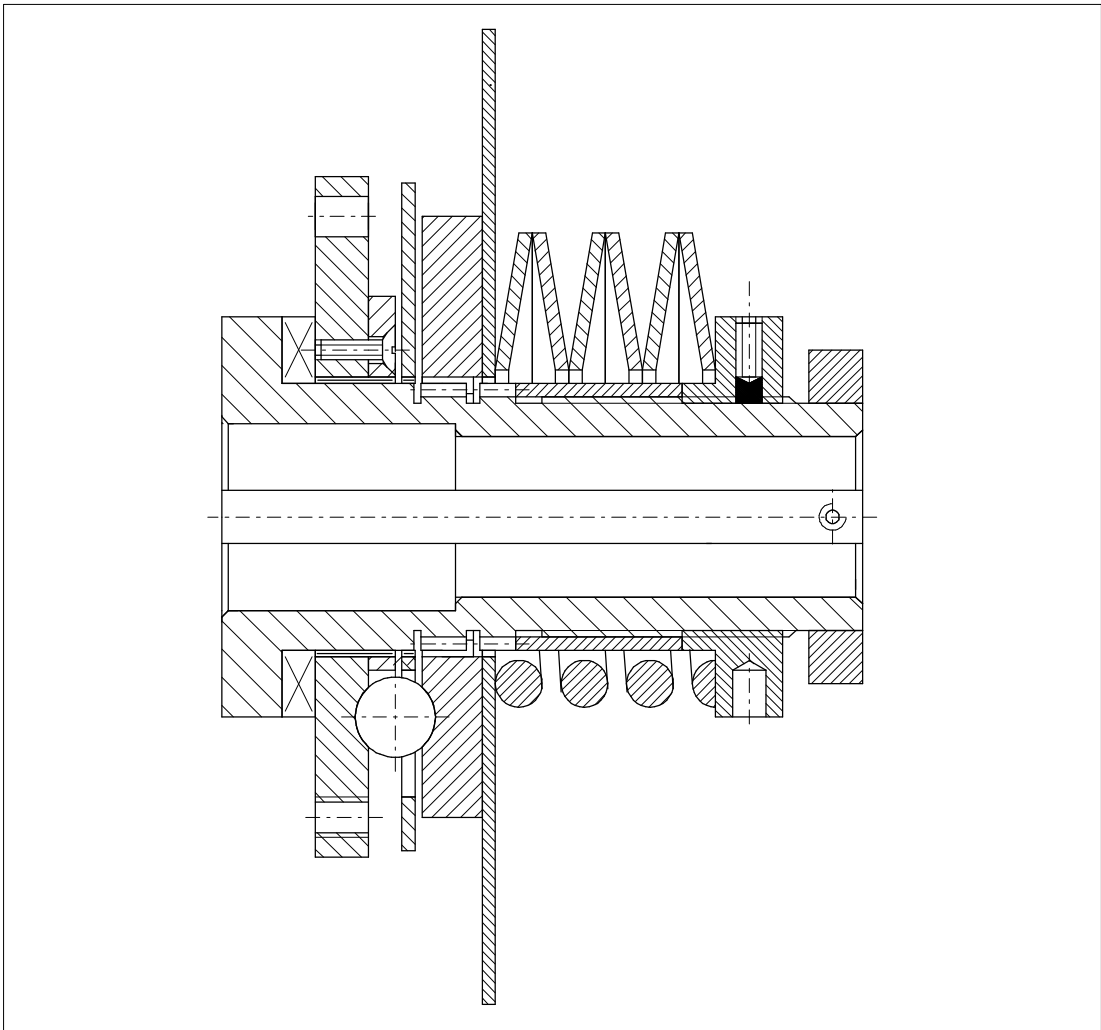


Operating Instructions

BA 8404 EN 02.96

for **AUTOGARD Series 200** Couplings
Types **ACW, ACTW** and **AFW**
Size 1-5S



258791



A. Friedr. Flender AG, D 46393 Bocholt, Tel. 02871/92-0, TX 0813841, Telefax 02871/922596

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1. Technical Data

1.1 Coupling-specific data

Order No.: _____

Serial No.: _____

Type: _____

Size: _____

Design data:

Helical spring set: _____

Actuating torque set T_e : _____ Nm

Calibration sleeve length (for T_{max}) : _____ mm

Maximum actuating torque T_{max} : _____ Nm

Bore: \varnothing _____ H7

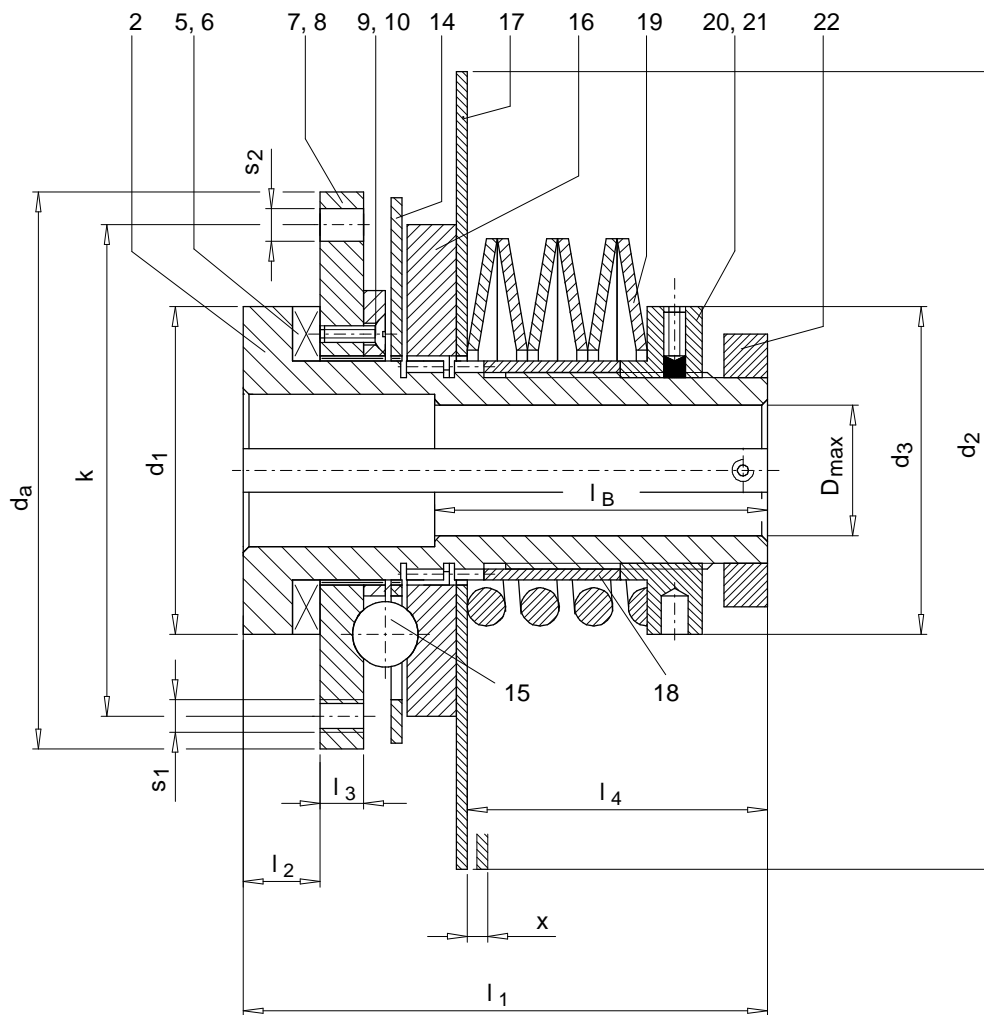
Keyway acc. DIN 6885/1

Keyway _____ wide x _____ deep

Special features: _____

1.2 General Technical Data

- In the case of Types ACW and ACTW, parts 9 and 10 are omitted



Size	Actuating torque	Speed n_{max}			D_{max} 1)	d_a	d_1	d_2	d_3	x	l_B	l_1	l_2	l_3	l_4	Weight kg
	T_{max} Nm	ACW 1/min	ACTW 1/min	AFW 1/min												
1	28	100	300	2000	12	60.3	36.5	83	SW 33	2.4	20	90	11.5	14.3	49.3	1
2	225	100	300	2000	25	101.6	60.2	140	SW 57	4.4	40	95	14.4	7.9	52.9	2.8
3	680	100	300	2000	38	127	78	165	80	4.4	60	137	14.4	12.7	86.2	6.2
4	1130	100	300	2000	50	158.8	95	203	108	5.3	75	165	13.2	15.9	106.7	14.5
5	2540	100	300	2000	75	215.9	145	305	152	6.3	110	216	27.9	19.0	134.4	31
5 S	5650	100	200	—	85	266.7	180	305	180	8.1	125	235	37.1	25.4	120.4	65

Table 1.1 : Maximum actuating torque T_{max} , speeds n_{max} , weights and dimensions

1) Bore see 1.1

- Size 5S is only available for Types ACW and ACTW
- See item 1.2.1 for hole circle k , number, layout and sizes s_1 and s_2 of the bores
- Weights apply to maximum hole sizes

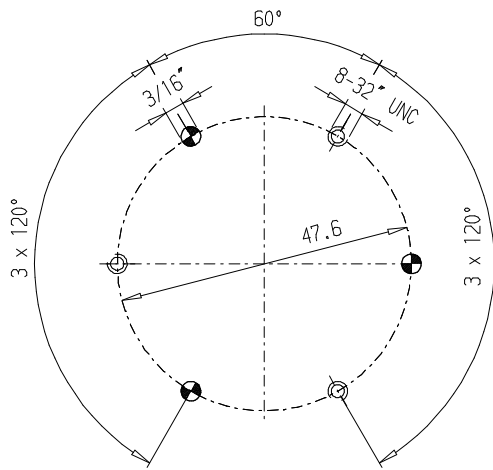
The actuating torques are applicable to:

- Daily operating period up to 24 hours
- Operation in the temperature range from -30 °C to +80 °C (ambient temperature or temperature of shaft ends)

Caution!

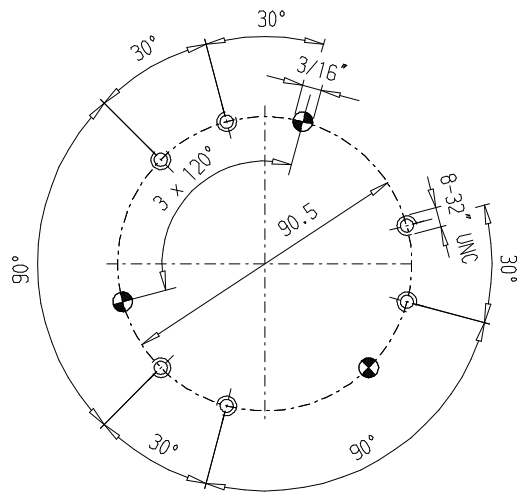
- Note the effect of the starting torque on the actuating torque
- Autogard torque limiters are supplied with a durable surface protection, so that no painting is necessary. If however, paint is applied by the customer, the following points should be observed:
 - Do not wash the coupling completely before priming. Grease and oil might be washed off which can only be replaced by disassembly of the coupling.
 - The coupling may only be painted on its outer surfaces. When doing so, ensure that no paint is allowed to penetrate into the interspaces.
- **To ensure sustained trouble-free operation, the torque limiter must be designed for the application involved. In the event of any change in the operating conditions (power, speed, modifications to prime mover and driven machine), it is essential to check the design.**

1.2.1 Drilling patterns



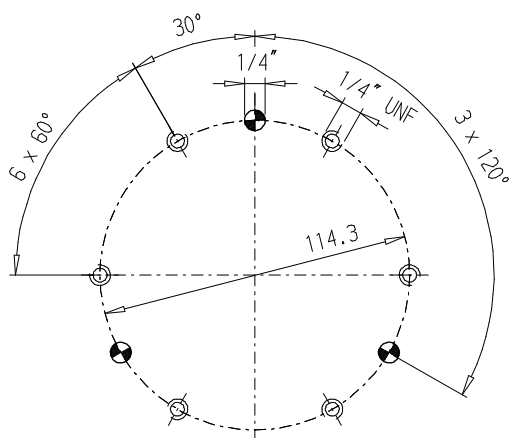
Größe 1

Tapped hole s_1

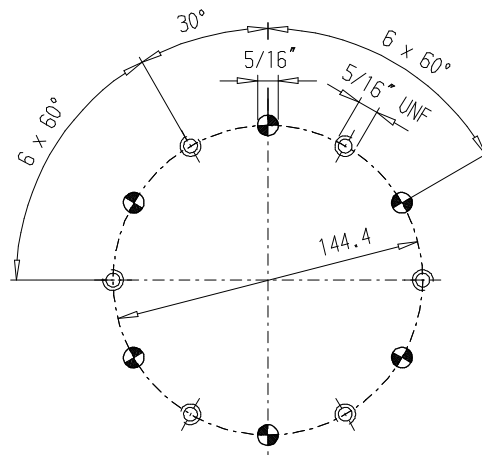


Größe 2

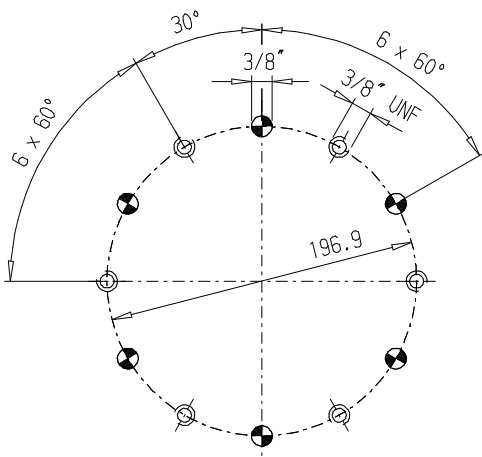
Spring-type straight pin hole s_2



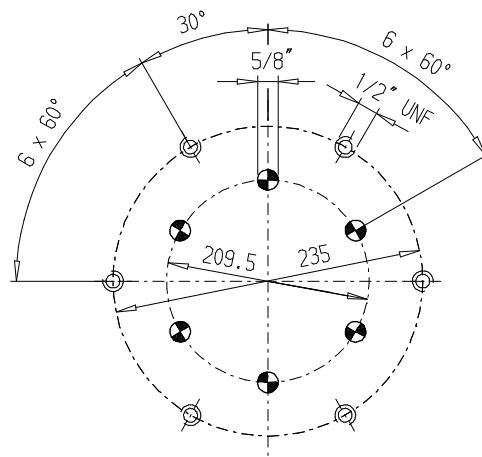
Größe 3



Größe 4



Größe 5



Größe 5S

Tapped hole s_1

Spring-type straight pin hole s_2

2. General Notes

2.1 General

These Operating Instructions constitute part of the coupling supply. They should be kept in the vicinity of the coupling at all times.

Only precise knowledge of the Operating Instructions will ensure trouble-free operation of the coupling. It is therefore in the interest of the customer for the Operating Instructions to be read, understood and observed in all respects by the persons responsible for handling, assembly and operation.

Note: We assume no liability for damage resulting from non-observance of the Operating Instructions.

The "**Coupling**" dealt with in these Operating Instructions has been designed for stationary use in general engineering.

The coupling is only suitable for the application specified in Section 1: Technical Data. Operating conditions differing therefrom will require fresh contractual agreements.

The coupling described here is in accordance with the state of the art at the time of printing these Operating Instructions.

In the interest of further development, we reserve the right to introduce modifications which we consider appropriate, while retaining the essential features, to increase efficiency and reliability.

The copyright of these Operating Instructions remains the property of **FLENDER AG**.

Without our express agreement, these Operating Instructions may not be duplicated in part or whole, utilized for the purpose of competition or made available to third parties.

All technical questions should be referred to our works:

FLENDER AG
D 46393 Bocholt

Telefon: 02871/92-2800
Telex: 813841
Telefax: 02871/92-2801

or to one of our Service Facilities. A list of these Service Facilities will be found in Section 11: Stocking Spare Parts, Service Facility Addresses.

3. Safety Notes

3.1 Safety Notes

- The coupling is constructed in accordance with the state of the art and is reliable in the state as shipped. Unauthorized modifications which impair reliability are not permissible. This also applies to safety devices which are fitted as protection against accidental contact.

- The coupling may only be used and operated under the conditions specified in the performance and supply contract.

- The customer has to ensure that the persons entrusted with installation, operation care and maintenance, as well as repair, have read and understood these Operating Instructions and observe them in all respects in order:

- To prevent hazard to life and limb on the part of the user and third parties

- To ensure the reliability of the coupling

and

- To prevent failure and environmental contamination resulting from improper handling.

- During the course of handling, assembly and disassembly, operation, as well as care and maintenance, the relevant regulations regarding industrial safety and pollution control are to be observed.

- The coupling may only operated, maintained and repaired by authorized, trained and suitably instructed personnel.
- All work should be carried out with due care with the safety aspect in mind.
- Work on the coupling may only be carried when it is stationary.
The drive unit must be secured to prevent accidental startup (for example by locking the key switch or removing the fuses from the power supply). A notice should be affixed to the startup point stating that work on the coupling is in progress.
- During operation, the drive unit should be shut off immediately if changes in the coupling are detected, such as for example changes in operating noises.
- The coupling must be protected by means of suitable guards to prevent accidental contact.
- When the coupling is installed in equipment or systems, the manufacturer of the equipment or systems is obliged to include the instructions, notes and descriptions contained in these Operating Instructions in his own Operating Instructions.

3.1.1 Notes used in the Operating Instructions

Important instructions contained in these Operating Instructions which concern operating safety are emphasized as follows:



This symbol draws attention to safety measures which **MUST** be observed to prevent **personal injury**.

Caution!

This symbol draws attention to safety measures which **MUST** be observed to prevent **damage to the coupling**.

Note:

This note draws attention to general **operating notes** to which special attention should be given.

4. Handling and Storage

4.1 Scope of supply

The scope of supply of the shipment is listed in the despatch documents. It should be checked for completeness on receipt. Any shipping damage and/or missing parts should be reported immediately in writing. An expert should be engaged after consulting FLENDER.

4.2 Handling

Packing of the coupling will differ, dependent on method of shipment and size. The packing will, unless agreed to the contrary, comply with **HPE Packing Guidelines**.

The symbols applied to the packing should be noted. Their significance is as follows:



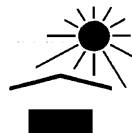
This side up



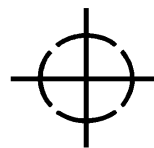
Fragile goods



Keep dry



Protect from heat



Centre of gravity



Use no hooks



Sling here

Caution!

Ensure that a suitable hoist is used

4.3 Storage

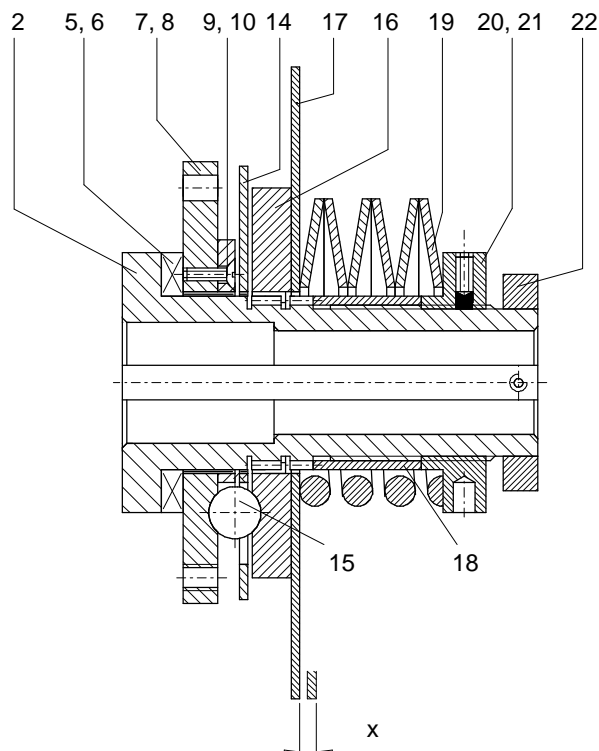
Autogard torque limiters are supplied manganese-phosphated and oiled and can be stored in a dry place for long periods of time. In the case of prolonged storage, the coupling should be covered to prevent excessive contamination. Long-term preservation is only necessary for the finish bore.

Caution!

If dirty, the coupling **MUST** be cleaned. Complete washing down can wash oil and grease out of the interior of the coupling, necessitating complete disassembly.

5. Technical description

5.1 General description



The Autogard torque limiter is an overload protection coupling which protects motor, gear unit and machine from overload and destruction due to excessive torque and momentarily interrupts the power train when the actuating torque set is exceeded.

The actuating torque is directly dependent on the spring force which can be continuously adjusted by means of adjusting nut (20). Dependent on the size of the torque limiter and the set actuating torque, either helical springs or laminated cup springs are used.

5.2 Torque transmission

The torque is transmitted by means of balls (15) which are located in conical recesses between two disks pressed together by spring pressure (drive disk -7- and sliding disk -16-).

The guide disc (14) has the function of retaining the balls in position in relation to one another after disengagement of the coupling. Thus, it assumes a function similar to that of the cage of a ball bearing. When the running torque reaches a value which exceeds the set actuating torque, the balls roll out of their recesses. The coupling disengages and the input drive and output drive sides are now completely separated. Apart from a minimal residual torque, caused by the rolling friction, no further torque is transmitted.

As a result of the disengagement of the coupling, the sliding disc (16) moves, and with it the actuator disc (17), in axial direction. This axial disengagement movement (x) should be monitored with a limit switch or a proximity switch. The disengagement of the Autogard coupling should be monitored in any case in order to maintain a high productivity of the machine and to prevent an early wear of the Autogard coupling.

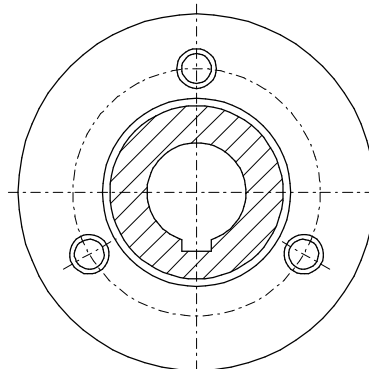
5.3 Disengagement and reengagement of the different types of subassemblies

The type ...W described herein is regarded as basic type for the combination with elastic, flexible, stationary or other coupling hubs or coupling types. In addition, a difference is made between three different actuating mechanisms.

5.3.1 Subassembly type AC.

After an overload, the balls (15) which are arranged asymmetrically on a pitch, circle roll out of their conical recesses. The balls (15) are guided by bores in the guide disc (14) and can thus only roll from one recess to the next. These sub-assemblies are designed for a speed of approx. 100 1/min.

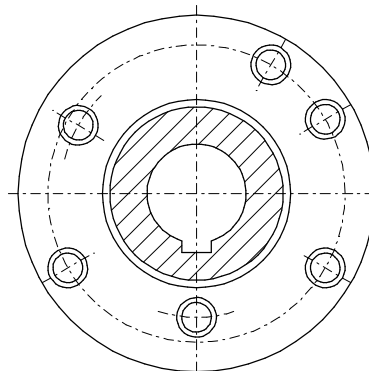
Reengagement takes place automatically and independent of the direction of rotation after starting the motor. The coupling can also be re-engaged manually. The re-engagement angle is between 60° and 240° dependent on size and desired actuating torque (re-engagement points every 30° are also possible for special designs).



5.3.2 Subassembly ACT.

After an overload, the balls (15), which are arranged asymmetrically on several pitch circles roll out of their conical recesses. The balls (15) are guided by bores in the guide disc (14) and thus can only get back into their original recesses. This sub-assembly is designed for a speed of approx. 300 1/min.

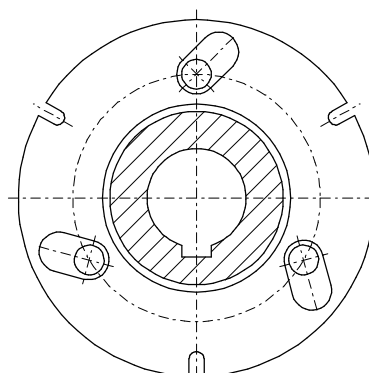
Reengagement takes place automatically and independent of the direction of rotation after starting the motor. The coupling can also be re-engaged manually. However, this sub-assembly will always re-engage in the same angular shaft position after 720° or two rotations, attributable to the balls rolling on the drive and guide disc. This is also termed synchronous re-engagement.



5.3.3 Subassembly AF.

After an overload, the balls (15), which are arranged symmetrically on a pitch circle, roll out of their conical recesses and are guided to a larger circle outside the ball seats by the slots in the guide disc (14) and the cam ring (9). They stay there without getting back into their conical recesses. Speeds up to automatically approx. 2000 1/min are possible with this sub-assembly.

The re-engagement is realized manually by aligning the slots on the outside diameter of the guide disc (14) with those in the drive disc (7) and fixing both discs to each other by means of a suitable tool (e.g. screw driver). By rotating these two discs into the correct direction of rotation to the sliding disc (16), the balls re-engage in the recesses of the drive disc (7). Depending on the position at which the coupling stops after disengaging, a further rotation is necessary for having the balls also engaged in the sliding disc. In case of an overload, couplings of sub-assembly type AF. disengage in both directions of rotation like all other couplings, too. The direction of rotation for re-engagement is determined by the position of the guide disc (14).



Caution!

Series 200 Autogard torque limiters should be monitored with a limit switch or a proximity switch in order to prevent unnecessary wear.

6. Assembly

6.1 Notes on provision of the finished bore, securing axially, balancing

6.1.1 Finish boring

Autogard torque limiters are always supplied bored and keywayed. Couplings without bore and keyway cannot be set to an exact actuating torque. In the case of queries, please contact FLENDER AG.

6.1.2 Securing axially

The coupling halves are secured by means of setscrews or with end plate and central locking screw.

When replacing the setscrews, setscrews with cup point acc. to DIN 916 should be used.



The length of the setscrews should be such that it fills the tapped hole, but does not project past the outside diameter ($L_{min.} = \text{setscrew diameter} \times 1.2$).

6.1.3 Balancing

Autogard torque limiters are generally supplied without special balancing. If a special application (for example high RPM and large coupling size) necessitates balancing or it is required by the customer, this balancing will be carried out at the works.

6.2 General installation notes

During installation, the Safety Notes in Section 3 should be observed.

Installation should be carried out with extreme care by specialist personnel.

Ensure right at the planning stage that there is adequate space is available for installation and subsequent care and maintenance.

Adequate hoists must be available when installation is commenced.

6.3 Fitting the coupling halves

Before commencing installation, the shaft ends and the coupling bores should be carefully cleaned. Cleaning the complete coupling can result in oil and grease being washed out of the interior of the coupling; this will necessitate complete disassembly of the coupling.



Observe the manufacturer's instructions when handling the solvent!

Caution!

The coupling halves should be fitted with the aid of suitable equipment to prevent damage to the shaft bearings resulting from the axial fitting force. Ensure that suitable hoists are used.

The shaft ends must not project on the inside of the hub. Axial securing is done by means of the setscrews or the end plate.

Caution!

The setscrews should only be tightened using an Allen key in accordance with DIN 911, without the use of any pipe extension.



Nonobservance of these notes can lead to the coupling exploding. Flying fragments will cause hazard to life and limb!!

6.4 Alignment

When attaching coupling halves to the Autogard torque limiter, the instructions for the latter regarding alignment should be noted.

6.5 Possible misalignment

When attaching coupling halves to the Autogard torque limiter, the instructions for the latter regarding misalignment should be noted.

7. Startup

7.1 Measures prior to startup

Before startup, the tightness of the setscrews should be checked and the coupling guard fitted to prevent accidental contact.

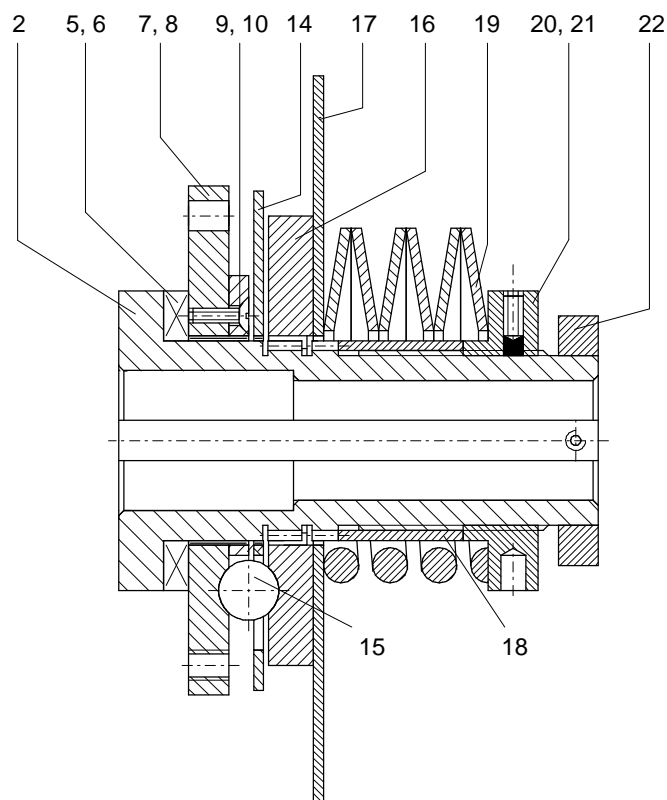
7.2 Actuating torque adjustment

Autogard torque limiters are supplied set to a fixed torque value in accordance with the customer's requirements. If the exact actuating torque cannot be determined beforehand, an actuating torque range is stated when ordering. The coupling is then set to the lower actuating torque, but a calibration sleeve designed for the higher torque will be fitted. The calibration sleeve restricts the adjustment possible with the adjuster nut to a predetermined maximum actuating torque. This will make it possible to increase the actuating torque (or to reduce it as well) without the necessity for removing the coupling from the shaft.

If it is necessary to alter an actuating torque setting subsequently because the theoretically calculated and the practically necessary actuating torque differ, an increase in actuating torque will usually be necessary. This will be noticed for example by the fact that the Autogard coupling engages already on startup (for example as a result of the starting torque of a three-phase AC motor).

Caution!

Response of the Autogard torque limiter should never be interpreted as a malfunction, but as an indication of the fact that in fact higher torque values are occurring in practical operation than were previously determined theoretically.



Increasing the actuating torque

- First of all, the locking screws (21) of the adjusting nut (20) should be slackened. These locking screws prevent accidental rotation of the adjusting nut during operation.
- The actuating torque is increased by turning the adjusting nut (20) CW. The calibration sleeve (18) underneath the adjusting nut restricts the maximum actuating torque possible. To further increase the actuating torque, the calibration sleeve can be shortened.

Caution!

Calibration sleeves (18) may not on any account be removed completely, as otherwise no guarantee can be accepted for disengagement of the coupling. Shortening of the fitted calibration sleeves is only permissible with the express approval of FLENDER. The minimum permissible operating lengths of the single spring types can be taken from item 7.2.1.

- Laminated cup spring assemblies must only be installed in the respective layers shown. See figure 7.2 to figure 7.5.
- If the maximum or minimum actuating torque of the fitted spring is not sufficient, it should be checked whether a stronger or weaker spring can be fitted. See also item 7.2.1.
- After each actuating torque adjustment, the locking screws (21) should be cleaned and smeared with Loctite 243 and then retightened.



When increasing the actuating torque, it is essential to note that the actuating torque may only be increased to the extent that even the weakest component in the drive train is still adequately protected.

Reducing the actuating torque

- First of all, the locking screws (21) of the adjusting nut (20) should be slackened. These locking screws prevent accidental rotation of the adjusting nut during operation.
- The actuating torque is reduced by turning the adjusting nut (20) CCW. When reducing the actuating torque, a minimum actuating torque should be observed which must be maintained, as otherwise proper actuation of the coupling cannot be ensured. See also item 7.2.1.
- After carrying out actuating torque adjustment, the locking screws (21) should be cleaned and smeared with Loctite 243 and then retightened.

7.2.1 Torque ranges, springs

Size	Spring				Torque range		min. permissible spring length mm	Number of balls		
	Type 1)	Designation	Quantity	Installation according to figure	from Nm	to Nm		AF.	AC.	ACT.
1	S	1C / 1	1	7.2	2.3	28.0	24.2	3	3	6
1	S	1C / 2	1	7.2	1.1	14.7	23.6	3	3	6
1	S	1C / 3	1	7.2	0.6	6.8	18	3	3	6
2	T	2D / 1 / S	6	7.3	56.5	225.0	25.9	3	3	6
2	S	2C / 1	1	7.2	13.6	73.0	27.8	3	3	6
2	S	2C / 2	1	7.2	5.6	45.0	25.4	3	3	6
2	S	2C / 3	1	7.2	2.3	14.7	24.9	3	3	6
3	T	3D / 1 / D	8	7.5	158.0	680.0	36.1	6	6	6
3	T	3D / 1 / S	6	7.3	68.0	407.0	28.2	6	6	6
3	S	3C / 1	1	7.2	45.0	283.0	42.7	3	6	6
3	S	3C / 2	1	7.2	11.0	136.0	37.8	3	6	6
3	S	3C / 3	1	7.2	4.5	57.0	31	3	6	6
4	T	4D / 1 / S	5	7.4	270.0	1130.0	35.3	6	6	6
4	T	4D / 2 / S	6	7.3	136.0	847.0	41.2	6	6	6
4	S	4C / 1	1	7.2	28.0	316.0	50	3	6	6
5	T	5D / 1 / S	6	7.3	618.0	2540.0	53.8	9	9	11
5	T	5D / 2 / S	6	7.3	340.0	2260.0	49.8	9	9	11
5	S	5C / 1	1	7.2	40.0	350.0	44.4	3	9	11
5 S	T	5SD / 1	5	7.4	1360.0	5640.0	51	-	12	16

1) S = helical spring, T = laminated cup spring

Caution!

Calibration sleeves (18) may not on any account be completely removed, as otherwise no guarantee can be accepted for disengagement of the coupling. Shortening of the fitted calibration sleeves (18) is only permissible with the express approval of FLENDER either. The minimum permissible operating lengths of the single spring types can be taken from item 7.2.1.

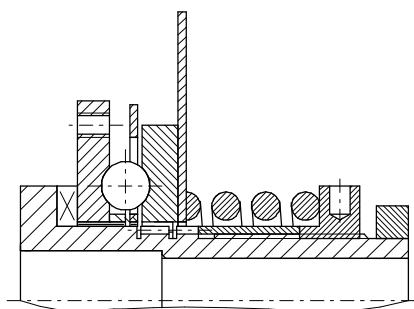


Fig. 7.2

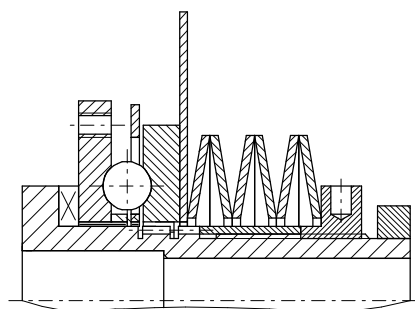


Fig. 7.3

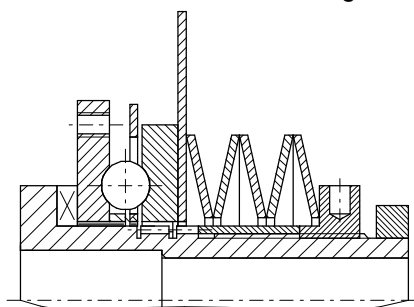


Fig. 7.4

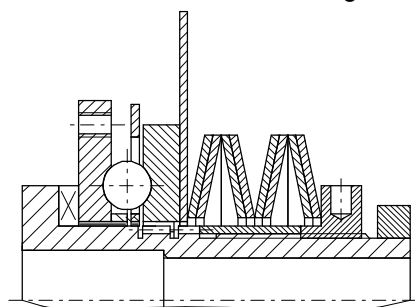


Fig. 7.5

8. Operation

8.1 General data

During operation, the coupling should be checked for:

- Changes in running noises.

Caution!

If irregularities are detected during operation, the drive unit should be shut off at once. The cause of the fault should be located with the aid of the Troubleshooting Table (Section 9).

The Troubleshooting Table lists possible malfunctions, their causes and suggestions for remedying them.

If the cause cannot be established or it is not possible to remedy it with in-house equipment, we recommend that you call in a Service fitters from one of our Service facilities (see Section 11).

9. Troubleshooting

9.1 General

The malfunctions listed below can only serve as a guide to troubleshooting.

With a complex system, all other components must also be included in troubleshooting.

The torque limiter must run silently and vibration-free in all operated stages.

After actuation of the Autogard coupling, a noise will be heard which is caused by the re-engagement of the balls (in case of sub-assembly type AC. or ACT.) until the drive is disengaged.

Any deviant behaviour should be regarded as a malfunction which is to be remedied at once.

Caution!

Series 200 Autogard torque limiters should be monitored with a limit switch or a proximity switch in order to prevent unnecessary wear.



Before carrying out maintenance, repairs or other work, the operator has to ensure that the entire drive train is stationary. In particular, the drive motors should be secured to prevent accidental startup.

In addition, we would drawing attention to the accident prevention regulations applicable on site.

9.2 Possible causes

Malfunctions	Causes	Remedy
Change in noise level during normal operation	Change in alignment of attached coupling	Shut the system down If necessary., remedy reason for changes in alignment (e.g. tighten foundation bolts)
Change in noise level after disengaging the coupling	Bearing(s) damaged	Shut the system down Dismantle the coupling, clean and check; replace damaged coupling parts as described under Section 10.

10. Maintenance and servicing

10.1 General

Maintenance and servicing may ONLY be carried out by the specialist designated for the purpose.

If suitable specialist personnel is not available, the coupling can also be submitted to FLENDER to ensure proper workmanship.

Autogard torque limiters can be used as standard in ambient temperatures of $-30\text{ }^{\circ}\text{C}$ to $+80\text{ }^{\circ}\text{C}$. Outside this temperature range, special greases and oils should be used. It will be necessary to consult FLENDER in this connection.

Under optimum conditions, an Autogard torque limiter is lubricated for life and requires no special maintenance.

The journal bearings used are of high-grade P.T.F.E. or oil-impregnated bronze and are maintenance-free.

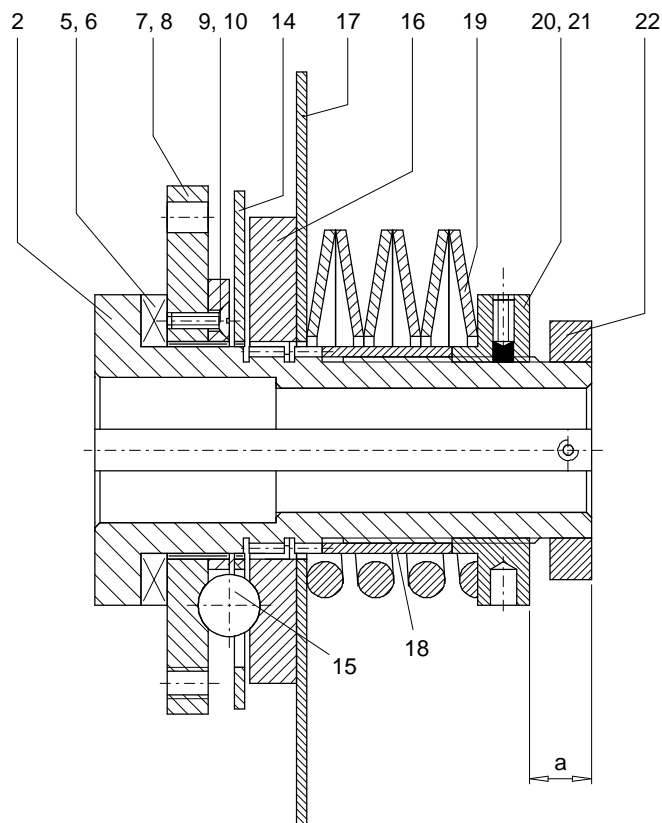
When a machine is subjected to a major overhaul, the Autogard torque limiter should also be checked at the same time.

Under very unfavourable operating conditions, the torque limiter should be checked after 12 - 18 months during a routine machine service.

It should be checked that all components are firmly attached to one another and that all components locate firmly on the coupling hub. For the purpose of checking the lubrication, the adjuster nut (20) and the sliding disk (16) should be removed from the torque limiter. This is best done after extracting the torque limiter from the shaft. If there is any indication that further service operations will be necessary, the complete torque limiter should be removed.

As grease and molykote grease, the lubricants described under Item 10.6 or equivalent products should be used.

10.2 Disassembly



The torque limiter should be placed on a suitable clean work bench such that the hub with the adjuster nut is on top. Scrupulous cleanliness should be observed when working on the torque limiter.

Caution!

Before the torque limiter is disassembled for cleaning or maintenance, the dimension "a" must be measured and recorded and the position of the adjuster nut marked to permit setting exactly the same actuating torque again after assembly.

All the components of the torque limiter should be kept in a safe place to ensure that none are lost.

Disassembly should be carried out in the following sequence:

- After unscrewing the two set screws, the set collar (22) should be removed.
- Slacken the locking screws (21) of the adjusting nut (20) and unscrew the adjusting nut from the hub (2).
- Remove the torque spring(s) (19) from the hub (2).
- Remove the calibration sleeve(s) (18) from the hub (2).
- Remove the actuator disc (17) from the hub (2).
- Remove the sliding disc (16) from the hub (2).
- Remove the guide disc (14) from the hub (2) over the balls (15).
- Remove the balls (15) from the conical recesses in the drive disc (7).
- The screws and dowel pins used for the drive disc have inch dimensions available ex stock.
- Remove the drive disc (7) provided with the strip thrust bearing (8) from the hub (2).
- Remove the needle roller thrust bearing (6) from the hub (2) together with both thrust washer (5).

Note: Screws and pins which have become unserviceable should be replaced by new ones of the same strength class and type.

10.3 Assembly

Before assembling the torque limiter, ensure that all components to be assembled are clean and in satisfactory condition. ONLY original Autogard components may be used, otherwise any form of warranty will be voided.

Assembly should be carried out in reverse order to disassembly as described under Item 10.2.

- Pack the needle roller thrust bearing (6) with grease and with the thrust washers (5) positioned on both sides, guide it over the vertically positioned hub (2) until it abuts on the hub flange.
- Place the oiled strip thrust bearing (8) in the drive disc (7) and position it on the needle roller thrust bearing (5, 6) over the hub (2). Make sure that the strip thrust bearing does not shift during assembly. Other conical recesses for the balls lie clearly visible on top. In case of couplings of sub-assembly type AF..., the cam (9) is screwed to the drive disc (7) before positioning the strip thrust bearing (8). The countersunk screws (10) should be secured with Loctite 243.
- The screws and dowel pins used in the drive disc have inch dimensions available ex stock. The screws should be secured with Loctite 243.
- The slightly greased balls (15) are placed in their respective conical recesses in the drive disc (7). When doing so, pay attention to a symmetrical distribution and the original piece number (see Section 7., item 7.2.1).
- Place the guide disc (14) on the drive disc (7) over the hub (2) so that the balls are located in their respective bores in the guide disc (14). Guide discs of sub-assembly type AF... are usually positioned such that the slot points to the outer right.
- The toothed systems of hub (2) and sliding disc (16) are smeared with Molykote grease. The sliding disc (16) is inserted in the toothed system with the conical recesses pointing downwards. It might be necessary to rotate the drive disc (7) against the sliding disc (16) until the balls (15) engage in their conical recesses on both sides.

- The calibration sleeve (18) suitable for the actuating torque should be placed over the hub (2) onto the toothed system. On initial assembly, the calibration sleeve can be fitted in one or several sections. If a coupling is equipped with laminated cup springs, the calibration sleeve also serves for centring the laminated cup springs.

Caution!

Calibration sleeves (18) may not on any account be completely removed as otherwise no guarantee can be accepted for disengagement of the coupling. Shortening of the fitted calibration sleeves (18) is only permissible with the express approval of FLENDER either. The minimum permissible operating lengths of the single spring types should be taken from item 7.2.1.

- The actuator disc (17) is placed on the sliding disc (16).
- The torque spring(s) (19) is (are) located on the actuator disc (17) over the hub (2). If the coupling is equipped with laminated cup springs, pay attention to the layer arrangement. See also Section 7., item 7.2.1.
- The threads of hub (2) and adjusting nut (20) are also smeared with Molykote grease and the adjusting nut is screwed onto the hub.
If the coupling is being reassembled after a service, ensure that the adjusting nut (20) is positioned exactly as before disassembly in order to ensure the same actuating torque (see dimension "a"). The adjusting nut (20) is locked in position by tightening the locking screws (21). On initial assembly, lead/copper balls are inserted into the tapped holes of the locking screws (21) beforehand in order not to damage the hub thread lying underneath when tightening the locking screws. The locking screws should be secured with Loctite 243.
- The set collar (22) is placed on the hub (2) and secured with set screws. When assembling the coupling on the shaft, the hub (2) should be located on the shaft with these set screws.

Caution!

When mounting drive devices to the drive disc, make sure that the screws and pins necessary for connecting do not project from the inside of the drive disc (7) otherwise, the function of the Autogard coupling will be affected.

10.4 Lubricants

- Grease: Calypsol Grease H443, or comparable branded products
- Molykote grease: Optimoly Paste PL, or comparable branded products
- Oil: Lastan X 220, or comparable branded products.

11. Stocking spare parts, Customer facility addresses

A stock of the most essential spare and wearing parts on site is an important precondition for serviceability of the coupling at all times.

Our warranty only covers original spare parts supplied by us.

Caution!

We would expressly point out that spare parts and accessories not supplied by us have not been tested and approved by us either. Installation and/or use of such products can under certain circumstances adversely affect the specified structural properties of the coupling and thus impair its active and/or passive safety. No form of liability or warranty is accepted on the part of FLENDER AG for damage which occurs as a result of the use non-original spare parts and accessories.

Please note that special manufacturing and supply specifications frequently exist for components and that we always supply spare parts in accordance with the state of the art and in accordance with the latest legal requirements.

When ordering spare parts, the following data should be stated:

- Original order No.
- Size
- Part No. (see figure under item 1.2)
- Piece number
- Designation as follows

Part No.	Designation	Part No.	Designation
2	Hub •	15	Balls
5	Thrust bearing washers	16	Sliding disc
6	Needle cage	17	Actuator disc
7	Drive disc	18	Calibration sleeve •
8	Strip thrust bearing	19	Spring / spring set •
9	Cam ring (only for type AF...)	20	Adjusting nut
10	Countersunk screw (only for type AF...)	21	Locking screw
14	Guide disc	22	Set collar

- When ordering these parts, please state the complete customer-specific data according to the specifications under item 1.1.

11.1 Addresses of spare parts stockists and service facilities

When ordering spare parts or requesting a Service fitter, please contact FLENDER AG first of all.

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INDIA

Flender Macneill Gears Ltd. ■
34, Diamond Harbour Road
Calcutta - 700 027
Tel.: (033) 49 20 47 / 2049 / 17 99
76 70

Tx.: 218 062
Fax: (033) 4 78 38 66

Flender Macneill Gears Ltd. ■
Nimpura Industrial Growth Center
P.O. Rakha Jungle
Kharagpur - 721 301
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SALES OFFICES:

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2, St. George's Gate Road, 5th Floor
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Fax: (0 33) 2 42 08 30

Flender Macneill Gears Ltd. ●
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Ballard Estate
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Flender Macneill Gears Ltd. ●
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Fax: (0 44) 8 52 34 74

Flender Macneill Gears Ltd. ●
Northern Region Office
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3 31 23 59

INDONESIA

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 P.O. Box 2280, Jakarta
 Tel.: (021) 37 22 09
 Tx.: 46 491
 Fax: (021) 35 54 85

IRAN

Cimaghand C. Ltd. ○
 P.O. Box 15745-493, No. 13
 16th East Street
 Beyhaghi Ave., Argentina Square
 Tehran 15
 Tel.: (021) 8 73 02 14, 8 73 02 59
 Tx.: 212 233
 Fax: (021) 8 73 39 70

ISRAEL

Greenspon Engineering Works Ltd. ○
 P.O. Box 10108, 26110 Haifa
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 Fax: (04) 72 62 31

JAPAN

Flender Ishibashi Co. Ltd. ■
 4636 - 15, Oaza Kamitonno
 Noogata City, Fukuoka 822
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 Fax: (0 94 92) 6 39 02

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 Fax: (06) 8 86 81 48

Flender Ishibashi Co. Ltd. ●
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 Korea Branch Office
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LEBANON

Gabriel Acar & Fils s.a.r.l. ○
 Dahr-el-Jamal, Zone Industrielle
 Sin-el-Fil, B.P. 80484
 Beyrouth
 Tel.: (01) 49 47 86, 49 30 58, 49 82 72
 Fax: (01) 49 49 71

PAKISTAN

Ticos International ○
 c/o O. T. Corporation, 114
 Allama Iqbal Road, Lahore - 5
 Tel.: (042) 6 36 93 98
 Tx.: 44 914
 Fax: (042) 6 36 90 30

PHILIPPINES

OTEC Philippines, Inc. ○
 4th Floor Equitable Bank Bldg.
 Sen. Gil. J. Puyat Avenue
 Corner Paseo de Roxas, Makati
 Metro Manila
 P.O. Box 3236 MCPO, 1272 Makati
 Metro Manila
 Tel.: (02) 8 10 35 92, 87 85 51
 87 85 55, 87 85 26
 Fax: (02) 8 18 71 58

**SAUDI ARABIA / KUWAIT
 JORDAN / SYRIA / IRAQ**

Please refer to Flender AG
 D - 46395 Bocholt

TAIWAN

A. Friedr. Flender AG ⊕
 Taiwan Branch Office
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 Nei Hu District, Taipei
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 Fax: (02) 7 90 64 44

THAILAND

Smith Technology Co. Ltd. ○
 128/75 Phaythai Plaza Building
 7th Floor, Phaythai Road
 Rajthevee, Bangkok 10400
 Tel.: (02) 2 16 58 31 / 3
 Fax: (02) 2 16 57 99

UNITED ARAB EMIRATES

Ticos International ○
 General Trading Co.
 P.O. Box 2191, Ajman (U.A.E.)
 Tel.: (06) 42 87 16
 Fax: (06) 42 87 30

A U S T R A L I A

Flender (Australia) Pty. Ltd. ●
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 Sydney
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 Tx.: 27 742
 Fax: (02) 7 56 48 92, 7 56 14 92

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Flender (Australia) Pty. Ltd. ●
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 Qld. 4006, Brisbane
 Tel.: (07) 32 52 27 11
 Fax: (07) 32 52 31 50

Flender (Australia) Pty. Ltd. ●
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 W.A. 6106, Perth
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 Fax: (09) 4 58 35 82

NEW ZEALAND

Please refer to Flender AG
 D - 46395 Bocholt

■ Subsidiary, Manufacturing,
 Sales and Stock

● Subsidiary,
 Sales and Stock

● Flender Sales Office

⊕ Flender Representative Office

□ Representative with Manufacturing
 Licence, Sales and Stock

○ Manufacturer's Agent

◇ Distributor

12. Declaration by the manufacturer

Declaration by the manufacturer

as defined by machinery directive 89/392/EEC Annex II B

We hereby declare that the

AUTOGARD couplings series 200 types ACW, ACTW and AFW size 1-5S

described in these operating instructions are meant for being installed in a machine and that their putting into operation is prohibited until it has been ascertained that the machine, in which these components will be installed, corresponds to the regulations of the EC guideline (original version 89/392/EEC incl. the further amendments).

This declaration by the manufacturer takes into consideration all harmonized standards - as far as applicable to our products - published by the EC Commission in the Official Journal of the European Community.

Bocholt,

01.02.1996
Date



Signature (person responsible for products)