TRANSFLUID

TRANSFLUID
trasmissioni industriali

INSTALLATION AND MAINTENANCE

BEFORE ASSEMBLING AND OPERATING THE FLUID COUPLING, CAREFULLY READ ALL THE SAFETY AND OPERATING INSTRUCTIONS REPORTED IN THIS MANUAL.

ALWAYS FOLLOW ALL THE INSTRUCTIONS AND ASSURE THAT ALL THE OPERATORS STANDING BY THE MACHINERY ARE WEARING ALL THE PROTECTIVE EQUIPMENT NECESSARY FOR THE JOB TYPE AND APPLICATION BEING PERFORMED.

DO NOT USE THE MACHINERY IF YOU DO NOT UNDERSTAND THESE INSTRUCTIONS, AND IMMEDIATELY REFER TO THE MANUFACTURER OR THE CUSTOMER SERVICE DESK FOR ASSISTANCE.

THE COUPLING MUST BE PROTECTED BY A CONVENIENT COVER GUARD TO AVOID PERSONAL INJURY TO PEOPLE.
AXIAL AND RADIAL VENTILATION OPENINGS SHOULD BE INCORPORATED IN THE GUARD FOR HEAT EXCHANGE.

IF THE COUPLING IS FITTED WITH FUSIBLE PLUGS, THE SAID OPENINGS SHOULD NOT BE DIRECTED TOWARDS OPERATORS OR ANY HOT OR ELECTRICAL INSTALLATION.

drive with us

FLUID COUPLINGS
...KR..., ...KS..., EK

1 - INSTALLATION

..KR.. - ..KSD series

1.1 For **KRG** model, remove half coupling G (item 29 – FIG. 4);
1.2 For **KRD** model, disassemble shaft D (item 31 – FIG. 1b). In case the fluid coupling is still filled with oil, drain it or, to avoid possible losses, position it vertically with the shaft D upwards; after disassembling the shaft D, block the bearing carrier (item 14) with at least 2 nuts and washers (item 11 and 12).
1.3 Check that the threaded hole at the end of the motor or gearbox shaft complies with DIN 332 (TAB. A1-A2 and FIG. 4).

a) without taper bushing

1.4.a Fit the coupling on the motor shaft by using a threaded bar with **S** dia. (TAB. A1 and A2) as shown in FIG**.** 1a, and using 2 wrenches (hold **a** to avoid shaft rotation, and turn **b** to draw the coupling on to the motor shaft).

1.5.a For a correct assembly, lubricate the connecting surfaces with oil or antiseizing paste. For hot mounting (not recommended), do not exceed a temperature of 90°C, which causes irreparable damages to oil seals.
N. B.: For 6K size, the axial fixing screw is not used because a retaining set screw locks on shaft (item 62 in FIG. 1a). We do not recommend to force coupling assembly on motor shaft, in order to avoid consequent difficulties during the disassembly phase.

b) with taper bushing

1.4. In case the bushing is not provided with keyway (item 50 or 51 – FIG. 1b), remove the key from motor or gearbox shaft (reverse mounting).

1.5.b Carefully clean all surfaces contacting the bushing by oil, grease, etc., possibly using solvent, whether they belong to motor, gearbox or fluid coupling.

1.6.b Fit the bushing on the motor or gearbox shaft, introducing a screwdriver into the axial cut to make mounting easier; assure that bushing goes as far as the shaft shoulder.

1.7 For **KRG** series, fit half coupling (item 29 – FIG**.** 4) on driven shaft, taking care that the shaft end does not protrude beyond face X. Fit the fixing screw and the washer (items 25 and 26 for **KR** models; items 26 and 27 for **KSD** models) holding the motor or the gearbox shaft still; lock the fixing screw **with a torque wrench**, respecting the torque reported in TAB. A1 and A2.

Only for **13 / 15 KR... - KSD** and **17 / 19 KR... - KSD** with taper bush (Ø 48 - 55 - 60 - 65) models (FIG. 3): fit the allan screw (item **d**) with flat washer (item **e**). Holding the motor or gearbox shaft with a 38 mm wrench **b** on the end **c**, lock the allan screw with a torque wrench **a**, respecting the torque reported in TAB. A2.
N.B.: For a correct assembly with the taper bushing, strictly apply to the prescribed locking torque.

1.8 For **KRG** models, lock and peg the driven machine, positioning the motor as far as the gap **k** (FIG. 4) between the half couplings reaches the indicated values listed in TAB. C. The error on radius must be checked with a gauge (FIG**.** 4); the angular gap with a feeler, by rotating the coupling at 4 points 90° apart: the errors should not exceed those listed in TAB. C.
1.9 For **KRD** model, reassemble shaft **D** using nuts and washers (items 11 and 12 – FIG. 1b) tightened at the prescribed torque (TAB**.** B).

FIG. 1a

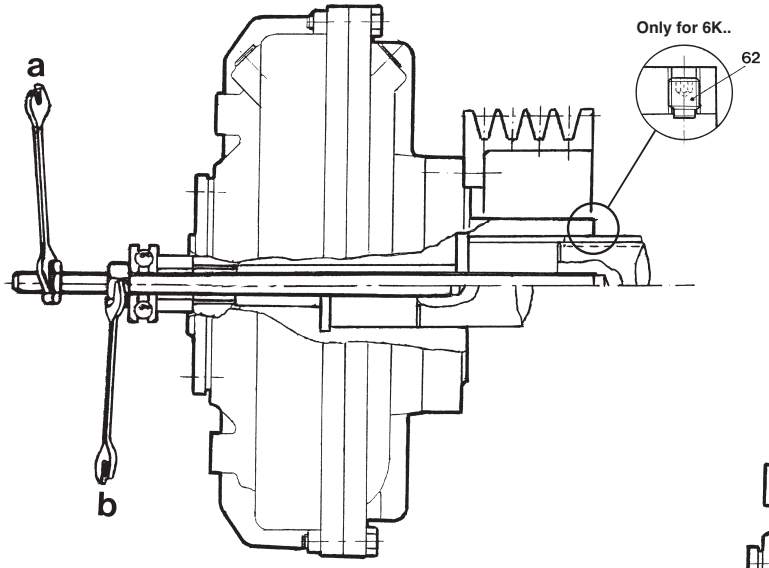


FIG. 2a (KSD)

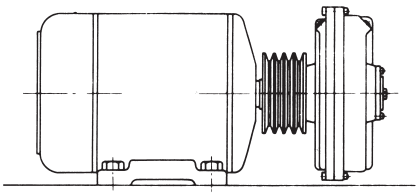


FIG. 1b

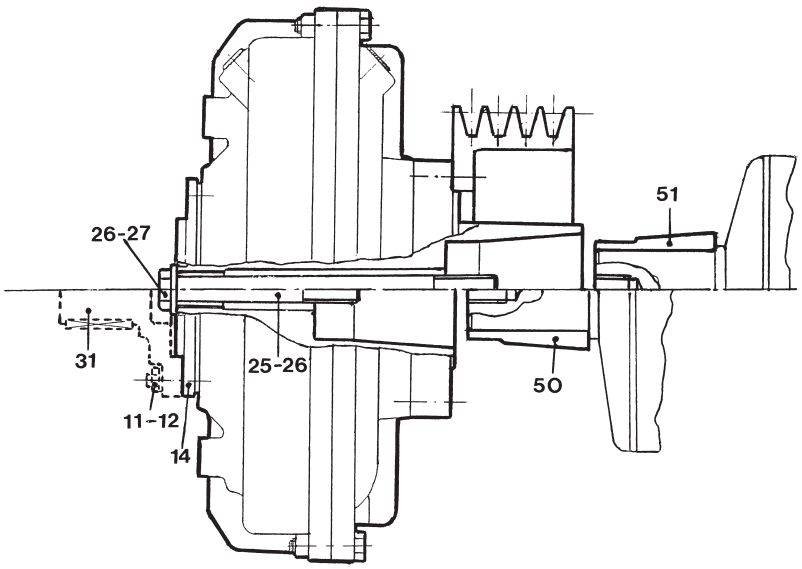


FIG. 2b (KRG)

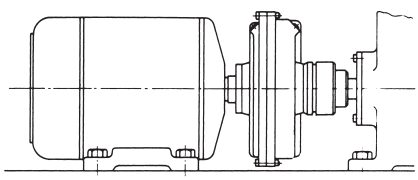


FIG. 3

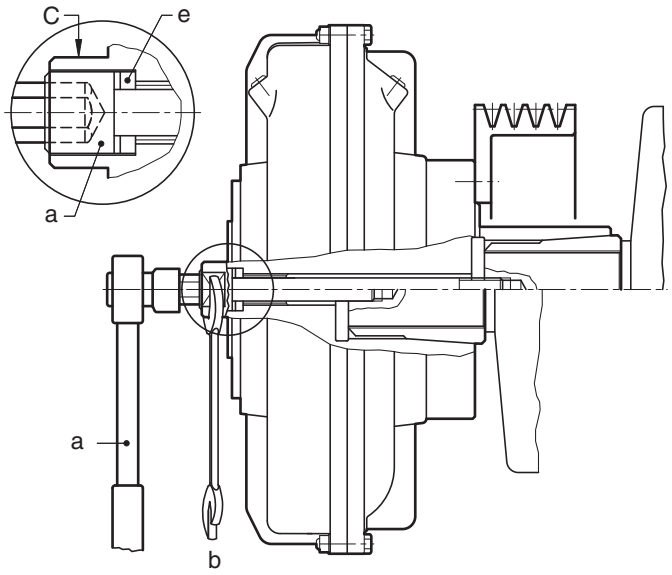
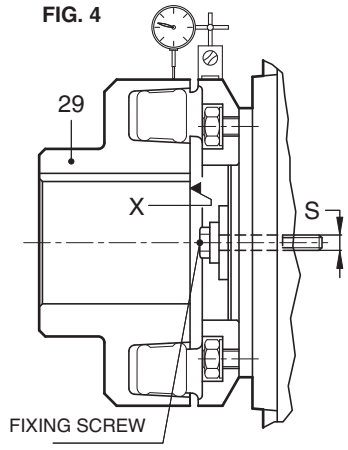
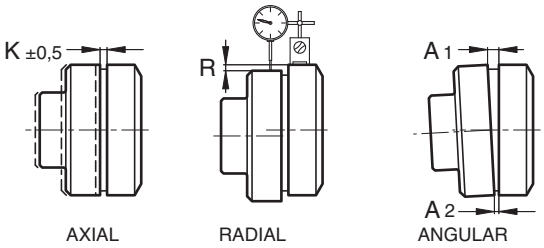


FIG. 4



MISALIGNMENT



TAB. A1 (without bushing)

K... CK../CCK..	FIX SCREW S	Steel spec.	Torque (Nm)
7 - 8	M6	8,8	10
	M8		24
	M10		50
	M12		85
9 - 11 - 12			
	M16		205
13 - 15			
	M20		400
17 - 19			
21 - 24			
27-29	*M24		690
34	*M36		1500
46			

*Only for max bore

TAB. A2 (with taper bushing)

K... CK../CCK..	FIX SCREW S	Steel spec.	Torque (Nm)
7 - 8	M6	10,9	15
	M8		35
	M10	8,8	50
9 - 11 - 12	M10	10,9	70
	M12	8,8	85
	M16		205
13 - 15	M20		400
17 - 19	M16	8,8	205
	M20		400

TAB. C

..KRG	Elastic coupling	Dimensions in mm k	R max	A1-A2 max
6	02	2	0,2	0,3
7 - 8	10		0,3	0,4
9 -11-12	20		0,35	
13	BT 30	3	0,4	0,6
15	40			
17 - 19	50		0,5	
21 - 24	60			0,8
27 - 29	80	4	0,6	
34	90	5		

EK series (FIG. 5)

1.10 Assemble the flange A on the corresponding one of the motor (of the gearbox for 6EK) and tighten bolts D.
1.11 Fit bell housing B onto the gearbox flange (electric motor for 6EK) and tighten bolts E.
1.12 Fit the fluid coupling C on the motor shaft, hitting with a soft hammer on the shaft end X, as far as it reaches the limit of the travel.
1.13 **For a correct fitting, it is important to lubricate surfaces with antiseizing paste.**
1.14 Fit the coupling / motor assembly into the gearbox hollow shaft as far as the flange A is connected to the bell housing B, then fix the bolts F.
1.15 Fit the safe guard G.

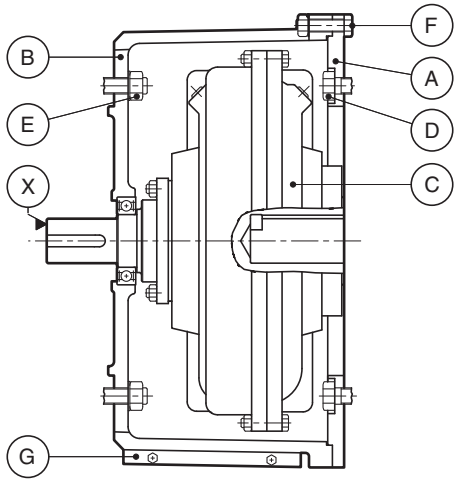
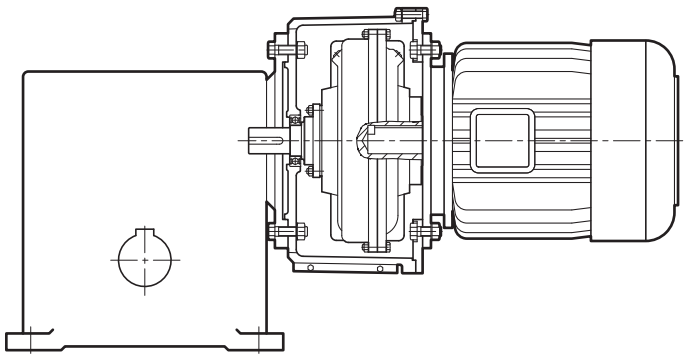


FIG. 5



..KRM series (FIG. 4a)

1.16 Assemble fluid coupling as reported in par. 1.1 to 1.7
1.17 Fit the hub (item 29a) on the driven shaft, lock and peg the driven machine. Position the motor as far as dimension **K** between hub (item 29a) and flange (item 27a) is within the values reported in TAB. C1.
1.18 Check dimensions **A1 - A2** with convenient gauge and **R** with comparator, by rolling the coupling and reading values at 90°. **Errors must not overcome the values reported in** TAB. C1.
1.19 Fit the elastic element (item 28a) with the screws (item 59), according to the locking torque reported in TAB. C1.

TAB. C1

..KRM	ELASTIC COUPLING MCF..F	Alignment tolerances (mm) k	A1-A2	α°	R	screw item 59	Locking torque Nm
9 - 11 - 12	53	75 ±1	1,5	0,75	0,6	M6	10
13	55			0,5			
15	56						
17 - 19	58			0,4			
21 - 24	65	116 ±1,5	2,0	0,5	1,0	M10	49
27	66			0,4			
29	68			0,3			
34	610						

..KRG3 series

1.20 Remove the half coupling (item 29 -91 Fig. 4b) and proceed as described from paragraph 1.3 to 1.6 on p. 1 of manual 150 GB.
1.21 Assemble the half coupling (pos. 29 -91 Fig. 4b) on the driven machine, ensuring that its end does not protrude from the surface **X** (Fig. 4b). Mount the rod and the washer (pos.25 and 26 - FIG. 1b) while holding the shaft of the electric motor or gearbox, lock the bolt with a torque wrench, according to the specified torque in the TAB. A1 and A2.
1.22 Lock and peg the driven machine, positioning the motor as far as the gap **k** (item 4c) between the two half-couplings reaches the values indicated in TAB. C2. The radial error **R** must be checked with a comparator; the angular gap **A1-A2** with a thickness gauge turning the coupling of 360° making readings every 90°.
The errors should not exceed values indicated in TAB.C2.

TAB. C2

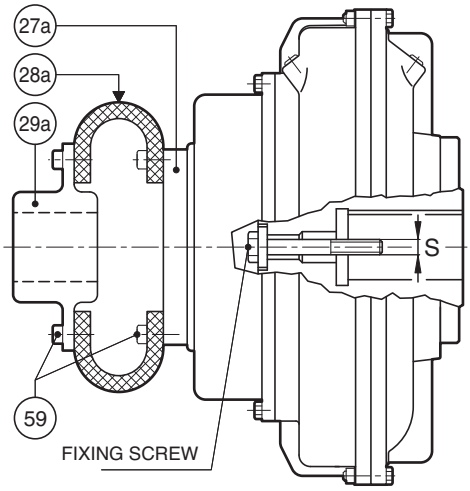
...KRG3	ELASTIC COUPLING B3T	Alignment tolerances (mm) k	R (max)	A1 - A2 (max)
17-19	50	3	0.5	0.6
21-24	60			0.8
27-29	80	4	0.6	
34	90	5		
(1) 46	100	7	0.8	1.1

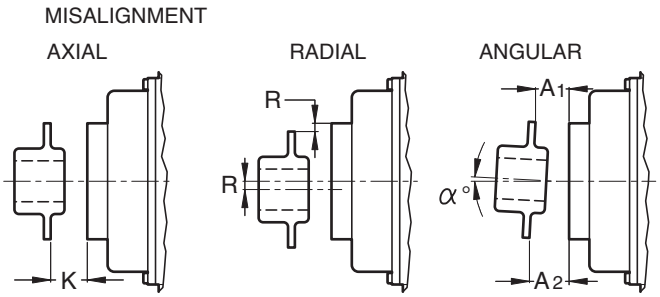
TAB. C3

...KRG3	Locking torque item 48 screw	Nm	item 48a screw	Nm	item 92 screw	Nm
17-19	M10	84.6	–	–	M12	14.3
21-24	–	–			M10	84.6
27-29					M14	228
34	M16	288	M14	135	M20	674
(1) 46	M20	410	M20	410	M20	410

(1) only for **CCKRG3**

FIG. 4a





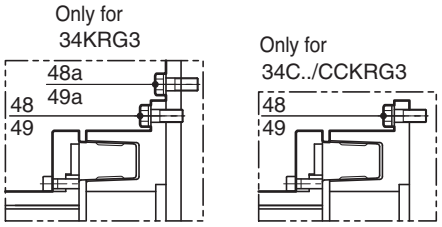


FIG. 4b

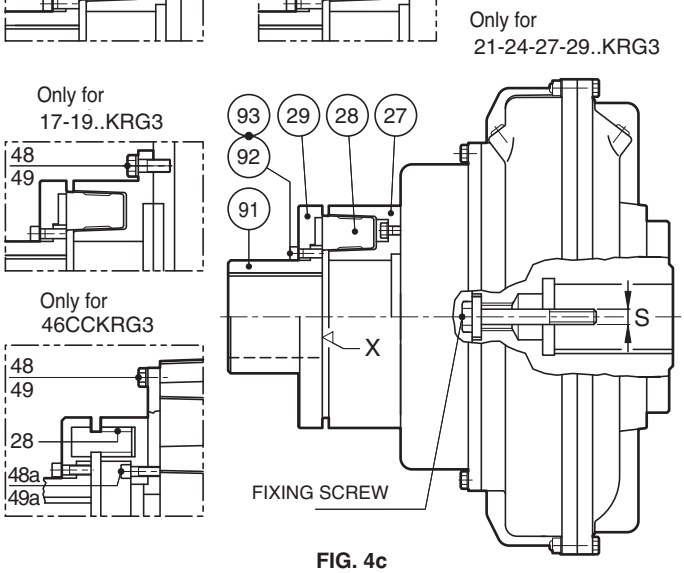
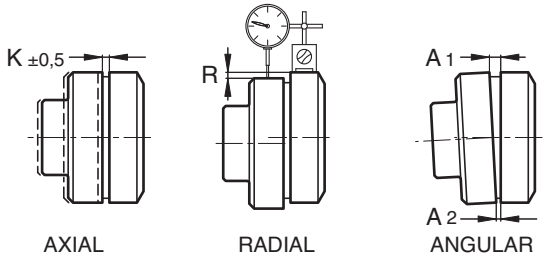


FIG. 4c
MISALIGNMENT



2 - FLUID COUPLINGS FILLING INSTRUCTIONS

KR… - KSD - EK SERIES

Transfluid fluid couplings are not supplied with oil.
Therefore it is necessary to achieve the following procedure:

2.1 Position the coupling axis horizontally (FIG. 6), turn it until the X mark cast into the housing gets at the top vertical (maximum fill), so that the oil plug (item 13) is inclined as shown in the picture.
2.2 Fill with oil until it overflows out of the filler hole. While filling, gently rock the coupling on its axis to make sure all air excess is vented out of the circuit, or, if possible, remove also the cap located in correspondence on the other rotor. The quantities to be introduced are those reported in TAB. D1.
2.3 Screw the cap (or both caps) at the prescribed torque (TAB. E) and make sure no leakages occur; otherwise use thread sealant on filler plug threads.
2.4 The fillings marked X-1-2-3-4 may be chosen by the operators to meet the best performance in terms of start-up and steady running operation.
With the maximum **fill X** a condition of minimum slip and maximum performance is achieved: the starting torque / nominal torque ratio gets higher (values generally comprised between 1.8 and 2.0); decreasing the oil quantity inside the coupling (fill 1-2-3-4), the opposite result is obtained.
2.5 High slip causes overheating of oil contained in the working circuit, with a consequent decrease in overall performance.
2.6 For normal operating conditions, use only **ISO HM 32** (or equivalent **SAE 10W**) oil types listed in TAB. D. At low ambient temperatures (near 0°C), it is recommended to use **ISO FD 10** (or equivalent **SAE 5W**) oil. For temperatures below –10°C, ask Transfluid.
2.7 For vertical mounted applications, the couplings recommended oil fills are reported in TAB. D1.

CKR… / CCKR… – CKSD… / CCKSD… SERIES

Fluid couplings with delayed fill chamber (CK series) have the main purpose of reducing the starting torque / nominal torque ratio to values up to 1.6 . This aspect is improved enlarging the delayed fill chamber further (CCK series) up to values of 1.3 the above ratio.

2.8 The starting torque limitation can be achieved by reducing the oil quantity into the working circuit (fill 2-3-4) without increasing the slip value at rated speed. In standstill position, the delayed fill chamber actually contains part of the oil fill that flows to the working circuit during start up.
2.9 The oil passes from the delayed fill chamber to the working circuit through **calibrated orifices** (FIG. 7) by centrifugal force. Starting from size **15CK/CCK**, such orifices diameters can be modified even when the coupling is already assembled, simply by replacement of the whole valve pos. 57. When reassembling the valve, always remember to fit the copper seal (item 58). Tighten screw with torque indicated in TAB. E. Then inspect for leakage.
This technical solution allows a very simple and easy operation, to be achieved in a very short time and (what is more important) without disassembling the fluid coupling.
2.10 For each starting torque / nominal torque ratio, Transfluid can give the exact oil fill. The fluid couplings with a **delay fill chamber** are generally foreseen with **fill 2** (TAB. D2), while the ones equipped with a **double delay fill chamber** with **fill 3** (TAB. D3).
As fluid couplings are supplied without oil, follow the instructions reported at par. 2.1 – 2.2 – 2.3 – 2.6.
2.11 For vertical mounted applications, the couplings recommended oil fills are reported in TAB. D2 and D3. Due to delayed fill chamber peculiarity, for vertical mounting the chamber must be downward.

TAB. D

RECOMMENDED OIL: ISO HM 32 (SAE 10W) CLASSIFICATION					
Agip	OSO 32	Chevron	RYKON OILS AW-32	Mobil	DTE 24
Aral	VITAM GF 32	Elf	ELFOLNA 32	Shell	TELLUS OIL 32
BP	ENERGOL HLP 32	Esso	NUTO H 32	Texaco	RANDO OIL HD 32
Castrol	HYSPIN AWS 32	IP	HYDRUS OIL 32	Total	AZOLLA ZS 32

TAB. D1

K…	OIL QUANTITY (lt.) X	1	2	3	4
6	0.505	0.480	0.455	0.425	0.390
7	0.920	0.860	0.800	0.730	0.650
8	1.510	1.405	1.295	1.190	1.080
9	1.950	1.820	1.690	1.550	1.400
11	2.750	2.550	2.350	2.100	1.850
12	4.100	3.875	3.575	3.250	2.900
13	5.200	4.850	4.450	4.050	3.600
15	7.650	7.150	6.600	6.000	5.400
17	11.70	10.90	10.00	9.100	8.200
19	14.20	13.30	12.30	11.20	10.00
21	19.00	17.80	16.40	15.00	13.50
24	28.40	26.50	24.60	22.60	20.50
27	42.00	39.00	36.00	33.50	31.50
29	55.00	51.00	47.00	44.00	41.50
34	82.50	76.60	70.60	66.20	62.50
46	189	170	158	148	135

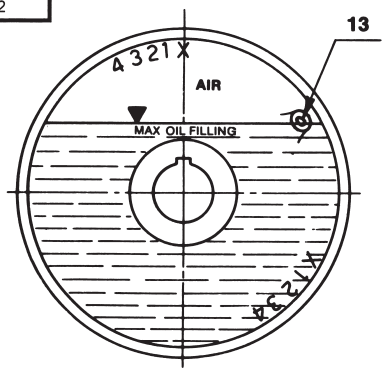
TAB. D2

CK…	OIL QUANTITY (lt.) 2	3	4
11	3.350	3.050	2.750
12	4.800	4.200	3.600
13	5.800	5.200	4.700
15	8.600	7.700	6.400
17	13.60	12.80	11.70
19	16.50	15.20	14.00
21	23.00	21.30	19.30
24	31.20	28.60	26.00
27	50.00	46.50	43.00
29	63.00	59.00	54.00
34	92.50	88.50	83.50

TAB. D3

CCK…	OIL QUANTITY (lt.) 3	4
15	9.30	8.00
17	16.36	14.86
19	18.76	16.86
21	27.30	24.30
24	35.43	31.63
27	59.35	55.15
29	70.60	65.20
34	96.70	86.40
46	215	200

FIG. 6

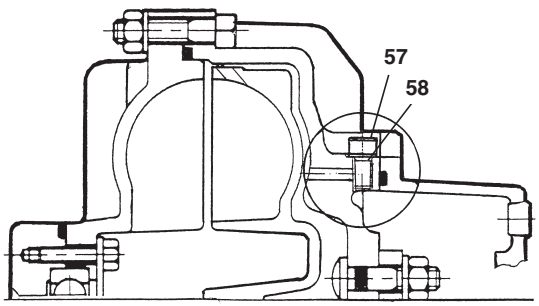


TAB. E

DIM.	13 - 13a N. 7018..	Torque (Nm)	D. nom.
6	AB	12	1/8"
7-8-9 11-12	BB	23	1/4"
13-15 17-19 21-24	CB	29	3/8"
27-29 34	DB	44	1/2"
46	EB	69	1"

DIM.	VALVE items 57 Dia	torque (Nm)
15 17-19	M8	7
21-24 27-29 34	M12	20
46	M16	45

FIG. 7



3 - OPERATION AND MAINTENANCE

3.1 The normal operating procedures have to be carried on keeping balance and temperature under control.
All seals are in Viton but it is recommended that the working oil temperature does not exceed 90°C.
As evidenced in TAB**.** F where the causes and the relative remedies are reported, a high temperature value may be caused by the following conditions:
a) Insufficient oil fill
b) Higher absorbed power than motor rated power
c) High ambient temperature
d) High starting frequency per hour
e) Excessive starting time
f) Too many consecutive start-ups
g) Inadequate air ventilation due to cover guard.
TRANSFLUID can supply all operating data upon request.

3.2 After the first 20 days operation, check the oil fill (**this operation to be carried out with cold oil**), the tightening of the screws, the motor and the driven machine.

3.3 Repeat the above checks every 6 months – For the KRG models, check the gap **k** (TAB. C) of the elastic coupling. If the torsional gap is excessive (about 2°), replace the rubber elements.

3.4 Fluid couplings are supplied with fusible plug at 140°C (120°C and 198°C settings are available upon request) as shown in FIG. 14.
If the fusible plug blows at regular intervals during normal service, then check a), f) in par. 3.1, and relative TAB. F should be considered.

3.5 In case the switching pin or the electronic overload controller are mounted, check that the distances shown in FIG**.** 9 and 11 are within the values imposed during the assembly phase.

3.6 Oil should be replaced after 4000 hours operation.

4 - DISASSEMBLY

4.1 Disassemble the fixing screw (item 25 for KR models; item 26 for KSD models), and set screw (item 62 for 6KR../KSD..).

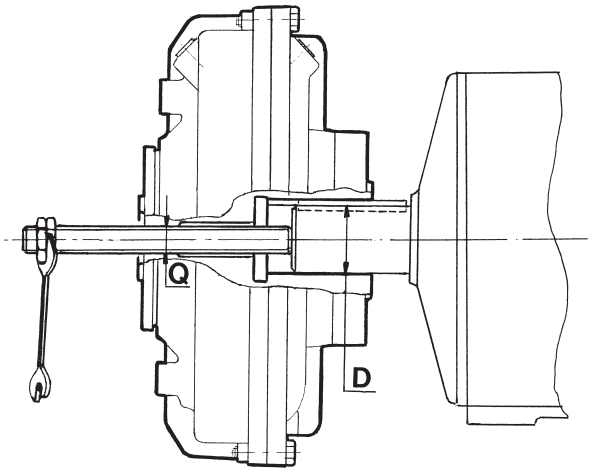
4.2 Screw threaded bar into tapped hole at the end of the fluid coupling and proceed as shown in FIG. 8. The said threaded bar (dimensions **Q** reported in TAB. G) will push the coupling off the motor shaft.

4.3 For the couplings assembled with a taper bush, a very small displacement is sufficient to disengage the coupling from its seat. In case the taper bushing is to be removed too, a screwdriver may be used to push into the keyway cut.
Do not force the taper bushing to avoid damaging the contact surfaces which may compromise the correct reassembly of the part.

TAB. G

K../ CK..	D	Q	
		without bushing	with bushing
7 - 8	19	M12	M12
	24		
	28	M14	
	38		
9-11-12	38	M16	M20
	42	M20	
	48		
13 - 15	48	M27	M27
	55		
	60		
	65		
17 - 19	65		–
	75		
	80		
21 - 24	80	M36	
	90		
	100		
27 - 29	100	M45	
	120		
	135		
34	150		
46	180	M52	

FIG. 8



TAB. F

SYMPTOM	CAUSE	REMEDY
TOO HIGH TEMPERATURE FUSIBLE PLUG INTERVENTION	INSUFFICIENT OIL LEVEL	Check level and possibly top up
	TOO MANY CONSECUTIVE START-UPS	Wait for cooling before restarting, or reduce number of start-ups
	HIGHER ABSORPTIONS THAN SPECIFIED ON TAG	Remove causes and/or review motor/coupling dimensioning
	HIGH AMBIENT TEMPERATURE	Improve coupling ventilation
	JAMMED OR OVERLOADED DRIVEN MACHINE	Remove causes
	TOO NEAR HEAT SOURCE	Remove source or introduce a shield
	TOO CLOSE PROTECTION COVER	Introduce convenient air passages to improve heat exchange
PERFORMANCE DECREASE	OIL LEVEL	Check oil level and fill with the right type if necessary
	OIL TYPE SPECIFICATION	Replace if necessary (tab. D of page 4)
		Verify whether responding to recommended oil specifications
	AMBIENT TEMPERATURE LOWER THAN O°C	Use correct oil type (see par. 2.6 at page 4)
INSUFFICIENT OPERATING SPEED AND/OR EXCESSIVE SLIP	FAULTY MOTOR	Check motor rotating speed (if electric, check connections)
	STAR / DELTA INSERTION TIME	If required time is too long, reduce it to 3 s max
	JAMMED OR BRAKED DRIVEN MACHINE	Remove causes
NOISE AND VIBRATION	ALIGNMENT	Check alignment (page 1 par. 1.8)
	FAULTY BEARINGS	Disassemble, check, replace bearings (and relative seals)
	ELASTIC COUPLING ELEMENTS WORN	Substitute worn elements
WHISTLE	PROTECTION COVER	Avoid small air passages between cover and machine

5. ACCESSORIES

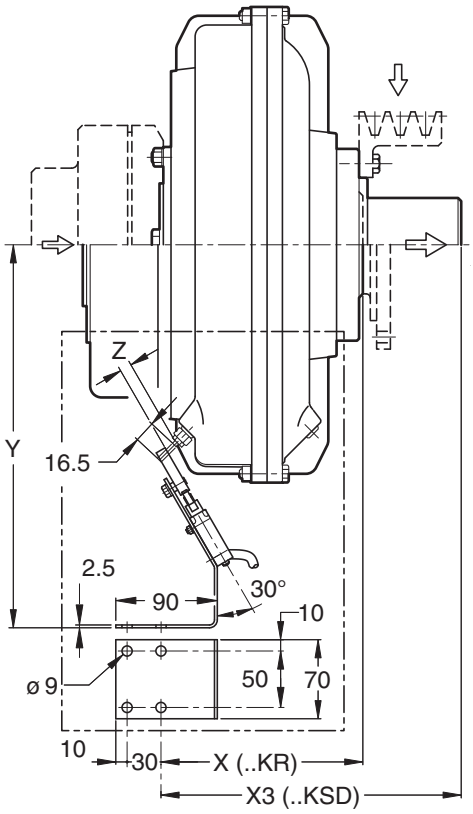
The fluid coupling can be equipped, beyond the standard fusible plug, with similar safety devices avoiding oil to escape, and that, in the case of the electronic overload controller, can manage a few more parameters too.
The fusible plug is present as an element of further safety, though being set at a higher temperature value.

5.1 SWITCHING PIN (FIG. 9)

This device is made of a fusible plug equipped with a metallic pin inserted in the fusible alloy material of the plug.
In case the intervention temperature is reached, the alloy material melts making the pin free so that it escapes due to the centrifugal force, intercepting the cam of the switch, activating it and supplying the relevant output signal, that can be used as alarm or motor trip.
In case of external impeller as a driver, indicated in Fig. 9, the switching pin operates in every condition, while in case of external impeller as a driven part, it can be activated correctly only in case of increase of the slip due to overload or to excessive absorption.
Install firmly the switch to the base unit according to dimensions of table Tab.G1, taking into account that the pin of the fusible plug, in case of intervention, escapes by 16.5 mm and it shall move the cam of the switch.
It is possible to install this system on all fluid couplings from size 13K even in case it has been not included as initial supply.
For couplings 7K ÷ 12K, switching pins must be installed by TRANSFLUID.
The package includes: percussion fusible plug, gasket, conical plug, switch complete with fixing holder, counterweight for balancing, glue, instruction for installation.
The electrical connection of the switch shall be realised with voltage not greater than 230 V and current max. 6 A.

NOTE: Regarding dimensions and further details, refer to the relevant supplied instructions (TF5728D).

FIG. 9

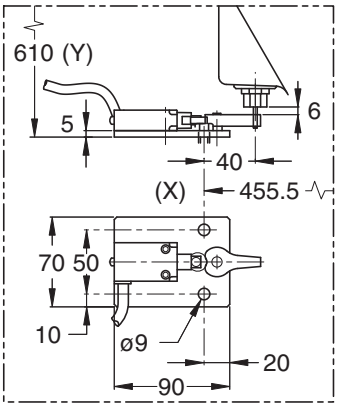


TAB. G1

DIM	X	X3	Dia.	Y	Z
7	115	148	24	262	-
		163	28		
8	124	187		272	
9	143	228		287.5	
11	(2) 150	(2) 236		300.5	
12	160	261		323	15
13	174	336		335	16
15	197	357		358	16
17	217	425		382	12
19	209	417		400.5	9
21	• 256	•• 471		423	8
24	• 256	•• 471		460	4
27	271			491	9
29	296	-		524	8
34	346			584	4

(2) only for K.. (CK.. on request)
• for Dia. 100 +35 mm
•• for Dia. 100 +40 mm
Reference dimensions

Only for 46..KR..

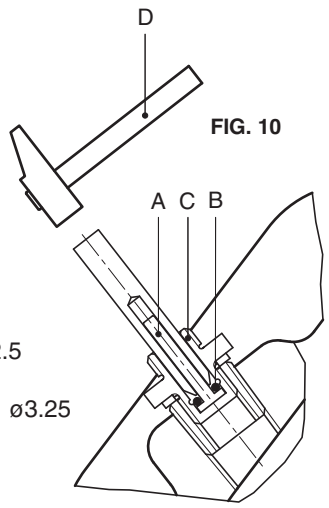


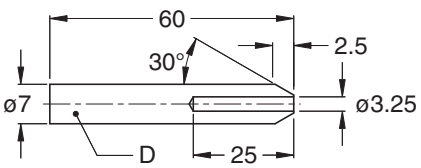
5a SWITCHING PIN REACTIVATION (Fig. 10)

5a.1 Unscrew white cover and take pin **A** out together with the scarps of the melted material.
5a.2 Fit the fusible ring **B** on the pin, paying attention to the right choice of the temperature value of the fusible alloy.
5a.3 Insert pin with the fusible alloy into the cap **C.**
5a.4 By means of a tool **D** similar to that shown in the picture, bump the fusible ring in the bottom of the seat.
5a.5 Make sure that the pin is steady into its seat.
5a.6 Screw the white cover on cap again.

NOTE: The said operations must be performed when the fluid coupling is at ambient temperature.

FIG. 10

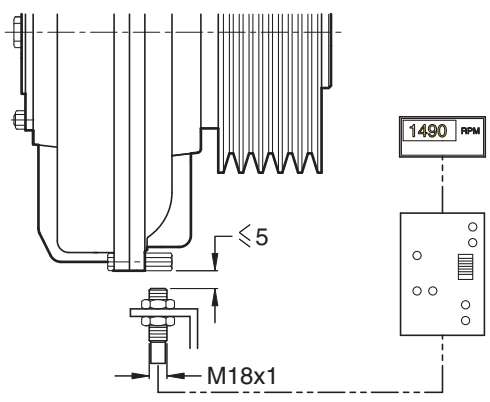




5.2 ELECTRONIC OVERLOAD CONTROLLER

formed by a proximity sensor and a speed controller detects the output speed of the fluid coupling continuously.
When the load torque increases, slip increases too and speed consequently decreases.
If the speed reduces down to the set threshold for a longer time than specified, this is signalled by the intervention of the internal relay.
The said electronic device can be mounted on all non installed O.E.M. fluid coupling. Only 2 bolts positioned at 180° around the external crown must be replaced (as shown in Fig. 11) with 2 special ones having a longer screw and nut.

FIG. 11



5.2 **ELECTRONIC OVERLOAD CONTROLLER**

As shown in FIG. 11, it is necessary to position the proximity sensor in line with the 2 bolts at 180°, at a lower distance than 5 mm, while the controller can be fitted in the most convenient place, chosen by the user, within a maximum distance of 20 m (making the proximity connecting wire adequately longer).

Before connecting to the electrical power supply, always verify the voltage.

The electrical connections must be made according to the schematic shown in the detailed instructions of the same electronic device, setting and/or adjusting all the functions on the control panel, as shown in FIG. 12:

a) Blind time for starting **TC**, with a screw regulation up to 120 s, avoiding the intervention of the alarm during the starting phase.
b) Speed range **DS**, by means of a Dip-Switch to be programmed on 5 and 8 positions, setting relay condition, proximity type, reset system, acceleration or deceleration.
c) Speed threshold **SV** to be screw regulated from 1 to 10. The value 10 corresponds to full range set with dip-switch.
d) Reset **R**, locally executable with a manual switch or remote connections.
e) Delay time **T** setting screw regulation up to 30 s. This function delays possible alarms caused by sudden torque variations.

The function of the timers respect to the state of the relays is diagrammed in FIG. 13.

Leds (FIG. 12) permitting to keep some vital functions under control are also present on the panel:

f) Speed level overtaken **SS** with a red light switching on as soon as the set threshold is overcome.
g) Red alarm **A** lighting up when the internal relay switches on.
h) Green supply led **ON** pointing out that the device is electrically supplied.
i) Yellow supply led **ENABLE**, signalling that the device is ready to operate.

N.B.: For further details concerning electronic features and connections, refer to the specific instructions supplied with the device.

FIG. 12

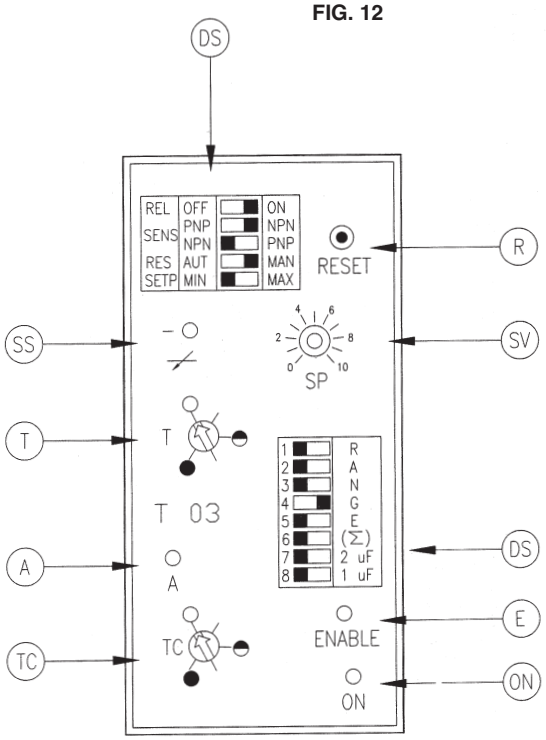
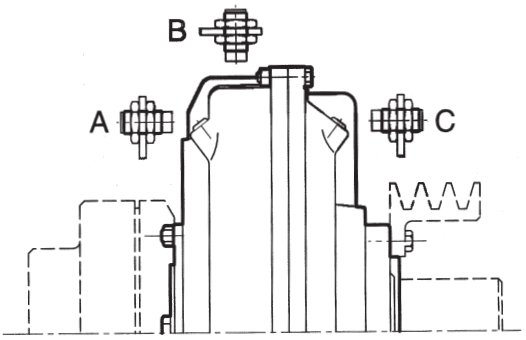


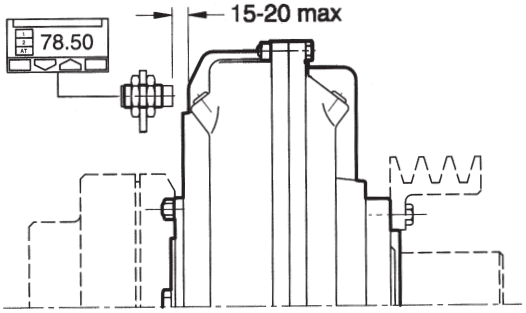
FIG. 13



5.3 INFRARED TEMPERATURE CONTROLLER

This is a non contacting system to check fluid coupling temperature. It is reliable and easy-mounting.
It has 2 adjustable thresholds with a logical alarm on the former, and a relay alarm on the latter.

The proximity sensor must be positioned near the fluid coupling outer impeller or cover, according to one of the layouts shown in Fig. **13**.
It is adviced to place it in **A** or **C** positions, as the air flow generated by the fluid coupling during rotation helps to remove possible dirt particles that may lay on the sensor lens.
The distance between the sensor and the fluid coupling must be about 15-20 mm (cooling fins do not disturb the correct operation of the same sensor).
To avoid the bright surface of the fluid coupling to reflect light, and thus compromise a correct temperature reading, it is necessary to paint the surface which is directly facing the sensor of a flat black colour (a stripe of 6-7 cm is sufficient).
The sensor cable has a standard length of 90 cm. In case of need, a longer one may be used only if plaited and shielded as per type "K" thermocouples.



N.B.: For further details concerning electronic features and connections, refer to the specific instructions supplied with the device.

6 - RECOMMENDED SPARE PARTS (FIG. 16 - 17 - 18 - 19)
When ordering spare parts, always specify model and spec. nr. marked on external impeller in the positions shown in FIG. 15 or in the opposite side (cover) 27K, 29K and 34K and 46K have got a plate reporting serial nr. too.
(With painted couplings the bom number is stamped on the bearing carrier).

6.1 Seal kit for …KR / …KSD items 4-5 (5a for C…/CC…versions)-6-15-20-41 (item 41 only for 27÷46, item 58 only for 15÷46, item 90 only for 46 ...KR)
6.2 Fusible plug item 13a
6.3 Rubber element (for ...KRG only) item 28

N.B.: Code numbers for possible orders are shown on TAB. H

TAB. H

DIM.	GASKET KIT VITON 2395		FUSIBLE PLUG N7018(°C)				RUBBER BLOCK Item 28 BT		B3T	
	K..	CK... CCK...	109	120	140	198	N°	CODE	N°	CODE
6	A						8	BT-A		
7	B									
	W(3)	–					12	BT-B		
8	C									
	X(3)		–	BA	BB	BC			–	–
9	D							BT-C		
11	EA	EB								
12KR..	FA	FB								
12KSD	GA	GB					–	–		
13	HA	HB						BT-C		
15	KA	KB								
17	LA	LB						BT-D	12	
19	MA	MB	CE	CA	CB	CC	16			BT-P
21	NA	NB						BT-P	16	
24	OA	OB								
27..KR..	PA	PB	DE					BT-T	16	BT-T
27..KSD	YA	YB	–	DA	DB	DC	–	–	–	–
29	QA	QB	DE				16	BT-T	16	BT-T
34	RA	RB					12	BT-I	12	BT-I
46..KR..	ZA	ZB	EE	EA	EB	EC	–	–	40	LU...MMD 4000(4)

(3) For version with metric taper bush
(4) Specify the type of material (SN, SP, ...).

TAB. K

K... / CK.. / CCK..	LOCKING TORQUE item 7-7a screw	Nm	9 screw	Nm	10 nut	Nm	11-37 screw or nut	Nm	30 screw	Nm	34 screw	Nm	60-70-88 screw	Nm	72 screw	Nm	78 screw	Nm
6			M6	10	M5	6	–	–	M6	10	–	–						
7-8					M6	10	M7	13										
9-11-12			M8	24	M8	24	M8	24	M8	24	M8	24						
13							M10	50										
15-17-19			M10	50	M10	50	M10	50	M10	50			–	–				
21	–	–			M12	85	M14	135			M10	50			–	–	–	–
24			M14	135	M14	115			M14	135								
27						135	M16	205										
29					M16	205												
34K							M14	135			M14	135						
34KRD			M16	205	M20	400	M16	205	–	–			M6	10				
34C e CCK																		
46	M22	332	M20	400	M20	400	–	–			M18	283			M22	532	M18	410

7 - O-RINGS AND BEARINGS REPLACEMENT (FIG. 16-17-18)

N.B.: To hit the surfaces described in the following, always use plastic hammers.

7.1 Drain oil from coupling by unscrewing the caps (item 13) on cover and delayed fill chamber, and fusible plug item 13a.
7.2 If the fluid coupling is supplied with a delayed fill chamber, remove it after unscrewing item 34.

only for 6 K.. ÷ 34..K...

7.3 Unscrew nuts (item 11), insert 2 screw-drivers in the slot between bearing carrier (item 14) and cover (item 3), and act to push bearing carrier and seal (item 15) out.
7.4 Unscrew bolts (items 8 – 10), tap over the cover (item 3) to remove it. pos. 29 (only for 27KS… remove the snap ring pos. 82, the seal carrier pos.19 including seals pos. 20 and 41, snap ring pos. 25)
7.5 Remove bearing (item 16) with an extractor, as well as the oil retainer (item 47).
7.6 Remove the snap ring (item 18) and then the impeller (item 1).
7.7 Remove screws item 9 and plate washer item 17. Bump on plane B of the shaft (item 24 for ..KR, item 25 for ..KSD) and slide the bearing carrier (item 23 for ..KR, item 24 for ..KSD) away with the seal (item 20).

only for 46K.. e CCK..

7.8 Take away 2 screw pos.7 (diametrally opposite) all bolts pos. 8-10 or remove the cover pos.3(KR) or pos. 3a (CCKR) by suitable extractor using the 2 holes made free of the screws pos.7. The cover will include the seal carrier pos.74 (KR…) or 74a (CCKR), seals pos.15 and 90, plate pos.85 (KR) or 85a (CCKR) and screws pos.70.
7.9 Remove the bearing pos.16 or bearing carrier pos.14(KR..) or 14a(CCKR..) by extractor.
7.10 Remove the inner impeller (complete with hub pos.75, spacer pos.76, screws pos.2 carrying off the screws pos.9. The impeller will include the seal carrier pos.19, seals pos.20 and 41, screws pos.60 or 88.
7.11 Remove the outer impeller item 2 taking away the screws item 9; the impeller will include: seal carrier item 19, seals items 20 and 41, screws items 60 or 88.
7.12 Remove the snap ring pos.22 and spacer pos.83.
7.13 Remove the bearing pos.21, bearing carrier pos.23 and gasket pos.6.
7.14 **For all couplings (6K.. ÷ 46..K..)** when reassembling, proceed backward replacing the bearings and all seals. Insert sealant (Loctite 518) between the disc plate pos. 17 and the impeller, pos. 2.

N.B. About locking torques of screws, nuts and plugs, please refer to following tables: tab.C1 (pos.59) - tab.C3 (pos. 48-48a-92) - tab. E (pos.13-13a-57) - tab. K (pos. 7-7a-9-10-11-30-34-37-60-70-72-78-88)

FIG. 14

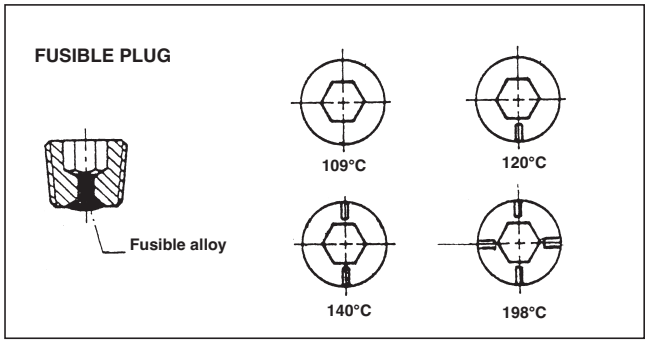
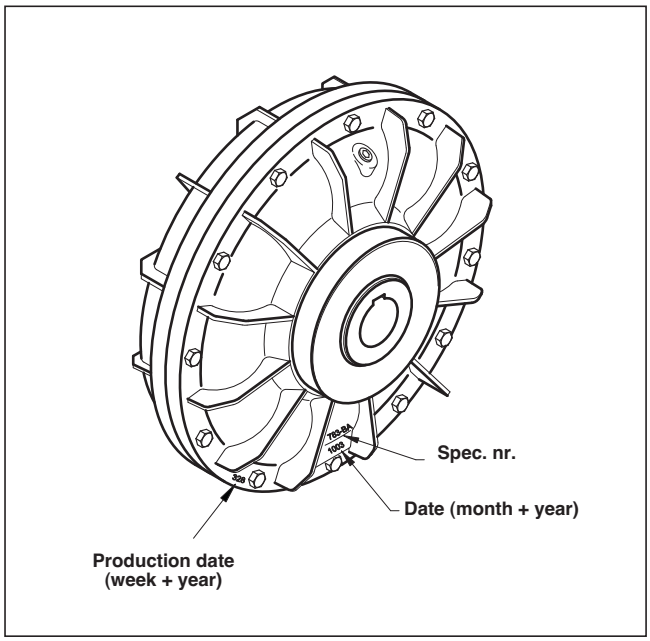


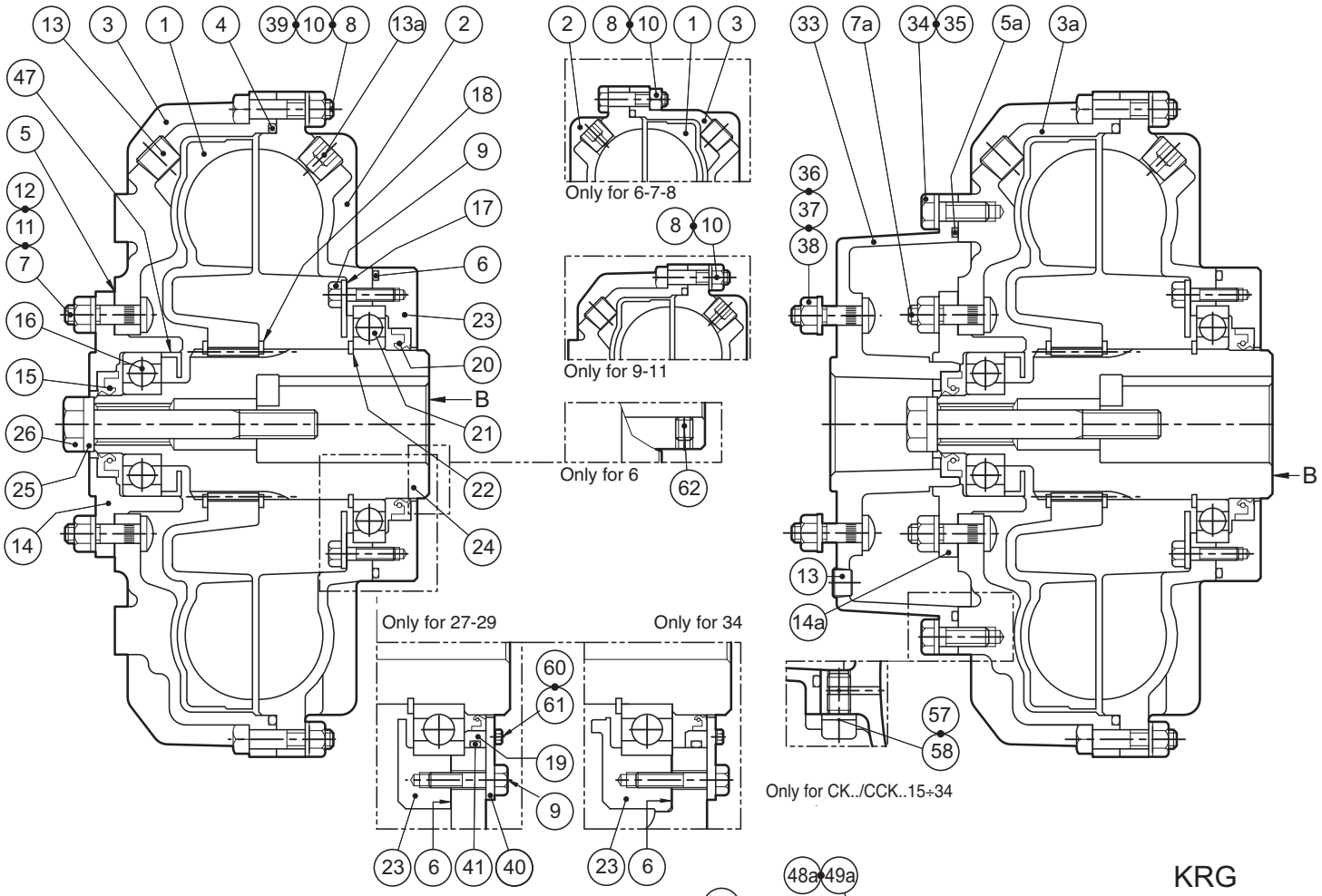
FIG. 15



KR

FIG. 16 (6÷34)

CKR/CCKR

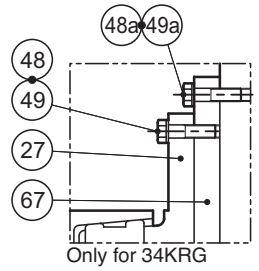


POS.	NAME
1	IMPELLER (INNER)
2	IMPELLER (OUTER)
3-3a	COVER
4	O-RING
5-5a	GASKET OR O-RING
6	GASKET OR O-RING
7-7a	SCREW
8	SCREW
9	SCREW
10	NUT
11	NUT
12	LOCK WASHER
13	PLUG
13a	FUSIBLE PLUG
14-14a	BEARING CARRIER
15	SEAL
16	BALL BEARING
17**	PLATE
18	SNAP RING
19	SEAL CARRIER
20	SEAL
21	BALL BEARING
22	SNAP RING
23	BEARING CARRIER

POS.	NAME
24	SHAFT
25	LOCK WASHER
26	FIXING SCREW
27	FLANGE G
28	RUBBER BLOCK
29	HALF JOINT G
30	HALF JOINT B
31	SHAFT D
31.1	KEY
33	D.F. CHAMBER
34	SCREW
35	LOCK WASHER
36	SCREW
37	NUT
38	LOCK WASHER
39	LOCK WASHER
47*	OIL RETAINER
48-48a	SCREW
49-49a	LOCK WASHER
57	VALVE ASSEMBLY
58	GASKET
62	SET SCREW
67	ADAPTOR

** excluded 6

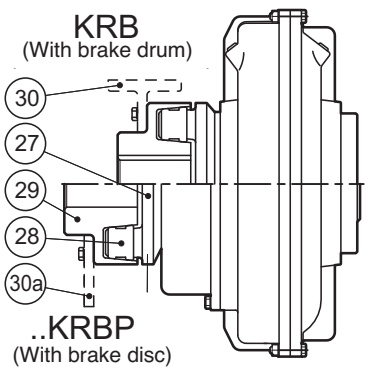
* only for 15÷34



KRG

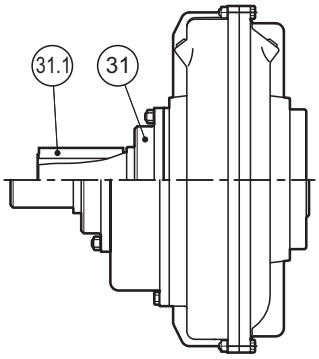
KRB
(With brake drum)

..KRBP
(With brake disc)



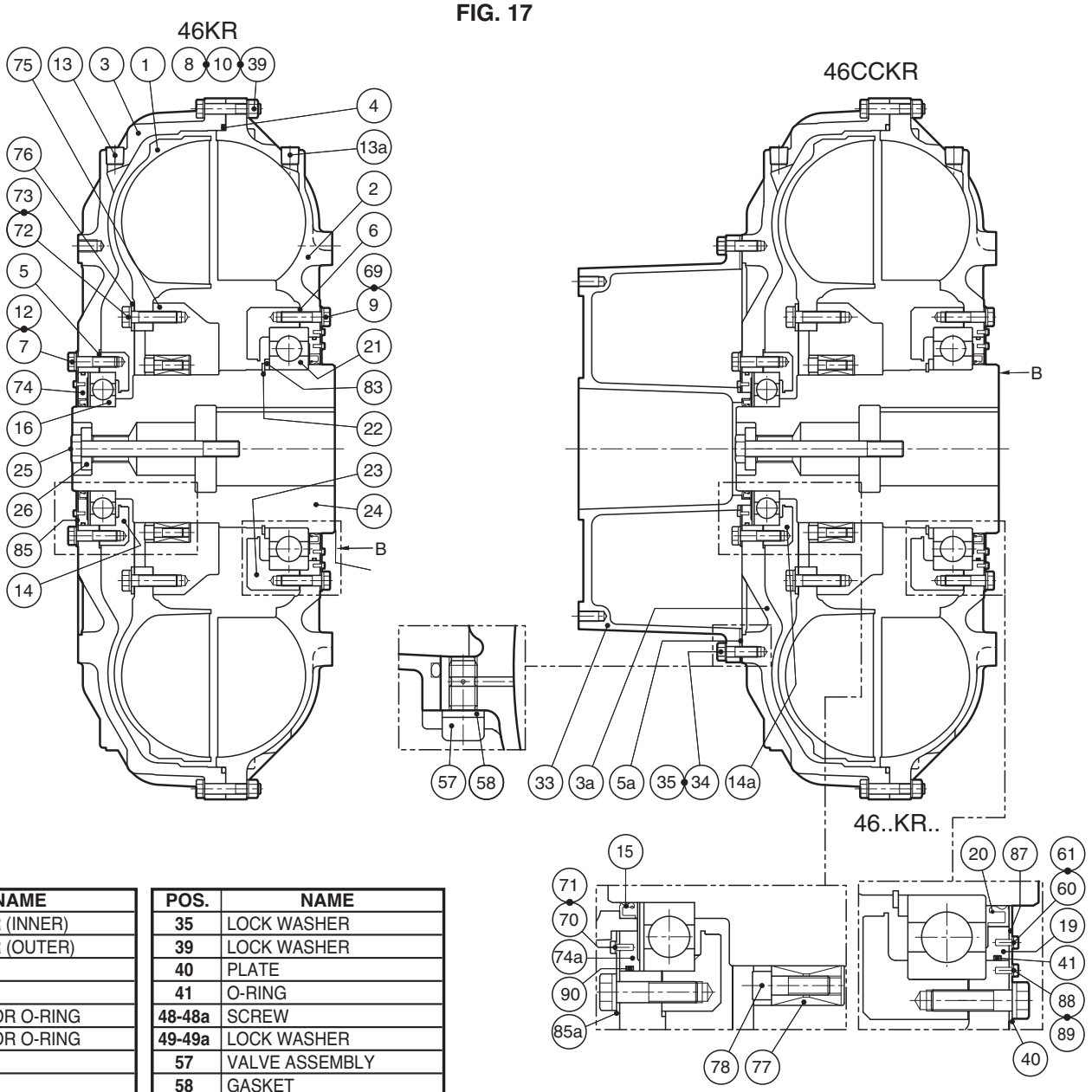
CKRG-CCKRG

KRD



CKRD-CCKRD

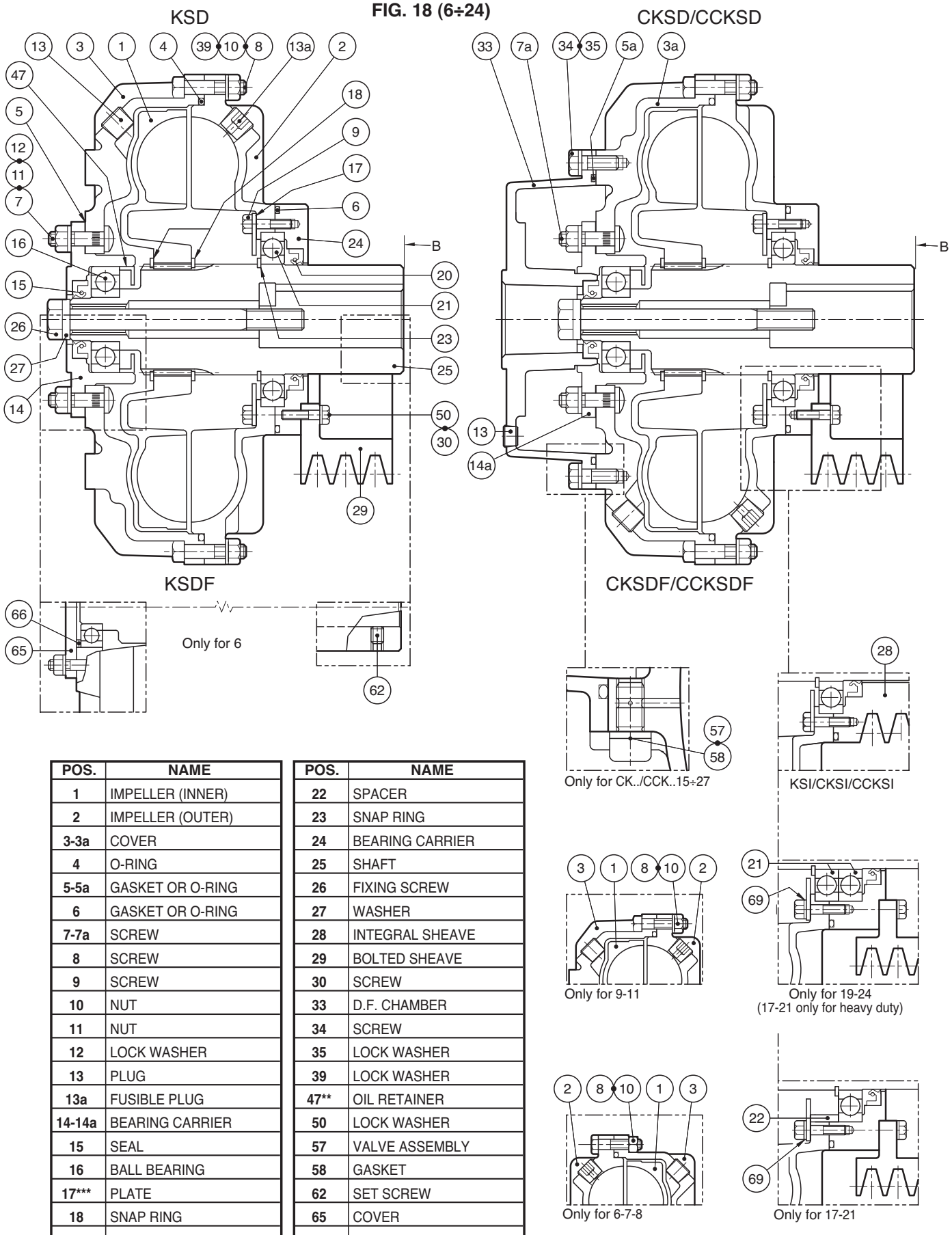
FIG. 17



POS.	NAME
1	IMPELLER (INNER)
2	IMPELLER (OUTER)
3-3a	COVER
4	O-RING
5-5a	GASKET OR O-RING
6	GASKET OR O-RING
7	SCREW
8	SCREW
9	SCREW
10	NUT
12	LOCK WASHER
13	PLUG
13a	FUSIBLE PLUG
14-14a	BEARING CARRIER
15	SEAL
16	BALL BEARING
19	SEAL CARRIER
20	SEAL
21	BALL BEARING
22	SNAP RING
23	BEARING CARRIER
24	SHAFT
25	FIXING SCREW
26	WASHER
27	FLANGE G
28	RUBBER BLOCK
29	HALF JOINT G
30-30a	BRAKE DRUM - BRAKE DISC
33	D.F. CHAMBER
34	SCREW

POS.	NAME
35	LOCK WASHER
39	LOCK WASHER
40	PLATE
41	O-RING
48-48a	SCREW
49-49a	LOCK WASHER
57	VALVE ASSEMBLY
58	GASKET
60	SCREW
61	LOCK WASHER
67a	ADAPTOR
69	LOCK WASHER
70	SCREW
71	LOCK WASHER
72	SCREW
73	LOCK WASHER
74-74a	SEAL CARRIER
75	HUB
76	PLATE
77	CLAMPING DEVICE
78	SCREW
83	SPACER
85-85a	PLATE
87	PLATE
88	SCREW
89	LOCK WASHER
90	O-RING
91	HUB
92	SCREW
93	LOCK WASHER

FIG. 18 (6÷24)



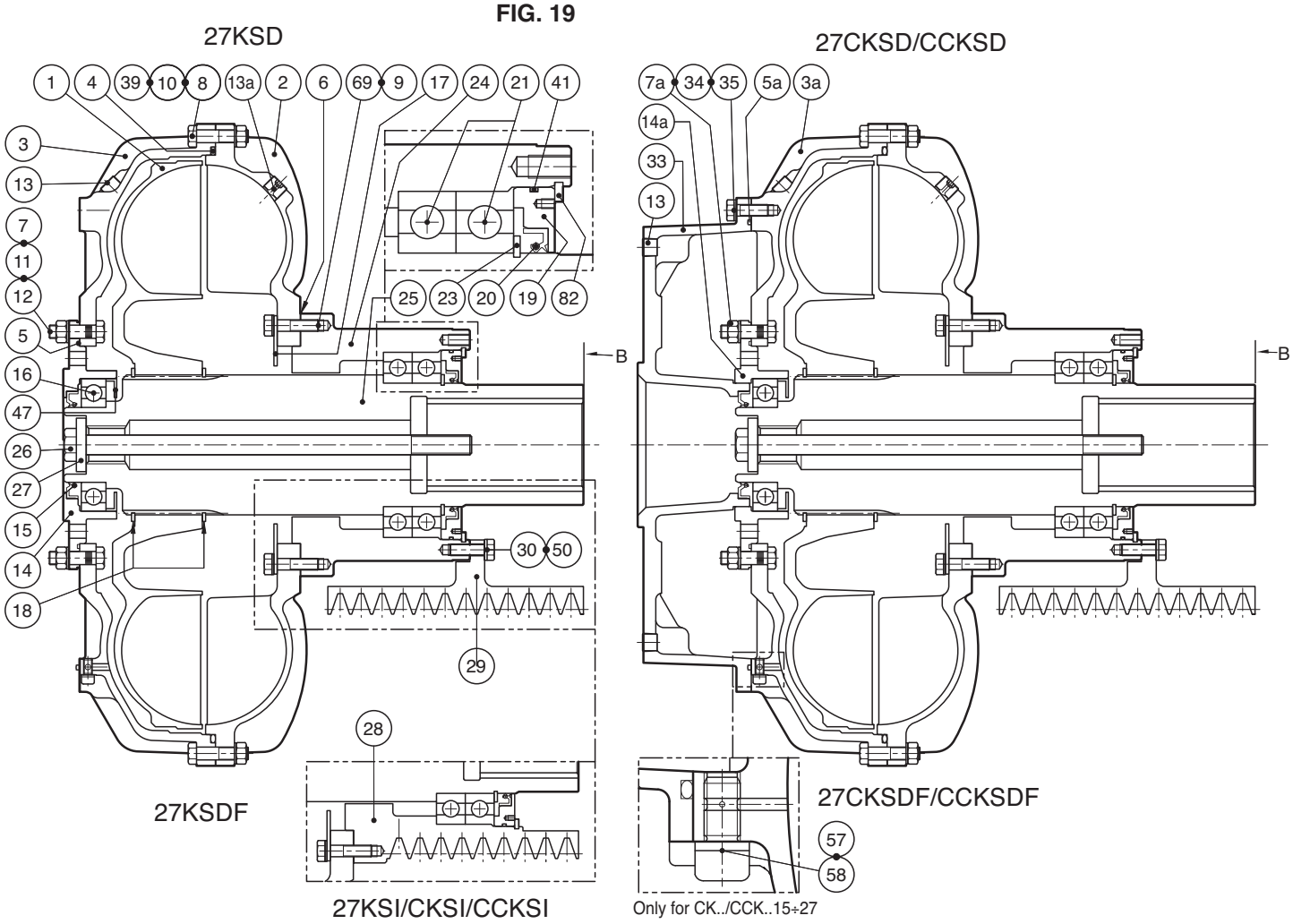
POS.	NAME
1	IMPELLER (INNER)
2	IMPELLER (OUTER)
3-3a	COVER
4	O-RING
5-5a	GASKET OR O-RING
6	GASKET OR O-RING
7-7a	SCREW
8	SCREW
9	SCREW
10	NUT
11	NUT
12	LOCK WASHER
13	PLUG
13a	FUSIBLE PLUG
14-14a	BEARING CARRIER
15	SEAL
16	BALL BEARING
17***	PLATE
18	SNAP RING
20	SEAL
21	BALL BEARING

POS.	NAME
22	SPACER
23	SNAP RING
24	BEARING CARRIER
25	SHAFT
26	FIXING SCREW
27	WASHER
28	INTEGRAL SHEAVE
29	BOLTED SHEAVE
30	SCREW
33	D.F. CHAMBER
34	SCREW
35	LOCK WASHER
39	LOCK WASHER
47**	OIL RETAINER
50	LOCK WASHER
57	VALVE ASSEMBLY
58	GASKET
62	SET SCREW
65	COVER
66	WAVE SPRING
69	LOCK WASHER

*** excluded 6

** only for 15÷34

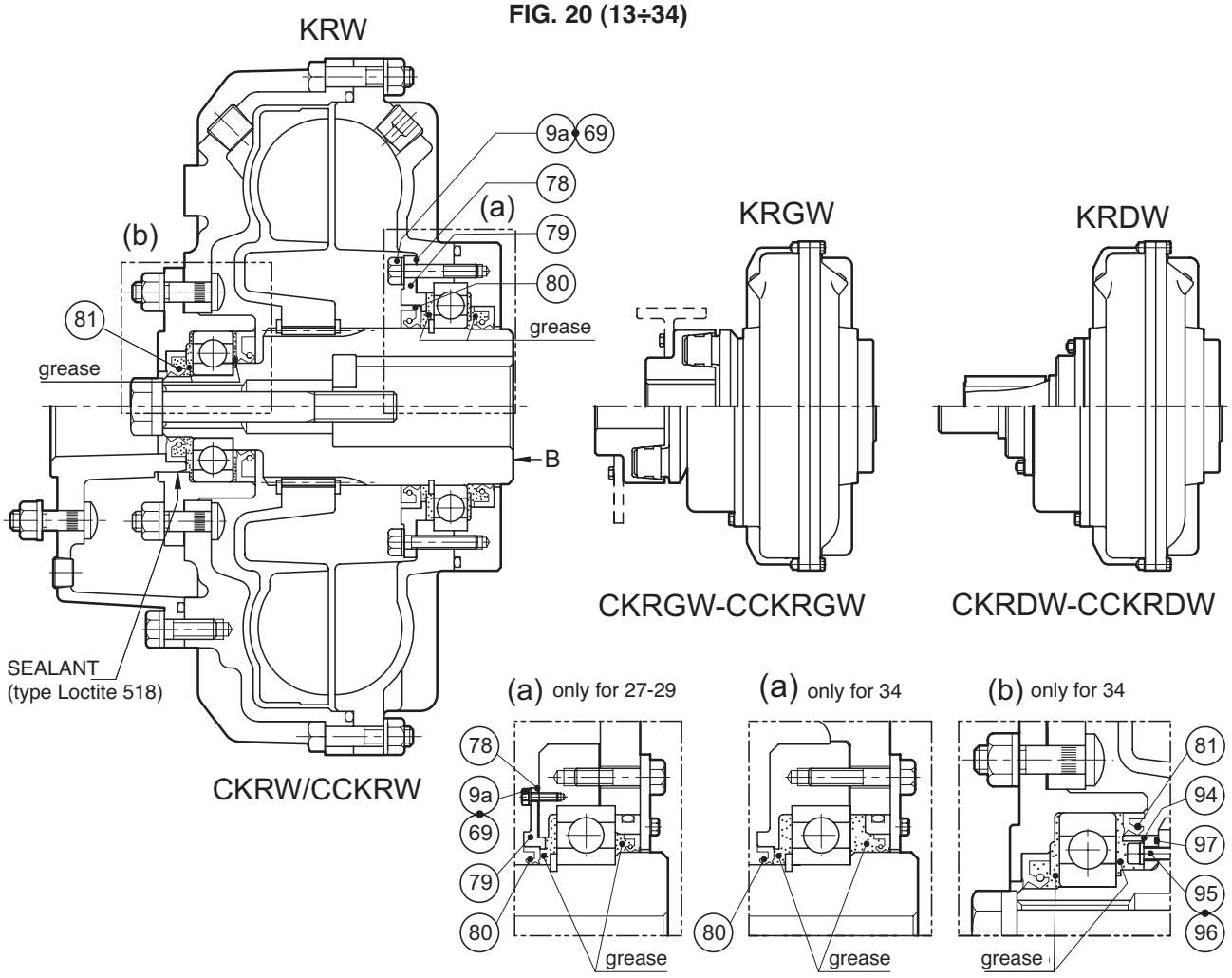
FIG. 19



POS.	NAME
1	IMPELLER (INNER)
2	IMPELLER (OUTER)
3-3a	COVER
4	O-RING
5-5a	GASKET OR O-RING
6	GASKET
7-7a	SCREW
8	SCREW
9	SCREW
10	NUT
11	NUT
12	LOCK WASHER
13	PLUG
13a	FUSIBLE PLUG
14-14a	BEARING CARRIER
15	SEAL
16	BALL BEARING
17	PLATE
18	SNAP RING
19	SEAL CARRIER
20	SEAL

POS.	NAME
21	BALL BEARING
23	SNAP RING
24	BEARING CARRIER
25	SHAFT
26	FIXING SCREW
27	WASHER
28	INTEGRAL SHEAVE
29	BOLTED SHEAVE
30	SCREW
33	D.F. CHAMBER
34	SCREW
35	WASHER
39	WASHER
41	O-RING
47	OIL RETAINER
50	WASHER
57	VALVE ASSEMBLY
58	GASKET
69	WASHER
82	SNAP RING

FIG. 20 (13÷34)



The fluid couplings serie... KR...W are working by using mixed distilled water instead of mineral oil. The bearings are greased for life by ROCOL SAPPHIRE AQUA 2 grease or equivalent.

The installation and maintenance manual 150 GB is also valid for fluid couplings serie **...KR...W**, except the table D (page 4) concerning the working fluid (water instead of oil).

The water is mixed to a special liquid (**AGIP ECOFREEZER or equivalent**) on the basis of inhibited propilic glicole which is normally used in a closed cooling circuit of internal combustion engines: it is **BIODEGRADABLE – ANTIFOAM - UNFLAMABLE**. Appropriately mixed (with 50% water and 50% special liquid) **it increases the boiling point and reduces the freezing point (see table L)**.

The fluid couplings **...KR...W** are supplied with fusible plug at **109°C** .

It is recommended to check periodically the fluid level and adjust it, if necessary, according to instructions given on p. 4.

For **replacement of seals and bearings**, see item 7 on page 8 considering the below variations:

7.5 Remove the bearing **pos.16** and seal **pos.81**

7.7 Remove the screws **pos. 9a**, the retainer **pos.79,** gasket and seal **pos.78** and **80**

7.8 When reassembling, proceed backward replacing the bearings and all seals, putting **grease ROCOL SAPPHIRE AQUA 2 (or equivalent)** between bearings and seals as **indicated in fig. (a)** and **(b)**.

TAB. L

Volume %	Boiling point	Freezing point
50	104°C	-33°C
60	106°C	-48°C
80	118°C	-54°C
100	160°C	-60°C

TAB. M

DIM	Locking torque			
	Pos. 9a		Pos. 96	
	Screw	Nm	Screw	Nm
15-17-19	M10	50	–	–
21-24	M14	135	–	–
27-29			–	–
34	M16	205	M8	24

TAB. N

POS.	NAME
9a	SCREW
69	LOCK WASHER
78	GASKET
79	SEAL CARRIER
80	SEAL

POS.	NAME
81	SEAL
94	SEAL CARRIER
95	SCREW
96	LOCK WASHER
97	O-RING

ADDITIONAL RULES FOR USE IN HAZARDOUS AREAS OF FLUID COUPLINGS

1 - INSTALLATION

Radial misaligment (R), must be measured with a dial indicator as shown on Fig. 4 of the manual.
Misalignment values stated on Tab. C - C1 and C2 are subject to the following limitations:

radial misalignment **(R)**	: max 0,2 mm
angular misalignment **(A1-A2)**	: reduce indicated valued by 50%
distance between coupling halves **(k)**	: dimensional tolerance is ± 0,5 mm

2 - OPERATION

- After first start-up verify the tightening of the drive and driven machines screws, however it's recommended also to check the tightening of them periodically.
- Check again misalignment according to the manual: paragraph 1.8 (KRG) - 1.17 (KRM) - 1.22 (KRG3)

It is recommended:

- to use a strong coupling guard, preferably in "no-spark" material which is equipped with openings for ventilation. The openings must be smaller than the smallest nut installed on the fluid coupling in order to avoid emission of metallic parts caused by centrifugation of the rotating coupling which may cause sparks.
- a careful cleaning of surfaces of the fluid coupling before every system start.
- to check if aluminium material of the fluid coupling is compatible with the working atmosphere (in case of uncertainty please contact TRANSFLUID).
- to use drive belts suitable for the pulley (if present) for potentially explosive atmospheres.
- the correct installation and proper use of joints alignment (see documents TF6429 - TF6429A).
- a periodic review and possible replacement of the rubber elements of TRANSFLUID elastic couplings. For BT and BM models, check that the machining of holes in the joints were carried out by TRANSFLUID.

Verify every 6 months:

- the condition of the O-rings and Viton oil seals. Replace them immediately if they are broken or show signs of wear.
- the wear conditions of the rubber elements (if present), that the rotational gap is always lower than 2° (as described in paragraph 3.3 of the manual).
- there are no oil leaks. If leaks are found, overhaul the fluid coupling immediately.

3 - ELECTRIC DEVICE

Check every 6 months the functionality of the electric device (if installed).

4 - MAINTENANCE

Any overhaul and repair of the fluid coupling must be carried out by an official TRANSFLUID service centre that will document modifications performed.

BASIC GUARANTEE
TERMS AND CONDITIONS

TRANSFLUID
trasmissioni industriali

1) Preamble

TRANSFLUID guarantees that at the time of dispatch, its products comply with the specifications published in its catalogues or technical documents, which were valid at the time of dispatch, and that the products are free from defects in material and workmanship. These terms of guarantee substitute all other guarantees, including legal, expressed or implicit guarantees, including but not limited to, guarantees of saleability and suitability for a particular use (and any other implicit guarantee arising during the course of the services, negotiations or commercial use). Except in the event of serious negligence and fraud, under no circumstances will TRANSFLUID be held liable for direct, indirect, consequential, fortuitous or extra contractual damage based upon claims for compensation by the Buyer for violation of the guarantee, contract or objective responsibility. Under no circumstances can the compensation by TRANSFLUID exceed the amount paid by the Buyer for the product supplied by TRANSFLUID.

2) Duration and limits of the guarantee

a) The duration of the guarantee is equal to eighteen (18) months from the time the product supplied by TRANSFLUID is commissioned, and nonetheless, no more than twenty-four (24) months from the date of dispatch of the original product from TRANSFLUID's plant.

b) Product that are not used and stored for a long period must be kept and handled in keeping with the guidelines, which are available upon request, drawn up by TRANSFLUID according to product type.

c) The wear or tear of parts, which is particularly due to conditions of use (tension of the belts, environmental conditions, unforeseen knocks and overloading), or to the sensitivity of the operator (use within the approved limits) or to external circumstances (jamming of the machine), is not covered by the guarantee if these parts have been used (are not new), unless the Buyer can clearly prove the manufacturing defect, which is ascribable to TRANSFLUID.
Typical parts subject to wear or tear include:
- Filters, seals and gaskets
- Springs, screws, plugs
- Switches and fuses
- Material and friction surfaces
- Belts and chains
- Lubricants in general

d) Installation and maintenance of TRANSFLUID products must be carried out following the installation, use and maintenance manual, which is always supplied with each product.

e) With regard to the supply of loose/disassembled parts, the guarantee solely and exclusively covers faults of the components themselves, related to the material or mechanical workmanship carried out by TRANSFLUID.

f) The guarantee is no longer valid when:
- the product is used exceeding the limits stated in the catalogues or installation manuals, or in applications that are not approved by TRANSFLUID;
- breakage results from abuse, negligence, omission or inadequate maintenance, failed connection or control of the protection devices or as a result of accidents;
- the product is modified or disassembled without TRANSFLUID'S written approval.

3) Services included/excluded in the guarantee

a) In TRANSFLUID'S final decision, products or components, whose faults are covered by the guarantee, will be repaired or replaced at no extra cost, with the exception of the subsequent points. The replaced parts will be covered from the remaining period of the original guarantee, which stays in force for the product initially supplied (a new guarantee period will therefore not come into effect).

b) Excluded from the guarantee and remaining at the Buyer's expense are the costs resulting from:
- Removal of the TRANSFLUID product from the machinery onto which it is fitted, and recommissioning;
- Suitable packing and charges resulting from the return transport of the material;
- Restoration of lubricants in general, piping, sound proof canopies, guards, etc.
- All other costs not expressly approved in writing by TRANSFLUID.

c) The Buyer can request the support of a specialised technician to disassemble/re-install/recommission the product by sending a standard purchase order. TRANSFLUID will invoice the work, applying the current ASSIOT rates (Italian Association of Gears and Transmission Elements Manufacturers, a member of EUROTRANS).

d) TRANSFLUID cannot be held liable for lost or reduced profit, costs for replaced machinery, still machinery, damage to equipment or property caused by failure of its products.

4) Conditions for requesting services under guarantee

a) If the Buyer intends to take advantage of the guarantee, he must inform TRANSFLUID in writing within 7 (seven) days of discovering a fault, stating:
- Product description;
- Series number (where foreseen), specification number or article code;
- Reference to the date and document of purchase or delivery;
- Reasonable proof that the fault falls within the conditions of guarantee, together with a detailed description of the irregularity or failure and where possible, supported by photographs.
In the event of failure after commissioning the product, the following must also be communicated:
- Type of application;
- Power and engine rpm (stating also the make and model for endothermic engines);
- Diameter, type, number of races and position of pulley (if foreseen by the application);
- Hours of operation.

b) TRANSFLUID will indicate whether the product must be delivered or sent free port to an authorised centre or directly to its own plant depending on the product concerned, the failure indicated and the urgency of the intervention.

c) On receiving the product, TRANSFLUID or the authorised distributor will carry out a thorough analysis; if the product is deemed to be covered by the guarantee:
- TRANSFLUID will repair or replace the parts needed to restore full and safe working at no cost;
If the product is NOT deemed to be covered by the guarantee, TRANSFLUID:
- will send a technical report explaining its decision;
- will draw up an estimate for the repair;
- will carry out the repair upon receipt of the order from the Buyer.

d) The repaired products will be returned to the Buyer freight collect, by the same means of transport that was used for the arrival (unless stated otherwise).

e) Should the Buyer decide not to accept the estimate for the repair, he must communicate his decision in writing, explicitly asking for the parts to be scrapped or returned; the parts will be sent in their current state.