuSn 10
181	Pump base	CI	
210.1	Shaft	1.0632	1.4401
210.2	Shaft	1.0632	1.4401
210.3	Shaft	1.0632	1.4401
230	Impeller	CI	G-CuSn 10
321	Grooved ball bearing	St	
323	Thrust ball bearing	St	
330.1	Bearing housing	CI	
330.2	Bearing housing	CI	
341	Motor stool	CI/St	
360.1	Bearing cover	CI	
360.2	Bearing cover	CI	
360.3	Bearing cover	CI	
412.1	O-ring	Rubber	
412.2	O-ring	Rubber	
471	Seal cover	CI	G-CuSn 10
502	Wearing ring	G-CuSn 12	
507.1	Thrower ring	Rubber	
507.2	Thrower ring	Rubber	
521	Distance Sleeve	G-CuSn 12	
524.2	Shaft sleeve	1.4021	1.4401
525.1	Distance Sleeve	G-CuSn 12	
525.2	Distance Sleeve	G-CuSn 12	
525.3	Distance Sleeve	G-CuSn 12	
525.4	Distance Sleeve	G-CuSn 12	
Part No	Part name	Construction Materials	
		Standard	Special
525.5	Distance ring	1.4021	
545.1	Bearing bush	G-CuSn 12	
545.2	Bearing bush	G-CuSn 10	
600	Axial balance pipe	St	1.4301
905	Tie bolt	St	
921	Shaft locking nut	St	
922	Impeller nut	G-CuSn 12	
932	Circlip	1.4401	
940.1	Key	St	
940.2	Key	1.4571	1.4571
Only for stuffing box with packing rings			
452	Gland	CI	G-CuSn 10
459	Lantern ring	CI	G-CuSn 12
461	Gland packing	TEFLON	
524.1	Shaft sleeve	G-CuSn 12	1.4401
Only for unbalanced mechanical seal			
433.1	Mechanical seal	Cr/Carbon	SiC/Carbon
471.1	Seal cover	CI	G-CuSn 10
524.3	Shaft sleeve	G-CuSn 12	1.4401
Only for balanced mechanical seal			
433.2	Mechanical seal	SiC/Carbon	SiC/SiC
471.2	Seal cover	CI	G-CuSn 10
524.4	Shaft sleeve	1.4021	1.4401
525.6	Distance sleeve	G-CuSn 12	

Other materials such as cast stainless steel 1.4408 are also available on request for the wetted components.

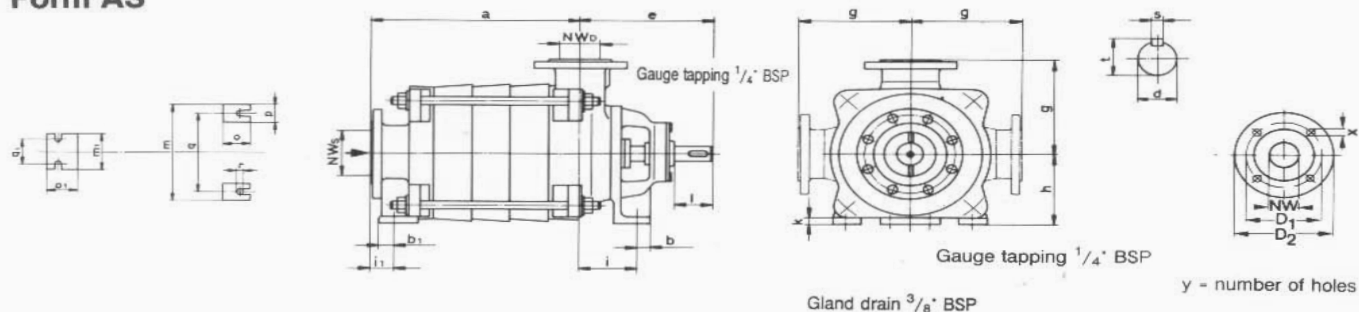
DIMENSIONS

Form H



Model	1 st stage			a for each add'l stage																
	NWs	NWD	a	e	f	g	h	i	b	k	m	q	o	p	r	l	d	t	s	
MS 80 L	100	80	140	83	290	205	240	180	123	30	16	330	270	80	60	18	85	35	38	10
MS 80 H	100	80	140	83	337	250	240	180	123	30	16	330	270	80	60	18	100	40	43	12
MS 100	125	100	175	104	397	305	280	225	155	35	20	420	340	100	80	20	110	45	48,5	14
MS 125	150	125	205	130	470	345	340	280	75	40	22	540	420	120	120	25	110	50	53,5	14
MS 150	200	150	235	150	510	395	380	350	85	45	25	640	500	140	140	27	110	60	64	18

Form AS

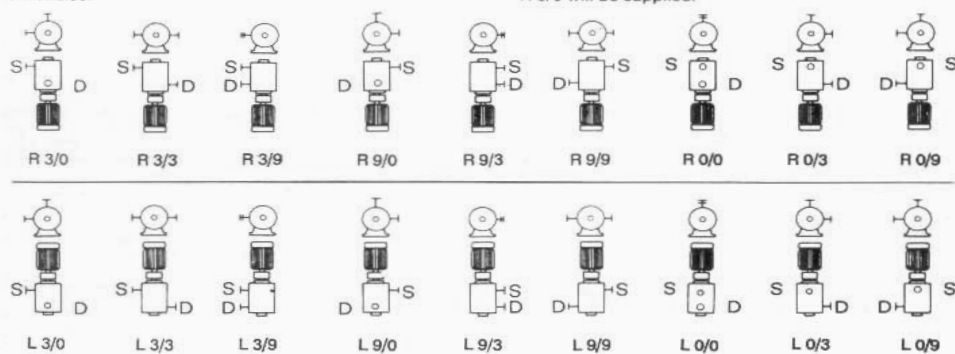


Model	1 st stage			a for each add'l stage																				
	NWs	NW _D	a	e	g	h	i	b	i1	b1	k	m	q	m1	q1	o	o1	p	r	l	d	t	s	
MS 80 L	125	80	210	83	290	240	180	123	30	50	35	16	330	270	125	85	80	85	60	18	85	35	38	10
MS 80 H	125	80	210	83	337	240	180	123	30	50	35	16	330	270	125	85	80	85	60	18	100	40	43	12
MS 100	150	100	266	104	397	280	225	155	35	75	40	20	420	340	160	120	100	100	80	20	110	42	45	12
MS 125	200	125	295	130	470	340	280	75	40	82	35	22	540	420	160	110	120	100	120	25	110	50	53,5	14
MS 150	200	150	300	150	510	380	350	85	45	75	45	25	640	500	200	140	140	120	140	27	110	60	64	18

Installation

Form H

Pump for clockwise rotation as seen from driver side.

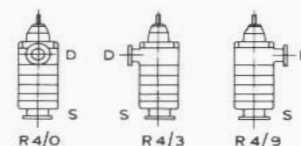


Counter-clockwise rotation as seen from driver side.

Branch arrangement
Unless otherwise specified, branch arrangement R 3/0 will be supplied.

Form AS

Branch arrangement
Standard construction R4/0



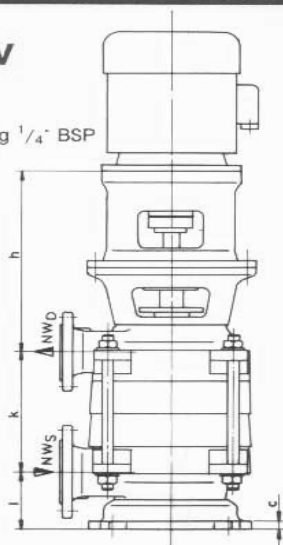
Clockwise rotation as seen from driver side

Branches in parallel on the same side only possible with 2 or more stages.

DIMENSIONS

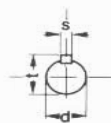
Form V

Gauge tapping $\frac{1}{4}"$ BSP



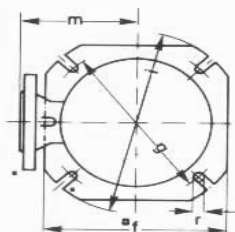
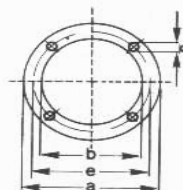
Gland drain $\frac{3}{8}"$ BSP

Drain $\frac{3}{8}"$ BSP

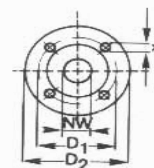


motor stool flange
DIN 42948

z - number of holes



y - number of holes

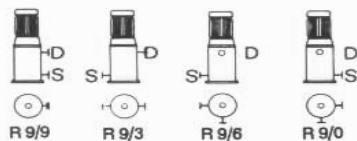


Model	1 st stage			k for each add'l stage																
	NW _s	NW _D	k		f	i	c	l	m	g	r	d	t	s	a	b	e	h	n	z
MS 80	100	80	140	83	350	400	23	145	240	350	18	32	35	10	350	250	300	465	19	4
															400	300	350	465	19	4
															450	350	400	495	19	8
															550	450	500	495	19	8
MS 100	125	100	175	104	450	510	25	170	280	450	23	42	45	12	350	250	300	465	19	4
															400	300	350	465	19	4
															450	350	400	495	19	8
															550	450	500	495	19	8
															660	550	600	495	22	8
															660	550	600	525	22	8
MS 125	150	125	205	130	600	680	28	205	340	600	27	50	53,5	14	450	350	400	615	19	8
															550	450	500	615	19	8
															660	550	600	645	22	8
MS 150	200	150	235	150	600	680	28	230	380	600	27	60	64	18	550	450	500	655	19	8
															660	550	600	685	22	8

Installation

Form V

Branch arrangement



In the absence of specific instructions pumps are supplied with the following branch arrangements:
1 stage: R 9/3
2 or more stages: R 9/9

Flange Dimensions

PN 16 DIN 2533

NW	80	100	125	150	200
D1	160	180	210	240	295
D2	200	235	270	300	375
x	18	18	18	23	23
y	8	8	8	8	12

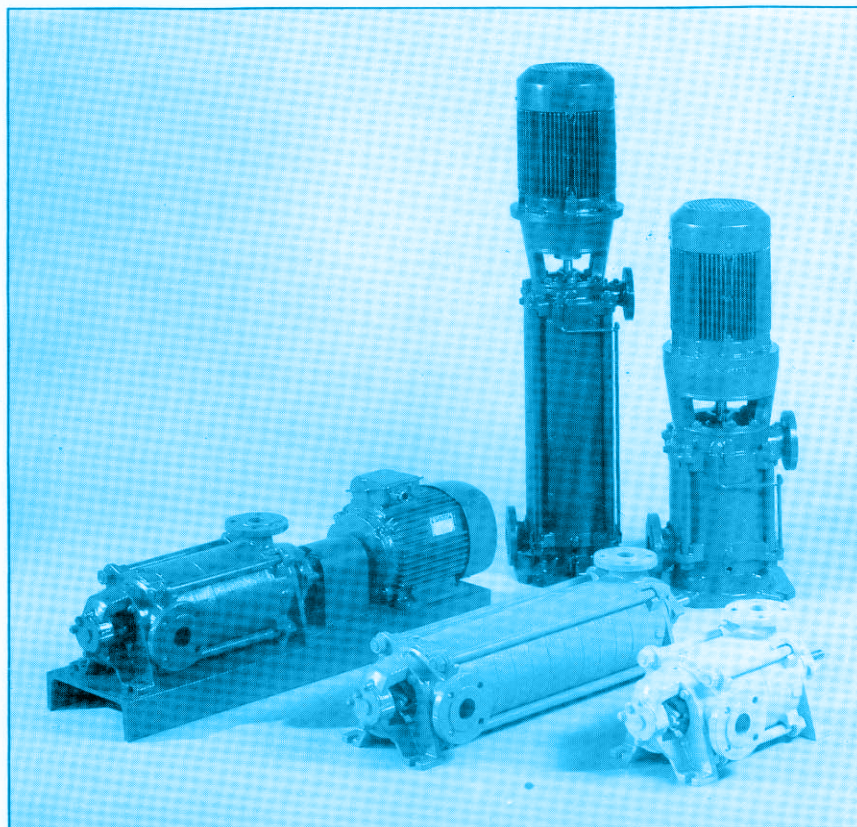
PN 40 DIN 2535

NW	80	100	125	150	200
D1	160	190	220	250	320
D2	200	235	270	300	375
x	18	23	27	27	30
y	8	8	8	8	12

The technical data in this brochure are subject to change without prior notice and should not be used for construction without the consent of the manufacturer.

MULTI STAGE HIGH PRESSURE CENTRIFUGAL PUMPS

TYPE MS - E



Applications

In waterworks, in irrigation and sprinkler installation. As a recirculating pump for cooling and heating water and also as a fire fighting, boiler feed or pressure boosting pump.

The pumps are used for handling clean or only lightly contaminated media, for oils up to 150 mm²/sec (cts) and for non-aggressive liquids.

Hydraulic Data

Capacity up to 100 m³/h

Total head up to 400 m

Max casing pressure (suction pressure + shut-off head) 40 bar.

Temperature -20°C to 140°C

Maximum number of stages and motor size:

Design

The pump casing consists of a number of sectional stages, held together by large diameter tie bolts.

All impellers are balanced. Axial thrust is compensated for by balance holes in each impeller.

The pump shaft is protected against wear by sleeves through the stuffing box. It is supported in amply dimensioned, externally housed, heavy duty bearings. All wearing parts such as impellers, diffusers, diffuser plates, and shaft sleeves are easily renewable and the glands are readily accessible.

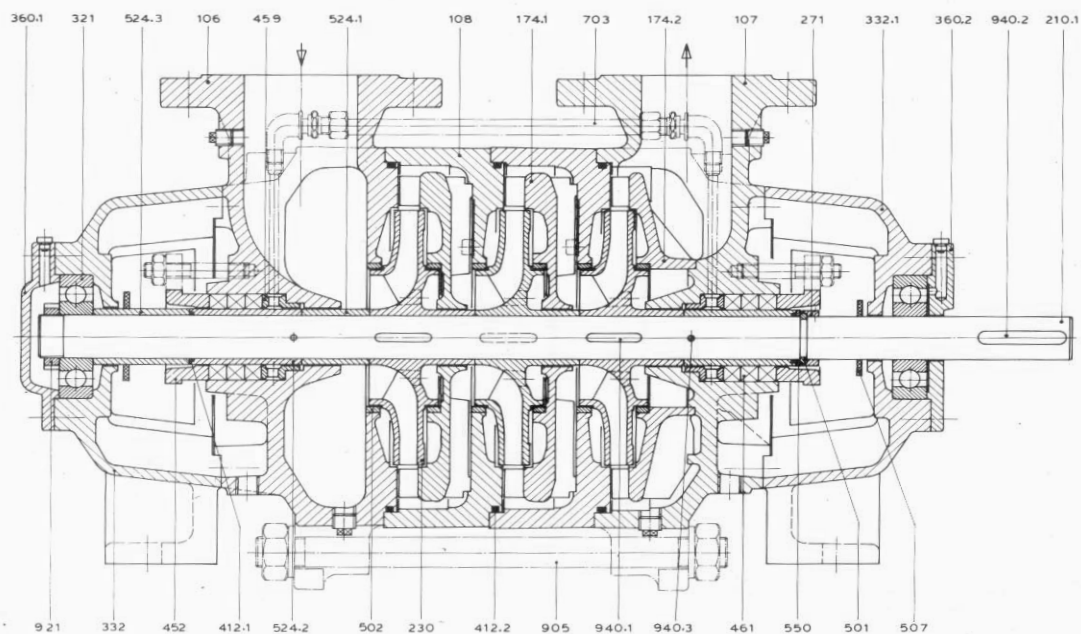
The by-pass arrangement relieves the pressure in the delivery stuffing box and provides a perfect water seal in the suction stuffing box, even at maximum suction lift. Sealing with packing or mechanical seal.

Pump type	Shaft 1.4021				Shaft 1.4401			
	Speed no. of stages	1450 RPM KW	Speed no. of stages	2900 RPM KW	Speed no. of stages	1450 RPM KW	Speed no. of stages	2900 RPM KW14
32 H+V	14 (14)	4 (7.5)	14 (10)	30 (30)	14 (14)	4 (7.5)	14 (10)	30 (30)
40 V	14 (14)	11 (15)	12 (7)	45 (45)	14 (14)	11 (15)	12 (7)	30 (37)
40 H	14 (14)	11 (15)	12 (7)	55 (55)	14 (14)	11 (15)	12 (7)	30 (37)
50 H+V	*13 (13)	18.5 (30)	8 (6)	75 (75)	*13 (13)	18.5 (30)	8 (6)	55 (55)
65 H+V	*11 (11)	30 (45)	7 (4)	110 (110)	*11 (11)	30 (45)	7 (4)	90 (110)

The values in the parentheses are valid for 60 Hz, 1750 and 3450 RPM respectively.

*a thrust bearing is used for vertical ("V") type with 5 or more stages (up to 16 stages).

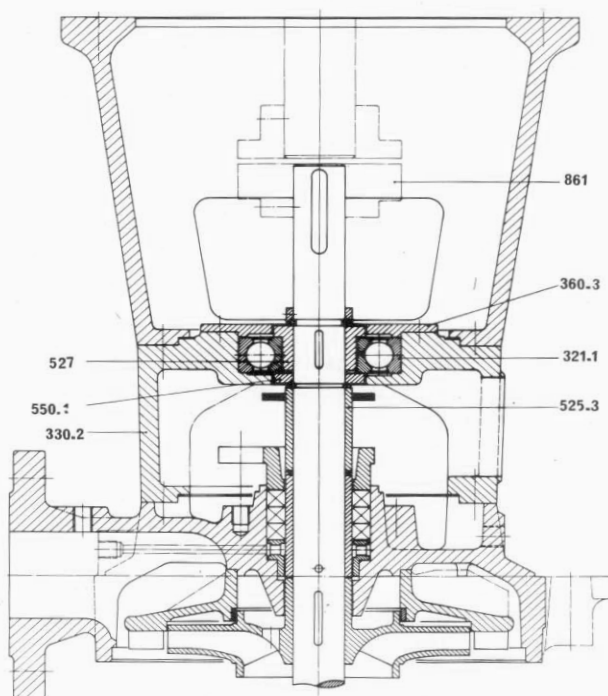
Form H / HORIZONTAL



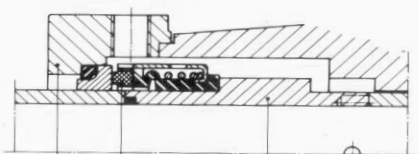
MS-E 50V & MS-E 65V

For 5 stages or more

Form V / VERTICAL



Mechanical seal



471.1 433.1 524.6

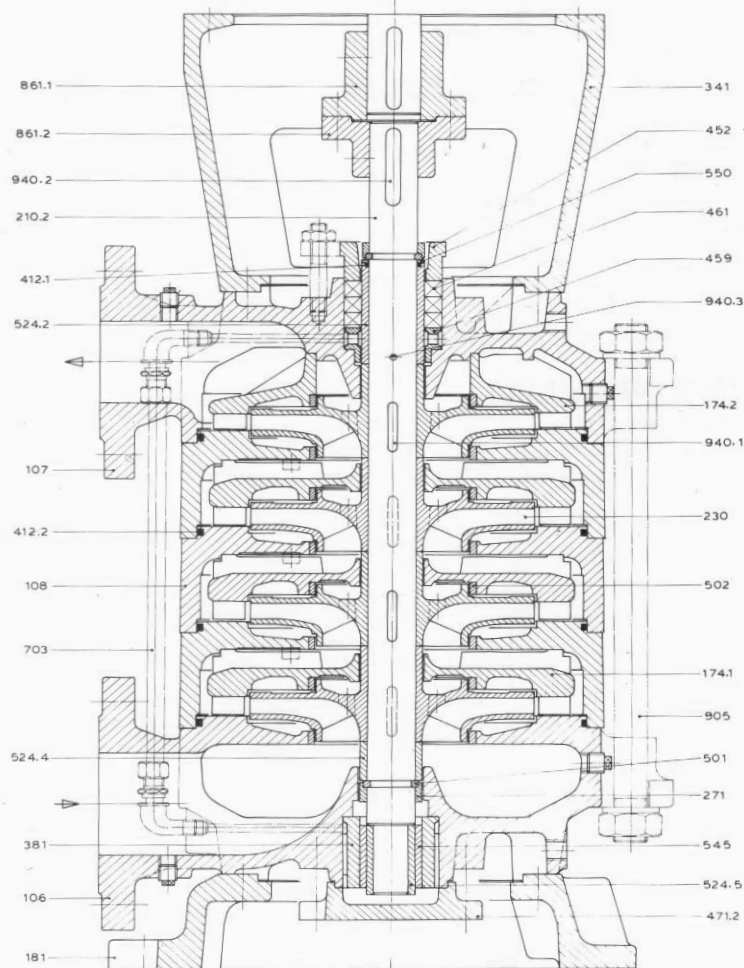
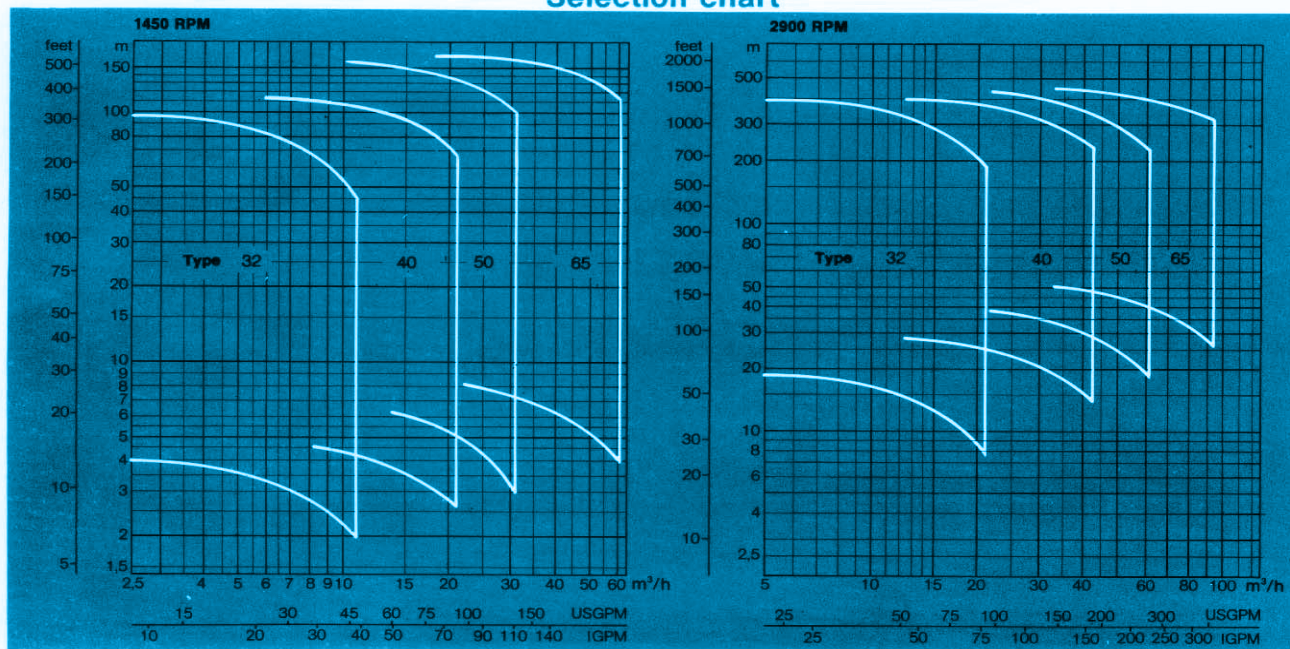


Table of materials for all forms

Part No	Part name	Construction Materials			Part No	Part name	Construction Materials		
		Standard	Special				Standard	Special	
106	Suction casing	CI	ZFB	SS 316	861.1	Coupling, motor half	CI	—	—
107	Delivery casing	CI	ZFB	SS 316	862.2	Coupling, Pump half	CI	—	—
108	Interstage casing	CI	ZFB	SS 316	905	Tie bolt	St	—	A4
174.1	Diffuser	CI	ZFB	SS 316	921	Lock nut	SS 316	—	—
174.2	Diffuser discharge casing	CI	ZFB	SS 316	940.1	Key	SS	—	—
181	Pump base	CI	—	SS 316	940.2	Key	St	—	SS
210.1	Shaft	SS 431	SS 316	SS 316	940.3	Pin	SS 316	—	—
210.2	Shaft	SS 431	SS 316	SS 316	Only for stuffing box with packing				
230	Impeller	ZFB	—	SS 316					
271	Locking ring	SS 316	—	—					
321	Grooved ball bearing	St	—	—					
332	Bearing housing	CI	—	SS 316	452	Gland	ZFB	—	SS 316
332.1	Bearing housing	CI	—	SS 316	459	Lantern ring	ZFB	—	SS316
341	Motor stool	CI	—	SS 316	461	Gland packing	TEFLON	—	—
360.1	Bearing cover	CI	—	SS 316	524.2	Shaft sleeve	ZFB	—	SS 316
360.2	Bearing cover	CI	—	SS 316	Only for mechanical seal				
381	Bearing cartridge	CI	ZFB	SS 316					
412.1	O - Ring	Rubber	—	—					
412.2	O -Ring	Rubber	—	—					
471.2	Seal Cover	CI	ZFB	SS 316	433.1	Mechanical seal	Carbon/SIC	—	—
501	Split ring	SS 316	—	—	471.1	Seal cover	CI	ZFB	SS 316
502	Wearing ring	ZFB	—	SS 316	524.6	Shaft sleeve	ZFB	—	SS 316
507	Thrower ring	Plastic	—	—	Only for axial thrust bearing				
524.1	Shaft sleeve	ZFB	—	SS 316					
524.3	Shaft sleeve	ZFB	—	SS 316					
524.4	Shaft sleeve	ZFB	—	SS 316					
524.5	Shaft sleeve	SS 420	—	SS 316	321.1	Grooved ball bearing	St	—	—
545	Bearing bush	ZFB	—	TC	330.2	Bearing housing	CI	—	—
550	Distance ring	SS 316	—	—	360.3	Bearing cover	CI	—	—
703	Bypass pipe	ST	SS 316	SS 316	525.3	Distance sleeve	ZFB	—	—
					527	Locating sleeve	SS 420	—	—
					550.1	Distance ring	SS 420	—	—
					861	Flexible couplings	GGG	—	—

Selection chart



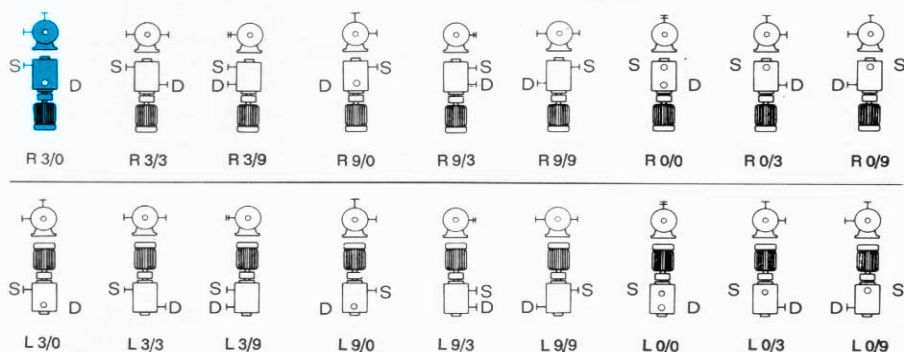
Form H / HORIZONTAL

Installation

Form V / VERTICAL

Pump for clockwise rotation as seen from driver.

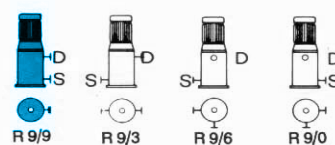
Branch position
Unless otherwise specified, branch arrangement R 3/0 will be supplied.



Pump for counter - clockwise rotation as seen from driver.

Parallel branches are only possible with 3 or more stages (model 65, 2 stages)

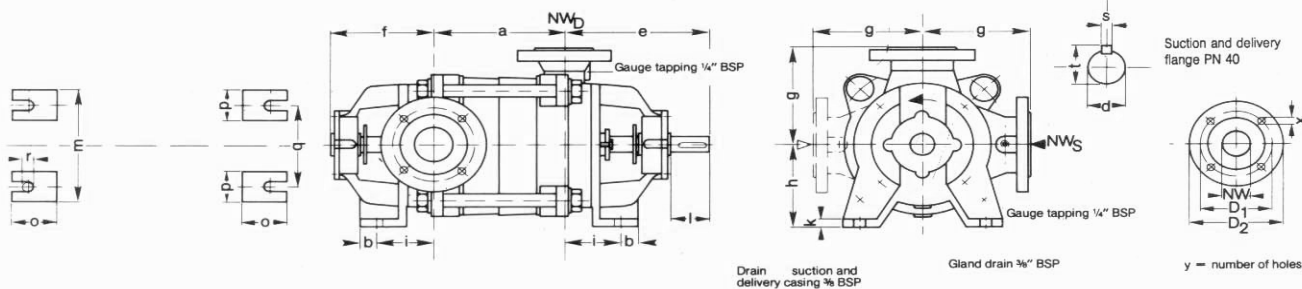
Branch arrangement



In the absence of specific instructions pumps are supplied with the following branch arrangements:
1 and 2 stage: as R 9/3, i.e. opposite to each other.
3 stages and up: as R 9/9, i.e. delivery branch above the suction branch.

Dimensions

Form H



Dimension "a" with number of stages

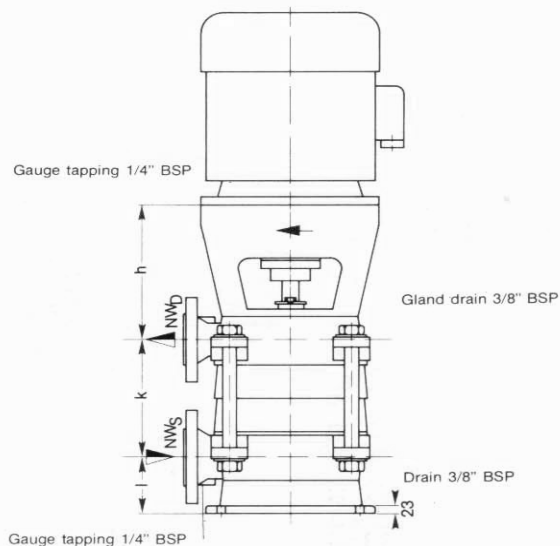
Shaft end

Type	NW _s	NW _D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	b	e	f	g	h	i	k	m	q	o	p	r	l	d	t	s
32	40	32	83	131	179	227	275	323	371	419	467	515	563	611	659	707	20	215	150	165	132	78	16	260	200	60	60	14	65	25	28	8
40	50	40	90	145	200	255	310	365	420	475	530	585	640	695	750	805	20	215	150	170	132	78	16	260	200	60	60	14	65	25	28	8
50	65	50	102	169	236	303	370	437	504	571	638	705	772	839	906		30	250	180	190	160	98	16	280	220	80	60	18	70	30	33	8
65	80	65	125	200	275	350	425	500	575	650	725	800	875				30	275	195	210	180	108	16	330	270	80	60	18	80	35	38	10

NW	D ₁	D ₂	x	y
32	100	140	18	4
40	110	150	18	4
50	125	165	18	4
65	145	185	18	8
80	160	200	18	8

Flange connections
to DIN 2501 page 1 PN 40

Form V



Motor stool
DIN 42948

z = number of holes

Suction and delivery
flange PN 40

y = number of holes

Dimension "K" with number of stages

motorstool flange DIN 42948

Type	NW _s	NW _D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	f	i	l	m	t	a	b	e	h	s	z
32	40	32	83	131	179	227	275	323	371	419	467	515	563	611	659	707	300	350	105	165	300	200	130	165	220	M10	4
																						250	180	215	230	M12	4
																						300	230	265	250	M12	4
																						350	250	300	280	18	4
																						400	300	350	280	18	4
40	50	40	90	145	200	255	310	365	420	475	530	585	640	695	750	805	300	350	105	170	300	200	130	165	220	M10	4
																						250	180	215	230	M12	4
																						300	230	265	250	M12	4
																						350	250	300	280	18	4
																						400	300	350	280	18	4
																						450	350	400	280	18	4
50	65	50	102	169	236	303	370	437	504	571	638	705	772	839	906		350	400	120	190	350	250	180	215	245*	M12	4
																						300	230	265	265*	M12	4
																						350	250	300	295*	M16	4
																						400	300	350	295*	18	4
																						450	350	400	295*	18	8
																						550	450	500	325*	18	8
65	80	65	125	200	275	350	425	500	575	650	725	800	875				350	400	130	210	350	250	180	215	245*	M12	4
																						300	230	265	265*	M12	4
																						350	250	300	295*	M16	4
																						400	300	350	295*	18	4
																						450	350	400	295*	18	8
																						550	450	500	325*	18	8
																						660	550	600	325*	23	8

*With axial thrust bearing 118 mm must be added
The technical data of this leaflet are subject to change without notice.



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