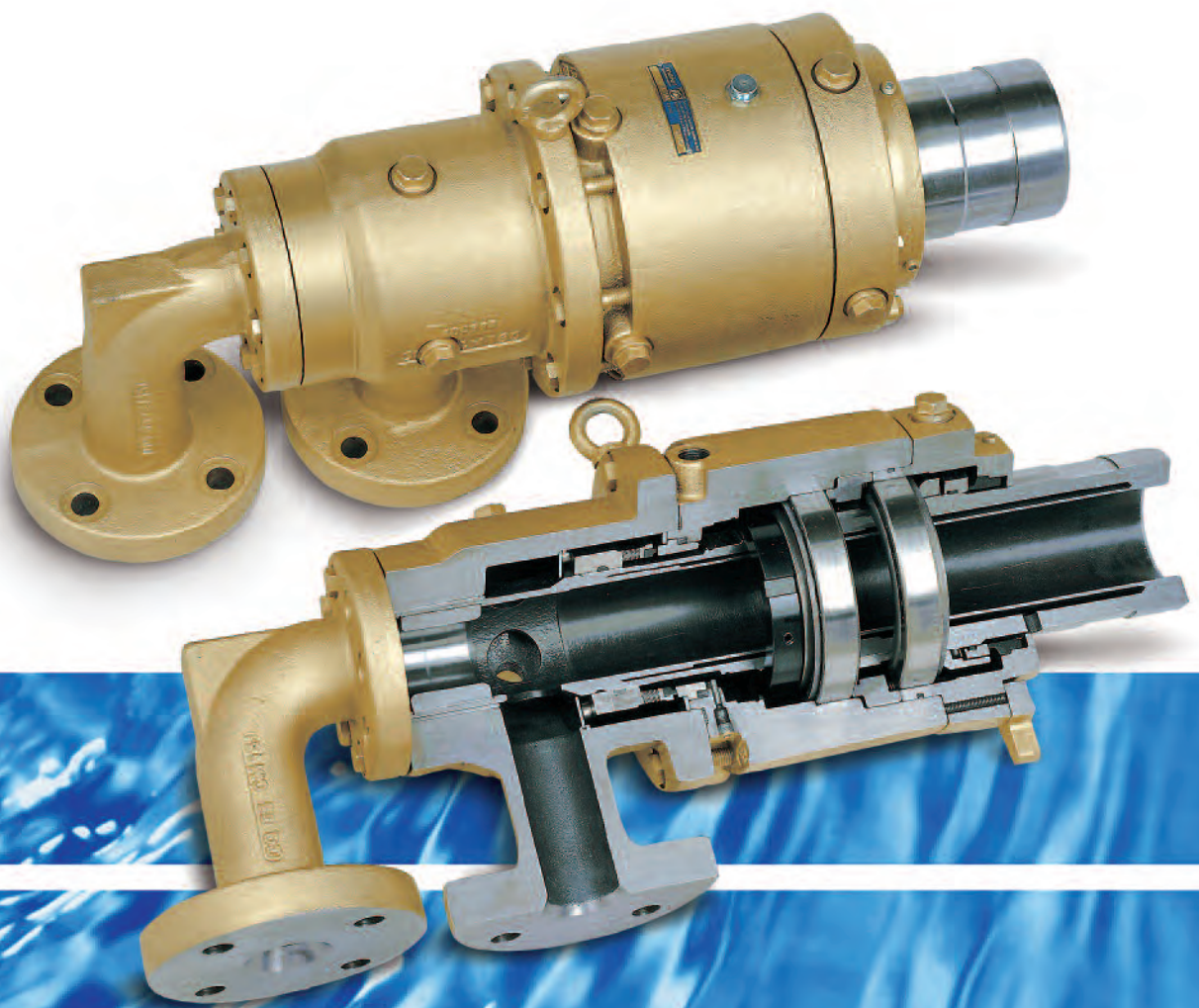


# Rotary Joints

## Series DQ



# Rotary Joints Series DQ

## DQ - Rotary Joints

are suitable for thermal oil up to 400°C and for rotational speeds of up to 2000 min<sup>-1</sup>. These applications can be found, for example, in coating and laminating plants, in paper, non-woven and textile calendars, in dryers and in rotary reaction vessels.

Chemical reactions in the form of carbonisation and cracking take place if hot thermal oil comes into contact with atmospheric oxygen. The seals will be damaged causing hot oil and oil vapours to escape.

The internationally patented DQ system prevents these effects thus offering unique advantages. Atmospheric oxygen is isolated from the hot oil by a barrier fluid. A cooling unit is used with the DQ and DQT series for cooling the barrier fluid using the same heat transfer medium as in the main circuit. The DQL version does not require a cooling unit since its temperature limit is 250°C.

The fifth DQ generation does not need a separate cooling unit. Instead, the existing oil lubrication circuit of the production facility is used and connected. This enables considerably higher speeds. Due to the temperature limitation to 250°C (482°F), series DQL does not require a cooling unit.

## Advantages and Features

- Much longer service life than other rotary joints.
- Longer machine availability and appropriate maintenance schedules due to constant monitoring of the rotary joint function via the cooling unit.
- Significantly reduced risk of thermal oil and oil vapours escaping.
- The primary seal is pressure balanced and free running. A seal protector disk provides protection against coarse contamination. Further safety due to the externally loaded mechanical seal.
- The secondary seal is subject to low stress thanks to the cooled barrier fluid.

- Insulation of the rotor protects the bearings from high temperature and prevents energy loss.
- The function of the rotary joints is monitored via control elements on the cooling unit. In case of leakage, it is possible to continue producing up to the next scheduled shut-down.

## Additional Technical Design Details:

- Housing parts of spheroidal graphite cast iron, for applications from 350°C upward of high-temperature steel.
- DN 25-40 with ball bearings; DN 50-150 with self-aligning tapered roller bearings in the area of the cooling oil.
- Bearing lubrication in the DQL via high-temperature grease. Cooled oil is used in the DQ and DQT.
- A screw plug at cooling oil connections Q is provided with thread M 6 for attaching a sensor for monitoring the bearings.
- Connection to the rotary pressure system via K-flange and conical inner rings.
- Radial and axial housing connection with flanges to DIN 2633. Flanges to other standards, e.g. ANSI, are also available.
- Barrier fluid connections with internal thread to ISO 228.
- Prevention of rotation by means of anti-rotation forks which can be mounted through 8 x 45° positions.
- Static support in the rotor for a rotating inner pipe prevents wear in this point.
- We recommend to use a special distribution system for distributing cooling oil to several rotary joints with one cooling unit.
- Please refer to our operating instructions that can be downloaded at [www.maier-heidenheim.de](http://www.maier-heidenheim.de) for additional information and safety precautions. Please get in touch with the factory for a user name and a password.

Subject to technical alterations!

## Application Data

Series		DQL	DQ	DQT	DQTX	DQ5
Design Nominal diameter DN	mm	1, B2 25...150	1, B2 25...200	1, B2 25...150	1, B2 25...150	1, B2 25...200
Additional device for cooling and lubrication		–	KE, KEW	KE, KEW	KE, KEW	oil lubrication circuit provided by customer
Medium		thermal oil	thermal oil	thermal oil	thermal oil	thermal oil
Temperature	max °C	250 200 (DN 50)	300	350	400	300
	max °F	482	572	662	752	572
Pressure PN	max bar max psi	10 145	10 145	10 145	13 189	10 145
Speed	max min <sup>-1</sup>	$\frac{55.000}{DN}$ DN 50 ≥ 200°C: $\frac{35.000^*}{DN}$	$\frac{100.000}{DN}$	$\frac{100.000}{DN}$	$\frac{100.000}{DN}$	$\frac{130.000}{DN}$

\* Speed depends on temperature – for more than 200 °C (392°F) contact us.  
Avoid the combination of maximum values.

## Ordering Instructions

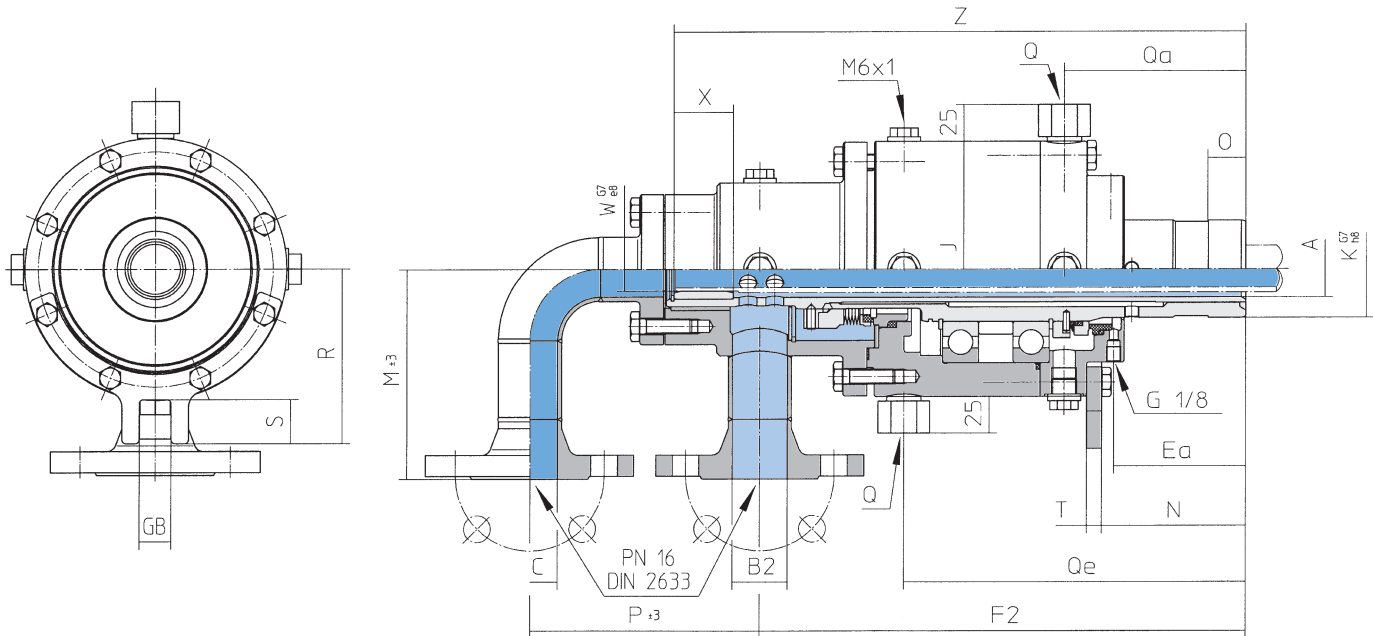
Example

DQ T B 2 50 K -100

<b>Series DQ</b>	
DQL	up to 250°C / 482°F
DQ, DQ5	up to 300°C / 572°F
DQT	up to 350°C / 662°F
DQTX	up to 400°C / 752°F
B	design for rotating inner pipe with static seal between inlet and outlet
1	number of housing connections for one-way flow (only on request)
2	for two-way flow
	Nominal diameter DN in mm (≙ dimension A) 25, 32, 40, 50, 65, 80, 100, 125, 150, 200
K	rotor connection for K – flange
-100	European standard
>100	consecutive numbers for special designs, numbering by factory

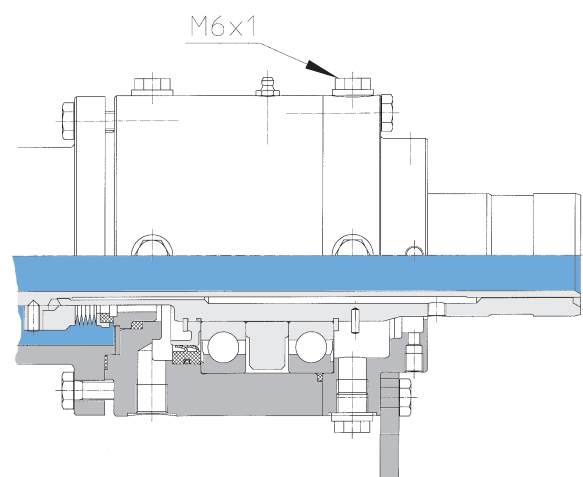
# DQB2 DN 25-40

for two way flow of a medium  
designed for rotating inner pipe



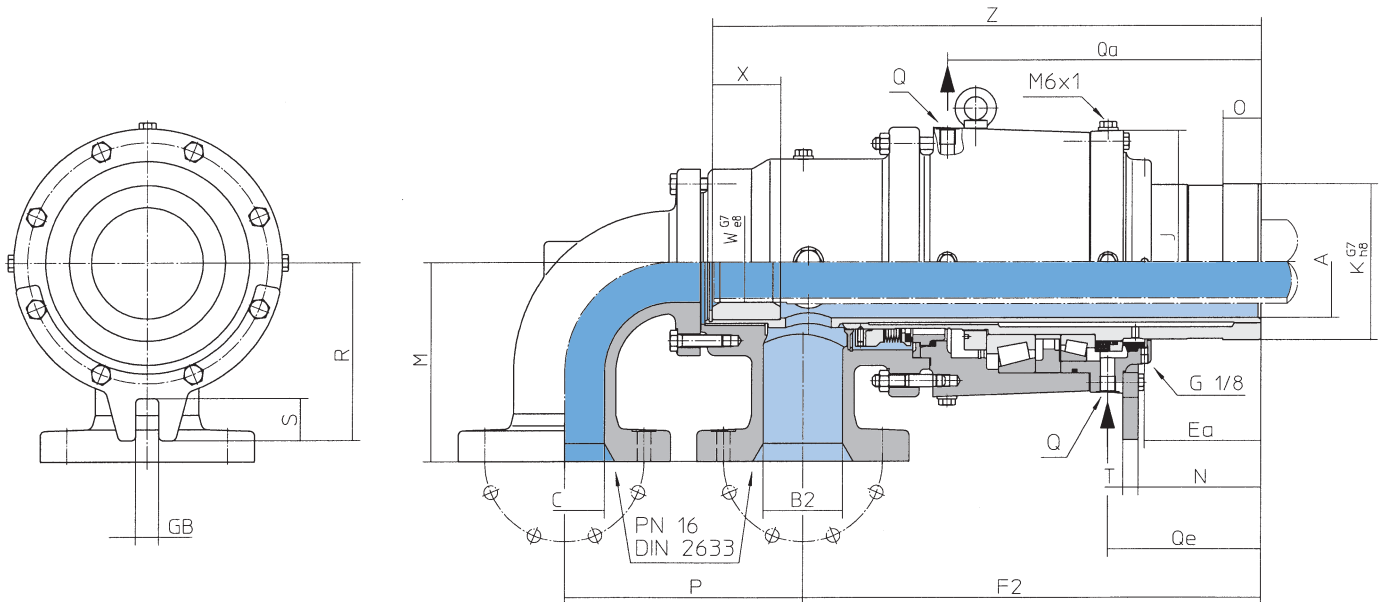
DN	25	32	40
Type	DQLB 225 K	DQLB 232 K	DQLB 240 K
Order no.	1110097	1110172	1110247
Type	DQB 225 K	DQB 232 K	DQB 240 K
Order no.	1110081	1110156	1110231
Type	DQTB 225 K	DQTB 232 K	DQTB 240 K
Order no.	1110091	1110166	1110241
Ø A	25	32	38
B2	DN 20	DN 25	DN 32
C	DN 20	DN 25	DN 32
Ea	71	76	88
F2	280	285	325
Ø J	150	150	170
Ø K G7/h8	45	50	65
M±3	120	120	140
N	77	82	96
O	20	25	25
P±3	140	140	155
Q (4x90°)	G 1/2	G 1/2	G 1/2
Qa	100	105	121
Qe	183	188	228
R	102	102	120
S	24	24	25
T	10	10	10
Ø W G7/e8	18	24	29
X	30	30	40
Z	325	330	383
GB	20	20	20
Weight (kg)	25	25	35

DQL



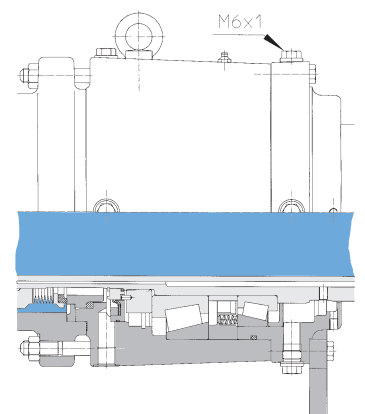
# DQB2 DN 50-150

for two way flow of a medium  
designed for rotating inner pipe



DN	50	65	80	100	125	150
Type	DQLB 250 K-100	DQLB 265 K-100	DQLB 280 K-100	DQLB 2100 K-100	DQLB 2125 K-100	DQLB 2150 K
Order no.	1110322-700	1110397-100	1110472-100	1110547-100	1110622-100	1110697
Type	DQB 250 K-100	DQB 265 K-100	DQB 280 K-100	DQTB 2100 K-100	DQTB 2125 K-100	DQTB 2150 K
Order no.	1110306-100	1110381-100	1110456-100	1110531-100	1110606-100	1110681
Type	DQTB 250 K-100	DQTB 265 K-100	DQTB 280 K-100	DQTB 2100 K-100	DQTB 2125 K-100	DQTB 2150 K
Order no.	1110316-100	1110391-100	1110466-100	1110541-100	1110616-100	1110691
Ø A	50	66	81	99	119	146
B2	DN 40	DN 50	DN 65	DN 80	DN 100	DN 125
C	DN 40	DN 50	DN 65	DN 80	DN 100	DN 125
Ea	101	116	119,5	134,5	138,5	152
F2	400	425	455	502	560	600
Ø J	186	204	234	265	310	352
Ø K G7/h8	85	105	114	135	170	204
M±3	145	170	180	195	230	260
N	83	125	131,5	146,5	149	160
O	30	35	40	45	50	50
P±3	170	180	205	225	280	315
Q (4x90°)	G 1/2	G 1/2	G 1/2	G 1/2	G 1/2	G 1/2
Qa	277	308,5	325	362	401	410
Qe	124,5	154	164,5	179,5	189,5	200
R	115	130	155	177	205	232
S	23	25	36,5	55	50	55
T	10	10	15	15	15	20
Ø W G7/e8	37	45	60	75	88	105
X	50	50	40	50	80	90
Z	460	500	535	587	676	720
GB	22	22	26	30	30	30
Weight (kg)	50	68	95	130	208	284

DQL



# KE + KEW Cooling Unit

## Cooling Unit KE/KEW

Rotary Joints of series DQ and DQT require a barrier fluid for cooling (we recommend to use the same heat transfer medium as in the main circuit). The barrier fluid is conditioned by an external cooling unit. Type KE is equipped with an oil-to-air heat exchange, type KEW has an oil-to-water heat exchanger. For monitoring the rotary joints as well as the cooling and filtering function of the barrier fluid, monitoring elements are installed which transmit signals to a control unit provided by customer. In case of leakage at the rotary joint it is possible to continue operating up to the next scheduled shut-down.

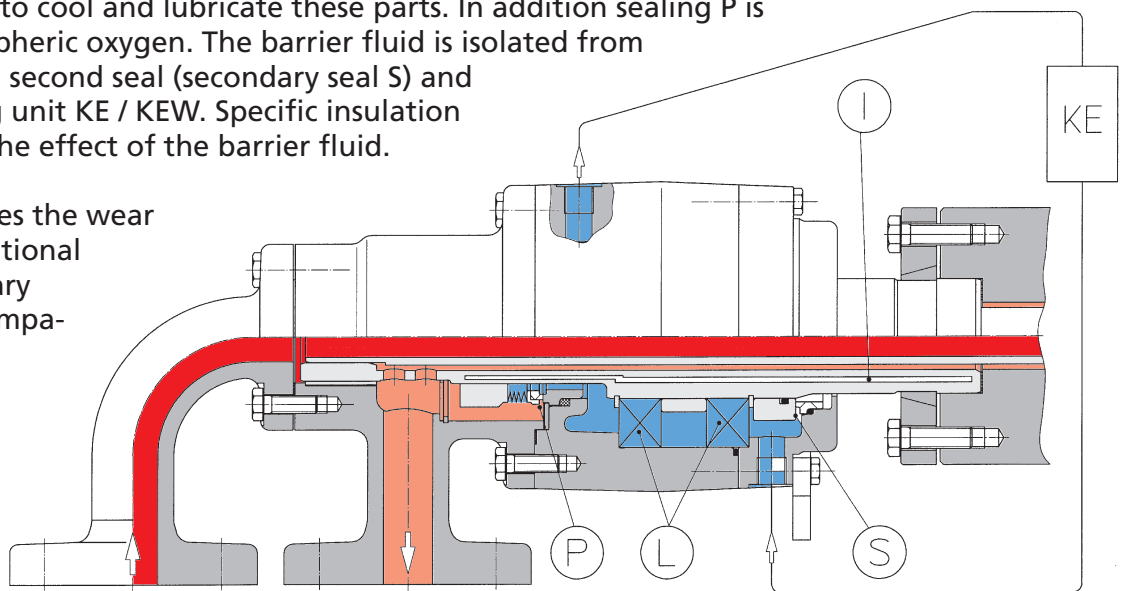
It is possible to have several rotary joints supplied by one cooling unit. In order to supply equally to each rotary joint the cooling unit is equipped with a cooling oil distributor in the inlet line.



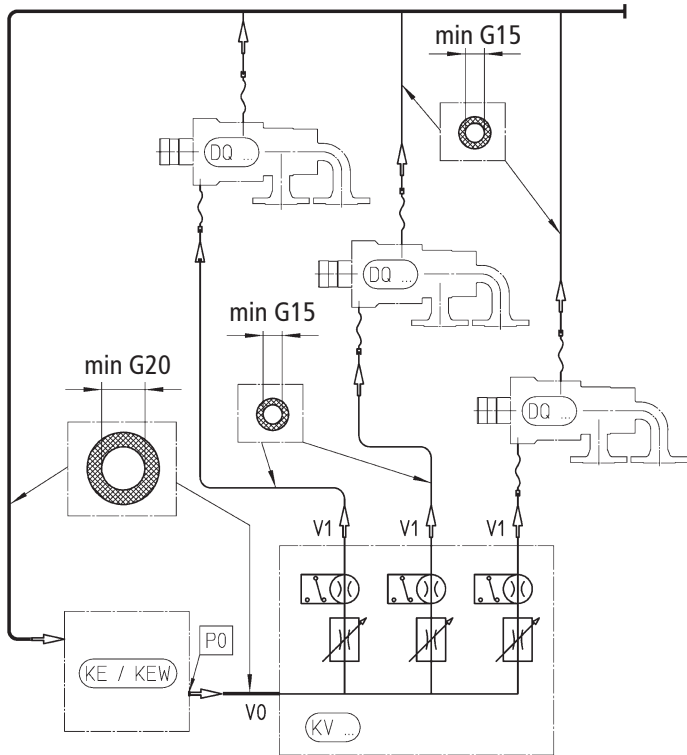
## Cooling Unit KE/KEW

Hot thermal oil flows through the rotary joint and is sealed by a mechanical seal (primary seal P). If the hot thermal oil gets in contact with atmospheric oxygen in the sealing gap P, chemical reactions (carbonisation) would be the result leading to damages on sealing P and bearing L. Therefore a barrier fluid (second oil circuit) flows through the bearing and sealing area of the rotary joint in order to cool and lubricate these parts. In addition sealing P is isolated from atmospheric oxygen. The barrier fluid is isolated from the atmosphere by a second seal (secondary seal S) and processed by cooling unit KE / KEW. Specific insulation measures I support the effect of the barrier fluid.

This solution improves the wear resistance and operational reliability of the rotary joint significantly compared to conventional rotary joints.



# Cooling Circuit for two or more Rotary Joints



For two or more rotary joints, the cooling oil circuit has to be executed in accordance with the accompanying diagram. A cooling oil distributor KV is recommended to compensate differences in length and cross section of the line. They ensure an even oil supply V1 to the rotary joints and transmit an electric signal to the control unit when the limit value is not reached.

Maximum line length is 25 m. Observe the minimum cross section of the line according to the diagram.

The maximum admissible head loss in the whole system is 5 bars (pump pressure P0) For further information see our operating manual B-KE.

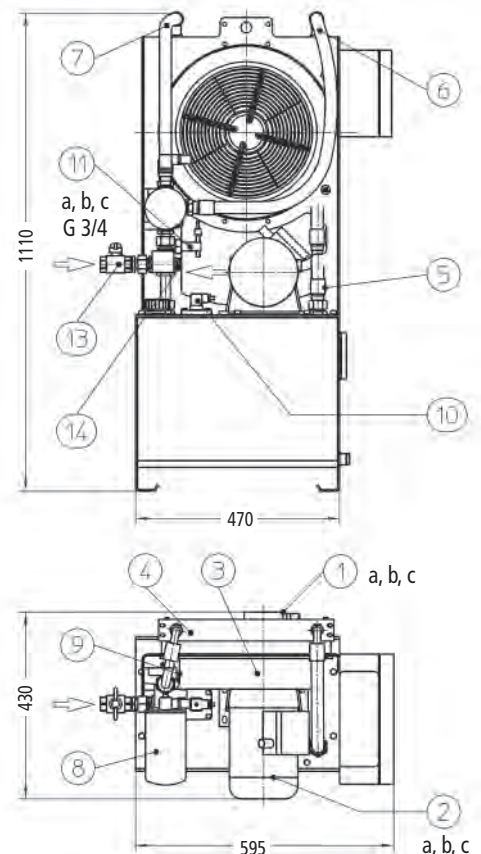
## Features of the Cooling Unit

In case of a malfunction, integrated monitoring devices for temperature, flow rate, level min/max. and filter condition transmit an electric signal to the customer's control. Wiring done as far as to the terminal box. Installation without main switch, fuses, or control units.

Size of pump	l/min	8	16	28
Type		KE 28-34	KE 28-16	KE 28
Order no.		1192058-034	1192058-016	1192058
Type		KEW 28-39	KEW 28-42	KEW 28
Order no.		1192059-039	1192059-042	1192059
Nom. tank volume	l	35	35	35
Motor power	50 Hz	0,37 kW; 380-420 V	0,75 kW; 380-420 V	0,75 kW; 380-420 V
Circulating pump	l/min	8	16	28
Cooling capacity*	kW	8 (KE) / 10 (KEW)	12,5 (KE) / 16,5 (KEW)	15,5 (KE) / 20 (KEW)
Control voltage	60 Hz	0,44 kW; 440-480 V	0,9 kW; 440-480 V	0,9 kW; 440-480 V
Circulating pump	l/min	9,6	19,2	33,6
Cooling capacity*	kW	8 (KE) / 10 (KEW)	12,5 (KE) / 16,5 (KEW)	15,5 (KE) / 20 (KEW)

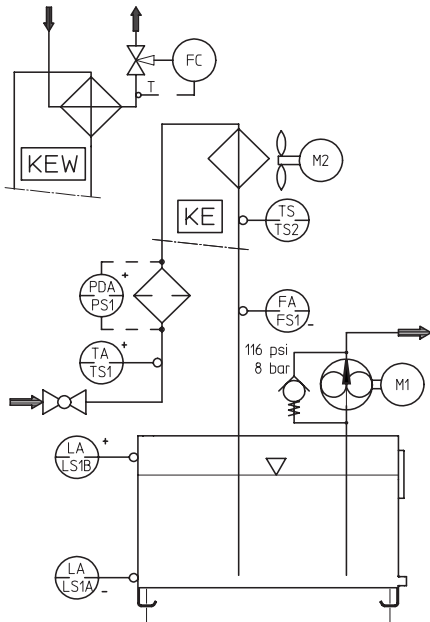
Control voltage 24V or 220V. Design according 2006/42/CE. Standard color RAL 7032 pebble grey structured.

\* at an air or water temperature of max. 30°C at the inlet.

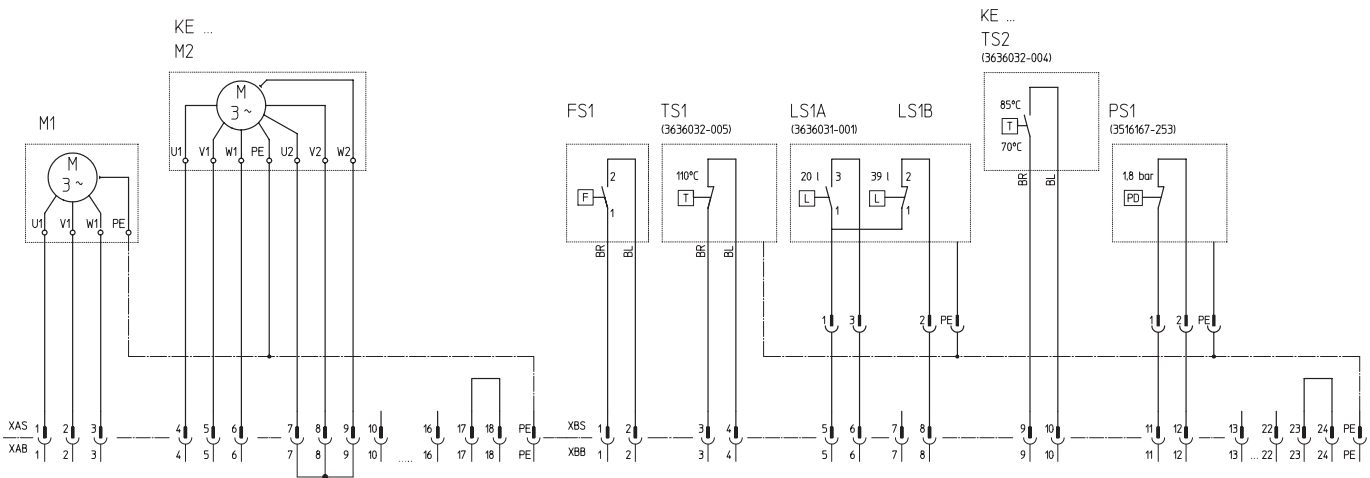


See parts list page 8

# Features of the Cooling Unit



M1		3-phase motor for pumps	Insulation cl. F, IP 54 380-420 V/50 Hz/1400 rpm 440-485 V/60 Hz/1680 rpm
M2		3-phase motor for air cooler <b>only with type KE</b>	0.18 kW insulation class F, IP 44 380-420 V/0.31 A 50 Hz/2600 rpm
FS1	FA-	Flow guard flow rate reached = 1	IP 65, AC/DC max. 250 V, max. 2 A, 60 W
TS1	TA+	Temperature guard Oil temperature too high = 0	IP 65, AC/DC, max 250 V 12 V: max. 10 A 24 V: max. 5 A
LS1A	LA-	Level indicator min Oil level too low = 0	IP 65, AC/DC
LS1B	LA+	Level indicator max Oil level too high = 0	max. 250 V, 55 W
TS2	TS	Controller for oil/air cooler <b>only with type KE</b>	IP 65, AC/DC, max. 250 V 12 V: max. 10 A 24 V: max. 5 A
		FC	Control valve for oil/water heat exchanger <b>only with type KEW</b>
			non-electrical controller
PS1	PDA+	Filter wear indicator Filter change = 0	IP 65, AC/DC, max. 250 V 220 V: max. 5 A, 24 V: max. 8 A



## Spare Parts

Type	KE	KEW
1a Pump 8 l/min (2.1 gpm)	3516157-001	3516157-001
1b Pump 16 l/min (4.2 gpm)	3516157-001	3516157-001
1c Pump 28 l/min (7.4 gpm)	3516157-002	3516157-002
2a El.motor for 1a	3631011-003	3631011-003
2b El.motor for 1b	3631017-001	3631017-001
2c El.motor for 1c	3631017-001	3631017-001
3 Coupling for 1a, 1b	3514092-001	3514092-001
3 Coupling for 1c	3514092-002	3514092-002
4 Heat exchanger	3516156-001	3516153-101
5 Hose 1	3513001-001	3513001-001
6 Hose 2	3513001-002	3513001-001
7 Hose 3	3513001-003	3513001-006

Type	KE	KEW
8 Filter cartridge	3516166	3516166
9 Temperature control	3636032-004	-
10 Level indicator	3636031-001	3636031-001
11a Flow guard for 1a	3636026-001	3636026-001
11b Flow guard for 1b	3636030-001	3636030-001
11c Flow guard for 1c	3636030-002	3636030-002
12 Cooling water contr. valve	-	3516002-003
13 Ball valve	3516171-001	3516171-001
14 Temperature control	3636032-005	3636032-005

Please specify exact type designation of the cooling unit plus order no. when placing an inquiry or an order.



# System Design Calculations

## Initial Data

Nominal diameter of rotary joint	DN	mm
Thermal oil temperature	T1	°C
Thermal oil pressure	p1	bar
Speed	n	n <sup>-1</sup>
Number of rotary joints per unit	z	pieces

## Calculation

Mechanical friction load per rotary joint $P_m = 0,105 * n * M_r / 1000$ ( $M_r$ from fig. 1)	=	kW
Thermal capacity per rotary joint ( $P_t$ from fig. 2)	=	kW
Cooling capacity per rotary joint $P_v = P_m + P_t$	=	kW
Required cooling capacity $P_{ke} * \geq Z * P_v$	=	kW
Required oil flow per unit: $Q \geq 1,35 * Z * P_v$	=	l/min

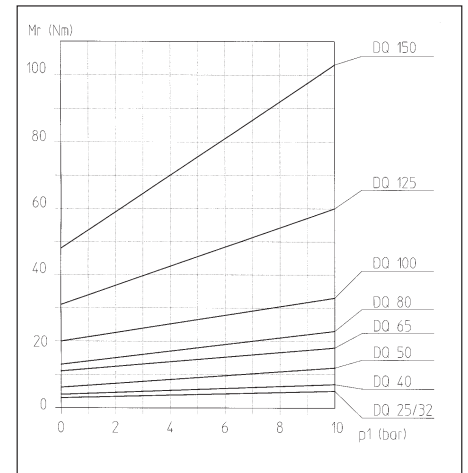


fig. 1

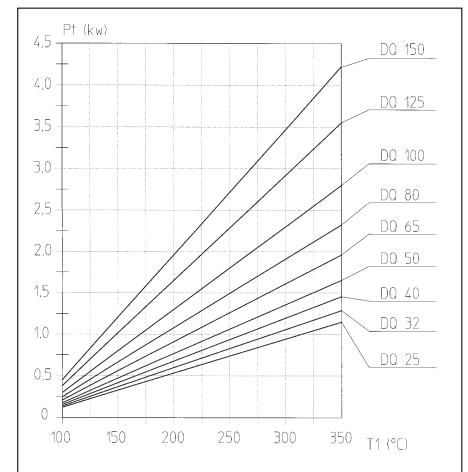
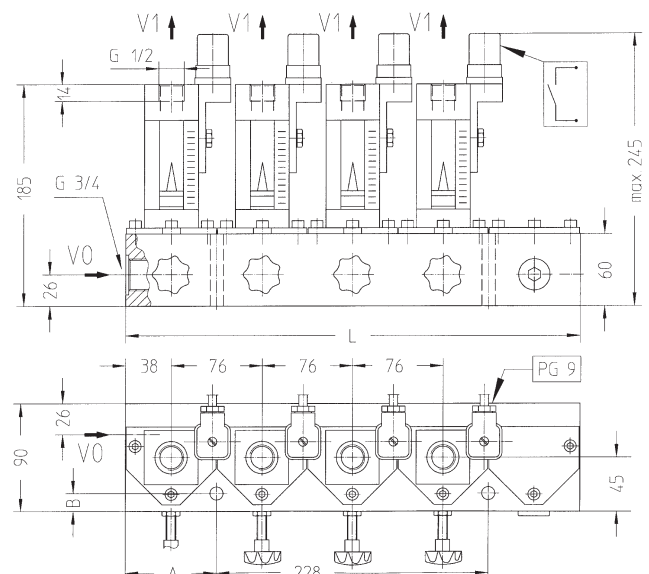


fig. 2

# Cooling Oil Distributor

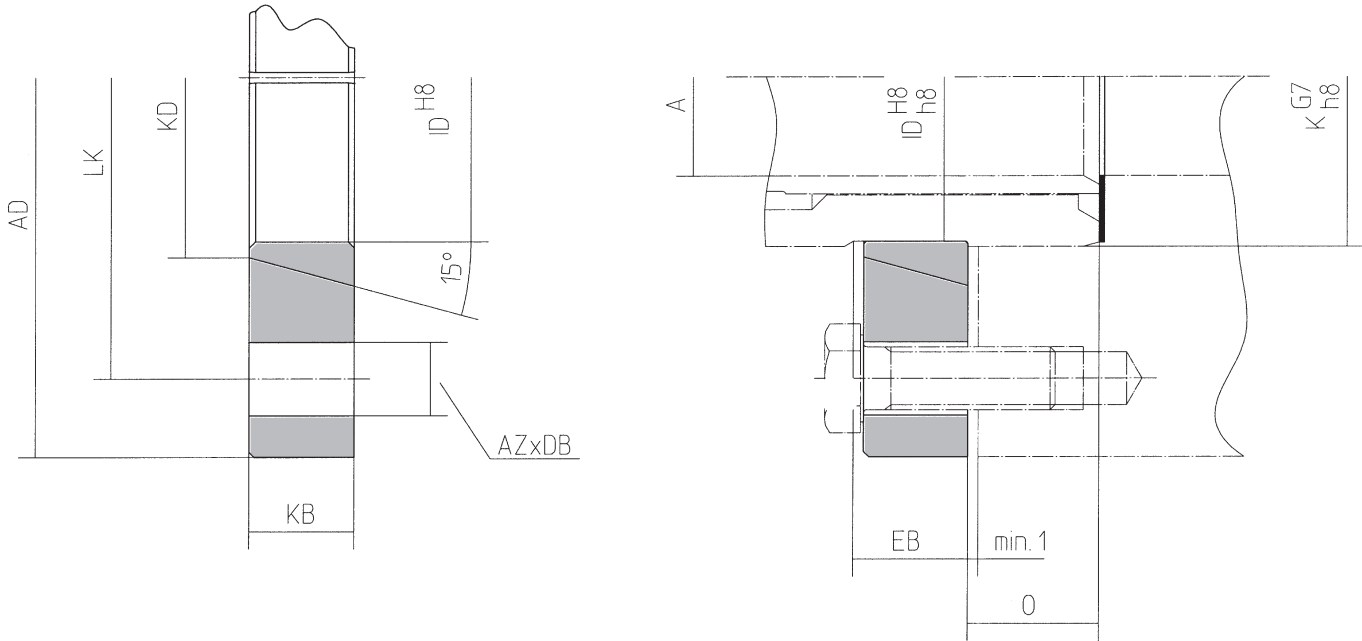
Oil volume/ rotary joint V1	Number of rotary joints z			
	z = 2	z = 3	z = 4	z = 5
4-10 l/min		KV 10-3 3516158-103	KV 10-4 3516158-104	KV 10-5 3516158-105
10-20 l/min	KV 20-2 3516158-202			
L	152	380	380	380
A	11	76	76	76
B	11	15	15	15

The size of the oil distributors must be adapted to the pump capacity. The above oil distributors are designed for a 28 liter pump.



# Journal Flanges for K Rotor Connection

K-flanges and Inner Rings – Material: carbon steel



DN	K-flange	Order no.	Inner ring	Order no.	Gasket Order no.	Ø A	Ø AD	Ø LK	AZ x Ø DB	Ø KD	Ø ID H8/h8	KB	Ø K G7/h8	O	EB
25	KF 32-500	1190434-500	IR 32-500	1190404-500	3512234	25	115	90	4 x 11	48	43	15	45	20	16
32	KF 40-500	1190435-500	IR 40-500	1190405-500	3512235	32	120	95	4 x 11	53	48	18	50	25	20
40	KF 50-500	1190436-500	IR 50-500	1190406-500	3512236	38	145	115	4 x 14	69	63	20	65	25	22
50	KF 65-500	1190437-500	IR 65-500	1190407-500	3512237	50	165	135	4 x 14	89	82	25	85	30	28
65	KF 80-500	1190438-500	IR 80-500	1190408-500	3512238	66	205	170	4 x 18	109	102	30	105	35	34
80	KF 100-500	1190439-500	IR 100-500	1190409-500	3512239	81	220	185	6 x 18	120	110	30	114	40	32
100	KF 100-41	1190439-041	IR 100-10	1190409-010	1190045	98	228	195	8 x 18	144	130	30	135	45	32
125	KF 125-9	1190450-009	IR 125-6	1190410-006	1190026	120	250	215	8 x 18	175	165	35	170	50	38
150	KF 150-19	1190451-019	IR 150-10	1190411-010	1190047	143	305	260	8 x 22	205	200	40	204	50	45

## Gasket for flange connections B2 and C (to DIN 2633)

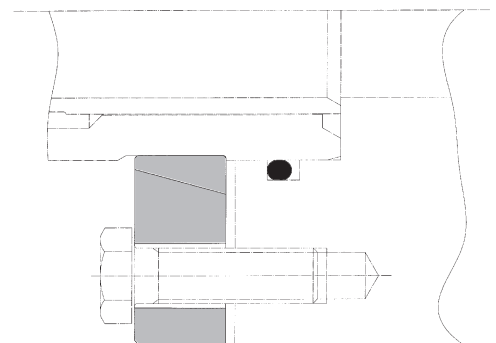
DN	Gasket for Connection B2, C
25	3512265
32	3512266
40	3512267
50	3512268
65	3512269
80	3512270
100	3512271
125	3512272
150	3512273

Attention: DN = DN of rotary joint.

### Journal Flange Connection with O-Ring

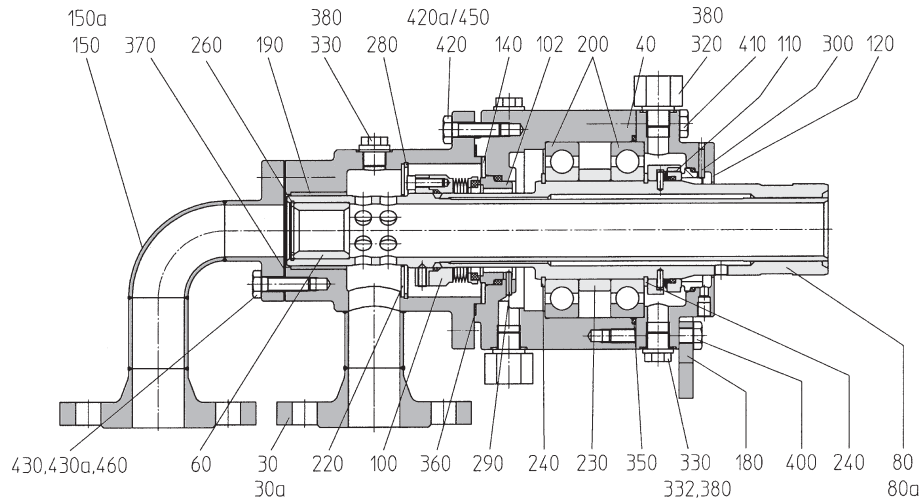
For mounting rotary joints without alignment for high speeds we recommend to use O-rings for sealing.

**Attention!** Consider medium and temperature when selecting the O-ring!

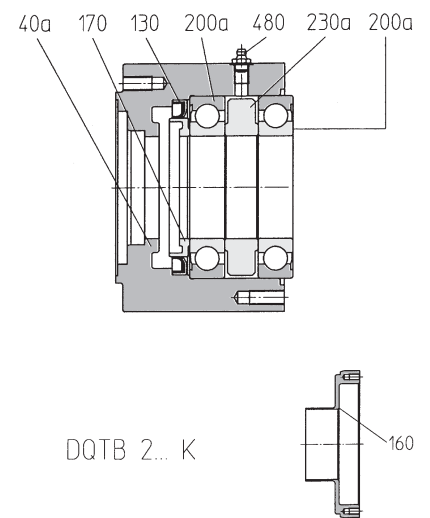


# Spare parts for series DQ DN 25-40

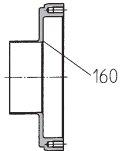
DQB 2... K



DQLB 2... K



DQTB 2... K



DN	25	32	40
30 Housing DQB2 / DQLB2	1110102	1110177-120	1110252-090
30 a Housing DQTB2	1110102-068	1110177-155	1110252-114
40 Bearing hous. DQ / DQT	1110184-145	1110184-145	1110259
40 a Bearing housing DQL	1110184-150	1110184-150	1110259-122
60 Rotor bushing	1110119	1110194	1110269
80 Rotor K DQB2 / DQLB2	1110115	1110190-146	1110265
80 a Rotor K DQTB2	1110115-072	1110190-157	1110265-116
100 Metal bellows primary seal	3511188-011	3511188-011	3511190-011
102 Counter face primary seal	1110202-133	1110202-133	1110277-101
110 Secondary seal compl.	1110201-141	1110201-141	1110276
110-10 Counter face secondary seal	3511404-077	3511404-077	3511405-046
110-20 Carbon sealing ring sec. seal	1110201-139	1110201-139	1110278
110-40 Compression spring	3511681	3511681	3511682
110-50 O-Ring 1	3511701-001	3511701-001	3511894-001
110-60 O-Ring 2	3511696-001	3511696-001	3511708-001
120 Cover	1110210-092	1110210-092	1110285-086
130 Shaft seal DQL	3511781-001	3511781-001	3511782-001
140 Support disk	1110206	1110206	1110281-057
150 Elbow DQ / DQL	1110139	1110214-123	1110289-092
150 a Elbow DQT	1110139-064	1110214-152	1110289-119
160 Deflector sleeve DQT	1110209	1110209	1110295-123
170 Shaft sleeve DQL	1110223-154	1110223-154	1110298
180 Anti-rotation fork	1110212-066	1110212-066	1110287
190 Slide bush	3510482	3210482	3510532
200 Grooved ball bearing	3510135-005	3510135-005	3510206-005
200 a Grooved ball bearing DQL	3510135-010	3510135-010	3510206-010
220 Seal protector disk	1110174	1110174	1110282-058

DN	25	32	40
230 Distance ring DQ / DQT	1110208	1110208	1110283
230 a Distance ring DQL	1110208-151	1110208-151	1110283-082
240 Circlip 1	3501023	3501023	3501024
260 Circlip 2	3501239	3500697	3501225
280 Retaining ring	3500696	3500696	3500706
290 Locking pin 1	3500886	3500886	3500904-004
300 Locking pin 2	3500890	3500890	3500890
320 Reducer fitting DQ /DQT	3513354	3513354	3513354
330 Screw plug 1	3500658	3500658	3500658
332 Sensor plug	3500658-063	3500658-063	3500658-063
350 O-Ring	3511871-001	3511871-001	3511719-001
360 Gasket 1	1110143-050	1110143-050	3512013
370 Gasket 2	3512012	3512012	3212014
380 CU-seal 1	3502116-001	3502116-001	3502116-001
400 Hexagon screw 1	3500053-007	3500053-007	3500128-007
410 Hexagon screw 2	3500052-007	3500052-007	3500127-007
420 Hex. screw 3 DQ / DQL	3500085-007	3500085-007	3500123-007
420 a Stud bolt 1 DQT	3500275	3500275	3500232
430 Hex. screw 4 DQ / DQL	3500084-007	3500084-007	3500123-007
430 a Stud bolt 2 DQT	3500275	3500275	3500232
450 Hexagon nut 1 DQT	3500301	3500301	3500303
460 Hexagon nut 2 DQT	3500301	3500301	3500303
480 Con. grease nipple DQL	3500914	3500914	3500914

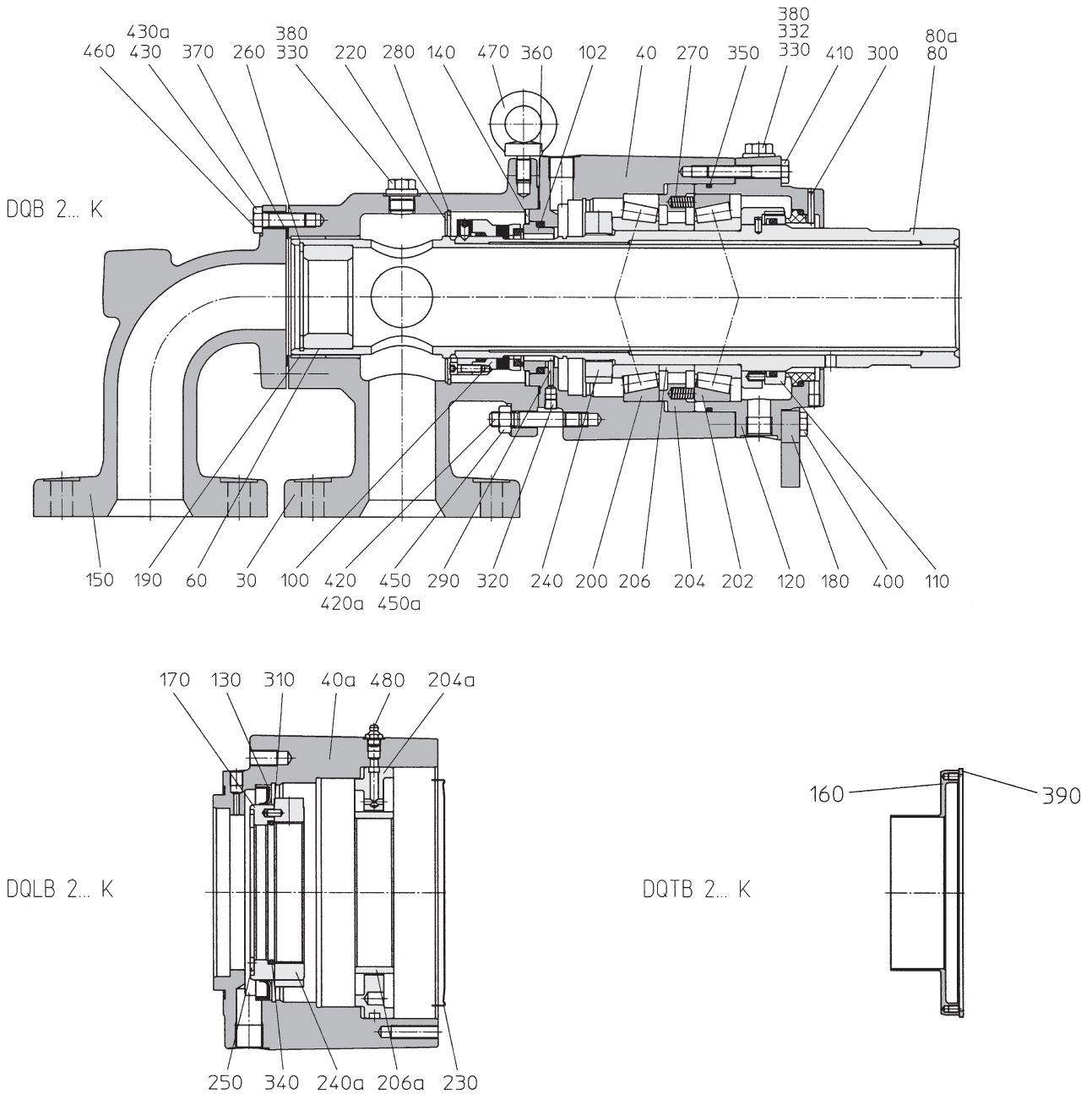
Please specify exact designation when placing an inquiry or an order!

# Spare parts for series DQ DN 50-150

	DN	50	65	80	100	125	150
30	Housing B2	1110327-135	1110402-142	1110477-209	1110552-148	1110627	1110702
40	Bearing housing DQ / DQT	1110334-137	1110409-141	1110484-210	1110559-135	1110634	1110709
40 a	Bearing housing DQL	1110334-151	1110409-145	1110484-224	1110559-159	1110634-160	1110709-146
60	Rotor bushing	1110344-080	1110419	1110494-140	1110569-109	1110644	1110719
80	Rotor K DQB2 / DQLB2	1110340-138	1110415-108	1110490-214	1110565-136	1110640-132	1110715
80 a	Rotor K DQTB2	1110340-141	1110415-159	1110490-232	1110565-166	1110640-165	1110715-171
100	Metal bellows primary seal	3511191-011	3511192-011	3511193-011	3511194-011	3511195-011	3511196-011
102	Counter face primary seal	1110352-119	1110399-102	1110502-198	1110549-130	1110652-113	1110727-126
110	Secondary seal compl.	1110351	1110426	1110501	1110576	1110651	1110726
110-10	Counter face secondary seal	3511406-043	3511407-049	3511408-077	3511409-043	3511410-043	3511411-041
110-20	Carbon sealing ring sec. seal	1110353	1110399-092	1110503-111	1110578	1110653	1110728-153
110-40	Compression spring	3511683	3511685	8 x 3511553	8 x 3511550	8 x 3511551	8 x 3511551
110-50	O-Ring 1	3511871-001	3511716-001	3511873-001	3511703-001	3511725-001	3511727-004
110-60	O-Ring 2	3511869-001	3511715-001	3511874-001	3511702-001	3511712-001	3511726-004
120	Cover	1110360	1110435-144	1110510-212	1110585-145	1110660-125	1110735
130	Shaft seal DQL	3511180-001	3511953	3511972	3511178-001	3511181-001	3511165
140	Support disk	1110356-144	1110431-120	1110506-219	1110581-150	1110656-059	1110731-054
150	Elbow	1110364	1110439-143	1110514-138	1110589-097	1110664	1110739
160	Deflector sleeve DQT	1110348-146	1110423	1110522-231	1110597-149	1110648	1110723
170	Shaft sleeve DQL	1110373-145	1110448-134	1110523-222	1110598-139	1110673-139	1110729
180	Anti-rotation fork	1110362-083	1110437-115	1110512-220	1110587-146	1110662-140	1110737
190	Slide bush	3510523	3510539	3510513	3510519	3510485	3510491
200	Tapered roller bearing 1	3510142	3510044-250	3510027-250	3510025-250	3510072-250	3510024-250
202	Tapered roller bearing 2	3510045	3510044-250	3510027-250	3510021-250	3510072-250	3510023-250
204	Distance ring DQ,DQT	1110358-147	1110433-113	1110508-217	1110583-144	1110658-136	1110733
204 a	Distance ring DQL	1110358-148	1110433-132	1110508-225	1110583-162	1110658-162	1110733-140
206	Spacer	1110359-136	1110436	1110509-218	1110586-143	1110661	1110736
206 a	Spacer DQL	1110359-152	1110436-135	1110509-226	1110586-169	1110661-168	1110736
220	Seal protector disk	1110357-149	1110432-065	1110507-180	1110582-151	1110657-061	1110732-056
230	NILOS ring DQL	3509060	3509076	3509075	3509062	3509058	1110738
240	Grooved nut DQ / DQT	3513513	3513512	3513508	3513505	1110624-137	1110699-138
240 a	Grooved nut DQL	1110324-150	1110399-133	1110474-223	1110549-160	1110624-137	1110699-138
250	Circlip 1 DQL	3500930	3500950	3501037	3500949	3500959	3500954
260	Circlip 2	3501232	3501236	3501205	3501251	3501207	3501237
270	Compr.spring f. bearings	3511525	3511558	3511560	3511558	3511587	3511557
280	Retaining ring	3500870	3500874	3500693	3501050	3500709	3500871
290	Locking pin 1	3500909-004	3500909-004	3500890	3500922	3500922	3500896
300	Locking pin 2	3500909-004	3500909-004	3500922	3500922	3500922	3500922
310	Locking pin 3	3500940	3500940	3500940	3500940	3500940	3500940
320	Screw plug G <sup>1</sup> / <sub>8</sub>	3500664	3500664	3500664	3500664	3500664	3500664
330	Screw plug G <sup>1</sup> / <sub>2</sub>	3500655	3500655	3500655	3500655	3500655	3500655
332	Sensor plug	3500655-158	3500655-158	3500655-158	3500655-158	3500655-158	3500655-158
340	O-ring DQL	3511701-001	3511569-001	3511871-001	3511776-004	3511780-004	3511758-001
350	O-ring DQ / DQT	3511755-001	3511839-001	3511758-001	3511773-001	3511757-001	3511759-001
360	Gasket 1	1110444-062	3512018	1110594-070	1110669-063	1110668-084	1110743-116
370	Gasket 2	3512281	1103449-261	1110519-154	3512018	3512020	3512255
380	CU-seal	3502115-001	3502115-001	3502115-001	3502115-001	3502115-001	3502115-001
390	Circlip DQT	3500873	3500948	3500692	3500947	3500699	3500875
400	Hexagon screw 1	3500137-007	3500094-007	3500134-007	3500137-007	3500137-007	3500173-007
410	Hexagon screw 2	3500134-007	3500092-007	3500128-007	3500128-007	3500134-007	3500164-007
420	Stud bolt or hexagon screw	3500123-007	3500164-007	3500274-007	3500271-007	3500271-007	3500271-007
420 a	Stud bolt 1 DQT	3500257	3500279	3500986	3500242-007	3500242-007	3500242-007

DN	50	65	80	100	125	150
430 Hexagon screw 3	3500123-007	3500123-007	3500165-007	3500161-007	3500166-007	3500204-007
430 a Stud bolt 2 DQT	3500257	3500257	3500227-007	3500234	3500234	3500236
450 Hexagon nut	–	–	3500285-007	3500287-007	3500287-007	3500287-007
450 a Hexagon nut DQT	3500303	3500285-001	3500285-001	3500300	3500300	3500300
460 Hexagon nut DQT	3500303	3500303	3500285-001	3500285-001	3500285-001	3500300
470 Eye screw	3500668	3500668	3500668	3500668	3500668	3500668
480 Conical grease nipple	3500914	3500914	3500914	3500914	3500914	3500914

Please specify exact designation when placing an inquiry or an order!



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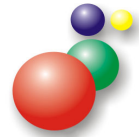
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